

Denis B. Solovev *Editor*



Smart Technologies and Innovations in Design for Control of Technological Processes and Objects: Economy and Production

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Editor

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“FarEastCon-2018” Volume 1

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Editorial

The International Scientific Conference “FarEastCon” took place on October 2–4, 2018, in Vladivostok, Russian Federation. The conference was organized by 10 universities—Far Eastern Federal University (FEFU, Vladivostok), North-Eastern Federal University (Yakutsk), Amur State University of Humanities and Pedagogy (Komsomolsk-on-Amur), Far Eastern State Transport University (Khabarovsk), Komsomolsk-on-Amur State Technical University (Komsomolsk-on-Amur), Amur State University (Blagoveshchensk), Vladivostok State University of Economics and Service (Vladivostok), Research Institute of Building Physics and Fencing Constructions of the Academy of Construction and Architecture (Moscow), Economic Research Institute of Far Eastern Branch of the Russian Academy of Sciences (Khabarovsk), and Pacific National University (Khabarovsk).

The conference was carried out under financial support of the Far Eastern Federal University, the Russian Foundation for Basic Research as well as at informational support of the Institute of Electrical and Electronics Engineers (Russian (Far Eastern) Subsection of IEEE).

The conference represents an informational platform for accumulation of expert opinion on projects and initiatives that are aimed at implementation of farsighted scientific research and development; it allows to present scientific and practical achievements to a wide circle of researchers.

Sections of the conference are of interest for the broad range of experts in the sphere of development of innovative solutions and organizing events that increase the efficiency of economic and innovative activities.

The international program committee has selected some papers for publishing in the Smart Technologies and Innovations in Design for Control of Technological Processes and Objects: Economy and Production—Proceeding of the International Science and Technology conference “FarEastCon-2018”.

FarEastCon is a high-quality conference with a competitive submission process. For example, in 2018, FarEastCon only accepted 30% of submitted papers. FarEastCon has a rigorous reviewing process that is similar to the processes used by IEEE. Every submitted paper and poster is subjected to this process.

The main criterion is a judgment of the degree to which the submitted paper contributes to substantial new research.

Reviewers rate the paper using a 10-point ranking scale and provide a written evaluation. The written evaluation needs to support the reasoning behind the numeric ranking.

After the review period, there is a discussion period, where all reviewers can see the other reviews.

Organizing committee would like to express our sincere appreciation to everybody who has contributed to the conference. Heartfelt thanks are due to authors, reviewers, and participants and to all the team of organizers for their support and enthusiasm which granted success to the conference.

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Singapore's Cybersecurity Act 2018: A New Generation Standard for Critical Information Infrastructure Protection

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Abstract. National mechanisms of critical information infrastructure (CII) protection differ depending on the information assets, authorities' powers, methods of regulation, etc. Singapore implements the state-driven approach for CII protection that is balanced and calibrated in order to harmonize the efficient powers of authorities with the burdens imposed on IT industry parties. Singapore's Cybersecurity Act 2018 (CSA) establishes a solid and precise framework for the CII protection specifying three core aspects: constant cooperation of public authorities and private sector in envisaging a CII system; broad authorities for prevention, management and response to cybersecurity threats and incidents in Singapore, and compulsory licensing of cybersecurity services. It emphasizes compliance with promulgated codes of practice and expresses designation of CII and cybersecurity threats. The distinctive feature of the act is its significant reduction of the compliance burden on cybersecurity professionals and CII owners. As for the CII protection it's important that computer systems in the supply chain supporting the operation of a CII (i.e. data centre owners and cloud services operators) will not be designated as CII. Thus the CSA illustrates the narrow approach of law makers in envisaging its jurisdiction – it implies just CII owners and not any network operators. Singapore is a first jurisdiction in South-East region that has developed its cybersecurity legislation to impose requirements on certain businesses to implement protections against cybersecurity risks into their computer systems.

Keywords: Cybersecurity · Critical information infrastructure ·
CII protection · Jurisdiction

1 Introduction

Communication networks are a significant element of the modern life. The vast majority of liaisons within the communities, the business environment, the state or the international community are allocated exclusively in such networks. They are the pillars of the information society and an essential part of the single digital market. Some of them are critically important for the national security reasons as they provide vitally important resources or support their movement. Such information infrastructures are critical for the people's convenience and even existence [1] and therefore they are

considered as critical information infrastructures (CIIs). CIIs are the frequent targets for cyber-attacks so the states try to cope with these threats and to search for the adequate structures and processes that could optimally tackle the new cyber risk while protecting core civil rights [2]. In general the situation with CIIs protection on the national level sounds like satisfying. The main trend of delegating responsibility to cyber security authorities, emergency agencies or national regulators which are responsible for operational tasks is being observed. Many of those authorities are responsible for additional tasks on the strategic or political level, such as the development of strategy papers, supervision of the national computer security incident response team or the proposing legislation. Still the half of the national mechanisms have established institutionalized forms of cooperation in forms of public-private partnerships in spite of the fact that the private sector bears responsibility for ensuring network resilience and moreover it participates in the regulation of national information security by providing technical expertise [3]. For all states the critical sectors with the strongest regulations are the telecommunications, finance and energy sectors. Not all the states conduct a risk assessment on a national level. They imply the policy of imposing the responsibility for the risk assessment on sector-specific agencies or on the individual operators [4]. Therefore national standards of CIIs protection differ from the simplest to the advanced ones. It is a fact that states that play a leading role in international economic relations and digital markets are constantly developing their national standards of CIIs protection in order to ensure not only the interior business and community liaisons but also a global supply chain.

Being a most connected nation in a world, Singapore is also an international centre of exchange and commerce. That makes it a perfect target to cyber threats and attacks with more severe consequences for the public order and economics of Singapore then for any other state. Therefore Singapore legislature presented a Cybersecurity Act (CSA) in 2018 following the harsh and productive public debates with private sector involved. It is considered as a new generation standard for protection of CIIs that makes it an object of close attention of professionals from different spheres.

2 Methodology and Literature Review

Please note that the first paragraph of a section or subsection is not indented. The first The methodology for this study comprises of two groups of methods: the general scientific ones (system-structural, formal-logical and hermeneutical methods) and the special legal methods of cognition (comparative legal analyses and formal-legal method). In order to obtain the most reliable scientific results they were used in complex.

CII protection system demands including stakeholders from the public and the private sectors. In many states CII is operated by private entities which are connected internationally through the participation in the entire supply chain. Häyhtiö and Zaerens (Häyhtiö and Zaerens 2017) introduce a management model which enables a network wide protection for critical infrastructure in a contractual environment between the actors with different business domains and functions in a supply chain [5]. Such management model can be used to assess financial differences between centralized and decentralized protection of critical infrastructure.

Because of its operative capacity, the private sector has come to be understood as the expert in network and information systems security, whose knowledge is crucial for the regulation of the field. Farrand and Carrapico (Farrand and Carrapico 2018) identify the shifting role of the private sector in the CII from one of a victim in need of protection in the first phase, to a commercial actor bearing responsibility for ensuring network resilience in the second, to an active policy shaper in the third, participating in the regulation of NIS by providing technical expertise [3].

Every state develops its own model for CII protection (the physical one primarily) and it requires the methodological approaches to be used. It helps to estimate hazards and threats to the infrastructure objects. Bobro (Bobro 2018) emphasizes the necessity of all hazards approach (considering the threats of any origin and directionality). The threats model must use not only the violator's model, but also the object's model and the model of socio-political situation [6].

The nature of cyberspace and its constant evolution are the key factors of development the adequate structures and mechanisms within the state machine. Matania, Yoffe and Goldstein (Matania et al. 2017) outline the necessity in the next phase of evolution of governmental structures – the formation of a single civilian entity with concrete operational capabilities, responsible for defending the national cyberspace and leading national cybersecurity efforts [2].

3 Hypothesis

Singapore is a first jurisdiction in South-East region that has developed its cybersecurity legislation to impose requirements on certain businesses to implement protections against cybersecurity risks into their computer systems. Taking into account its leading role in regional and international economic relations and digitalization processes the CSA clauses should be thoroughly considered and positive experience in regulation of the mentioned sphere applied.

4 Results and Discussion

The internationally recognized definition of the critical information infrastructure is very broad, such as European Commission in its Directive 2008/114/EC of 8 December 2008 on the identification and designation of European Critical Infrastructures and the assessment of the need to improve their protection considers information and communication technologies systems that are critical infrastructures for themselves or that are essential for the operation of critical infrastructures (telecommunications, computers/software, Internet, satellites, etc.) [7]. In the Green Paper on a European Programme for Critical Infrastructure Protection [8] the European Commission provides an indicative list of 11 critical sectors: Energy, Information, Communication Technologies (ICT), Water, Food, Health, Financial, Public & Legal Order and Safety, Civil Administration, Transport, Chemical and Nuclear Industry, Space and Research.

Therefore every state sets the criteria for the declaration of any data, database, network, communications infrastructure, (or part thereof), or anything associated with them as the CII. National authorities have to identify the CII and in this process of identification they have launched different initiatives regarding this topic while others are starting now to develop their own approaches [9]. That leads to the difference in the national mechanisms of CII protection depending on the information assets, authorities' powers, methods of regulation, etc. Within the EU Member States have highlighted their own list of critical sectors based on the special characteristics and peculiarities of each country, adding with some new: e.g. Austria excluded Chemical and Nuclear Industry, France excluded Chemical and Nuclear Industry but included Industry; Italy and Greece excluded almost all sectors except Energy and Transport; UK excluded Public & Legal Order, Chemical and Nuclear Industry, Space and Research but included Emergency services [9].

Analysts observe four different maturity levels with regards to CII activities across the states. Level 1 is being characterized with the absence of activities related to the protection of CII; states have identified only transport and energy as critical sectors. At maturity level 2 the state identifies the information and communications technology sector as one of critical sectors that should be addressed. At the level 3 states develop a general methodological framework for the identification of critical information assets with specific steps and responsibilities assigned to involved stakeholders. And the highest maturity level 4 outlines the development of a definition for CII and establishment of specific criteria for the identification of CII assets. At this level states are being considered as the mostly advanced in the area of the CII protection and have taken specific measures for the identification and protection of CII assets [9].

The crucial factor for the CII protection is the effective collaboration between public sector (Government & mandated Agencies) and the private sector, which often controls numerous critical infrastructures. It is a common practice that the service providers are defined by the mandated agency as operators of CII: they offer certain critical services to public, support the large scope of the population and the territory, their risks may become the national ones. They are responsible for determining the core processes, the respective applications and, as a last step, the network assets and services (connectivity solutions) which are used to operate the respective applications. An asset can be critical related to (a) the business value, (b) the scope of the population served or (c) the technical dependence of critical applications and this classification depends on the sector and the role of the CII [9].

There are two different approaches for an identification of critical services depending on the leading role for such identification. The state-driven approach assumes the leading role of the government agencies that have the mandate to identify and protect CII and the operator-driven approach assumes the leading role of the CII operators. The latter is performed in France, where the state identifies a list of operators (called also 'vital operators'), who are responsible to identify the individual critical services and assets that comply with a number of risk analyses and risk management directives. Then, the responsible ministries review the selected services and assets along with the drafted CII protection plans. This is a pragmatic approach given the current state of the art of CII identification since operators have a better knowledge of

their infrastructures. It also represents a shift of the effort needed to the operator to which is delegated the accountability [9].

The essence of standards for the CII protection implemented by the CSA in Singapore emphasizes cybersecurity as a default consideration, which means that developers of Smart City eco-systems will need to provide the reassurance and security required within interconnected networks and devices in order for such eco-systems to flourish. The Singapore's emphasis of protecting CII mirrors the position taken in other countries and regions, notably in European Union and in China, emphasizing the need for parties who are interconnected within the eco-system in which CII owners and operators operate to adopt a harmonized approach [10].

Singapore's Cybersecurity Strategy distinguishes four core pillars. The first one is to strengthen the resilience of CIIs by mobilizing businesses and the community. The second pillar is the safety of cyberspace, where all cyber threats are countered; cybercrime is combated and personal data are protected. The third pillar is a developed vibrant cybersecurity ecosystem comprising a skilled workforce, technologically-advanced companies and strong research collaborations, so that it can support Singapore's cybersecurity needs and be a source of new economic growth. And the last but not the least pillar is the forging of strong international partnerships [11].

In 2016 Singapore has identified a list of CII sectors which are services (government and emergency services, healthcare, media, and banking and financial services), utilities (power, water and telecommunications), and transport (land transport, maritime and port, civil aviation) [11]. In 2018 the CSA scoped the CII sectors within a term "essential service", which means any service essential to the national security, defense, foreign relations, economy, public health, public safety or public order of Singapore, and specified them in the First Schedule (46 in a list): services relating to energy, information communications, water, healthcare, banking and finance, security and emergency services, aviation, land transport, maritime, media, and services relating to functioning of Government [12].

The CSA defines "critical information infrastructure" as a computer or a computer system that is necessary for the continuous delivery of an essential service, and the loss or compromise of the computer or computer system will have a debilitating effect on the availability of the essential service in Singapore; and is located wholly or partly in Singapore (section 2, section 7(1)).

The designed framework for the CII protection is being headed by Commissioner of Cybersecurity (Commissioner). Deputy Commissioner and one or more Assistant Commissioners of Cybersecurity assist the Commissioner in the discharge of the Commissioner's duties and functions (section 4). Duties and functions of Commissioner are stated in a Clause 5 of the CSA. They comprise among many others such duties as identification and designation of CII, regulation of owners of CII with regard to the cybersecurity of the CII (section 5(e)); establishment of cybersecurity codes of practice and standards of performance for implementation by owners of CII (section 5(f)); licensing and establishment of standards in relation to cybersecurity service providers (section 5(j)); establishment of standards within Singapore in relation to cybersecurity products or services, and the recommended level of cybersecurity of computer hardware or software, including certification or accreditation schemes (section 5(k)).

The most sufficient parts of the CSA are parts 3, 4 and 5. Part 3 provides for the designation of CII and the regulation of owners of CII with regard to the cybersecurity of the CII. Part 4 provides for the taking of measures to prevent, manage and respond to cybersecurity threats and incidents in Singapore. Part 5 provides for the licensing of providers of licensable cybersecurity services. The Commissioner of Cybersecurity office is responsible for implementing the provisions of above-mentioned parts.

As for the designation of CII the Commissioner may, by written notice to the owner of a computer or computer system, designate the computer or computer system as a CII. To ascertain if computer or computer system fulfils criteria of CII the Commissioner has a power to obtain the necessary information from the owner of such computer or computer system and to require the owner of a CII to furnish information relating to CII. The CSA grants a right to withhold such information in a case it is protected by law, contract, or the rules of professional conduct (section 8(5)). However, a contractual obligation remains an invalid excuse for refusing to disclose information in the context of (i) an information request pertaining to a known CII or (ii) investigations of cybersecurity incidents (section 19(6)). Under the CSA, the CII owner will not be treated as being in breach of any such contractual obligation if the disclosure was done with reasonable care and in good faith for the purpose of complying with such an information request. However, these provisions still risk raising concerns with businesses about protection of their commercially sensitive information. The CSA requires owners of CII to report “prescribed” cybersecurity incidents or any other incidents specified by the Commissioner. Previously, the Draft Bill required the reporting of all “significant” cybersecurity incidents. Prescribed cybersecurity incidents requiring notification will be set by the Commissioner [13].

The Commissioner is also empowered to issue written directions which may relate to (a) the action to be taken by the owner or owners in relation to a cybersecurity threat; (b) compliance with any code of practice or standard of performance applicable to the owner; (c) the appointment of an auditor approved by the Commissioner to audit the owner or owners on their compliance with this Act or any code of practice or standard of performance applicable to the owner or owners; (d) such other matters as the Commissioner may consider necessary or expedient to ensure the cybersecurity of the critical information infrastructure (section 12).

The CSA requires audits at least once every two years and risk assessments once a year for the affirmation of compliance of the CII with this Act and the applicable codes of practice and standards of performance, to be carried out by an auditor approved or appointed by the Commissioner (section 15). Clause 15 implies severe consequences in a case of violation of this provision – the owner of the CII shall be guilty of an offence and shall be liable on conviction to a fine not exceeding \$100,000 or to imprisonment for a term not exceeding 2 years or to both and, in the case of a continuing offence, to a further fine not exceeding \$5,000 for every day or part of a day during which the offence continues after conviction.

The prevention of cybersecurity incidents is fulfilled by conducting compulsory cybersecurity exercises for the purpose of testing the state of readiness of owners of different CII in responding to significant cybersecurity incidents. The Commissioner writes a direction and any person who, without reasonable excuse, fails to comply it

shall be guilty of an offence and shall be liable on conviction to a fine not exceeding \$100,000 (section 16).

On response to cybersecurity threats and incidents the Commissioner empowered to investigate and prevent cybersecurity incidents including the serious ones by (1) receiving signed statements, physical or electronic records and documents; (2) examining orally any person who appears to be acquainted with the facts and circumstances relating to the cybersecurity threat or incident; (3) appointing cybersecurity technical experts etc. (sections 19, 20, 22).

Clause 23 empowers the Minister to authorize or direct any person or organization to take emergency cybersecurity measures and comply with necessary requirements, for the purposes of preventing, detecting or countering any serious and imminent threat to the CII. Those measures or requirements (a) do not confer any right to the production of, or of access to, information subject to legal privilege; and (b) have effect despite any obligation or limitation imposed or right, privilege or immunity conferred by or under any law, contract or rules of professional conduct, including any restriction on the disclosure of information imposed by law, contract or rules of professional conduct. The CSA obliges any person to meet the requirements of the specified person otherwise he or she shall be guilty of an offence and shall be liable on conviction to a fine not exceeding \$50,000 or to imprisonment for a term not exceeding 10 years or to both. Clause 23 comprises detailed specifications on different aspects of meeting the emergency measures and requirements.

Another specific feature of the CSA that makes it a new generation standard is a licensing framework for cybersecurity service providers. It is aimed to assure a safety and security to consumers of cybersecurity services, to address information asymmetry in the industry and to provide the improvement of the standards of cybersecurity service providers and professionals. Section 24 details the main principle of the CSA - no person to provide licensable cybersecurity service without license. Licensing functions are assigned to the Commissioner who is responsible for the administration of that framework. The licensable cybersecurity services are (a) managed security operations centre (SOC) monitoring service; and (b) penetration testing service.

Managed security operations centre (SOC) monitoring service is a service for the monitoring of the level of cybersecurity of a computer or computer system of another person by acquiring, identifying and scanning information that is stored in, processed by, or transmitted through the computer or computer system for the purpose of identifying cybersecurity threats to the computer or computer system.

Penetration testing service is a service for assessing, testing or evaluating the level of cybersecurity of a computer or computer system, by searching for vulnerabilities in, and compromising, the cybersecurity defenses of the computer or computer system, and includes any of the following activities: (a) determining the cybersecurity vulnerabilities of a computer or computer system, and demonstrating how such vulnerabilities may be exploited and taken advantage of; (b) determining or testing the organization's ability to identify and respond to cybersecurity incidents through simulation of attempts to penetrate the cybersecurity defenses of the computer or computer system; (c) identifying and quantifying the cybersecurity vulnerabilities of a computer or computer system, indicating vulnerabilities and providing appropriate mitigation procedures required to eliminate vulnerabilities or to reduce vulnerabilities to an

acceptable level of risk; (d) utilizing social engineering to assess the level of vulnerability of an organization to cybersecurity threats (Second Schedule).

The CSA envisages three types of licenses depending on their conditions specified: (a) general (conditions are applicable to all licensees); (b) specific (conditions are applicable to a specified class of licensees); and (c) individual (conditions are applicable to a specified licensee only). A license is in force for such period (not exceeding 5 years) as the licensing officer may specify in the license, starting from the date of its issue. Such a discretionary authority of the Commissioner provides for the optimal protection of the CII. A licensee is obliged to fulfill the requirements imposed by the CSA (first of all it's a duty to keep records of the information necessary for the CII protection for three years) and is a subject of financial penalty if fails to comply with it (a fine not exceeding \$10,000 or imprisonment for a term not exceeding 12 months or both).

The appeal authority in a licensing framework is a Minister and the Clause 35 provides for an avenue of appeal to the Minister against decisions made by the licensing officer. The decision of the Minister on an appeal is final (section 35(7)).

5 Conclusions

Singapore implements the state-driven approach for the CII protection. At the same time this approach is well-balanced and calibrated. The legislature has tried to harmonize the efficient powers of authorities with the burdens imposed on companies and private individuals in the IT industry. The CSA establishes a solid and precise framework for the CII protection specifying three core aspects: (1) constant cooperation of public authorities and private sector in envisaging the CII system; (2) broad authorities for prevention, management and response to cybersecurity threats and incidents in Singapore, and (3) compulsory licensing of cybersecurity services. It emphasizes on compliance with promulgated codes of practice and expresses designation of CII and cybersecurity threats. The distinctive feature of the CSA is its significant reduction of the compliance burden on cybersecurity professionals and CII owners. As for the CII protection it's important that computer systems in the supply chain supporting the operation of a CII (i.e. data centre owners and cloud services operators) will not be designated as CII. Thus the CSA illustrates the narrow approach of law makers in envisaging the CSA jurisdiction – it implies just CII owners and not any network operators. At the same time the CSA has created some temporary uncertainties, for example, it contains a term “debilitating effect” (section 7(1)) referring to availability of an essential service. It is expected to be fixed in the upcoming Cybersecurity Act's Regulations containing detailed prescriptions relating to the practical operation of the CSA: the process for the designation of CII, the standards to be maintained by an owner of CII, the responsibilities and duties of an owner of a CII and the type of changes that are considered material changes to the design, configuration, security or operations of CII to be reported by an owner of CII [13, 14]. All above-mentioned characterizes the CSA as a new generation standard for the CII protection in a modern high-risk digital world.

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Modern Developments in Behavioral Economics

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Abstract. The study examines the place of behavioural economics in the structure of economic science and the practice of state regulating. The thesis that neoclassicism is an appropriate normative approach for analysing human behaviour is defended but the comparative advantages are on the side of behavioural economics in the answers of descriptive, diagnostic, prognostic and perspective questions. It tracks the historical roots, the ideas of behavioural economics for the limited rationality, will and egoism are presented in short as well as the contribution of behavioural approach to the state intervention's ideology and practice. The libertarian paternalism idea and its role for the transformation of "state of wealth" into the gaining clearer and clearer outlines "new paternalistic state" are presented.

Keywords: Behavioural economics · Libertarian paternalism · Nudge

1 Introduction

There is consensus existing in the behavioural sciences that three types of questions need theoretical explanation. The first is the normative question "How should people act". The second type of questions are directed towards three problems: the descriptive "How do people actually act", the diagnostic "Why they act this way" and the prognosis "What results their behaviour would lead to". The third type of questions is the perspective question "How to achieve that the people act the way they should act". Although desirable, a theoretical construction is not able to give answer to all three types of questions.

Undoubtedly, the neoclassical idea for "Homo Economicus" is successful in finding normative answers for the ideal we should strive for. "Homo Economicus" is rational, possesses unlimited possibilities to acquire and process necessary information, reacts in a predictable way to the stimuli created by the market and public institutions, pursues his own interest and has the will to realize his goals. The assumption for rationality is altogether simplified, powerful and precise enough tool, with which one can quest for descriptive answers and prognosticate wide range of economical phenomena. However, there are phenomena and facts that are in contradiction with the fundamental assumptions for rationality.

We difficultly estimate the possible outcomes and the probability of their occurrence. We overestimate ourselves and act with prejudice towards the others. Our optimism is unduly high and at the same time, we exaggerate the damage of possible losses. We use mental models that frame information the way we often interpret it incompletely and wrongly. Our choices depend on the context and we show tendency for anchoring to useless and unspecified information. We stick to the status quo, follow our previous behaviour or the others, show conservatism and avoid changes, even when they are urgent. We are led by reciprocity and often turn our back to our own interests: we are ready to allocate resources and efforts to encourage those, who behaved fairly, and to penalize injustice.

In general, most of the people do not succeed in maximizing the expected usefulness and apply simplified but wrong strategies for decision-making and make better choices when having limited number of alternatives. They often act against their own interest: they postpone important things such as prophylactic examinations, qualification and saving for retirement, they stick to the option implicitly even if it is not the best choice of theirs, invest unreasonably, tend to accept tricky advices and to vote for unreasonable political projects, etc.

All these are examples of behavioural failures, which cannot be integrated in the picture of neoclassical economics. They are manifested particularly strongly at: time discrepancy between decisions' benefits and losses (savings and insurances, consumption of alcohol or other problems of self-control); need of expert knowledge (choosing a leasing plan or another financial product); low repetition of decisions and impossibility to learn from experience (family binding, purchase of home and car, how many children to have and the choice of a career); bad feedback (healthcare, education and savings); choosing among unknown alternatives (working place, medical procedure, school or vacation package); experience accumulation is damaging (the negative dependences). The list practically means that there are behavioural failures in almost all situations and activities, except the repeating simple deals. Besides, they are universal. Despite his intelligence, education, experience, wealth or influence, at certain circumstances and regarding certain issues, each one of us is limited within his rationality, self-control and egoism.

Not considering the limitation of rationality, self-control and egoism and the resulting behavioural failures prevents neoclassical economics from presenting correct descriptive picture of human behaviour and forces for its idealized understanding for "Homo Economicus" to be corrected. A new stream in the theory of economics that became popular as behavioural economics tries to put the real human and the behavioural failures in the centre of the economic analysis attention in the last forty years. Its goal is to improve the reality and quality of economic analysis, which would result in better prognosis of the real humans' behaviour and in formulating better recommendations for the followed policy.

The present article aims to summarize the achievements and challenges ahead of behavioural economics in achieving its purposes. It would track the sources and the logic of its development, would present its main achievements worldwide and at home and would outline its role and perspectives within the frame of modern economic sciences and the state governing practice.

2 Behavioural Economics: Development, Condition and Perspectives

Sources and Development

The roots of the behavioural economics' methodological approach are in the remote 1759. Then the 35-year old teacher in Ethics in the University of Glasgow Adam Smith publishes his first big work, *Theory of Moral Sentiments*. There he uncovers some features of human behaviour that cannot be integrated in the idea for the "economic person". Among them are the over-confidence ("the haughty self-reliance on the own capabilities that most of the people possess") and the lack of foresight at choices that regard the future ("the pleasure we will get in ten years is interested for us much less compared to what we can enjoy today"). Adam Smith also reasons for the first time about avoiding losses, pointing that we suffer more when we fall from good to worse state than we enjoy it when the state changes from bad to better. He admits that we possess the natural trend to take care of ourselves because prudence dictates so. However, as far as we are also social beings, we are gifted with natural sympathy with the others, with striving towards justice and virtues like involvement, self-control, self-criticism and conscience. In the process of taking many of our decisions, we do not need to think, but we are led by ethic rules and norms. Despite our passing emotions and interests, the raised by them "sentiment of duty", proud and shame help us observe the principles of moral and unpremeditatedly to contribute to the others' happiness and to the public peace. For Adam Smith legal penalties and encouragements may be aim the same results but they could never be so consistent, immediate and effective as conscience and moral rules dictated by nature and society.

Psychology and sociology do not exist as independent behavioural sciences in the first years of economic theory development and economists pay considerable attention to moral, sentiments, human impulses and emotions. Their theoretical tools like the Law of Diminishing Marginal Utility for example, use psychological arguments. Despite the proclaimed respect to Adam Smith, since the 70s of the 20th century, influenced by the works of William Jevons, Karl Menger, Leon Walras and Francis Edgeworth, economic theory takes away from his intellectual heritage. Then the emerging neoclassical paradigm starts referring more and more critically towards the hedonistic assumptions of Jeremy Bentham's Utility Theory, economy gains the image of a natural science that explains human behaviour as rational and relies fundamentally solely on the behaviourist stream of psychology. The human act itself becomes its problem, not the motives behind it; the results, not the processes that caused them; what people do, not why they do it; what the problems in the relations between the separate agents are, not the problems in each one of them.

The neoclassical models of rational choice dominate in economics until the end of the 20th century. Economics and the other social sciences use them to explain in logic and convincing way not only the behaviour of the market and how the companies stimulate their employees and the consumers react to the changes in prices. Neoclassical economics' application field considerably broadens in the course of years and includes such issues as voting at elections, family behaviour, education and healthcare, dependencies, criminality, terrorism and armament.

Neoclassical stream attracts numerous researchers but the searches of some of them lead to results that contradict the neoclassical theories that had inspired them. Strong is the critics coming from other sides, too. In his *General Theory of Employment, Interest and Money* John M. Keynes uses many times as arguments “animal instincts”, “spontaneous optimism”, “money illusion”, “tendency for stubbornness in making mistakes” and other social-psychological characteristics that cannot be attached to the understanding for the optimizing “Homo Economicus”. Fr. Von Hayek also emphasizes that Rational behaviour is not a precondition in economic theory although it is often presented to be. The theory’s main statement is rather that competition would make people act rationally in order to make their own living. Enough evidence appears in the second half of the 20th century that the principles of rationality are unrealistic and that the economic theory evolution anticipates considerably human evolution. This gradually restores the connection of economics with the rest of the behavioural sciences, directing researchers’ attention towards actual behaviour and psychology new achievements in fields like thinking, problems solving and decision making.

In the middle of the 50s Herbert Simon (1916–2001) proves that economic agents, even if they want to maximize their wealth, they do not have the necessary information, cognitive capacity and time to process the available information and instead of following the postulates of rationality, they find “satisfying” solutions. As far as they are not able to catch and make sense of all the available information, they react consciously to only a small part of it and act in a way different from the way they would follow at the availability of all the information.

In the beginning of the sixties Vernon Smith (1927–), also awarded Noble Memorial Prize in Economic Sciences in 2002, brings into question some of the basic assumptions of the rational choice model, which concern markets functioning. V. Smith conducts experiments to simulate markets functioning. This sets the beginning of the so called “experimental economics” and results in a remarkable discovery: although the participants in the experiments do not have full information and are not always rational in their behaviour, market equilibrium is anyway achieved. This means that in methodological aspect we do not need rational individuals to explain the rational market result.

In 1967, the German-born American psychologist Ulric Neisser (1928–2002) published his work of *Cognitive Psychology*, with which he gave the name to this new branch of psychology. He develops it as inter-disciplinary stream that unites intuitive models of classical philosophical thinking with the experimental psychology’s empiric approach.

A year later, in 1968, Howard Raiffa published his book “*Decision Analysis: Introductory Lectures on Choice Under Uncertainty*” and sets the beginning of modern decision making theory. The same year he, John Hammond and Ralph Keeney publish an article that describes seven psychological traps, which could negatively influence the way of decision making, namely the traps of: (1) anchoring – giving disproportionate weight to unessential incidental information; (2) status quo – sticking to the present choices even if better alternatives exist; (3) the sunk cost – binding and consecutive repetition of mistakes from the past; (4) confirming evidence – looking for status quo

confirming information and discounting opposing information; (5) overconfidence – overestimating the accuracy of own forecast; (6) the prudence – over-caution at estimating uncertain events; and (7) the recallability trap – giving undue weight to recent, dramatic events.

The ideas of Herbert Simon, Vernon Smith, Ulric Neisser and Howard Raiffa are the base for a huge jump for the economic agents' behaviour understanding. It was carried out by the Israeli cognitive psychologists Daniel Kahneman (1934–) and Amos Tversky (1937–1996) in the last quarter of the 20th century. They discover number of features of human thinking that offer natural explanation of observed reactions and anomalies in the made decisions.

The first important conclusion out of Kahneman and Tversky's studies is that thinking is dual and is predominantly automatic, not rational. Automatic thinking resorts to what comes to our mind without efforts. In great part of the time, instead of making complicated calculations and thinking over all possible ways of acting we prefer simple decisions and use “short mental paths” or “heuristics”. Our ability of elaborating intuitive assessments plays the main role in this way of thinking and acting. It has formed long before logic thinking developed and is common for humans and animals. Intuition is characterized by speed and automatism necessary for surviving. It is based on the accumulated knowledge and experience from the past but often has no answer to the more difficult issues we face in our social interactions, in professional field or in economic relations. Then intuitive system consults rational thinking. It is slower, is managed by formal rules, has a lot of knowledge and this makes it flexible, but at the same time is way lazier and tend to save its efforts.

The last fact is easily explained. Brain is very powerful tool for assessment and decision-making. However, it is much ineffective. Typical human brain is just two percent of the total body weight but consumes 20% of the body energy. More, its energy ineffectiveness does not even allow its full capacity to be used. Brain cannot set in simultaneous operation more than two percent of its neurons. If it exceeds that limit, the reserves of the used fuel – glucoses – exhausts so rapidly that the person loses consciousness. Because of these restraints, each economy of intellectual efforts and time is much desirable. That is why, when possible, consciousness always acts intuitively and processes automatically sensuous signals as well as the information about gains and losses, wealth, prestige and social hierarchies. Intuitive system quickly and imperceptibly pre-formulates the received information into its abstract representation and leads to the relevant act.

The second revolutionary contribution of Kahneman and Tversky comes in 1979 with their article Prospect Theory: Decisions Under Risk. Here they present evidences for number of animalises that contradict the Expected Utility Theory and offer an alternative theory, based on several principles: separate estimating of each possible outcome toward particular reference point, losses exceptive avoidance and asymmetric estimation of benefits and losses, different attitude towards the risk at gains and losses. Their article is published in the renowned magazine of *Econometrica* and is one of the most cited publications of the magazine – more than 40 000 times.

When Daniel Kahneman summarized his ideas in his book *Thinking* in 2011, the *Economist* magazine compared the scholar's achievements with the ones of Copernicus and Darwin: “As Copernicus removed the Earth from the centre of the universe and

Darwin knocked humans off their biological perch, Mr Kahneman has shown that we are not the paragons of reason we assume ourselves to be”. Actually, Kahneman’s position is a way more moderate. According to him, “The main feature of agents is not that they reason wrongly, but that they often act intuitively. And that their behaviour is not guided by what they are capable to calculate, but what they happen to see at the certain moment”. Said in other words, the problem behind the often lack of rationality is not that people are fool of undereducated but that they are driven by intuition and emotions, i.e. that they are humans.

The collaboration of Kahneman and Tversky’s in the 80s of the 20th century with the then young American economist Richard Thaler (1945–) results in the occurrence of behavioural economics as a separate stream of economic theory.

Behavioural anomalies that cannot be explained by the traditional economic models become motive for progress and main object of research in the first steps of behavioural economics. It is revealed they are natural and systematic and this allows them being studied and being predictable. To analyse them, behavioural economics integrates the newest theories and hypothesis of economics and the latest achievements of cognitive psychology, social psychology, psychophysiology, evolutionary economics, sociology and even neurology. Within this integration, behavioural economics takes from traditional economics the interest towards decision’s results, from the cognitive psychology and neurology – the interest towards the very process of decision making, and from sociology – the interest towards environment and norms impact. It is already interested in not only what choice people make but also why they do it and what processes define their ratiocinations, estimations, decisions and actions. Thus understanding about human behaviour is achieved, where the assumption for rationality is corrected.

Behavioural economics ideas do not exhaust with the explanation of human behaviour and behavioural deviations from rationality. Predictability of behavioural failures allows them not only being recognized and reported but also being overcome. Two articles published in 2003 – Libertarian Paternalism (and Regulation for conservatives: Behavioural Economics and the Case for the Asymmetric Paternalism point the intellectual connection between the condition, in which people make behavioural mistakes and the questions whether, when and how these mistakes to be corrected. The conclusions turn behavioural economics into political doctrine that gives the grounds of new responsibilities and new scope of tools for the state to intervene, which change the context of individual choices the way that they: (1) increase individual wealth and help people achieve their own normative preferences and (2) do not limit the individual rights and freedom of choice. In 2008 this doctrine gets its own popular name – “nudge”), although the authors of the book bearing the same name prefer it to be called “Liebratrian Paternalism”.

Nudging as Contribution in the Ideology and Tools of State Regulating

“Each form of intervention in individual choices, if it contributes to the effective removal of the problems with behavioural failures” is desired and acceptable for behavioural economists. Thus, in contract to neoclassical paradigm, an extensive state intervention is allowed including the cases, when the decisions regard only the ones, who take them (even at the absence of failures and distribution problems).

The scope of tools and methods of governmental intervention is extremely wide. On one hand, behavioural economy re-estimates many of the traditional plans and regulatory tools, suggesting conceptual frame for ones and has serious doubts on the effectiveness of others. On the other hand, it introduces new, non-standard tool of “behavioural” policy in society’s agenda. Their character is paternalistic and they may have impact upon: (1) the results, without disturbing people’s actions or opinions (automatic transfer of additional mandatory insurance payments from private funds into the National Insurance Institute); (2) the actions, without changing the beliefs (the fines for exceeded speed limit); (3) the beliefs, aiming influence on the actions (educational campaigns on the damage of overweight); (4) the preferences, no matter if it changes beliefs (the warning signs on the cigarette boxes and commercials).

However, not all tools of paternalistic intervention are equally preferred for the behavioural approach.

First, the preferred is the paternalism that affects the means, not the goals. For example, if you would like to save funds, you’d better use energy-saving and reliable appliances. Directing your choice towards such type of appliances through information on the labels on the electric power consumption or through imposing standard of power effectiveness does not disturb your goal, but helps you achieving it. Navigation systems integration in the automobiles has the same effect. You decide where you would like to go and the navigation system helps you do it with the least expenses of time and fuel. “Smart” pedestrians with inscription “Look right” or “Look left” are also an example for tools paternalism. Focusing the attention on the correct direction, they just help the pedestrians to do safely what they themselves had decided to do – to cross the street. The same is with the regulations for mandatory belts in automobiles and helmets for motor-bikers, the labels containing the ingredients of food and the standards for their production. Paternalism of tools respects the individual goals – you to save, to move safely, to make informed decisions of your own interest – but considers that people’s actions are not always complied with them, and directs their actions in the correct direction.

Second, behavioural approach prefers the “soft” forms of paternalism. These forms affect without imposing high expenditures. Examples are the small and moderate fines, the warnings, the educational programmes, the requirements for information about products, including the energy effectiveness and the fuel expense, the regulations on the place, time, packaging and way of selling of products, the options by implication and the automatic inclusion in a saving or insurance plan.

Behavioural economists support the “hard” forms and the paternalism of goals in two cases. The first is when they bring much bigger benefits than expenses. An example is the imposing of energy effectiveness and fuel expense standards, the ban for drug use, the frightening pictures on the consequences of smoking upon the cigarette boxes that overexpose problems, etc. Paternalistic interventions are asymmetric in all similar cases: “... they do great good to the ones, who make mistakes, and at the same time, impose little or no expenses on those, who are completely rational. Such regulations are relatively harmless for the ones, who make decisions that correspond to their best interest, whole, at the same time, are favourable for those making non-optimal decisions”. The second one is when they are demanded by John St. Mill’s harm principle. However, essentially such constraints are not purely paternalistic, because

they are not grounded on protection of people's own interests, but on the principle that everyone is free to do what he wants under the condition not to disturb anybody else's rights. In these two cases, if the decisions are left to the people themselves, then they would strive for getting insignificant short-term benefits and would neglect the much bigger long-term expenses for them as well as the damages they cause to the others with their own behaviour.

Third, libertarian paternalism prefers open, public and directed to rational system tools for "nudging". They are meant for taking out of the automatic mode and for alarming the rational systems through drawing the attention and focusing upon the action, that is taking place at the moment. The "nudged ones" are aware with these aims before undertaking action and if they do not accept them, they can follow another type of behaviour, too. Not opened, hidden and directed towards the automatic system "nudging" works the way that the ones towards whom it is directed, cannot uncover neither the intentions nor the means, by which behaviour change is sought. No matter whether they cause unconscious or conscious reactions, their non-transparency does not allow people even to understand they are subject to correcting influence, and this means that practically, they do not have the freedom and cannot avoid it. As a result "nudging" may easily turn into manipulation of others' choices and behaviour and open the door to their unconscious in order thoughts, desires, fears, worries or model of behaviour to be put inside to lead them to actions that are not of interest for them. And, as far as this happens non-transparently, "nudging" would stay unnoticed and "the ones who initiate the nudging" would avoid the control on their actions and the responsibility for them.

The pointed three characteristics contain the contribution of libertarian paternalism to state regulation's ideology and the practice. It extends the boundaries of admissible state intervention in people's lives compared to neo-liberalism, but the position it proclaims is much more balanced, prudent and moderate than the one of traditional paternalists. However, critics are not few. Radical opponents of neoclassicism consider it too soft and inconsistent. Neoclassicism supporters consider it form of manipulation of civilians and of state directing them towards actions they have not agreed and cannot avoid.

Critics and Reactions

The main critics are fed by the possibility for paternalistic manipulations. Limited rationality and will do not mean people are fool. They might be aware of their own deficit of self-control when they choose chips instead salad but consciously and certainly to prefer the first if they are not on diet. Why should someone intervene in their choice and change it? If "nudging" is premeditated attempt to influence others' behaviour and decisions, which is based on certain values and has certain goals, what is the guarantee that these values and goals comply with own values and goals of the nudged ones? How to guarantee that "nudging" is "for good" and how to avoid "evil nudges"? What makes libertarian paternalism's moral different from the one of traditional paternalism if, in the long run, it also forces people without their agreement and often without them being aware, to act in certain direction? How can the "initiators of nudging" uncover "the real" preferences of others if the latter, being rationally limited, are not aware of their own preferences and do not even think about them. If people

cannot achieve what they would like to, because of their deformations, what prevents the “initiators of nudging” from the same deformations they should save the others from?

Libertarian paternalism faces critics also because of the effect upon stimuli and responsibility of people. It establishes the relations between state and civilians after the model of the relations between adults and children. “Nudging” children is much easier than adults. That is why most often the “nudging” ones behave in infantile manner with the “nudged” ones. In most cases their behaviour uses arguments, symbols, words and intonation as if speaking of children with impediments in their growth or mentally ill. Manipulative potential of that is dangerous and should be taken into consideration. If someone behaves with a person this way, as if he is unconscious child, then his reaction would be lack of critical estimation and the desired behaviour and choices would be easier achieved.

Infantilization of civilians is a problem because of yet one more reason. It creates danger of state intervention escalation: the more infantile and deprived of stimuli to develop their good decision making potential the civilians are, the more care from the state they need; but the greater these cares are, the bigger civilians’ irresponsibility and dependency grow. Thus, practical application of “nudge” tools may result in self-performing prophecy: decreasing ability of people to learn from their mistakes and to make good decisions would lead to more people making wrong decisions, which, on its part, justifies new interventions through “nudges”.

Not the last, libertarian paternalism is also criticized for it uses peripheral mechanisms for influence and can achieve only shallow and short-term changes. As far as it avoids the main way of influence, it does not provoke long-term transformation of attitudes and is not able to lead to long-term changes in behaviour.

All these issues are serious and behavioural economics agrees they have their grounds. It admits they cannot be overcome solely through greater attention towards the selection, expert background, moral and motivation of the “choice architects”. Two more types of measures are necessary. The first one is to use predominantly the forms of soft paternalism and transparent nudges that are directed towards the rational system, and to avoid hard paternalism and non-transparent nudges, particularly the ones using the automatic system of thinking as a channel for influence. Second, emphasis should be put on enhancing personal responsibility of people for their own present and future well-being as well as on the formation of knowledge and skills in everyone to be able himself to “nudge” his own behaviour in the desired direction, to understand the techniques and methods used to be manipulated and controlled against his will, and to prevent himself from undesired and “evil nudges”. The latter means to pay serious attention to study and increase critical weight of factors that raise the rationality level, for example education, specialized training on the reasons for behavioural mistakes and techniques for prevention from them, building public values and norms, construction of self-control supporting infrastructure, etc.

New Theories and Recognition

Despite these critics, behavioural economics gains new territories in the recent years. The main reason is that it works, where the others fail. While the economic processes surprise the adherents of traditional approaches in the first decade of the new century,

behavioural economists succeed in prognosticating them. Robert Shiller with his book *Irrational Exuberance* (2000), Hersh Shefrin, author of *Beyond Greed and Fear: Understanding behavioural Finance and the Psychology of Investing* (2000), Andrei Shleifer and Meir Statman, authors of *Inefficient Markets: An Introduction to behavioural Finance* (2000) have significant contribution to that.

All those give some of the behavioural economists grounds for direct attack against the dominating neoclassical economic theory. “We pay awful price for our blind faith in the power of the invisible hand”, Dan Ariely considers. “Neoclassical theory is inaccurate. It does not allow us to understand why economy progresses at leaps”- Nobel laureates George Akerlof (1940-) and Robert Shiller (1946-) diagnose in their book *Animal Spirits*. And explain “how economy actually functions, when people are really human”, they present ambitious programme: “To achieve what existing theory have not been able to realize.”

Behavioural economy adherents gain bigger and bigger recognition within the economic sphere since the beginning of the new century. In October 2004 Eugene Fama, the founder of effective markets theory, admits for *Wall Street Journal*: Shares prices could become irrational to a certain extent. Even Alan Greenspan, who serves as pillar of neoclassical ideas for many years and leads United States Federal Reserve between 1987 and 2006, notes that behavioural economics does not enervate completely neoclassical approach but plays crucial role in the process of investors’ decision making: September of 2008 is turning moment for all analysts, including me. It forces for our macro models to include animal instincts, which dominate finances.

Symbol of the recognition of behavioural approach achievements and possibilities is the prizes of the Swedish Central Bank in memory of Alfred Nobel, awarded to Herbert Simon in 1978, to George Akerlof in 2001, to Daniel Kahneman in 2002, to Thomas Schelling in 2005 and to Robert Shiller in 2013, as well as the John Bates Clark medal for Andrei Shleifer in 1999 and for Matthew Rabin in 2003 and the bronze medal of the French National Center for Scientific Research (CNRS) for Davis Masclet in 2012.

Cognitive deviations referred to as “curio” by traditional economists, are studied already in details in respected academic editions. The number of their publications and quoting increase exponentially. The three specialized editions in the field of behavioural economics – *Journal of Economic Behaviour & Organization*, *Journal of Economic Psychology* and *Journal of behavioural and Experimental Economics* (former *Journal of Socio-Economics*) – are prestigious and have a high rating.

Today behavioural economics is taught and developed in the most prestigious American universities – Harvard University, the Massachusetts Institute of Technology, Stanford University, Berkeley, University of California, the University of Chicago, Columbia University and Princeton University. Leading in this field in France is the Group for Economic Analysis and Theory (GATE) in Lyon and in the Toulouse School of Economics. In Canada – this is the University of Toronto. In Great Britain – it is the London School of Economics and the University of Warwick. The Institute for New Economic Thinking – a brain trust, founded in 2009 thanks to the fifty million dollars donated by George Soros – also puts behavioural economics in the centre of its researches.

The application field of the stream is also extending. Similarly to the neoclassical approach “economic imperialism”, it gradually embraces the traditional territories of many other social sciences. Behavioural Law and Economics, Behavioural Finances, Behavioural Economics of Development, Behavioural Public Finances, Behavioural Theory of Games and behavioural Macroeconomics develop as separate branches. All of them are on their way up and not only extend the influence of behavioural economics, but also enrich its core, supplying it with new ideas, examples and arguments.

Behavioural economics enjoys up going success yet among the wide audience. Readers buy as hot cake books like *Blink* by Malcolm Gladwell, *Nudge* by Richard Thaler and Cass Sunstein, *Influence: The Psychology of Persuasion* and *Pre-Suasion* of Robert Cialdini and Dan Ariely’s *Predictably Irrational*, being thirsty to understand why they take “wrong” decisions so often and how to avoid them.

Even film industry turns directly to behavioural economics. The film that got five Oscar nominations in 2016, *The Big Short*, presents not only the understanding of behavioural economics about the world financial crash of 2008 and how human ignorance, stupidity, thoughtlessness, negligence and carelessness, combined with greed and arrogance, can collapse economy and civilization for a day. The film uses also behavioural economics’ advices how pretty complicated financial terms and operations should be communicated – the explanation should be simpler and should be made by liked people, who dominate media space.

Within the last decade behavioural economists increase considerably their political influence, too, and applications of their suggestions can be found in fields like healthcare, savings, finances, traffic safety, employment, discrimination, environmental protection and consumer protection.

Lasting interest towards the behavioural economics’ ideas exists in Great Britain, too. The first in the world specialized team – behavioural Insight Team, BIT, functions to the prime minister’s office since 2010. BIT work gives practical results and its ideas for improving safety, education, social protection, healthcare, tax and fines collectability, energy efficiency, alcohol and cigarettes consumption reduction among young people, consumer protection and organs donation registering are already in operation. Only for the period 2011–2012 BIT work has brought benefits that exceed the expenses for its functioning 22 times. According to current data, the savings from the group’s introduced recommendations within the next five years would make up more than one billion pounds. In 2014 the group consisting of 14 members working in London is partially privatized. Its members are about 100 people now. They are based in London, Manchester, New York, Singapore and Sidney and fulfill tasks of the governments of USA, Great Britain, Australia, Canada, the Netherlands, Mexico, Moldova, Poland and other countries.

As president of the United States, Barack Obama also refers to behavioural ideas many times in his speeches. In addition, he states that he “grounds his policies not upon abstract models... but upon real fact about how people act”, i.e. cleared from the delicacy of the expression that is led not by the neoclassical but by the behavioural economics. The *Time Magazine* calls the group of his 29 close advisers, among whom Richard Thaler, Dan Ariely, Cass Sunstein and Daniel Kahneman, “behavioural dream team”, which goal – “to transform the state”, is pursued with the behavioural economics recommendations. Since 2014 a subcommittee to the National Science and

Technology Committee functions in the White House – Social and behavioural Sciences Team, <https://sbst.gov/>. The group works actively and publishes annual reports and many of the behavioural economists' suggestions are already realized in practice – the ideas for health insuring and retiring plans 401(K) reforms, attracting of servicemen to the TSP saving plans, greenhouse gases reduction, organs donating organization, tax return system, the obligatory information about energy efficiency, fuel expense and the products contents.

Great Britain and the USA are not the only ones interested in the behavioural approach. “Nudge” mechanisms are applied in more than 150 countries, and in many there are functioning formal structures that elaborate, suggest and introduce initiatives based on behavioural economics. An Innovation Hub to the Privy Council Office consultative committee is established in 2015 in Canada. The Hub collaborates with Canadian universities and scientists interested in behavioural approach for conduction of its experiments. In 2016, the Australian government establishes Behavioural Economics Team, which functions as part of the prime minister's office. Centralized consultative structures exist also in Chile (Laboratorio de Gobierno), in France (Secretariat-General for Government Modernization), in Germany (Staff of Policy Planning Unit, the Federal Chancellery), etc. The approach in the Netherlands is different, 11 ministries and regulative bodies are included in the network behavioural Insights Network, initiated in 2014. The Ministry of Economics is assigned the role of network's secretariat, which connects the groups and experts from various ministries and ensures the collaboration and knowledge sharing. European Commission uses the behavioural approach yet in 2008. At first, behavioural ideas develop within the Commission's research center, Joint Research Centre (JRC). Specialized part is set in JRC since 2014 – Foresight and behavioural Insight Unit (FBIU), and since 2015, one more section functions to the EC – the EU Policy Lab. In 2016 FBIU analyses the progress of the behavioural approach application in the member states and publishes its conclusions.). The reports *Green Behaviour* (2012) and *Nudging the Lifestyle for Better Health* are among the EC publications, again full of behavioural recommendations. The analysis and recommendations in these and in other publications follow accurately the behavioural economics approach. Even the World Bank dedicated its report for the world development for 2015 to the behavioural economics (*World Development Report 2015: Mind, Society and Behaviour*).

Unfortunately, behavioural economics is little known territory at home. Although the most significant western works are already translated in Bulgarian, the efforts for complete presentation of behavioural ideas by Bulgarian authors exhaust by two theoretical studies – my own *Architecture of Choice*. The *Advices of behavioural Economics* (2016) and the student book by Atanas Atanasov from University of National and World Economics, *behavioural Economics*. There are also few interesting and promising progress studies in the fields of cognitive psychology, organizational relations and behavioural finances. Among the examples are the works of Georgi Karastoyanov in the field of cognitive psychology and particularly his book *Psychology of Premeditated Influence* and the study of Marin Paunov in the field of organizational behaviour, *Human Emotionality in Behavioural Sciences and the Practice of Management*.

More quality scientific products are seen in the field of behavioural finances. Standing out among them is the book of Boyan Ivanchev, *Everybody Can Invest Successfully if Avoids Illusions and Irrational Behaviour*, also two articles by Teodor Sedlarski and Gergana Dimitrova from Kliment Ohridski University of Sofia – *Basic Concepts in the behavioural Finances Theory* and *The World Financial Crisis and the behavioural Finances Perspective*; few publications of Alexander Apostolov from the University of National and World Economics – *Key Concepts in the behavioural Finances Theory*, *Projection of Profitability of Stock-Traded Assets with Considering Investors' behavioural Characteristics* and *behavioural Approach for Projection of Financial Assets Profitability* as well as Tsvetan Pavlov's article, *Application of behavioural Finances at the Modelling of Bulgarian Shares Risk Premium* stand out. Nevertheless these positive trends and the increasing interest towards behavioural problematic among the Bulgarian scientific community, the field is still little researched [1–4].

3 Conclusion and Perspectives

Behavioural economics is still in the beginning of its development and regarding the methodological aspect, it still does not offer neither systematized knowledge, nor even “standard number of terms and classifications”. It is early to pronounce it new economic school, yet less pronounce it radical counterpoint of neoclassical paradigm and kind of “revolution”. Libertarian paternalism considers governmental intervention tool for drawing closer the observed behaviour of the rationally limited individuals and the theoretical ideal for complete rationality. In this sense, it does not part from the usual notions of rationality. Just the contrary, it appeals for their most consistent practical application: “The irony is that, attacking “Homo Economicus” as empirically false description of decision making process, (the libertarian, author's note), paternalism presents it as a model people should strive for. Or rather – as model of a person, the kind paternalists themselves would like to exist.” Even though being engaged with the positive and perspective issues, behavioural economics does not exchange but corrects and returns neoclassical theory back to its classical roots, supplementing it on one hand, and on the other hand makes some of the assumptions about human behaviour more realistic. The perspectives theory, the avoiding losses concept and hyperbolic discounting are examples for the first. The ideas for the two mental systems, the heuristics and deformations, limited will, social influences and concern about justice are examples for the second one.

Although deep and long-term consequences of the behavioural approach are still in germ, they manifest brighter and visibly. According some researchers, we are even witnessing already the transition from traditional “state of prosperity” to a newly structuring model of “new paternalistic state”. Of course, it would be naïve to believe that the formation of “state of new paternalism” results directly from the occurrence of behavioural economics, the persuasiveness and the widely spreading of its ideas. However, it would be wrong to underestimate behavioural economics' role. It gives theoretical grounds and intellectual support to many, elemental until recently, and imposed without any theoretical grounds, forms of governmental intervention and it is this way rationalizing and justifying them. At the same time, it suggests many new,

improved paternalistic policies. In the words of J. Saint-Paul “thanks to it the last bastion of rationality in social sciences, what until recently was economics, fell”. By all that, paternalistic economics contributes to strengthening the paternalistic trends in the functioning of modern states. Is that trend useful? Future will answer.

Has, as a whole, behavioural economics succeeded giving an adequate picture of human behaviour and explaining the choices we make? Here the answer is rather negative either. First, because its conclusions are not final and many more studies are necessary in order to be completely confident of their rightness. Second, many more and more different points of view are necessary to solve social problems. behavioural economics increase the possibilities of economic analysis and succeeds there, where others fail, because of its wide frame, which crosses the borders between behavioural sciences and unites their scattered pieces into united new integer. But, as it is with putting frames regarding personal choices, the behavioural economics’ frame is not perfect either and is not able to give a complete picture of human behaviour. It is only one of the tools that allow to solely get closer to the truth [5, 6].

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Provision of Integrated Employment and Social Assistance Services in Bulgaria

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Abstract. The article presents the implementation of the project for establishing Centres for Employment and Social Assistance in Bulgaria in the period 2015–2017 as a model of the provision of integrated employment and social assistance services aiming at increasing the efficiency of coordination and work in Employment Agency and Social Assistance Agency and enhancing social inclusion. Services and provided support are analysed and conclusions and recommendations are drawn on the need of better evidence and data on their functioning so that to create reliable instruments for assessment of activities and outcomes.

Keywords: Employment · Unemployment · Labour market · Social assistance

1 Introduction

The provision of the integrated employment and social services in Bulgaria is implemented via a project which is implemented within Priority Axes 1 and 3 of the “Human Resources Development” Operational Programme (HRD OP) 2014–2020 and is thus co-financed by the European Social Fund. The project is being implemented within the framework of a tripartite partnership between the Ministry of Labour and Social Policy (MLSP) as the direct beneficiary of the funding, the Employment Agency (EA) and the Agency for Social Assistance (SAA) as project partners. The project receives funding amounting to approximately EUR 11,760,000 (BGN 23,000,000). In order to implement this project 73 Centres for Employment and Social Assistance (CESA) have been created.

The overall objective of the project is to improve the co-ordination and the interaction between the Employment Agency (EA) and the Social Assistance Agency (SAA) by implementing a pilot model for co-integrated services for vulnerable groups by delivering more individualised services. This support has to be achieved through multidisciplinary and crosssectoral approaches delivered by joint teams from EA and SAA. The overarching aim is to prevent social exclusion and to improve quality of life as well as to achieve more effective and smoother transitions between grant support receipt and sustainable employment.

The specific objectives of the project are:

Developing an administrative service model in an integrated way by providing and supporting the work of the Centres for Employment and Social Assistance (CESA),

which will provide counselling, guidance and information to facilitate access for unemployed persons and people receiving social assistance to the labour market and opportunities for social inclusion through more active services to reduce the period of social assistance;

Expanding the scope and the effectiveness of active labour market policies as well as improving the effectiveness of EA through the development of a performance monitoring system in Bulgaria. This should include more efficient processing of documentation and information received, thus leading to improved service provision for citizens and business;

Pilot testing of a new integrated model of administrative services of vulnerable groups to improve the efficiency of processes of delivering services;

Enhancing the capacity of staff in the institutions responsible for developing and implementing policies for the unemployed and people with disabilities, as well as developing skills to under-take activities, decisions and policies that are appropriate to address the identified needs.

2 Services and Support Provided by Centres for Employment and Social Assistance in Bulgaria

As mentioned above the Centres for Employment and Social Assistance provide a new integrated service model through a joint approach and interaction between the territorial divisions of the Employment Agency and the Social Assistance Agency. The centres provide counselling, guidance and information to facilitate access for unemployed and people receiving social assistance to employment and social inclusion opportunities through more active services to reduce the period of social assistance receipt. The employment and social assistance services in these centres include the following:

Employment services provided for job-seekers include:

- Information and/or consultation on their rights and obligations under the Employment Promotion Act; job vacancies and the associated skills and capacity requirements; the opportunities for participation in active labour market policy measures; opportunities for adult education; career guidance for those wishing to change profession and assistance with mobility for those seeking employment in another locality; the terms and conditions for work in other countries under intergovernmental agreements.
- Acceptance of applications and registration of job seekers.
- Targeting and assisting in starting work, including in another location in the country or in other countries within the EURES mobility network.
- Psychological support and motivation for active job seeking behaviour.
- Establishment of targeted action plan to move towards employment/integrate into the labour market.
- Professional information, counselling and guidance.
- Targeting and enrolment in adult learning.
- Providing access to public information.
- Answers to queries received through different access channels.

Employment services provided for employers include:

- Providing information on registered jobseekers in certain professions, specialties, professional experience, additional skills and readiness to start work.
- Providing information on programmes and measures to preserve and promote employment and training of hired personnel.
- Providing information on their rights and obligations of employers.
- Recruitment mediation through providing information on the procedures and ways of announcing vacancies; accepting vacancies; processing and disseminating information; selection of suitable candidates; directing suitable candidates to the relevant workplace; requiring feedback; targeting appropriate employment and training programs and measures; providing information on the issuance of employment permits to foreigners.

Social assistance services provided in CESA include:

- Informing, advising, targeting and providing assistance to vulnerable citizens, according to their individual needs in search of opportunities for their social inclusion and employment:

Providing information and guidance, the delivery of services; receipt and management of applications, complaints, alerts and inquiries;

Providing clear, accurate, reliable, systematized and complete information on the possibilities for social support - conditions, order and method of support, in accordance with the current legislation;

Targeting and liaising with other institutions responsible for addressing any issues faced by clients;

Displaying prominent (information boards) normative documents, up-to-date information, sample forms for filling in, important announcements and changes in legislation, "hot" telephone;

Accessible information for people with disabilities;

Provision of an advice hotline;

Submission of application forms.

- Acceptance and processing of applications/declarations and the necessary documents for support on the different legal bases, use of social services and issuance of certificates:

Reception of requests/declarations, verification of documents;

Processing of the documents: distribution by regions, conducting a social survey (verification at the person's home, investigation and collection of information), electronic processing, issuance of an administrative act and notification to the person concerned about it;

Methodological and control activities;

Carrying out spot checks.

Vulnerable groups on the labour market are regulated in the Supplementary Provisions of the Employment Promotion Act and are as follows: "Disadvantaged groups on the labour market" are groups of unemployed individuals facing more significant challenges in accessing employment. Such groups include: unemployed youths;

unemployed young people with permanent disabilities; unemployed youths from social institutions who have completed their education; long-term unemployed; unemployed persons with permanent disabilities; unemployed - single parents (adoptive parents) and/or mothers (adoptive parents) with children up to 5 years of age; unemployed persons who have been sentenced; unemployed over 50 years of age; unemployed persons with basic or lower education and without professional qualification; other groups of unemployed. Each year the National Action Plan for Employment defines the target groups to be addressed by active policy support.

In 2015, at the start of the project implementation activities, 65 CESAs were established as written into the project application. In order to approve the new model of administrative service in an integrated way, joint teams of employees of the territorial units of the EA and SAA were founded in the newly established service centres on the territory of the whole country where conditions for joint provision of services are available):

- Burgas District: Karnobat Municipality, Sungurlare Municipality, Pomorie Municipality and Malko Tarnovo Municipality.
- Blagoevgrad District: Belitsa Municipality.
- District Veliko Tarnovo: Elena Municipality, Zlataritsa Municipality and Polski Trambesh Municipality.
- Vidin District: Kula Municipality.
- Montana District: Valchedram Municipality, Brusartsi Municipality and Medkovets Municipality.
- Vratsa District: Borovan Municipality, Krivodol Municipality and Mizia Municipality.
- Gabrovo District: Tryavna Municipality and Sevlievo Municipality.
- Dobrich Region: Tervel Municipality.
- Kyustendil District: Bobovdol Municipality, Kocherinovo Municipality and Sapareva Banya Municipality.
- Kardzhali District: Dzhebel Municipality and Kardzhali Municipality.
- Lovech District: Lukovit Municipality and Teteven Municipality.
- Pazardzhik District: Batak Municipality and Rakitovo Municipality.
- Pernik District: Pernik Municipality and Breznik Municipality.
- Pleven District: Levski Municipality.
- Plovdiv District: Rakovski Municipality, Sopot Municipality, Saedinenie Municipality and Sadovo Municipality.
- Razgrad District: Tsar Kaloyan Municipality.
- Rousse District: Borovo Municipality and Tsenovo Municipality.
- District of Silistra: Silistra Municipality.
- Sliven District: Tvarditsa Municipality.
- Smolyan District: Devin Municipality, Dospat Municipality, Borino Municipality, Zlatograd Municipality.
- Sofia District: Slivnitsa Municipality, Samokov Municipality, Svoge Municipality, Godech Municipality, Elin Pelin Municipality and Kostenets Municipality.
- District Sofia city: Sofia city.

- Stara Zagora District: Kazanlak Municipality, Gurkovo Municipality, Nikolaevo Municipality and Stara Zagora Municipality.
- Targovishte Region: Popovo Municipality.
- Haskovo District: Ivaylovgrad Municipality, Topolovgrad Municipality and Stambolovo Municipality.
- Shumen District: Varbitsa Municipality, Smyadovo Municipality, Venets Municipality, Novi Pazar Municipality, Nikola Kozlevo Municipality and Kaolinovo Municipality.
- Yambol District: Straldzha Municipality.

At the end of 2016, after the preparation of an interim evaluation on the effectiveness of their work, 8 additional CESAs were created up in January 2017 following a decision of the Monitoring Committee of the operational program (Fig. 1). The new eight centers were established in municipalities with a large number of persons from the target group of the project - unemployed persons subject to social assistance as follows: Byala Slatina Municipality, Ruzhintsi Municipality, Lom Municipality, Petrich Municipality, Strazhitsa Municipality, Targovishte Municipality, Karlovo Municipality, Botevgrad municipality.

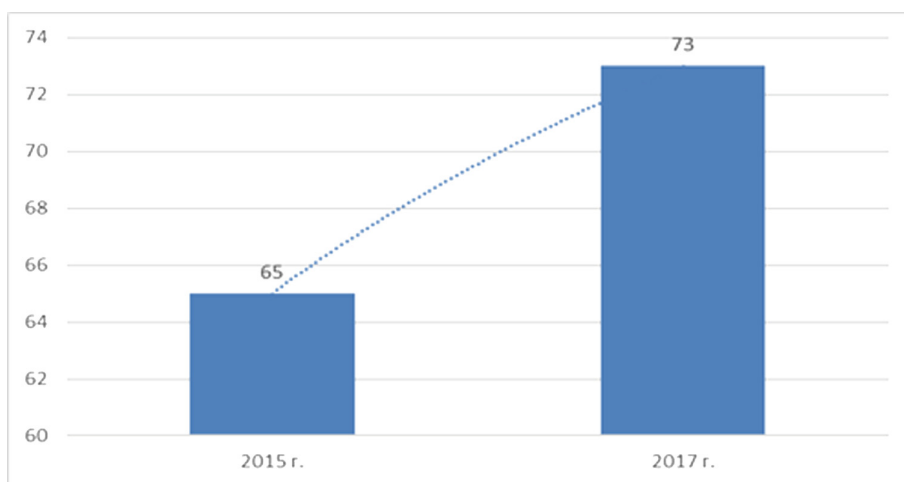


Fig. 1. Change in the number of CESAs in the period 2015–2017.

The CESAs are set up in offices made available by the municipalities and – as mentioned above – bring together staff of the Employment Agency and the Social Assistance Agency. The organization of the work is subject to the model set up for the integrated service provision and includes the provision of information, guidance and counselling to facilitate access for unemployed and people receiving social support to employment and opportunities for social inclusion through more active services to reduce the period of social assistance.

As a result of assistance provided in 2015 by the 65 centres 69,812 unemployed persons were employed, out of which 45,066 found jobs in the primary labour market. 11,823 individuals were employed among the long-term unemployed (registered unemployed for more than 12 months) (Fig. 2).

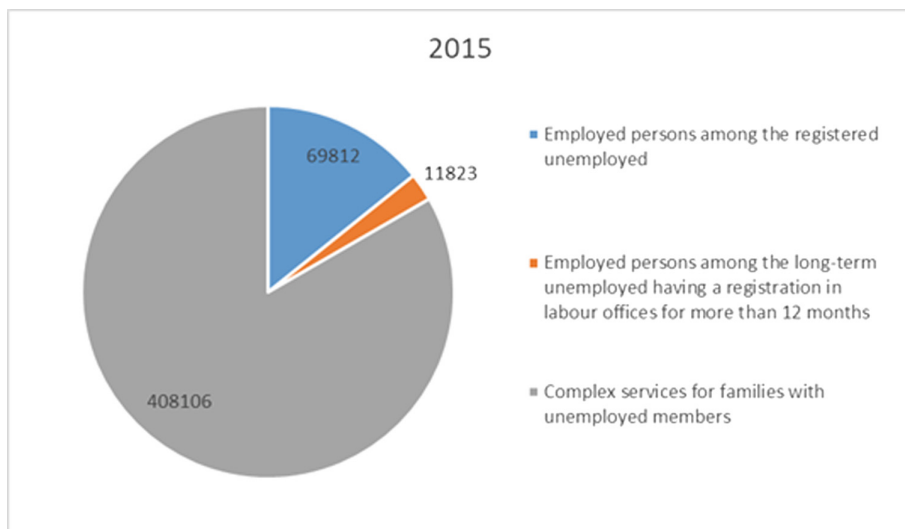


Fig. 2. Services provided to unemployed persons in 2015 by CESAs.

During the period January - December 2015, complex services were provided at a total of 408,106 persons and families with unemployed members including (Fig. 3):

- targeted heating aid – 57,403 persons and families;
- monthly allowances for children - to 155,929 families with children;
- monthly supplements for social integration - for 181,009 persons with permanent disabilities;
- appointed 644 personal assistants under the National Program “Assistants for People with Disabilities” for servicing 644 persons with permanent disabilities;
- 11,756 persons and families have been granted monthly support under the Social Assistance Act.

In 2016 the number of long-term unemployed persons reduced by 2,613, which are also the main group receiving social support, as well as being the basic group that needs integrated social services. These are a precisely defined group of unemployed people suffering from a particular loss of competencies and skills due to a gradual process of social exclusion, at least partly linked to their absence from the labour market. For this group, reintegration into the labour market is particularly challenging.

In 2016, as a result of the work of CESAs, 76,552 persons were employed of which 52,404 on the primary labour market. 14,436 long-term unemployed have started work.

There were 19,091 unemployed persons, out of which 7,658 were employed (5,419 persons - on the primary labour market, 1,021 - under programs and measures under the Employment Promotion Act, and 1017 persons under HRD OP schemes); 226 persons are enrolled in training, and more than 27,800 have received services for active labour market behaviour (job search, psychological assistance, etc.) (Fig. 4).

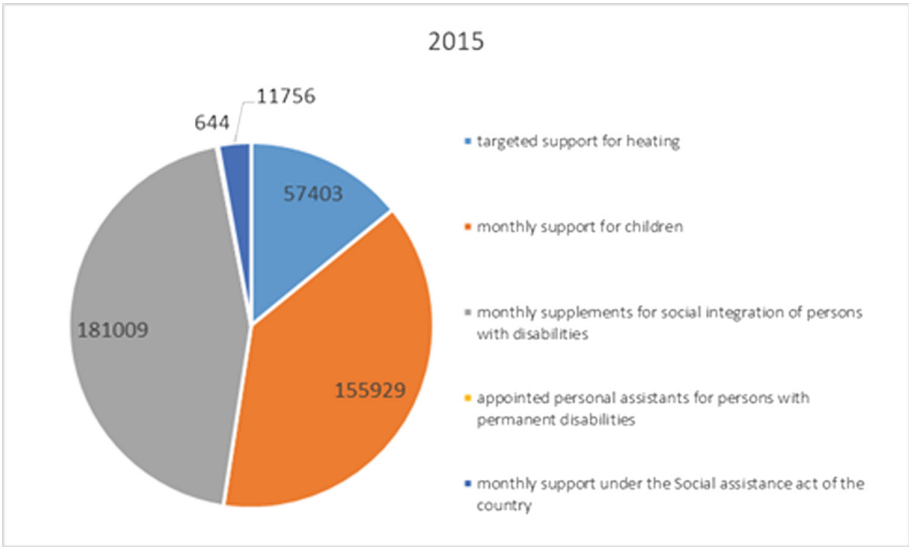


Fig. 3. Complex services of families with unemployed members in 2015.

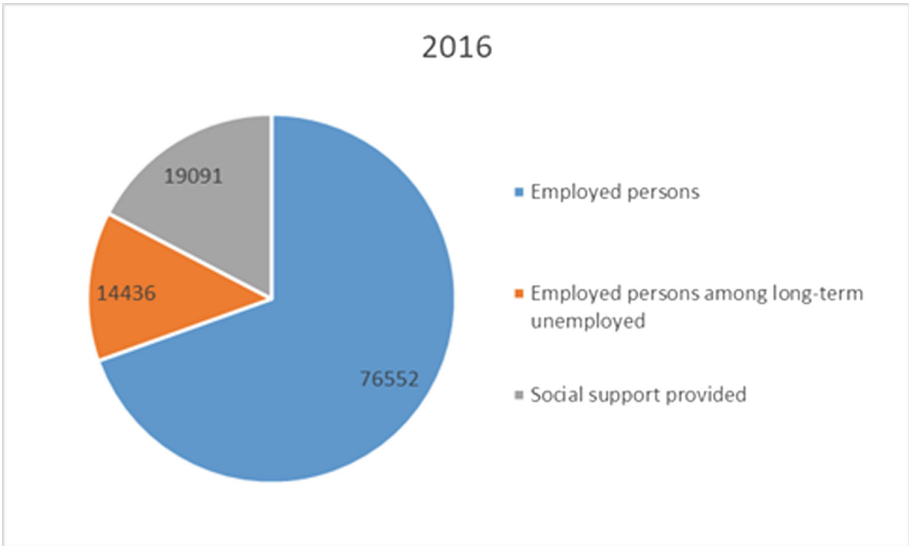


Fig. 4. Services provided by CESAs in 2016.

In 2016 in the municipalities on whose territory the project is being implemented the average monthly number of persons and families with unemployed members who were granted social support is (Fig. 5):

- under the Social Assistance Act – 10,094;
- under the Law on Family Benefits for Children – 134,918;
- under the Law on the Integration of People with Disabilities – 177,105;
- under Decree RD07-5 of 2008 – 57,157 persons and families were granted targeted heating aids;
- under the National Program “Assistants of People with Disabilities” 592 unemployed persons who care in their home environment for their relatives with permanent disabilities were appointed as personal assistants (Figs. 6 and 7).

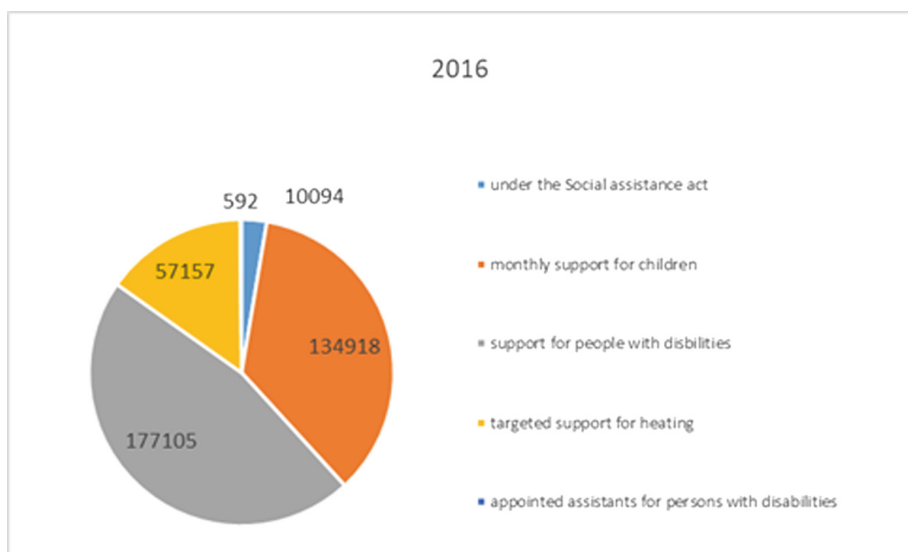


Fig. 5. Average monthly number of persons and families with unemployed members who were granted social assistance in 2016.

It should be underlined that the actual number of persons to whom social services are provided in the CESAs is considerably larger, as according to the specific laws in force regulating social assistance, for the most part, they are subject to counselling, information and assistance not only for the unemployed but also their families.

In the first half of 2017 in CESAs as a result of measures for social protection of families with unemployed members who did not give up work, inclusion in employment programs or trainings were provided 12,704 monthly average number of monthly

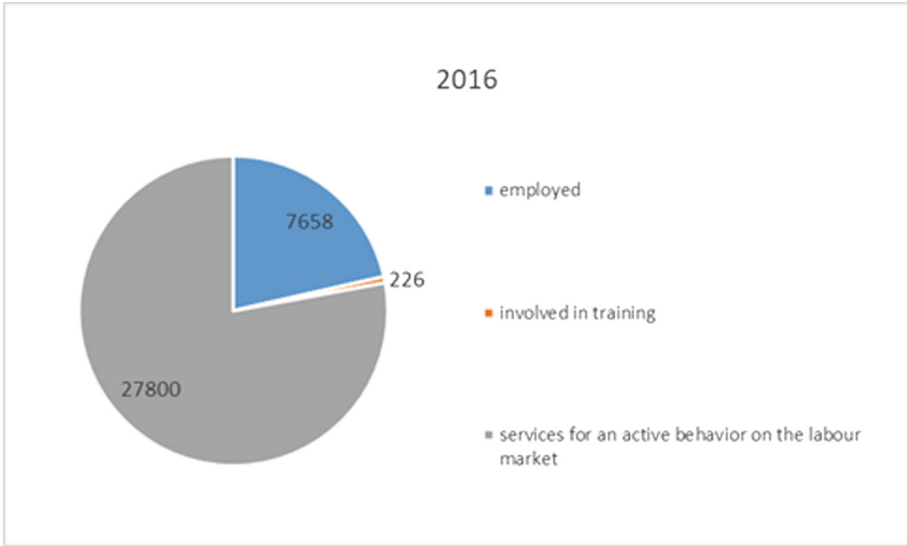


Fig. 6. Persons subject to social assistance at CESAs in 2016.

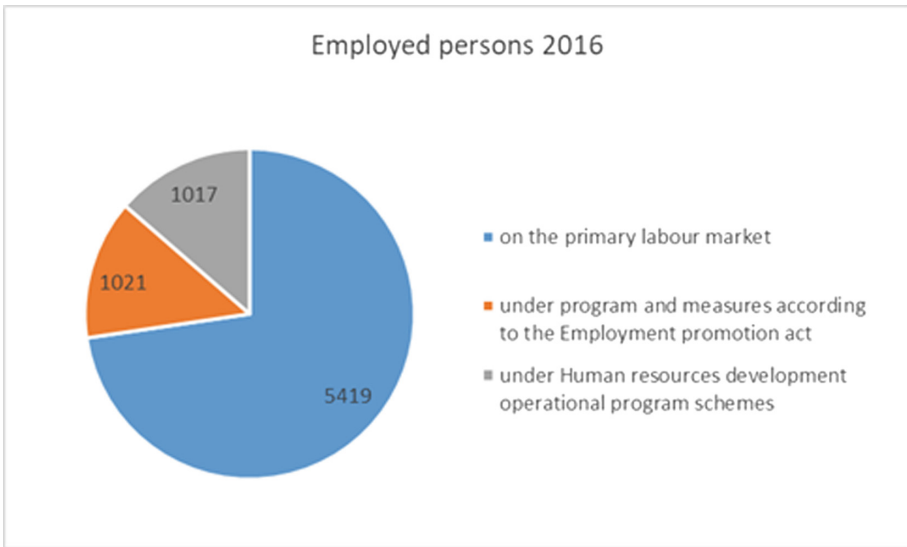


Fig. 7. Employed persons in 2016.

support under the Social Assistance Act. Family support under the Children's Family Allowance Act were provided to 128,056 families with low incomes, and integrative supplements and benefits under the Integration of Persons with Disabilities Act were granted to 119,144 persons with permanent disabilities (Fig. 8).

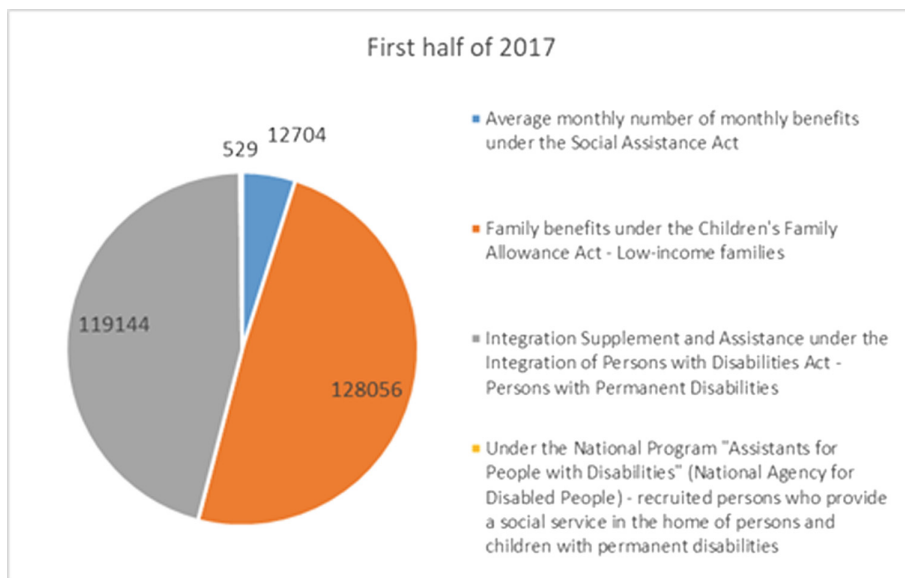


Fig. 8. Services provided to unemployed persons in the first half of 2017.

From the beginning of the acceptance of the applications-declarations for granting of targeted heating aid (1 July 2017) and as of 1 September 2017, some 29,358 persons and families were granted targeted heating allowances for the heating season 2017/2018 under the terms and conditions of Regulation RD 07-5 of 2008 of the Minister of Labour and Social Policy. Under the National Program "Assistants of People with Disabilities" 529 persons have been appointed to provide a social service in the home to 529 persons and children with permanent disabilities. As of 30 September 2017 60,849 unemployed persons were registered in the municipalities where CE-SAs operate, 22,282 of them being socially supported. Of the unemployed persons of social assistance 15,126 have basic and lower education and 13,309 are long-term unemployed (Figs. 9 and 10).

As a result of the work of the CPPS during the period 01.01.2017-30.09.2017 a total of 8,077 unemployed persons receiving social assistance are employed (6,529 persons in the primary labour market, 899 persons under programs and measures under the EPA and 649 persons under the HRD OP schemes), 706 persons are involved in training, and more than 14,301 have received active labour market services, job search, psychological assistance, working with a case manager, etc.

For the purposes of a mid-term evaluation of the effectiveness of the CESA, on-site visits and documentary checks were carried out in 31 FPCs; interviews with 2,200 users of the service were carried out, and evidence was sought from 260 staff working at CESAs (Fig. 11).

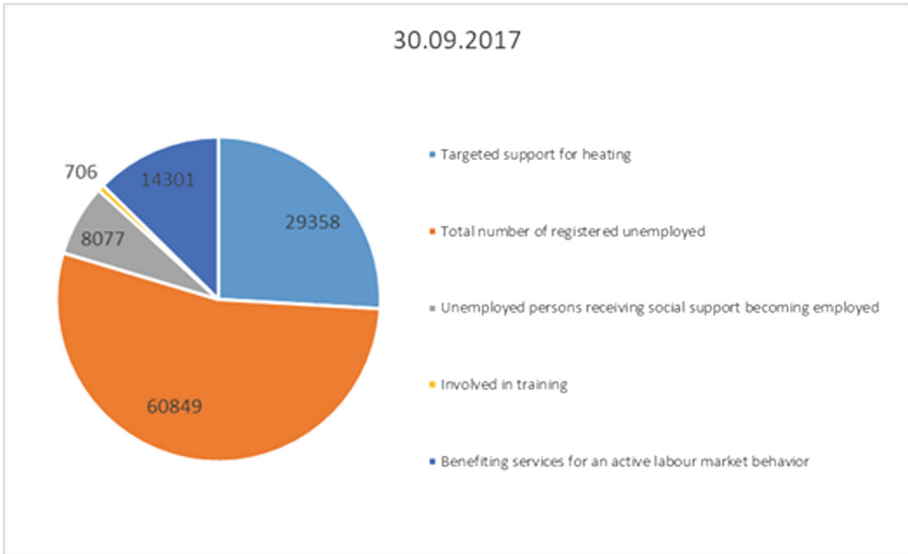


Fig. 9. People subject to the implemented social policies as of 30 September 2017.

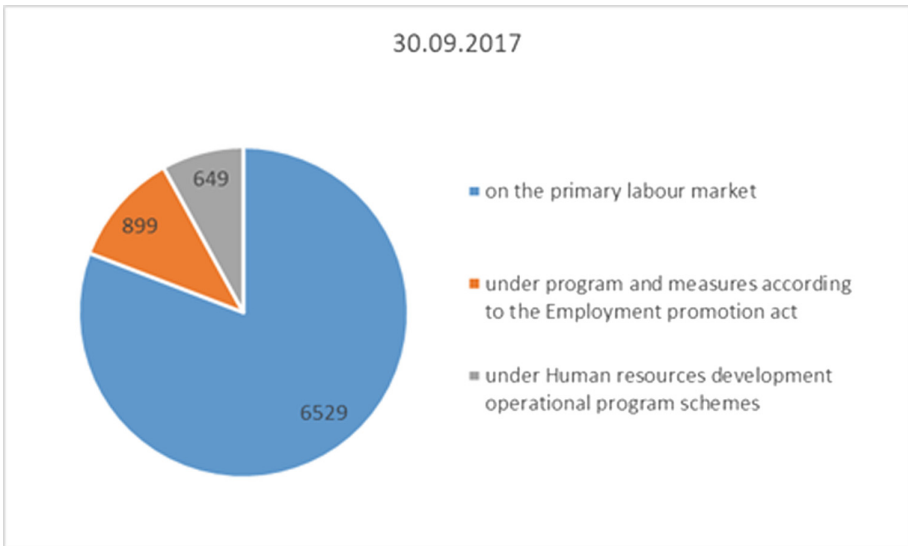


Fig. 10. Unemployed persons on social assistance working on 30 September 2017.

As a result of the work of the CESA a total of 11,112 unemployed persons receiving social assistance were employed (8,992 persons on the primary labour market, 1,113 on programs and measures under the EPA and 1,007 persons under

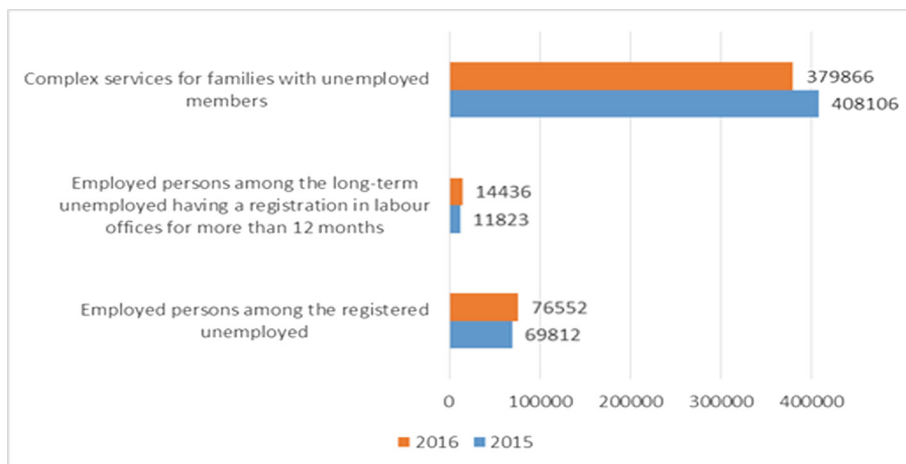


Fig. 11. Comparison of the work in CESAs for the period 2015–2016.

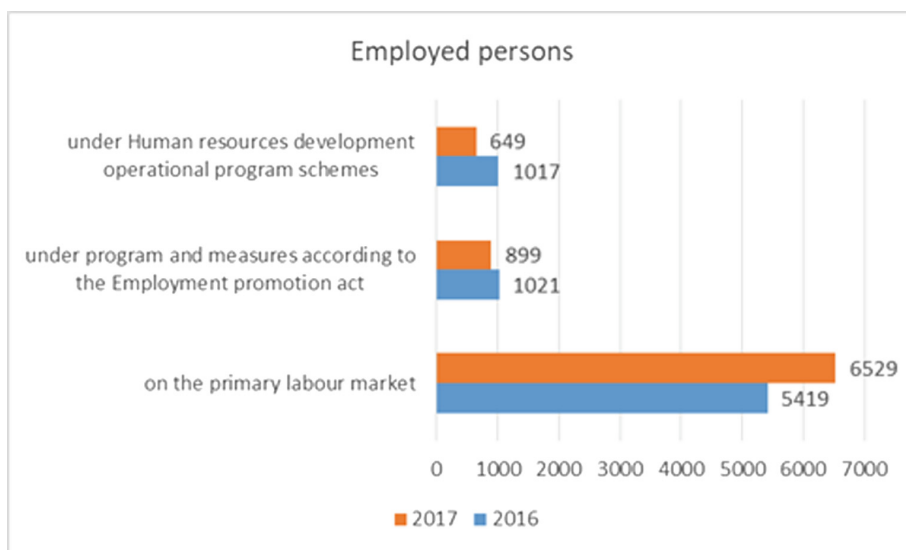


Fig. 12. Comparison of the work in CESAs for the period 2016–2017.

schemes under the HRD OP), 776 people are enrolled in training, and more than 18,600 have received active labour market services (in job search, psychological support, etc.) (Fig. 12).

In 2018 it was decided to continue to implementation of the activities of CESAs with the tripartite participation of the Ministry of Labour and Social Policy, the Employment Agency and the Social Assistance Agency and several new services were

added. 73 Centres for Employment and Social Assistance, which provide an integrated service through joint teams of the territorial divisions of the Employment Agency and the Agency for Social Assistance, continue to operate.

The priority of the work of the centres is to assist long-term unemployed individuals in receipt of social assistance. They will also benefit new employment and social assistance services by building on a package of individualized labour market measures. It will include new services focused on education, training and social inclusion. 'Family labour counselling' will be introduced as a pilot scheme, which offers on-site work with the whole family of long-term unemployed person subject to social assistance. The development of mobile support teams is also being envisaged. This will provide a comprehensive service to unemployed people from regions with high levels of unemployment and hard-to-reach and remote settlements [1–24].

3 Conclusions and Recommendations

Overall it must be noted that there remains a lack of evidence to underpin the assessment of the integrated service model. Despite the increasing call for evidence based policy making, evaluation efforts remain too limited and need to be extended in future to provide better evidence for the further development and benchmarking of this complex integrated model.

Certain achievements for the group of longterm unemployed is rather their momentary inclusion in the labour market rather than a complete solution for this complex problem. This observation can be determined by the operational statistics of the Employment Agency and the National Statistical Institute. The high relative share of long-term unemployed registered with the employment services is a problem that cannot be overcome by only providing a set of integrated social services. Of course, this activity can help this process.

It is imperative that all the social processes that are relevant to it must be studied in the creation of such a technology or model. We cannot consider the affordability of the services provided, at least because the current analysis and survey is based only on statistical data and works with quantitative measures assessing the current state without taking into account the prospect and without evaluating past conditions.

In order to integrate services successfully, all involved agencies should agree on desired out-comes and evaluate performance to monitor their success. This includes looking at results for service users and their communities as well as the effects for all involved organisations. Consequently, there should be a consensus on what the targeted outcomes are and how to measure them. Local and regional authorities use different methods to evaluate the effectiveness of their practices. However, it is not always clear what is exactly measured and information on possible effects is not always accessible [25–32].

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Pacific Arctic: The System-Forming Role of Infrastructure in the Sustainable Development of the Region

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Abstract. Rapid changes of climatic and environmental conditions for the international Arctic zone development, as well as increasing the participation of this zone in the processes of world markets globalization creates a lot of problems and consequences not only for the Arctic as a whole, but also for the cross-border region - the Pacific Arctic. This region includes the Chukotka Autonomous Okrug of Russia and the State of Alaska, United States, as well as the seas of the Arctic and Pacific oceans, linked together by the Bering Strait. At the beginning stage of the formation of this new geo-political and geo-economical region the role of the spatial infrastructure, including its internal and external elements dramatically increases for a solution of the problem of sustainable regional development in the future. In this regard, it is necessary to strengthen the scientific and applied researches in the area of infrastructure theory and application of their results in the formation of this region. Based on the study it can be concluded that the formation of the Pacific Arctic region does not correspond to regularities of spatial infrastructure development identified as a result of research on theoretical issues of its system-forming and multiplicative role in these processes. This is a very serious obstacle to the effective and sustainable functioning of the studied spatial system in the present time and in the future.

Keywords: Pacific Arctic · Infrastructure theory ·
External and internal elements of infrastructure ·
System-forming role of infrastructure · Multiplicative effect of infrastructure ·
«chaos» and «order» in the spatial entities ·
Sustainable development of the region

1 Introduction

The Far Eastern Arctic territories and water areas in Russia are a very important second “point of support”, the Eastern outpost of the Russian Arctic together with highly developed the first Western “point of support” - the European part of the Arctic coast of the country. The State of Alaska is an outpost of the United States and the entire North American continent in the Arctic in the Bering Strait region on “crossroads” with Russia. On the basis of the Far Eastern Arctic and Alaska a new cross-border spatial

formation is developed – the Pacific Arctic. In this region in the present time the faster modernization is required of the whole infrastructure complex, the priority system-forming role of which is very important for the sustainable development of the region. The timeliness of these problems - without a doubt.

Analysis of the research results in the theory of infrastructure and their applications to the formation of the Pacific Arctic [11–16, 18–22] was the basis for setting of several scientific problems, which in recent years were investigated, namely: (1) development of new methodological approaches and methodical techniques in the study of a pivotal role of spatial infrastructure in the formation of the natural-economic entities, and (2) to study the opportunities to use the new scientific approaches and techniques in formation of the concrete regions on example of the Pacific Arctic.

2 The Scientific Novelty of the Theoretical Issues

2.1 The Theory of Infrastructure

Concerning the infrastructure theory in application to the study of the spatial natural-economic systems, these problems are very little learned and practically don't have theoretically based methodology and techniques of scientific research. Work in this area is focused primarily on the use of traditional, mostly sectoral and narrow-disciplinary approaches to research [6]. The first attempts to study infrastructure as a system category began in early 1980-ies [16]. These studies are conducted right now at the “crossroad” of spatial, system and evolutionary economics and based on a new research methodology, which, along with a certain breakthrough in theory of infrastructure, give high effect in the spatial development of the national economy [7–9, 14, 21–24].

With regard to the scientific-applied issues, which associated with concrete natural-economic systems, the situation is no better. Proclaiming a systemic approach to research, the authors practically remain in positions of fragmentary, non-coordinated, narrow-disciplinary evaluations of infrastructure elements activity [5].

Study shows, the concept of infrastructure is an integral part of the terminology used in general systems theory and synergetic theory, which became an independent direction of science. The term of infrastructure at its core, functions and roles is much more general and applicable not only to human activities, but also to all systems as biotic (“live”, organic) and abiotic (inorganic) character. The infrastructure elements “cement” the inorganic and organic objects in a single physical-geographical and spatial-economic formation.

The term “infrastructure” in this article refers to the following: *a group of closely related internal and external elements of the analyzed system (in this case, spatial), which dictates and provides the processes of self-organization and future development of this spatial formation. These elements vary from basic (primary) elements and closely related with them support and servicing elements by the following specific properties, namely: (1) communication, (2) the immediacy of the created links, and (3) a strict focus on creating both the material (“hard”) and institutional (“soft”) conditions for the basic elements of this system.*

So, the concept of infrastructure is a system concept, the primary role of which is manifested not only by organization of efficient operation of its own elements, but mainly by the synergetic effect of enhancing the effectiveness of the system as a whole. A study of the role of its external and internal elements in the formation of spatial systems and their impact on the maintenance of transparency, sustainability and self-adaptation of these formations - is an extremely important task that requires specific approaches based on deep interpretation of postulates of the synergy theory.

These scientific approaches should put on the first place the commonality of processes of evolution and self-organization in physical, chemical, biological, social, economic and other systems. The task of synergy theory - not only “a catch” and use external analogy, but also set the internal patterns and natural isomorphisms concerning various system entities, in our case - the spatial-economic.

2.2 The Infrastructure Role in the Hierarchical and Heterarchical Economic Models

Widely discussed two polar models of economic systems: hierarchical and heterarchical. Basic principles of hierarchical models are formed on vertical linkages (links of subordination), providing a strong hierarchy of power. Heterarchical models are based on horizontal connection (links of connection), which implies a decentralized management structure and the formation of horizontal power [10].

The theoretical basis of justification of heterarchical models is the laws of synergy theory, which proves the commonality of open dissipative nonlinear processes in nonequilibrium systems of the diverse nature. It is allowing you to describe the phenomenal processes from different areas on the basis of close models. The synergetic view on these processes shows that under self-organization we should understand the ability of the system to modify and adapt its spatial, temporal or functional structure basically at its own resources. In these processes also, it is very important to assess the role of external influences (related with *chaos*) and the internal self-organization (related with *order*). Chaos, with one hand “pushes” a system to a point of bifurcation, but on the other hand contributes to dynamic processes in self-organization of systems for the new position of sustainability [17].

Study shows that infrastructure, its internal and external elements implement these conditions of *order* and *chaos* in the natural-economic systems development. The internal elements of the infrastructure are mainly responsible for creating and maintaining *order* in the system, the external elements - for the openness of the system, which involves some certain portions of *chaos* from exogenous level. It forces the system to improve mechanisms of self-organization and adaptation to changing internal and external conditions. It means that hierarchical and heterarchical models of economic systems are implemented through external and internal elements of infrastructure.

The role of basic (primary) system elements (in economics - industries of specialization, coupled with their subsidiary and service industries) in participation in the formation of synergetic effect here is absolutely not belittled. These elements produce the substance (products or services) that is amorphous, motionless. This substance cannot be used until the sufficiently advanced network of infrastructure between

manufacturer and consumer will be formed. But a relational concept dictates that the energy of the material system as a whole continues and grows only in motion, without which this system is dead. The enough active movement of the substance in the spatial system is produced by its infrastructure, both by its internal and external elements.

On the basis of the data given in [10], the *chaos* measure (or entropy measure) - E and the *order* measure (measure of stability) - R of the economic system are related by ratio:

$$E + R = 1 \quad (1)$$

This is logically understandable, because in the ideal system stability case the equal proportions should be in a ratio of internal infrastructural elements (that ensure *order*) and its external elements (that ensure non-stability - *chaos*). This ratio can be called as the “golden ratio”. In this case the external impact should be equally balanced by adequate response of the internal system elements. The formula (1) can be written as follows:

$$E[f(G_i)] + R[f(G_j)] = 1 \quad (2)$$

where the G_i and G_j - levels of development of internal and external elements of the infrastructure.

But in the real life the situation generally is far from perfectly balanced system. For each system, depending on the time of its formation, the ratio levels of development of infrastructure components may vary greatly. But any time they must give an opportunity for the system, balancing on the verge of *order* and *chaos*, be adapted to both internal and external changing conditions for its survival, existence and development.

Study shows that infrastructure has a large *multiplier effect* on the system final performance indicators (synergetic, economic, social, environmental, spiritual, etc.). But it is necessary to develop appropriate tools to reach the best proportion of its internal and external elements for each type of infrastructure at each stage of system development, that will provide an opportunity to use this multiplier [7, 25, 26].

3 The Pacific Arctic

On the basis of the described above theoretical trends it was carried out the scientific-applied research related to the development of the Pacific Arctic. This region has become not only the largest “crossroads” of maritime roads in the Arctic (Russian Northern Sea Road and American-Canadian Northwest Passage, and also sea routes from the ports of the Russian Far East, South East Asia and the Western parts of the United States and Canada). Arctic territories and waters of the Pacific Ocean are also crucial “crossroads” for a radical solution of the geopolitical, socio-economic and environmental problems in this zone. This is possible only in close cooperation of the multi-disciplinary Russian and the United States (Alaska) researches that should be realized immediately despite various political sanctions because it is dictated by the laws of nature and society [1–5, 11–13, 18, 22].

At the present time, this region is in the initial stage of its formation as more or less interconnected spatial natural-ecological, socio-economic and in general public system that is important segment of the international Arctic zone. Of course, its regional constituents belong to different countries - Russia and the United States and have seriously differing levels of socio-economic development. But as it is well known - in such cross-border systems the existing imbalances in regional development lead to the rise of political confrontations in sustainable development of the region as a whole.

As follows from the scientific researches in theory of infrastructure and its system-forming and multiplier role in a system-wide synergy effect especially at the beginning stage of the system formation it is necessary to develop both the closely interconnected and coordinated internal and external infrastructure elements which must support the dynamic processes in the creation of a single spatial system on the verge of balancing between external chaos and internal order.

Generally, each spatial-economic system up to the level of the municipality must include a specific set of structural components or spheres, the level of development of which influences on the effective formation of the full capabilities of this system. These spheres are associated with both the physical-geographical and social-economic areas and also with components of the scientific-technical progress at its level in the region. It is possible to select eleven such regional spheres, although this classification is more complex and require the special studies. There are the next spheres: cosmos-sphere, geosphere, biosphere, socio-sphere, the economic sphere, techno-sphere, noosphere, the institutional sphere, the political sphere, the spiritual sphere, and environmental sphere.

The internal structure of each of these spheres as relatively independent subsystems must have and its basic elements, and infrastructural elements. None of these spheres cannot be ignored, each of them must be under constant attention of the scientific organizations and the regional governments. The degree of their influence on the processes in various activities of the regional economic entities varies, but they all must be under permanent control and science, and Government. The absence or retardation of at least one of them shows that the spatial formation is defective, this regional system is unable to provide normal conditions for self-organization, survival and self-adaptation.

Expert review of the realized researches indicates, first, that neither the Arctic as a whole nor its subarea - Pacific Arctic does not have at the present time the necessary complex of spheres mentioned above. It means that these regions are seriously deficient, not ready for full operations, don't have real opportunities for sustainable development by all their parameters. These spatial economic formations are not sufficiently prepared for survival and self-adaptation to changing of the natural-environmental conditions, and also for wildlife management and creation the necessary level of livelihoods for indigenous and newly arrived population. This situation drastically reduces the possibility of a system-forming role of infrastructure to serve as the multiplier to improve both the Arctic zone as a whole, and its sub-zones, in particular - Pacific Arctic.

In addition, the research of proceeding processes in economic development of Arctic regions also shows the following.

As was said above, the scientific researches in the field of infrastructure theory show that the system-forming and multiplier role of infrastructure to receive the system-wide synergy effects requires the necessary interrelated and coordinated development of its internal and external elements that must provide the dynamic processes in the creation and functioning of a single spatial system on the verge of balancing between external chaos and internal order.

In the Pacific Arctic case as a single spatial entity the *external* elements of “hard” and “soft” infrastructure of this region are the management structures and institutional documents established at the intergovernmental level by the eight countries of the Arctic basin in the frames of the Arctic Council, and other international organizations, agreements and structures (see the last Arctic Council ministerial meeting in Fairbanks, Alaska, United States, 2017) [11–13]. The “hard” and “soft” elements of the *internal* infrastructure of this region are very limited and mostly fragmented relationships that exist between the two sub-regions of Pacific Arctic, namely between Chukotka and Alaska [5]. These internal infrastructure elements relate mainly to exchange visits of indigenous peoples of the North, living in this zone, to some problems of the Beringia as natural ecological park and a number of issues, concerning using the Alaska experience mainly in the social area in development plans of Chukotka.

Taking into account this situation, evaluation of correlations between *external* (responsible for introduction of the portion of *chaos*) elements of infrastructure, operating in the frames of the Arctic Council, and *internal* (responsible for providing an *order*) elements of infrastructure in Pacific Arctic as relatively independent sub-system in various its spheres reveals biggest imbalance. Development of external infrastructure elements exceeds development of internal elements in two - three times. This is far from the “golden ratio”, mentioned above. This situation reduces the possibility of infrastructure in system-forming processes in this region. It also shows very low socio-economic sustainability of the considered spatial natural-economic system and its limited ability to adapt to the drastically changing conditions for development through self-organization reserves.

4 Proposals and Conclusion

It is a reason to present a proposal for the development of the “technological chain” of multi-disciplinary complex of natural and social-economic researches concerning the Pacific Arctic as a whole. This “chain” is in reality the very important infrastructure element of the different regional spheres, mentioned above. It’s quite possible through the very close coordination and cooperation of research institutes of the Far Eastern Branch of the Russian Academy of Science (FEB RAS) and the Yakutsk Scientific Center of the Siberian Branch of the Russian Academy of Sciences (YSC SB RAS), and also through the enhanced cooperation with research and educational units of the Far Eastern Federal University (FEFU) and North-Eastern Federal University (NEFU), including its Chukotka branch.

The scientific divisions of these organizations currently develop very important researches on the Arctic issues. But they are incomplete, inconsistent, narrow-disciplinary, don’t have a unified database, etc. In this respect, it is possible to develop

and implement a joint plan of the *Complex Scientific and Applied Researches* (CSAR) between institutions of FEB and YSC SB RAS and such large educational organizations as FEFU and NEFU. Realization of this plan will bring a significant “synergetic” effect and in researches, and in implementation of their results in the further development of the Far-Eastern and Pacific sectors of Arctic.

In this regard, it is necessary to establish a *joint Working Group* of specialists of different directions of research. This group should implement the synthesis of all results of researches and analyze the databases that held by national and international scientific divisions of transboundary studies by its own “sectoral” disciplines. This Working Group should also summarize information about scientific researches concerning the Arctic Pacific region that held by universities and scientific centers in Alaska, United States. Based on this information, it is necessary to prepare in the near future the *International Conference on the Problems of the Far Eastern and Pacific Arctic Sectors* and to invite for this conference the specialists from various national and foreign institutes, universities and research centers which study the problems of these Arctic sectors.

It is possible in the near future to develop joint international plan of the scientific and applied researches and invite to this plan the units of Alaska (despite various political sanctions of US against Russia). The different scientific publications show that the Alaska research units have a big interest for international cooperation with the Russian research organizations [1, 2, 5, 11, 15, 23, 24]. There are, mainly, the Arctic research centers of all campuses of the University of Alaska and also an independent Institute of the North, located on the territory of the State. It gives an opportunity to extend these studies to the entire region of the Pacific Arctic for scientific and practical interests of both countries.

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Tax Policy of the State in Oil Industry as One of the Factors Ensuring Financial Security of the Russian Federation

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Abstract. The article reviews the tax policy of the state, with taxation of the oil industry under financial crisis, sanctions imposed against Russia, and low oil prices. The subject of the research is the tax policy of the state with regard to the oil industry. The paper considers the main options of tax mechanisms proposed by the Ministry of Finance of the Russian Federation and the Ministry of Energy of the Russian Federation, as well as it analyzes the opinions of the chief executives of the largest oil companies of the Russian Federation concerning the existing taxation system for the oil industry. Special emphasis is given to the analysis of the first results of the tax reform being implemented with regard to the introduction of the tax maneuver as one of the main mechanisms of state financial security. It reasons that the implementation of the main directions of the budgetary, tax, and customs and tariff policies of the state in the oil industry, on the one hand, will provide for significant and stable tax revenues to the state budget, on the other, to maintain sufficient investments incentives in this economy sector. The principal findings of the research are that with a view to obtain beneficial results, systemic work with respect to tax reform in the oil industry is required, alongside phased transition to the added income taxation on oil companies and the abolition of export duties.

Keywords: Financial security · Oil industry · Tax maneuver · Mineral extraction tax · Added income tax

1 Introduction

In the context of the financial crisis, sanctions imposed against Russia, and relatively low oil prices, the importance of state attention to the tax policy in the oil industry of Russia was repeatedly noted by the President of the Russian Federation in the Addresses to the Federal Assembly of the Russian Federation [1], with participation in commissions for strategy development of the fuel and energy sector and environmental safety [2], as well as at meetings with the chief executives of oil companies [3].

Research related to the development of specific tax mechanisms aimed at withdrawing the added income from the oil industry is now becoming ever more relevant. In recent years, the issue of differentiation of the mineral extraction tax (hereinafter referred to as MET), as well as the introduction of the added income tax (hereinafter referred to

as AIT) in the oil industry is widely discussed by the executive and legislative branches of the Russian Federation, together with managers of the largest oil companies.

The study of oil taxation issues has been reflected in the scientific works of such researchers as G.R. Golovanov, V.S. Pancheva, S.V. Chernyakovsky, M.A. Ilyicheva and others.

Further, this article gives a comprehensive study of the main directions of the budget, tax, and customs and tariff policies of the state concerning the oil industry [4]. Particular attention is paid to the taxation system of the oil industry, as one of the most important elements of financial security, in times of unstable economy and sanctions imposed against Russia.

Nevertheless, having studied the scientific works within the subject-related research, the author comes to the conclusion that there exist contradictions between the conclusions.

Thus, the need to solve pressing problems and to develop specific theoretical bases and practical recommendations for improving the tax legislation in the oil industry has determined the choice of the topic and the relevance of this article.

1.1 Research Materials and Methods

The President of the Russian Federation Vladimir Putin suggested “within the next year to thoroughly and comprehensively consider proposals to adjust the taxation system, be sure to do this with the participation of business associations. Despite the internal political calendar, it is still necessary for us in 2018 to prepare and adopt all the relevant amendments to the legislation, to the Tax Code, and from January 1, 2019 to put them into effect, fixing new stable rules for a long-term period. At the same time, I request the Government to address the issues of mechanisms improvement for ensuring a stable budget and public finances, fulfilling all of our obligations, regardless of external factors, including hydrocarbon prices” [5]. In order to stimulate the development of new deposits and the rational subsoil use, a new taxation system (AIT) is envisaged for pilot facilities, including both new and mature deposits. The new system provides for a reduction in the total amount of taxes that depend on gross indicators (MET and oil customs duty) and an introduction of the added extraction income taxation. As a result, higher flexibility of taxation is ensured due to the dependence of the taxes amount on the economic performance of the reserves development.

The AIT base is proposed to be defined as hydrocarbon production estimated revenues minus operational and capital oil field development costs, with the tax rate to be fixed at 50%. Herewith, for organizations employing AIT, the current income tax calculation procedure remains effective, but with a reduction in the taxable base in the amount of the AIT paid.

In order to limit incentives to overstate costs and to minimize budget shortfall in revenue, the deductible costs for mature fields are limited to 9520 rubles per ton of produced hydrocarbon crude, adjusted for inflation. Depending on the implementation results of the AIT in pilot projects, a decision will be made whether to adjust and expand the application range.

Furthering a purpose to ensure a rental income tax equity during the planning period, further steps provide for the convergence of the rental income tax burden in the oil industry.

In order to reduce the deficit of the federal budget, it is proposed to increase the tax burden on the oil and gas industry within the 2017–2019 period by specifying the MET rate calculation procedure for oil as to complementing its calculation formula with a new 14th addendum fixed for the 2017 at a rate of 306 rubles, for 2018 - 357 rubles, for 2019 - 428 rubles.

It is also proposed to amend the basic value calculation formula for a unit of equivalent fuel to be employed to fix the MET rate for natural and condensate gas production. The changes are designed to increase the MET rate for natural gas production exclusively for organizations that own the Unified Gas Supply System facilities and affiliated companies. Additional revenues to the federal budget in 2017 will amount to 170 billion rubles, in 2018 – 125 billion rubles and in 2019 – 130 billion rubles.

It is proposed to change the taxation mechanism for the multicomponent complex ores extraction by fixing specific MET rate in the amount of 730 rubles per ton. This mechanism will be applied to multicomponent ores extraction in the Krasnoyarsk Region.

It is planned to monitor the application of the existing taxation mechanism for oil, gas condensate, and combustible natural gas production, including new offshore fields, and feasibility analysis of the authority delegation to regional authorities to fix MET rates and to assess the tax base by types of mineral resources that belong to widespread mineral resources, and, if needed, to amend the legislation.

In parallel, other amendments to the tax legislation within the hydrocarbon production taxation have come into effect, which affected the MET calculation mechanism. In particular, the calculation procedure for the degree of oil production complexity, alongside the MET final rate calculation have been modified; how regional specific features of the oil field location and its properties influence on the MET rate have been considered; applicability of a zero oil tax rate has been changed. Of note, there is a MET differentiation due to increase in a number of factors that determine the mining specific feature of the minerals extraction [6].

Due to the high competition on world hydrocarbon markets, maintaining of production and putting new oil fields into production are becoming extremely important for the Russian oil industry. The oil industry needs tax incentives in order to be competitive on world markets.

It is evident that at present time our country, with its unstable market economy, should stay reasonable and employ two taxes for the oil production: MET and AIT, which are meant to withdraw various types of rent (absolute and differentiated) stemming from subsoil use.

Additionally, further work on the draft law on excess profits tax for oil companies should be done. After the excess profit tax for oil companies has been enacted, it is possible to cancel the MET.

Thus, there is an obvious conflict of interest between the Ministry of Energy of the Russian Federation and the Ministry of Finance of the Russian Federation in terms of AIT introduction. In this context, it is important to find the necessary balance between regulatory and fiscal functions of this tax, since “the main goal of a tax reform is to

develop and implement a modern and efficient tax regime that would ensure a continuous and stable flow of tax revenues to the budget, and contribute to the long-term development of the oil industry.”

Such a balance has not been stricken yet: rather than levying the AIT, the MET is being reformed, with a number of privileges granted causing huge losses to the budget of the Russian Federation.

2 Results

Over the last few years in Russia the taxation in the oil sector has been reformed. At different times this reform was declared to have various goals, it bears many components, strategic and tactical tasks, but its main medium-term vector is to reduce crude export duty rates, to gradually align them with export duty rates on dark and, to some extent, light oil products, as well as to raise mineral extraction tax rates. The implementation of this particular vector of the reform of the legislation adopted in 2013–2014 was called a tax maneuver.

In due time, the need for the “tax maneuver” was explained by loss minimization from oil and oil products reexport by Belarus and Kazakhstan, when export duties were much lower than Russian ones. This became a pressing issue due to the Eurasian Economic Union Treaty enactment dated January 1, 2015. Also, one of the goals of this novation was to reduce the dependence of the Russian budget on export duties, which reduction, due to the calculation specifics, depends on oil price movements. It was assumed that the tax burden on operating enterprises at high oil prices would be lower compared to the previous taxation system.

However, at the time when the “tax maneuver” was being developed, no one could have expected the economic sanctions to be imposed against Russia and the steep fall in oil prices. Originally designed to revitalize the oil and gas industry and to increase the performance of oil refineries, the “tax maneuver” has had mixed results in the present context.

Of note, the World Trade Organization calls on Russia to abolish export duties on raw materials. Also, the World Bank experts claim export customs duties to have changed prices of export sales and domestic supply, they are generally not charged in the oil and gas sector, but Russia remains to be a notable exception.

An increase in the MET income alongside a refusal to grant oil customs subsidies within the Eurasian Economic Union will constitute the sources of additional incomes to the federal budget.

Within the planned period under the current legislation, the federal budget revenues are expected to decrease as for GDP. The oil and gas revenues to the federal budget in 2017 will amount to 5,769 billion rubles, in 2018 – 5,380 billion rubles, in 2019 – 5,577 billion rubles and in 2020 – 5,860 billion rubles, according to the principal lines of the budget, tax, and customs and tariff policies. This trend, primarily is due to lower oil and gas revenues to the federal budget as for GDP, which relies on three main factors:

Firstly, with no serious shocks in the global economy, energy prices on the world market are expected to remain close to the structurally balanced level (Urals crude 40 USD per barrel), while the ruble-US dollar exchange rate will remain stable in real terms.

Secondly, during the forecast period, the share of the oil and gas sector itself within the GDP structure will continue to decline against the backdrop of lagging growth rates (decline in individual positions) of production physical output and export of these products.

Thirdly, as the depletion of the developed reserves increases, alongside the investments transferred to the concessional oil fields, the amount of the MET tax exemptions and export duties will continue to grow.

November 24, 2014 Russian President Vladimir Putin enacted the Federal Law No. 366-FZ “On Amendments to Part Two of the Tax Code of the Russian Federation and Certain Legislative Acts of the Russian Federation”, which provides for a reduction in current rates of export customs duties on crude oil and petroleum products, with concurrent increase in the base MET rate for stock-tank oil.

As of January 1, 2015 the new law fixed the following MET rates per ton of crude oil:

- 766 rubles from January 1, 2015 to December 31, 2015 (the previous rate - 530 rubles);
- 857 rubles from January 1, 2016 to December 31, 2016 (the previous rate - 559 rubles);
- 919 rubles from January 1, 2017 (the previous rate - 559 rubles).

At the same time, the adopted amendments reduce the marginal rate of the export customs duty on crude oil (decrease in the index of the calculation formula at an actual price over 25 USD per barrel) from the current 59% to:

- 42% from January 1, 2015 to December 31, 2015 (the previous rate - 57%);
- 36% from January 1, 2016 to December 31, 2016 (the previous rate - 55%);
- 30% from January 1, 2017 (the previous rate - 55%).

Also, the provisions of the Federal Law No. 366-FZ “On Amendments to Part Two of the Tax Code of the Russian Federation and Certain Legislative Acts of the Russian Federation” provide for reduction of the export customs duty rate for light petroleum products (including gasoline) and increase in dark oil products, remaining associated with export oil customs duty.

As part of the “tax maneuver”, it is also planned to change excise tax rates on oil products, to change the MET calculation procedure for gas condensate, and to adjust tax exemptions, most of which will be retained in absolute terms.

The decisions taken in 2014 to reform the tax, and customs and tariff regulations in the oil industry (“tax maneuver”) both prolong the period of increase in dark oil products duty (rates alignment is to be carried out in 2019) and lead to lesser amounts of shortfall in revenues due to this step: in accordance with the budget projection made before the fall in oil prices, the “maneuver price” for the budget, that is, including the price of withdrawal 100% duty on residual fuel oil, was estimated by the Ministry of Finance of Russia in the amount of around 140 billion rubles in 2015 [9]. It was assumed that the balance (around 200 billion rubles) will be distributed between the consumers of oil and oil products in Russia and the countries of the Eurasian Economic Union due to the increase in prices, in contrast, the oil industry will even raise additional revenues in the form of increased profitability from oil production and necessary postponement to complete the modernization of refineries.

A preliminary impact analysis of the “tax maneuver” carried out following the results of 2017, shows that although such impact is somewhat different from those expectations shaped in the context of different oil prices and ruble-foreign currency exchange rates, the maneuver did not result in negative impact on oil production and refining, and did not entail additional budgetary losses. Moreover, the decisions taken amid falling prices and the ruble-foreign currencies exchange rate growth allowed to keep motor fuel prices down early in the year.

3 Discussions

According to experts, the existing taxation system hampers investments in development of new deposits and does not stimulate the maintenance of production output in depleted areas. The system is still focused on mature deposits. In order to attract oil companies to develop new deposits, it is necessary to significantly reform the legislation [7].

According to Alexey Sazanov, head of the Tax and Customs Policy Department at the Ministry of Finance of the Russian Federation, it is necessary to stop granting unsystematic MET privileges for low-margin fields to various oil and gas companies and to start focusing on the systematic AIT introduction.

This standpoint partially contradicts the one of the Ministry of Energy. First Deputy Minister of Energy of Russia Alexey Tessler believes some tax exemptions granted to companies will remain applicable until the end of their validity. With all that, the Deputy Minister does not rule out the introduction of additional privileges for particular oil and gas fields, if these measures will be beneficial both for economy and budget of the Russian Federation [8].

In the light of the foregoing, the introduction of additional pinpoint tax exemptions may have a negative impact on revenues to the budget and reduce competition in the Russian economy. Minister of Finance of the Russian Federation Anton Siluanov considers the taxation regime in the oil industry to be changed as soon as possible. He supposes it is necessary to amend the Tax Code of the Russian Federation concerning the switch to AIT as early as in 2017, so that companies could administer the new tax from 2018 onwards. Also, Mr. Siluanov notes the changes in the tax system to be adopted before 2019 will remain unchanged for the next 5–6 years. Such taxation stability in the oil and gas industry should positively affect the investment climate in Russia.

4 Conclusions

The attempt to introduce a new tax is explained by the need to consider oil production costs when taxing oil companies. Thus, the MET and export duty calculation depends on the oil price, while the hydrocarbon production costs are not considered. Nevertheless, the relocation of extraction fields to new territories, the complication of new development and the depletion of existing deposits lead to the need for additional privileges, because under the current taxation system the development of reserves in such zones is considered unprofitable.

However, according to the Ministry of Finance of the Russian Federation, the introduction of a profit-based tax (PBT) in the oil industry will result in selective introduction of a preferential taxation for randomly selected investment projects. What is more, the feature of the drafted PBT bill is that the tax parameters imply accelerated depreciation and, as a consequence, the state's refund of oil production capital costs, though this will negatively affect the investments efficiency. Also, concerns of the Russian Ministry of Finance relate to the fact that if the MET was abolished and the PBT was introduced, the federal budget would lose stable revenues from the previous tax with a more specific tax base [11].

In conclusion, I would like to highlight a number of key problems that the oil industry faces when employing the oil production taxation legislation in Russia:

Firstly, issues when applying tax exemptions for oil production taxation. Anyhow, it becomes obvious that there is a need to provide tax deductions for MET, the purpose of which will be to raise a geological exploration fund. This approach seems to be the most effective one to address the growth stimulation issue of new oil reserves, to maintain the annual rate of hydrocarbon production, and, in the long run, tax revenues and other mandatory payments to budgets from additional extraction.

Secondly, tax incentives issues for geological exploration. The solution to this problem can be accomplished by introducing surcharge rates for corporate income tax expenses. A tax deduction in the amount of expenses for effective geological exploration work from the amount of the calculated MET within MET may reserve as an alternative mechanism [12].

Thirdly, the transition to the financial result taxation. This approach allows to transfer the tax burden for the period when the project begins to actually generate revenue.

Fourthly, the transition to a different oil production taxation in Russia. The main problem is the taxation itself, where taxes (MET and export duty) are calculated based on the volume of oil produced. With this approach, the state has the same amount per ton of oil, regardless of the production cost. Similar system works perfectly when the production cost of all the reserves is approximately the same. However, in Russia this cost varies considerably not only between different oil fields, but also within particular ones.

In order to ensure that the taxation system of the Russian Federation meets modern requirements and reality of the domestic oil industry, a reform of the taxation system introducing AIT was proposed. Its key advantage is that it provides for reducing the tax burden of new undiscovered deposits with a high potential for further oil production [13, 14].

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Import Substitution in Agriculture: Crises of Overproduction, Choice of Institutional Policy, Application of Behavioral Economics

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Abstract. The policy of import substitution showed the first results in the agricultural production sector. Despite the economic growth in the agricultural production sector, the problem of rational allocation of resources and choice of the optimal production structure has been outlined. Weak awareness of market actors about the volume of production of certain types of crops, product prices creates situations of uncertainty in which the decision-making process of producers can not be optimal. It is necessary to determine the options for providing producers of agricultural products with information on the volume and structure of production, which is possible both in the framework of the Pigouvian and Coasian directions of institutional reforms. The article shows options for implementing both directions, gives examples of the successful implementation of institutional reforms, and also suggests to depart from the concept of rationality in decision-making by actors in favor of limited rationality and libertarian paternalism in the spirit of the behavioral economy in accordance with the ideas of the Nobel Prize winner in economics R. Thaler (2017) and his predecessors, G. Simon (1978), T. Schultz (1979), D. Kahneman (2002). The article uses the methodology of institutional analysis and behavioral economics to determine possible directions of influence on decision-making by agricultural producers in order to ensure the most efficient production structure, a balanced distribution of income and avoid overproduction crises for individual crops.

Keywords: Pigouvian and Coasian directions of institutional reforms · Import substitution in agriculture · Behavioral economy · Crisis of overproduction · Production structure

1 Basic Provisions

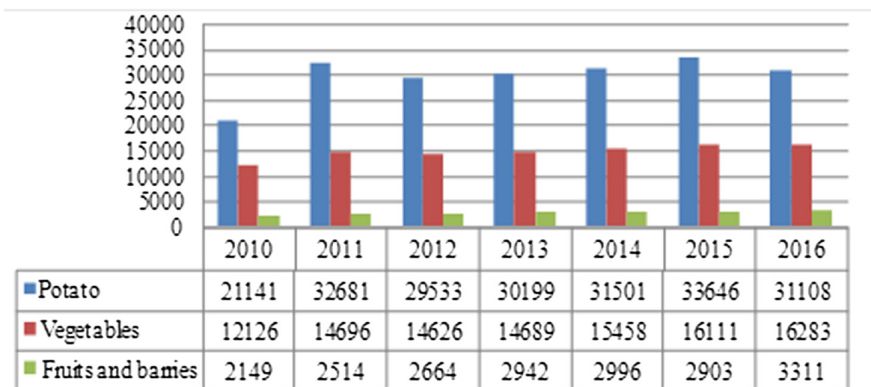
- Lack of information about the structure of production leads to inefficient decisions of agricultural producers on what and how much to produce;
- Direct state intervention in the decision-making process of agricultural producers can not lead to an increase in the effectiveness of such decisions;

- Both the Pigouvian and Coasian directions of institutional reforms can offer options for providing agricultural producers with the necessary information for making effective management decisions;
- The methodology of the behavioral economy makes it possible to develop mechanisms for indirect soft impact on decision-making by agricultural producers.

2 Introduction

Russian Statistical board published updated data that the results of 2016 due to agriculture managed to achieve economic growth, that is, the contribution of agriculture to the rate of economic growth was the most significant in comparison with other industries. The agricultural production index for 2016 showed a value of 104.8%, which is more than in 2015 and in 2014. The unfavorable weather conditions of 2017 can spoil the emerging positive trend, however, the Ministry of Agriculture of the Russian Federation almost excludes such scenario (Table 1).

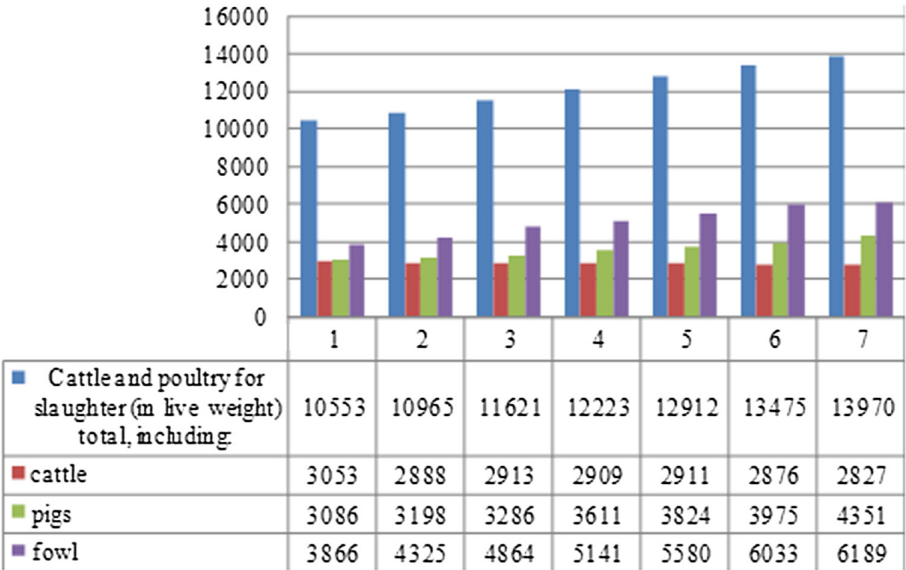
Table 1. Production of basic cultures in Russian Federation, hndr of ton. Datas of Federal Statistics Board www.gks.ru.



Neither bad weather nor conditional overproduction (growth in agricultural production compared to the previous period) and the corresponding deterioration in the market situation resulted in a 15.2% increase in grain and legumes production, sunflower seeds 18.6%, and sugar beet - all 31.6% %, slightly less – vegetables of protected soil (about 30%). The growth in the volume of greenhouses for the industrial production of vegetables of protected soil gives its results. Economic sanctions and response measures to restrict the supply of agricultural products from some states led to import substitution in the agricultural production sector as a whole, and for the industrial production of vegetables of protected soil, and at all to a change in the previously distorted market where imported vegetables dominated. While there is encouraging growth in the crop industry, the livestock sector and especially dairy cattle

shows less than positive results. This is mostly due to the fact that processing has increased capacity over the past period, but also because of the arrival of ever larger volumes of ready-made dairy products from neighboring Belarus to the Russian market. Due to pork production, as well as some other industries in 2016, imports fell by 6.5%, and exports amounted to \$ 17 billion (a percentage increase of 5.2%). Producers of pork were able to increase exports in 2016 by 4.3 times compared to 2015. The policy of promoting Russian products abroad is important, and also the changing of taste preferences of Russians - the rejection of chicken in favor to pork. Growing demand of pork, as well as a relatively short period of pig rearing, attracts investors with quick return on investment, which can cause overproduction of pork and the classic economic crisis of overproduction (Table 2).

Table 2. Production of basic livestock products in the Russian Federation, hndr of ton. Datas of Federal Statistics Board www.gks.ru.



The acute increase in sugar beet and oilseed production in 2016 compared to 2015, as well as the demand that can not keep up with production growth can provoke a crisis of overproduction in these sub-sectors. In such situation, if the production growth continues to rise along the vegetables of the enclosed soil, crisis of overproduction is also possible while the domestic market is saturated and there are no exits to the world market. The problem of vegetable production in closed ground is especially sharp due to the gradual removal of restrictions on the import of certain types of vegetables (for example, tomatoes from Turkey). For vegetables of open ground, a crisis of overproduction is possible in case of switching to their production from other crops (oilseeds, sugar beets, etc.).

Thus, overproduction of individual crops leads to distortions in the market, as a result of which producers switch to the production of another crops. The latter, because of the inflow of new producers, also leads to overproduction in the market of another culture. Distortions happen in the market here because of the fundamental institutional problem of the absence of an interested actor who performs one of the following functions:

1. Indicative planning (which leads producers in the frames of the Pigouvian direction of institutional reforms [6] to the desired volumes of production by quantity and assortment).
2. Information support for agricultural producers on the volume of production that has taken place, the structure of areas, prices of sales, etc., within the frames of the Coasian direction of institutional reforms [6], producers themselves will receive information signals and, as a result, adjust their production programs.

While there are no such interested actors (and state is not ready to perform the function of indicative planning, but there are no actors capable of giving an informational signal to the markets), crises of overproduction of one crop will switch to other cultures, and this process will resemble the Brownian movement, when actors in the market carry out erratic switching from one culture to another and seek to “guess”, what will be in demand in the year of harvest on the market.

3 Methods

While making research, general scientific and special methods and methods of research characteristic of economic science were used: a set of scientific methods of the abstract-logical method; monographic and economic-statistical methods, the method of institutional analysis, methods of behavioral economics.

4 Results

It is important to take into account one limitation, which was expressed by the Nobel Prize winner in economics (1979) Theodor Schultz: “Agriculture, as a rule, is a highly decentralized sector of the economy. Where the government takes over the function of farm management, it hinders the realization of entrepreneurial talent; and such government does not succeed in providing effective options for allocating resources that can modernize agriculture. The ability of farmers and their families to allocate resources is an important factor that determines their economic opportunities” [4]. Hence the limited ability of the state to set up a mechanism for the functioning of the agro-food market, as well as the need for indirect weak signals to market actors about how to act not only in their own interests, but also in society as a whole [2].

In our opinion, one should turn to the achievements of the behavioral economy and try to use the rooting rapid switching from culture to culture so that producers can “correctly guess” the market situation and not carry out undesirable operations that could lead to market distortions and overproduction crises. In addition, both the

Pigouvian and the Coasian directions of institutional reforms are quite capable of influencing the decisions made by agricultural producers and preventing overproduction crises on the one hand, but also contributing to a more careful attitude to the soil on the part of agricultural commodity producers, as it is obvious that because of speeding up the decision-making process in terms of the production program, the reproduction of soil due to violations of crop rotations will be the first thing that will be sacrificed, depletion of soil due to repeated use under the same culture, etc.

Foreign experience of successful institutional solutions of both directions of reforms in the agrarian sphere provides a wide range of opportunities. For example, in Germany and Austria a network of AgrarMarkt institutes has been implemented, which includes the collection and dissemination of information on the production of food products, sowing areas, livestock, crop yields, livestock productivity, and prices for agricultural products. The dissemination of information goes through several channels - both AgrarMarkt collections, and through state (ministries) and public (unions) organizations. The interaction of state and private actors here is based on the obtained objective market information. The state on the basis of this information forms subsidiary funds, and entrepreneurs develop production programs.

The producers of agricultural products in France have a slightly different position. Indicative plans dominate there, when the state determines the desired production volumes and brings these plans to the producers, and they, in turn, form production programs taking into account the indicators that have been raised if they want to receive subsidies from the state. Thus, the state gently pushes actors toward a certain production structure. Nevertheless, such economic mechanisms that lead actors to correct behavior can not function constantly, the power of their influence can be weakened for political reasons, and this kind of “social” agreement between the authorities and farmers will be violated by the state. You can recall the dissatisfaction of French farmers by imposing sanctions against Russia and the closing closure of our food markets for French agricultural producers. Such a violation of the terms of the contract leads to the increase of farmers’ distrust in the state. In our case, the problem of mutual distrust of business, society and power is much more serious. Hence, we need even more subtle adjustments to the economic mechanism of soft pushing agricultural producers to correct solutions.

Ideas of behavioral economics and libertarian paternalism in the spirit of the work of the laureate of the Nobel Prize in 2017 by R. Thaler may prove to be more needed for Russian practice, and most importantly, can provoke the process of rooting confidence in the state-business triad.

The datas of import substitution production give us the opportunity to assess not only the growth of production (or fall) for certain types of agricultural products, but also to characterize the volumes of its processing. We can state that practically all kinds of agricultural products are falling in volumes from 2015, and even from 2014. These are alarming trends, as they indicate a fundamental failure of the current economic policy in terms of encouraging deep processing of raw materials. In fact, this is evidence of the encouragement of the raw materials industries and the gradual oppression of the deep processing industries.

As we noted earlier [7], the policy of import substitution has its own logic and does not consist in achieving replacement of imported goods by domestic ones on the domestic market. The policy of import substitution has the ultimate goal of growing national champions – producers which are able to compete in the international market. A simplified understanding of the goals of the import substitution policy leads to wrong decisions and erroneous actions that can lead to systemic institutional dysfunctions, as in the case of chaotic switching of agricultural producers from one culture to another in search of higher profits (Fig. 1).

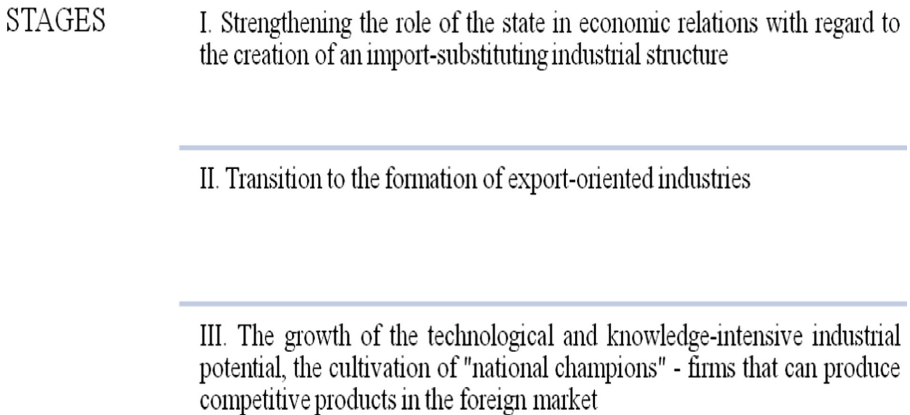


Fig. 1. Stages of import substitution policy.

Deep rebuild of national economy of Russian Federation after 1991 was based on the idea of an open economy that is conscious rejection of the policy of protectionism. Moreover, only the introduction of economic sanctions in 2014 has forced to think over retaliatory measures, which served as the basis for introduction of mechanisms of import substitution, primarily in agricultural industry. If we leave the political field and switch to an economic assessment of solutions in the field of agro-food policy, then we get a scale of possible combinations of management decisions from the need of food security and food sovereignty to the desirability of considering the theory of comparative costs as basis for such decisions. Tracy says: “as a result of protectionist measures and state intervention, agricultural producers in most European countries, although, of course, affected by the crisis (the great depression) but were spared from the worst forms of it. Incentives to agricultural production has not been weakened, rather the opposite – the production of the majority of kinds of agricultural products in the countries of Western Europe after 1929 was higher than in the previous period...” [11]. We see that the American specialist acknowledges the accuracy and validity of

protectionist measures in agriculture to avoid the worst manifestations of the crisis. This allows deducing of several items:

1. Western European countries used protectionist measures in order to avoid the negative consequences of the economic crisis for agricultural producers; they actively closed their markets to other countries to save agricultural producers from ruin;
2. Protectionist measures help to prevent (to some extent) the negative effects of the economic crisis for agricultural producers;
3. Judging by the consequences of protectionist policies as one of the stages of the agricultural policy of the European countries and later the EU, agricultural producers not only managed to overcome the negative manifestations of the crisis, but also to gain a foothold in national markets as reliable food producers. Rooting of the manufacturers in the domestic market allows them to get used to the ongoing agricultural policy, institutional conditions, and to grow export ambitions. Any entrepreneur considering the life cycle of the company through its stages, and the stage of rapid development requires the expansion of market for manufactured products. Then the need for expansionist agricultural trade policy arises. Access to foreign markets becomes a priority of agrarian policy and then there is the need to negotiate within the GATT, and later WTO, about opening of markets, conditions of food trade, etc. It is important to emphasize that such a need arises after rooting producers on the national market, and not before this, as it was done in Russia.

Modern agricultural policy of the EU although has undergone several changes, however, retained a number of measures to support agricultural producers, including direct payments [8]. I would like to point out the fact that before the establishment of the food producers (as well as products of other industries) of the European countries on national markets, both in scientific literature and in the practice the idea of protectionist policy were actively promoted. So, Professor T. von der Holtz said: “the State is not only has the right but also has obligations ... to take the necessary preventive and repressive measures... in the internal trade and external trade relations” [12, 13]... Buchenberger spoke even more harshly: “fundamental right of the state influence on the establishment of market prices for products of agricultural production can not be disputed...” [5] And further “away from agricultural protectionism remained only one England. But for this policy of laissez-faire it paid the price of economic ruin of thousands of farmers and dramatic reduction in the production of wheat, so its dependence on the supply from abroad from year to year is growing” [5]. We draw the reader’s attention to the fact that the author condemns the agricultural policies of Britain and championed the policies of other countries. In the Manual of Trade policy, in connection with the entry in WTO, there is a need for trade liberalization [10]. The administration of US President Roosevelt also introduced protectionist measures in agriculture and substantial state intervention in the sphere of agricultural production. So, Agricultural Adjustment Act was adopted in order to eliminate cycles of high and low production [1].

Thus, we can conclude that the Russian Federation will have to attend to the problem of overproduction in certain areas of agricultural industries and ensure balanced production. It’s necessary to make a decision about which way of institutional

policies it is need to carry out such a balancing of production volumes –Pigouvian or Coasian. Choosing the direction, implement relevant institutional policy or plan indicators of production and convey them to producers, accompanying the performance targets indicators with the relevant measures of the state support, or to expand the network of institutions for the dissemination of information on the state of agricultural markets, the volumes and structure of production, prices of products, etc.

5 Discussion

Agrarian economy, in fact, just as economic theory, consists of two components: Economics of agricultural production (micro-level) and agricultural policy (macro level). Economics of agricultural production explores the problems of the production itself and the food markets. Agricultural policy aims to guide the behavior of agricultural producers, that is, to facilitate their proper choice of decisions. Hence, there is the need to explore the real behavior of actors, and not rationalized models that are not very applicable to their behavior in reality.

Obviously, the first limitation of rational behavior of agricultural producers is in different from those, that of actors in other sectors, attitude to risk. Realized risks of crises of overproduction force farmers to be more sensitive to risks, that is, their behavior is less risky than the behavior of actors in other sectors of the national economy. The behavior of farmers owning different in quality and fertility of soil is different. Those actors, who possess more fertile soils, spend less funds to get higher yields, compared to those actors, who own more poor soils and have to put more labor and means of production to achieve the same level of yield as it on more fertile soils. The difference in the cost of production, therefore, is not only in arithmetic difference, but also in the logic of behavior of farmers on different soils. It is the weak sensitivity of the agricultural producers to new technologies, which allow obtaining higher yields and profits than traditional methods, especially during the “green revolution” has forced researchers to look for the causes of such behavior. For example, farmers will not use technology that doubles the yield during a drought, the likelihood of which is 10%. Actors prefer to avoid risk rather than to increase their average yield.

Special attention to losses compared to the possible achievements is connected with the concept of “avoidance of losses” [9], a key element of prospect Theory [3]. Kaneman and Tversky revealed the effect of avoidance of losses, which proved to be a serious limitation in the process of making rational decisions and helped to identify the behavioral elements in contrast to the neoclassical approach of the “expected utility» in making risky decisions. Nobel laureate Theodore Schultz proposed the term “human capital”, which he used to explain differences in performance. In addition, he also acknowledged that in contrast to classical economic theory, which emphasized the relations of equilibrium modern economic systems are rarely in equilibrium. There new technologies appear, there accidental climatic and political upheaval happen, and people need to adapt to the new reality. Therefore, a key attribute of human capital is the ability to cope with the irregularity and to adapt to changes. Meanwhile he noted that: “the Technical abilities are becoming more favorable, but the economic incentives needed for farmers to realize the potential, are in disarray because of lack of relevant

information or due to the fact that prices and costs that they face, are distorted. Despite the desire to have incentives, that make profit, farmers do not make the necessary investments; in particular, don't buy high quality fertilizer and equipment" [4]. The lack of information, as we identified earlier, rather the problem of implementation of Coasian direction of institutional reforms, but it does not remove the question of choosing the direction of institutionalization of mechanisms of functioning of agricultural markets to avoid crises of overproduction in certain crops.

6 Conclusion

In case of choosing any institutional policy, it should be taken into account, that agricultural producers are ready for the fast reorientation of production, and is also quite sensitive to changes in agricultural policy, therefore, it is necessary to consider the requirements of behavioral Economics, that is, try to move away from direct methods to indirect methods of impacts, from paternalism to libertarian paternalism.

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Western Sanctions and Their Consequences for Russia

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Abstract. The article examines the anti-Russian sanctions imposed by the United States and a number of other Western states with a view to forcing the Russian Federation to abandon undesirable actions in the southeast of Ukraine: in the Donetsk and Lugansk regions, as well as in the Crimea.

The purpose of the study is to analyze the situation and determine the further steps on both sides to improve relations between Russia, the US and the EU, despite anti-Russian sanctions.

The authors give a chronicle of events after the reunification of the Crimea with Russia in 2014, analyze the reasons for the introduction of anti-Russian sanctions by the US and its allies in connection with the assistance of our country to compatriots in the southeast of Ukraine. The article analyzes not only the reasons, but also the nature of quite serious political, economic, financial and other measures (sanctions) to force Russia to change the chosen policy towards sovereign Ukraine and its territories.

The authors note that the initiators of the introduction of anti-Russian sanctions were the United States and the leading states of the European Union; Among the participants in the “sanctions” were also Australia, Canada, Norway, Switzerland, Japan and other states. In the opinion of the initiators of pressure on Russia, the reunification of Russia and the Crimean Republic, the former part of Ukraine, was illegal, as it violated the universally recognized borders and territorial integrity of a sovereign state, a member of the UN Security Council. The authors not only describe in detail the step-by-step introduction of anti-Russian sanctions, but also make a valid conclusion that the state policy of counteracting Western sanctions, conducted in 2014–2018, yielded positive results both in the political and economic spheres in particular, accelerated the implementation of programs on overcoming dependence on imports in a number of areas of the economy, including in industry and the agro-industrial complex of our country.

The consequences of imposing sanctions against Russia, their influence on the economy of different countries are being investigated by both Russian and Western scientists and specialists. So, in August 2017 a survey was conducted among 193 German companies operating in the Russian Federation. The study showed that 97% of the polled representatives of German business assess the new American law on sanctions negatively, among them 77% - “unambiguously

negative.” In a positive light, only 3% of the polled companies expressed their opinion about the new sanctions.

More than half of the respondents (52%) reported that the new sanctions, directly or indirectly, but will affect their business. “At the same time, most companies are afraid of indirect consequences. About a third of respondents (30%) indicated that the new US sanctions would not affect them. And for 18% of respondents it is not yet clear whether sanctions will affect their business. Two-thirds of companies (65%) expect that sanctions will have a negative impact on their business. Entrepreneurs are afraid of fines from the US. In addition, the survey revealed an increased degree of uncertainty: one third of respondents at the time of its holding did not know whether new sanctions would be applied to their current projects or not.” Despite the tightening of sanctions, almost three-quarters of respondents (72%) plan to keep the level of business activity and investments in Russia at the same level, and 15% are going to even increase their activity and increase the volume of investments in the Russian economy. Only 13% of respondents are going to reduce their activity because of sanctions.

According to many respondents, sanctions are designed to promote the economic interests of the United States, as a result, almost three quarters of companies (73%) “call on the EU and the government of Germany to respond.”

The leitmotif of the need to apply sanctions against Russia was its participation in the events that unfolded on the territory of the neighboring state - Ukraine. By the end of 2013, a civil revolution had begun in Ukraine, which led to a coup d'état. One [western and central] part of Ukraine's population supported a coup d'état, while another [southeastern] part of the country's population opposed it. Since the conflict of political and other interests was accompanied by acts of violence in different parts of the country, separatism in the southeast of the country sharply increased in Ukraine. The first to withdraw from the unitary Ukraine was declared by the Autonomous Republic of Crimea [and the city of Sevastopol], having conducted on March 16, 2014 a referendum on the formation of the Republic of Crimea with the subsequent intention of joining Russia on the rights of the subject of the Federation. Russia supported the holding of the referendum by a military presence on the peninsula. The referendum was voted by 82.71% of voters, with a result of 96.77% for joining the Russian Federation. On March 17, the leadership of the Republic of Crimea asked Russia to join as a subject. In the end, the Russian Federation recognized the referendum in the Crimea and granted a request for the annexation of the peninsula to Russia, since Crimea has an important strategic importance for the Russian Federation in the Black Sea region.

The international community, in the person of states with developed market economies, primarily the United States, did not recognize the referendum in the Crimea and found the Crimea's joining Russia, despite the will of the population of Crimea itself, an act of military aggression towards Ukraine's territorial integrity. Separate trends covered the east of Ukraine - the Donbass region. On the basis of the Luhansk and Donetsk regions of Ukraine on May 11, 2014, the Luhansk People's Republic and the Donetsk People's Republic were proclaimed through a referendum. In Ukraine, a war broke out on the one hand for preserving the territorial integrity of the unitary Ukrainian state, on the other hand, for the formation of a new [con] federal state formation, Novorossiia, on the basis of the south-eastern regions of Ukraine. Despite the fact that the Russian

Federation has not officially recognized LDP and the DNR until today, it did not introduce its peacekeeping troops into the territory of Ukraine, nevertheless, the blame for the events and the escalation of the conflict and violence in southeast of Ukraine are western countries, including Australia and Japan, try to entrust exclusively to Russia. Although the Western countries themselves provide financial, humanitarian, technical and other assistance to the Ukrainian authorities in the current civil war, which automatically makes them involved, that is, equally response.

The article contains a well-founded conclusion that, despite numerous difficulties, the state policy of counteracting Western sanctions played a positive role in Russia's socio-political and economic development.

Keywords: Anti-Russian sanctions · The policy of Russia · Counteraction to Western sanctions

1 Introduction

The first package of anti-Russian sanctions was implemented immediately after Russia recognized the results of the Crimean referendum. Initially, anti-Russian sanctions had a pronounced economic pressure: financial assets and other assets were frozen, companies were forbidden any economic cooperation with our country.

Simultaneously with attempts to force Russia to give up actions in Ukraine, pressure was exerted on the environment of the Russian president through the introduction of visa restrictions for persons included in special lists. So, under President Barack Obama's decision, sanctions were imposed against a number of Russian officials in the form of refusal to issue entry visas, as well as by freezing their bank accounts, seizing property allegedly located in the United States. Under the sanctions, one of the first to fall: VI Matvienko, S. Yu. Glazyev, DO Rogozin, V. Yu. Surkov and other officials. Restrictive measures were also taken against a number of companies and banks, for example against Bank Rossiya, which allegedly is a "personal bank of high-level officials of the Russian Federation." At the same time, they tried to harm major Russian businessmen who were somehow related to President Vladimir Putin, and in a number of countries such Russian citizens as the brothers A.R. and B.R. Rotenberg, Yu. V. Kovalchuk, G. N. Timchenko, who became dollar billionaires with the support of the first person of the state, believed that this would affect Vladimir Putin and his decision.

When these restrictive measures did not bring the desired results to the initiators of anti-Russian sanctions, the United States and its allies began to exert pressure on our state by political methods. Thus, the above facts indicate that the introduction of anti-Russian sanctions was carried out with a constant increase, beginning with the restriction of officials of the Russian Federation and individual companies and ending with sanctions against key sectors of the Russian economy. At the same time, political pressure on our state was intensified with the aim of forcing it to give up assistance to the Donbas and return the Crimea to Ukraine.

A number of Western countries, acting in the wake of the United States anti-Russian policy, began to impose economic and political restrictions on cooperation

with Russia. So, Japan, supporting the US sanctions, in March 2014 ceased negotiations on the liberalization of the visa regime for Russian citizens, and then canceled and stopped issuing visas to 23 employees of state structures of Russia. At the same time, in order to please Uncle Sam, Japan stopped consultations on the issue of disputed islands, suspended negotiations on signing investment treaties.

Australia, an ally of the United States for the military-political bloc SEATO, in March 2014 canceled a number of official visits to Russia, and then froze accounts and banned the entry of a number of Russians who allegedly threatened “the sovereignty and territorial integrity of Ukraine.” In May of the same year, this country expanded its sanctions list to 38 Russians and 11 companies, and in September introduced a ban on Russia’s supply of equipment for the oil and gas sector. However, the most significant of all previously adopted restrictions was the ban on Russian banks to take cheap loans in Australia in foreign currency. In addition to depriving the lending of our banks, the government of this country imposed a ban on investments in the Crimea and trade with it. This was already a serious economic measure of pressure on our country.

The World Bank, based on the above facts, issued a negative outlook for the development of the Russian economy in the face of Western sanctions. According to the forecast, Russian enterprises, faced with restrictions in terms of access to international capital markets, will have to reduce their investment activity, and Russian banks, exempt due to favorable borrowing abroad, will worsen their credit policy, as a result of which “in the Russian economy will be a long recession” [1].

Thus, the money resources aimed at maintaining the liquidity of the banking system and the real sector of the economy contributed to overcoming the negative impact of Western sanctions.

Seeing that the imposed restrictions practically do not affect Russia, the European Union on May 12, 2014 expanded the list of persons against whom sanctions were imposed for 13 people, and imposed sanctions against the companies “Chernomorneftegaz” and “Theodosia.”

Canada, acting in sync with the United States, extended sanctions to sixteen Russian banks and companies, and in July 2014 this state expanded its sanctions list to include another 190 large Russian companies. Thus, Canada almost completely duplicated the US sanctions list.

Similar measures of economic impact on Russia were taken by the European Union. On July 30, the European Union imposed sanctions against the Russian National Commercial Bank, Almaz-Antey Concern and Dobrolet Air Company, a subsidiary of Aeroflot. EU countries closed access to Russian banks and key companies for the lending market, where our businessmen could earlier take on their shares cheap foreign currency loans, which were much more profitable than domestic borrowing. At the same time, the European Union has banned investments in the Russian economy, including in the energy sector, oil, gas and other raw materials. It is forbidden to supply equipment for these sectors. This was a serious blow to the commodity economy.

On August 6, 2014, the US administration set out to strike at the most vulnerable place in the Russian raw materials economy - in its oil and gas sector, which brings the main revenue to the state budget. It banned the supply of equipment to Russia for oil production, as well as drilling rigs and platforms, high-pressure pumps, marine

equipment for work in the Arctic. In addition, the United States introduced a mandatory verification that Russia could not acquire unique equipment through third countries.

Vulnerability of the Russian economic strategy of the last decade is, as you know, in the rate for the export of energy carriers and other raw materials. Therefore, the US has sought through sanctions to disrupt the volume and stability of energy exports from Russia. Bulgaria, a former USSR ally in the Warsaw Pact, a member of the Council for Mutual Economic Assistance, through which it received financial and other assistance from the Soviet Union, joined the EU sanctions imposed on Russia on April 11, 2014. On June 8, 2014, Bulgaria suspended work on the South Stream gas pipeline project, which was built to supply Russian gas to Europe bypassing Ukraine. It was one of the most painful blows for our country.

However, it was not possible to completely break the raw export of Russia to Europe by the Obama administration because of the economic interest of European states in Russian oil: Russia accounts for 46.38% of the European structure of oil consumption. Therefore, it is unprofitable for Europe to join the US initiative, declare an embargo and thereby deprive itself of the lion's share of consumed energy resources. Russia sells 67.5% of its export oil to Europe, and the United States only 6% [2].

It should be recognized that as a result of the imposed economic sanctions of the West, the banking, defense and energy sectors of the Russian economy suffered to varying degrees. Although the media were pretending in every possible way that they did not achieve their effect. This is not true. Suffice it to say that Russian banks, having lost access to cheap Western loans (where they took financial means and instruments at very low interest rates - from 2 to 5% per annum, and borrowers in the homeland gave them already with a large margin - at 15–20% per annum) lost profits in the hundreds of billions of dollars.

The US Treasury Secretary, by the law of 2.08.2017, received the right to impose sanctions on Russian state-owned companies operating in the railway, metallurgical and mining sectors. In the original version, shipping was also indicated, which threatened to trouble the state operator of the tanker fleet Sovcomflot.

The document also implies tougher sectoral sanctions against Russian oil and gas companies. In particular, the term of lending to Rosneft, Gazprom Neft, NOVATEK and Transneft is proposed to be cut from 90 to 60 days. In the original version it was suggested to shorten this period to 30 days. Another change concerns the restrictions on the transfer of American technologies for the exploration and production of Russian oil in the deep water, on the Arctic shelf and in shale formations. Earlier, American companies were prohibited from supplying goods, services or technologies for such projects, if they are led by Gazprom Neft, Gazprom, Surgutneftegaz, Rosneft or LUKOIL, projects in which one of the five of these Russian companies owns a share of 33%. The ban will only concern "new" oil projects in the deep water, the Arctic shelf and in the shale formations. They see the desire of the senior partner to squeeze Russian natural gas from Europe and replace it with American liquefied gas. The law allows the US president to impose sanctions related to the exchange of energy between Russia and Europe and financial institutions. The law also may be applied to new pipelines in the construction phase, as well as to maintenance of the existing pipelines (including those passing through the territory of Ukraine). However, if Gazprom does not complete the

construction of new pipelines by 2019, gas supplies from Russia to Europe will depend on the results of negotiations with Ukraine on transit. At the same time, there is the possibility of a temporary cessation of gas supplies. The “Nord Stream-2” gas pipeline depends on the degree of firmness of the West European partners, and they need it. It should be recalled that both the first oil pipeline and the Druzhba gas pipeline met strong resistance from the United States, it made every effort to prevent them from being built. But Europe insisted, because they needed it. So now, everything depends not on Russia [3]. A tangible blow to Western economic sanctions could inflict on Russia’s financial sector. International payment systems Visa and MasterCard in 2014, at the request of the Ministry of Finance, temporarily stopped servicing the cards issued by Russian banks. This prompted Russia to create its own system for servicing bank cards and on March 27, 2014, President V.V. Putin instructed relevant structures this work [4]. In late October 2016, Sberbank started issuing cards of the national payment system “MIR”. This is quite a welcome event, as many banks in Russia have long been offering similar cards to their customers. The payment system “Mir” will become mandatory for state employees, who make up almost half of all workers in Russia. From July 1, 2018, all employees of the budgetary sphere (civil servants, state employees, beneficiaries of social payments) will be transferred to the Mir card. And pensioners already having cards of other payment systems will be able to change them to “Mir” cards after the expiration of their validity, but not later than July 1, 2020.

It should be emphasized that, in connection with the sanctions imposed, the flow of foreign investment in Russia is gradually decreasing. If before the introduction of sanctions in the Russian economy, only 40.14 billion dollars were invested in the first quarter of 2013, then in 2014 there was a sharp decline and the volume of direct investments amounted to only \$ 20.958 billion, which is 30.3% compared with the previous year. Foreign businessmen who want to invest in the economy of the Russian Federation realize that investments are not only related to high levels of corruption, bureaucratic obstacles, but also to increased economic and political risks due to imposed sanctions [5]. In 2015, the production of Opel cars was closed, in the IT sector closed offices of Google, Skype, Adobe Systems, significantly reduced its presence Raiffesen Bank [6]. In 2015, foreign investment in Russia fell to 6.853 billion US dollars [7]. The dynamics of foreign investment reflects the increased risks faced by investors conducting business in the territory of the Russian Federation. Foreign investors, even if they do not agree with the policy of sanctions against our country, will not go to confrontation with their authorities. Therefore, Russia has to rely more on its own resources.

It should be noted that because of economic backwardness, Russia is extremely dependent not only on foreign investment, but also on imported technologies and goods. At present, the share of imports in various sectors of the economy is extremely high. According to the Ministry of Industry and Trade of the Russian Federation, its own production in such important sectors as heavy engineering, machine-tool construction, radio-electronic industry is only 20–30% of the demand, and the share of imports exceeds the permissible limits to ensure national and economic security of the country. This is evidenced by the following data: Civil aircraft construction more than - 80%; Heavy engineering (depending on the product category) – 60–80%; Oil and gas

equipment 60%; Machine-tool construction in light industry – 70–90%; Agricultural machinery (depending on the product category) – 50%–90%; Radioelectronic industry – 80–90%; Pharmaceutical and medical industry 70–80% etc. [8].

From the data follows that the dependence of the branches of the Russian economy on imports is excessively high. In a number of sectors, it reaches 90%. The greatest concern is the state of domestic machine-tool construction, where the share of imports today exceeds 90%, while the production of metal-cutting machine tools in comparison with the Soviet period has decreased in our country more than 10 times [9, c. 7–8]. The production of tractors declined by about 14 times, spinning machines - 50, and weaving - 127 times [2]. By the number of products, many industries are still in the last century. This applies to shipbuilding, and instrumentation, and aircraft building, to some other branches of the economy. “Unfortunately, most of the technological equipment currently used by Russian industry lags behind the advanced level, not even for years, but for decades,” acknowledged V.V. Putin when he was in his first presidential term [10]. Medvedev at the All-Russian Forum of Industrialists and Entrepreneurs, held in Krasnodar on January 31, 2008, declared: “Without an immediate breakthrough - technological and, by and large, moral - Russia also risks to stay away from progress. Infinitely exchange oil and gas for shoes from China and TVs from Korea, we still can not afford” [11]. However, even after such sharp statements by the leaders of the state, there have been no tangible shifts in the transfer of the domestic economy from raw materials to an innovative development path. The lack of financial and material resources, political instability, and crisis phenomena in the economy did not facilitate the implementation of the state policy of import substitution.

It is not difficult to imagine what will happen in the Russian Federation if, with an exacerbation of relations with the West, imported medicines cease to flow, and such inhumane sanctions are quite real. In this case, the life expectancy of cores, patients with diabetes mellitus and other categories of Russians, consuming imported drugs in the absence of domestic, will significantly decrease. What economic and national security can we talk about in such a situation? That is why under the conditions of Western economic sanctions, a sharp drop in export earnings, our country urgently needed import substitution [12].

The course towards Russia’s international isolation, limiting its access to world financial markets, modern technologies can increase the already substantial technological gap in Russia from Western countries.

When investigating the problems of anti-Russian sanctions, the authors mainly focused on analyzing their impact on the economy of the Russian Federation. The greatest interest of researchers was caused by such problem, as mutual losses from the imposed sanctions both from Russia, and from those who introduced or supported them. France, implementing the decisions of the European Union, thwarted the supply of two paid helicopter carriers “Mistral” to Russia, despite financial losses and penalties. In the Western press, it was suggested that the dissolution of a military contract beneficial to France was caused by fears that Russia could use its “Mistrals” in the Crimea or elsewhere in the alleged conflict with Ukraine.

Of course, the Russian leadership could not leave the political and economic sanctions of the West without an adequate response. One of these answers was the Decree of the Head of State of August 6, 2014 No. 560 “On the application of certain

special economic measures to ensure the security of the Russian Federation, a ban was imposed on agricultural imports from countries that imposed sanctions on Russia" [12] (USA, the country EU, Canada and Japan).

The second decree was signed by the president in November 2015, which established a ban on the import of vegetables, fruits and other food to Russia from Turkey, Ukraine and other countries-sanctioners. Import of meat, fish, some confectionery products, chocolate, baby food, as well as cigarettes with a filter, beer and vodka was banned. This was a fairly effective response: in 2015 the Ministry of Economic Development of Ukraine estimated the losses from the trade war with Russia at \$ 98 billion. That's just whether it should be rejoice? Once the fraternal people who lived in the same state share the sanctions and impedes the normalization of already strained relations because of the events in the Donbass and Crimea.

Russian countermeasures have caused some concern among economically vulnerable countries, in particular, Turkey, Poland and Italy. Due to the closure of the Russian agricultural market in these countries, the number of jobs is decreasing, which negatively affects the performance of their agricultural sector. The European Union has already announced the estimated losses of its farmers in the amount of 400 million euros, which they suffered from the sanction war.

The Russian government, together with key oil companies, has taken preventive measures to reorient its energy resources to the markets of China, India and Japan. As a result, it was possible to conclude a number of trade agreements that increase the stability of oil exports. Only in China, 16.85% of the share of Russian oil was brought to almost 17%. In autumn of 2016, the Rosneft oil company agreed on the supply of crude oil to India for 10 years ahead. The preliminary contract with the Indian company provides for the supply of 10 million tons of oil.

Counter-sentences imposed by Russia on a number of EU countries have had a negative impact on their economies. Therefore, the sanctions have, in our view, negative economic and socio-political consequences not only for Russia, but also for those states that introduced them. So, according to the calculations of the agency "Reuters", Germany, Russia's largest trading partner, suffered serious losses due to sanctions. According to the calculations of the head of the Russian branch of the Chamber of Industry and Commerce of Germany Tobias Braumann, German exports to Russia in 2014 fell by almost 20%, with the largest losses suffered by machine-building companies. Note that before the introduction of sanctions, Germany sold goods to Russia worth 36 billion euros, and then this commodity turnover has significantly decreased through the fault of the European Union.

The European Union was forced to create a special group to reduce losses from Russia's foreign trade restrictions. According to expert estimates, Russia's economic losses from EU sanctions will amount to approximately 100 billion euros in two years. The EU countries will suffer from the restriction of Russia's access to the financial market, as well as from the ban on the supply of arms, dual-use goods and technologies [13].

The new outlines of cooperation between Russia and the EU are important not only in the conditions of the bilateral crisis of relations, but also in the period of tightening of anti-Russian sanctions by the US. On August 2, 2017, US President Donald Trump signed a new law on sanctions against the Russian economy and financial system,

which was quickly adopted by the Congress and the US House of Representatives. This law, which has received the identifier H.R. 3364, involves the states of the European Union that are strategic allies of the United States in the anti-Russian orbit. It is obvious that the next sanctions initiated by Washington are aimed at weakening the Russian economy, its financial stability and the decline of international authority. The American law on tightening anti-Russian sanctions, first of all, as analysts say, increases uncertainty for European participants in the gas market [14].

From the introduction of economic sanctions, the leading companies of Russia, primarily the oil and gas sector of the economy, suffered notable losses. So, the leading taxpayer, Gazprom because of the sanctions was forced to resort to optimization of price policy and geographical diversification of sales markets. The company also suffered from a ban on the construction of the South Stream bypassing Ukraine. Rosneft asked the government for financial assistance because of sanctions in the amount of 1.9 trillion rubles. The money was needed to maintain the liquidity of the technologies that it needs to extract oil from the Arctic shelf [15]. The oil company LUKOIL, due to sanctions, was forced to reduce its investment program.

The US law under number H.R. 3364 obliges the Ministry of Justice, the Office of the Director of National Intelligence, the Ministry of Internal Security to work to “identify the most significant high-ranking politicians and oligarchs, determined by their proximity to the Russian regime and the size of their fortune” as well as the identification of “the sources of income of these individuals and their families (including marrieds, children, parents and siblings), their assets, investments and business interests.” And another quotation: “The Ministry of Justice, the Office of the Director of National Intelligence, the Ministry of Homeland Security is charged with significantly increasing the number of investigations concerning US real estate acquired by Russian citizens or in their interests. Moreover, all these measures, in fact, are considered as extraterritorial, because Art. 252 of the law on sanctions says that the United States will work “with individual countries in Europe and Eurasia” in order to “guarantee the non-use of their financial systems to conceal the illegal financial activities of the members of the government of the Russian Federation that profit from corruption.” At the same time, European structures, linked by allied and block obligations, are compelled to help the US in anti-Russian events and campaigns [16]. The US law on sanctions was criticized in the European Union. As stated in the German Foreign Ministry, with the help of sanctions, Washington is trying to make way for the supply of US gas to the EU.

In the Kremlin, the bill was rated “extremely negative.” After its approval in the Congress, Moscow ordered the reduction of personnel of American diplomatic missions in Russia. President V.V. Putin suspended an agreement with the US on the disposal of plutonium because of their unfriendly actions, making the appropriate substantiation to the State Duma. The urgent law on the suspension of the agreement with the US on the disposal of plutonium provides for the renewal of the treaty under a number of conditions, in particular: the repeal of the “Magnitsky law” and the reduction of NATO military forces concentrated along the borders with the Russian Federation.

After the introduction of anti-Russian sanctions, the economy of the European Union lost more than \$ 100 billion, and the loss of the Russian economy amounted to

about \$ 55 billion. Such estimates are given by the UN. Some experts, however, did not agree with them. But it's hard to deny that, for example, a new package of US sanctions is causing growing concern in European business. In particular, German entrepreneurs are afraid of fines because of their projects in Russia and call on European politicians and diplomats not to allow further tightening of the sanctions regime. From the introduction of sanctions against Russia, the EU economy loses \$ 3.2 billion a month. Then, as the Russian economy lost \$ 55 billion due to sanctions in 2014. This is reported by the UN special rapporteur on the negative impact of unilateral coercive measures on the implementation of human rights Idris Jazairi. From his data, it can be concluded that the EU has lost twice as much from sanctions in 2014 as against Russia, that is, more than \$ 100 billion. Jazairi prepared a special report on the impact of sanctions on his visit to Russia in August this year. He held meetings in Moscow with representatives of the government, business, the UN, diplomats, and, as RIA Novosti specifies, the staff of the diplomatic missions of states that imposed enforcement measures (the United States and the EU countries) refused to meet with the special rapporteur. Let's clarify: perhaps this refusal affected the damage estimates.

The main conclusion of Jazairi - the anti-Russian sanctions were counterproductive, because as a result of globalization they affected, in particular, the initiating countries themselves. Although the speaker also acknowledges the negative impact on Russia: according to his estimates, the sanctions could become "the reason for the decline in the Russian Federation's GDP in the period 2014–2016, an average of 1% maximum," and the number of people living in Russia below the poverty line also increased. The damage from anti-Russian sanctions for the Russian Federation is assessed in different ways. The Center for Macroeconomic Analysis and Short-Term Forecasting reported that "over the period 2014–2015, cumulative losses in the growth rate of Russian GDP amounted to 1.2% points." According to the calculations of the Institute of Strategic Analysis FBK, each year the continuation of sanctions costs the Russian economy a loss of about 900 billion rubles [17].

The main problem of the present study, as noted above, is to investigate the problems that have arisen in Russia with the European Union, the US, and other states after the imposition of sanctions. In the framework of this study, not only are the causes of the deterioration of these relations. It should be recalled that the European Union began imposing sanctions against Russia in March 2014. On March 6, at an emergency summit of the EU, it was decided that "in the absence of detente tension in the Crimea "The European Union will apply" measures of pressure on Russia". At the same time it was announced that three stages of sanctions are planned. The first stage was the decision taken on the same day to cancel the June Russia-EU summit, suspend negotiations on a visa-free regime and a new basic agreement on cooperation. The EU promised that at the second stage "targeted measures would be introduced against those responsible for the escalation of the situation in the Crimea", and at the third stage - sectoral sanctions, that is restrictive measures of trade, financial and military nature. On March 17, the EU began to apply sanctions related to the second stage. A list of 21 individuals was published, including Sergei Mironov, Head of the State Duma's "Just Russia" fraction, and Sergei Aksyonov, the Crimean Prime Minister. They were banned for six months from entering the EU countries, and their banking assets in the EU countries (if any) were frozen. On March 21, the European Union expanded the

sanction list in connection with the “further escalation of the Ukrainian crisis.” Under the sanctions were, in particular, Deputy Prime Minister Dmitry Rogozin, President’s Adviser Sergei Glazyev, Federation Council speaker Valentina Matviyenko and State Duma speaker Sergei Naryshkin.

In September 2014, the debt financing of three fuel and energy companies (Rosneft, Transneft, Gazprom Neft) and the three largest defense concerns (Uralvagonzavod, Oboronprom and United Aircraft Corporation) was banned; the restrictions on trading in their bonds with circulation terms in excess of 30 days, and the participation in the issue of such securities were imposed. Nine Russian defense concerns are banned from supplying European dual-use technologies. The limits on the provision of loans and provision of investment services to five Russian banks - Sberbank, VTB, Gazprombank, VEB and Rosselkhozbank - have been established. The operations with new bonds and other securities having circulation term in excess of 30 days are prohibited. Cooperation with Russia in the field of services for deepwater development of oil fields and oil production is limited.

2 Conclusion

Thus, these and other facts confirm the complication of relations between Russia and the EU because of economic sanctions introduced at the initiative of the United States.

Today, Europe, being convinced of the unprofitable continuation of economic sanctions against Russia, is trying to find its own ways of developing relations, without US dictates. At the EU summit on March 19, 2017, a political statement was adopted that the effect of economic sanctions against the Russian Federation should be tied to the full implementation of the Minsk accords by the end of 2015. However, the decision to extend the sanctions was not taken. Some countries do not support the sanctions policy towards Russia. On May 3, 2017, in an exclusive TASS interview, Czech President Miloš Zeman announced that Western sanctions against Russia should be abolished, as they increased tensions and did not lead to a detente. “Sanctions are not only ineffective, but, on the contrary, counterproductive, they increase tensions rather than promote détente.” Austrian Chancellor Werner Faymann says the same, the same opinion is shared by Slovak Prime Minister Robert Fico and Hungarian Prime Minister Viktor Orbán,” the President of the Czech Republic underlined. Miloš Zeman supported the early abolition of anti-Russian sanctions. According to him, the pressure on Russia is unsuccessful and leads to increased tensions in relations with the West. On March 31, 2017, the Prime Minister of Greece stated that Athens did not agree with the sanctions of the West against Russia, it was a road to nowhere. The Greek prime minister stressed that “economic war as a continuation of a real war implies a dead-end policy”.

“I am for diplomacy,” said Tsipras, “I consider it very important to achieve the Minsk accords.” I believe that everything possible must be done to end tensions in Ukraine. Cyprus also spoke out against the sanctions policy, as this could eventually lead to negative consequences for the economies of European countries. The anti-sanction policy from words gradually turns to action. Thus, despite the extreme position of the United States in relation to Iran, France recently signed the largest

contract for the construction of an automobile plant “Renault” in Iran. Europe will be less united, each will begin to find its way. The only country which will more or less coordinate its policy with the United States is the United Kingdom. But the anti-Russian orientation of Britain is even more ancient and pathological than the American one. And all other European countries will somehow improve relations with Russia in the economic field. At least the concept of a united Europe against the backdrop of the EU’s relations with the United States is becoming more and more problematic. And when Europe is not united, then there are more options and opportunities for each country to develop its economic, political ties on its own.

The political influence and financial injections gradually decrease, as well as the desire of the states of Europe to participate in the Ukrainian conflict. In the absence of international assistance, the gradual degradation of the Ukrainian economy challenges the existence of the current regime. It is difficult to predict whether it will be as a result of elections, or there may be a riot, seizure of power by various kinds of radicals and Nazis. It is important that any development of events will weaken the current situation. The US law under number H.R. 3364 obliges the Ministry of Justice, the Office of the Director of National Intelligence, the Ministry of Internal Security to work to “identify the most significant high-ranking politicians and oligarchs, determined by their proximity to the Russian regime and the size of their fortune” as well as the identification of “the sources of income of these individuals and their families (including marrieds, children, parents and siblings), their assets, investments and business interests.” And another quotation: “The Ministry of Justice, the Office of the Director of National Intelligence, the Ministry of Homeland Security is charged with significantly increasing the number of investigations concerning US real estate acquired by Russian citizens or in their interests. Moreover, all these measures, in fact, are considered as extraterritorial, because Art. 252 of the law on sanctions says that the United States will work “with individual countries in Europe and Eurasia” in order to “guarantee the non-use of their financial systems to conceal the illegal financial activities of the members of the government of the Russian Federation that profit from corruption.” At the same time, European structures, linked by allied and block obligations, are compelled to help the US in anti-Russian events and campaigns [18, 19].

As a conclusion, the following should be noted. First, the economic sanctions imposed by the Western countries led by the United States can significantly slow down the growth of the Russian economy. The fact that in 2015 and 2016. Russia’s GDP showed negative values, there is a certain negative impact on Western economic sanctions. More precisely, the macroeconomic effect of sanctions for the Russian economy is still difficult to determine, but it is already clear that Western sanctions did not lead to the collapse of the Russian economy, as the US and its allies counted on, but some negative phenomena in the Russian economy, as mentioned above, all the same was not possible. The Prime Minister of the Russian Federation stressed that due to the sanctions there were “not the best conditions” for external borrowing, the situation also “does not contribute” to the inflow of foreign investments. In an interview with the largest news agency Bloomberg, Dmitry Medvedev said that “sanctions will not have catastrophic consequences on the Russian economy” [20]. Secondly, the response

measures taken by the leadership of our country are capable of causing notable damage not only to Western economies, but also to introduce complications for domestic entrepreneurs.

Thirdly, apart from the negative consequences of the imposed sanctions, it is hoped that they will be an additional incentive for the modernization of the Russian economy, its transfer from the raw material to the innovative, industrial development path. And this work began with the implementation of the president's instructions on the need for import substitution, both in industry and in agriculture. Fourth, the reduction of foreign investment in the Russian economy forces the Russian government to take long-overdue measures, including more efficient use of domestic sources for the growth of the domestic economy. President of the Russian Federation V.V. Putin, speaking at a press conference in India on the results of the BRICS summit on October 17, 2016, referring to Western sanctions and retaliatory measures, stressed that the Western states "have never managed to achieve the goals for which they were committed with the help of sanctions." At the same time, the head of the Russian state noted that our country has regained its position as a full-fledged player in the political arena, and therefore, "the West seeks to hinder strengthening of our positions by any means" [21]. As a confirmation of these words, Barack Obama's "lame duck", while leaving his post, extended anti-Russian sanctions.

US President Donald Trump called anti-Russian sanctions difficult, noting that cooperation with Russia is beneficial to the whole world. Earlier, Trump said he hoped for Putin's help in solving the North Korean crisis. Trump wrote on Twitter on the results of the Asia-Pacific Economic Cooperation (APEC) summit in Vietnam, held in November 2017.

The Ukrainian conflict has become a convenient formal reason for the restriction, with subsequent elimination of competition from Russian companies in the world and primarily the European market, as transnational US companies are interested in increasing their share in the world, including the European market, where Russia delivers its oil and gas, trying to diversify their supply to the EU countries. Mechanisms for eliminating competition from Russian companies, primarily in the oil and gas industry, are chosen not market-oriented, but political, through sanctions. Since the European Union consumes a lot of hydrocarbons and is solvent, American and British oil companies are seeking to squeeze out Russian oil and gas companies by any means from the European market.

It seems to us that sanctions against Russian companies and banks will increase in order to try to get the Russian companies out of the European markets.

Thus, the accession of the Crimea to Russia, its assistance to the population of Donbass and Lugansk became a convenient reason for imposing economic sanctions to squeeze out Russian oil and gas companies from the European market.

The US is preparing a new blow against Russia. In America, they think of an increase in the number of persons involved in the Kremlin report. The publication of the previous list already hit the reputation and business of Russian entrepreneurs. Secretary of State Rex Tillerson in an interview with CBS reported that the United States is considering the possibility of imposing additional sanctions against the Russians. According to him, the US has already "taken steps in accordance with

CAATSA (the law "On Countering America's Opponents through Sanctions," "which prevented significant defense deals in Russia." "We are considering additional persons for the possible imposition of sanctions," Tillerson said, responding to the question "why sanctions are not being imposed, which the overwhelming majority of members of Congress want". In January 2018, the US Treasury also published the Kremlin list. Almost all of Russia's leadership, as well as large businessmen and public figures, were in it - only 210 people. The criterion of selection for officials was proximity to the highest echelons of the Russian government, for businessmen the same amount of income is not less than \$ 1 billion. When the sanctions against the persons mentioned in the list begin to act, it is unclear. But as Nikolai Zlobin, head of the Center for Global Interests in Washington, pointed out, entrepreneurs are very vulnerable to sanctions: large Russian businesses have extensive partnerships with the West and they have something to lose. As reported by the agency Bloomberg, Russian businessmen have already begun to notice that their activities are paid more attention after the publication of the "Kremlin report" in the United States. So, an unnamed businessman from the list noted that the deal, which should be closed within a few months, may fail. Another businessman complained that the report "hit his reputation". Sources of the agency also pointed out that after the publication of the report, banks began to closely monitor the transactions of businessmen from the list [22].

Time will tell whether these and other hopes of the United States and its allies, which actively carried out anti-Russian sanctions, will come true. History shows that the sanctions repeatedly imposed by the West against the USSR were defeated. Russia, in our opinion, has all the resources to successfully overcome such unfriendly actions of Western states led by the United States.

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Formation of Student Professionally Oriented Skills Using the Potential of Network Interaction

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Abstract. The article is devoted to the possibilities of the network interaction between the university and the base enterprise on the example of The Far Eastern State Transport University and Far Eastern Railways a branch of OJSC Russian Railways.

Keywords: Network interaction · University · Base enterprise · Student · Employer

1 Introduction

Currently, there is a system gap between the market of educational services and the requirements of the employer to the university graduate. The employer is not satisfied with the educational system which cannot independently eliminate this gap. It is necessary to enter an open educational system which suggests the participation of key stakeholders interested in the process of personnel training [8].

In the railway industry the most complex projects are being realized on which the future of the national transport system of Russia depends. Proceeding from this, the level of tasks facing OJSC Russian Railways requires the appropriate qualification of employees who must not only possess the relevant knowledge, but also be able to apply them in practice.

The specifics of the work of railways are based on the characteristics of the corporate culture which has developed over many decades and is quite conservative. Russian Railways is a developing company. It responds to the demands of the economy. Along with changes in the economy, Russian labor legislation has undergone changes that have a direct impact on the relationship of workers and employers with regard to the introduction of a system of professional qualifications. This is a new mechanism that should ensure a balance between the interests of employers, the education system and the workforce. The system of professional qualifications is aimed at development by synchronizing the needs of employers and the objectives of the educational system [1, 6, 12, 17, 28].

Currently, the industry lacks professional staff: it reaps the fruits of the 1990s. At that time, the priorities in the training of personnel changed to the humanitarian and economic professions, in addition, the birth rate significantly decreased which led to a shortage of qualified specialists able to perform their duties qualitatively and to combine professions.

An important task for railway universities is to combine the requirements of the Federal state educational standards with the competence of the graduate and the requirements of the employer for the professional qualification of the university graduate.

In this regard transport universities have an objective need to solve the problem: how is it possible in the current conditions of higher education to create professionally oriented skills of future specialists in the field of railroad operation in the process of their training?

Introduction

The system of transport education in Russia clearly focuses on the railway industry and links its mission with its staffing.

Transport universities today are the basis for the implementation of the Strategy for Human Resources Development of OJSC Russian Railways aimed at implementing the document “Transport Strategy of the Russian Federation for the period until 2030” that is fundamental for the state transport complex.

The Strategy of Human Resources Development of OJSC Russian Railways states that “... in the conditions of developing the transport services market, the Company needs specialists capable of accelerating the introduction of new equipment and technologies, to improve the quality of work and the efficiency of economic and financial management” [29].

In accordance with the transport strategy of the Russian Federation for the period up to 2030, the assigned tasks of the development of the transport system of Russia can be solved only if the industry is provided with a sufficient number of highly professional specialists. The industrial labor market has its own peculiarities and imposes strict requirements on its employees.

Speaking about the outstripping development of education as a leading strategic landmark, V.I. Zagvyazinsky notes that it is important to compare today’s interests and the demands of society and an individual in particular to take into consideration the needs of current employers and value orientations of children, youth, parents, as well as what the new social situation and a person living in it will require in 10 to 15 years [6, p. 40].

The existing normative documentation at the federal level is The Federal Law on Education. Article 15 of the Law on Education in the Russian Federation defines the implementation of interaction in the field of education. The implementation of educational programs provides an opportunity for students to learn an educational program using the resources of other organizations. This form of interaction is defined by law as a network [32].

The Far Eastern State Transport University has developed a set of conditions and a legal framework in the form of local acts, where the idea of social interaction is clearly indicated. The problem of the quality of training specialists is directly related to the content of education and the technology of implementing educational programs that

allow the graduate to engage in the performance of their immediate duties without additional training and adaptation to the conditions of real production. This determines the need to organize the training of engineering and technical personnel that ensures an effective result by combining theoretical training with the development of professionally oriented skills in production under the conditions of network interaction between educational organizations and base enterprises. Satisfaction of the employer's requirements to the training of graduates having professionally oriented skills, as well as working specialties, is a topical task of professional training of future specialists [13].

The topicality of this problem is emphasized by the federal level documents by the Federal Law on Education in the Russian Federation, the National Doctrine of Education in the Russian Federation until 2025, and the state program Development of Education for 2013–2020, which determines the modernization of vocational education in accordance with the development needs of the production sphere of the country and ensuring its competitiveness.

Objectives and Methods

The scientific literature reveals the prerequisites for solving the problem of forming professionally oriented skills. In particular, the peculiarity of the formation of professional, labor, and educational, professionally oriented skills are presented in the works of Adolf, Batysheva, Zera, Lerner, Novikova, Skatkina [1, 6, 12, 17, 28].

A.I. Adamsky Y.V. Vasilevskaya, Yu. E. Putikhin consider the role of network interaction as a powerful innovative resource in education by pointing out the need to search for the most effective and mutually beneficial ways of integrating educational institutions and professional organizations [1, 7, 26]. Ovsienko, Zimina, Klintzova, Muller, Livanov reveal prospects for the development of network interaction between universities and basic enterprises in target-oriented training in their studies [18, 28]. Network interaction within the framework of social partnership realized by the scientific and educational cluster is reflected in the works of Loshchilova, Osipova, Furiaeva, Chuchalina [19, 25, 33, 34].

For all the undoubted theoretical and practical significance of these studies the problem of forming professionally oriented skills of students in the network interaction of the university and the base enterprise was not a special subject of scientific research. This issue was partly considered in the development of professionally oriented skills of students, while the features and benefits of networking were not taken into consideration.

This interaction which satisfies the principles of voluntary entry into the network, the willingness to share resources, and the multiplicity of interaction levels on the basis of a unifying goal, fosters the formation of professionally oriented skills through: the joint determination of the list of real topics of course and final qualification works of students at the request of the base enterprise; immersion of students in a professionally-oriented environment and pedagogical support by a mentor from an enterprise passing practice; joint organization and conducting of scientific and practical conferences; use of the material and technical base of the enterprise for conducting scientific experiments; and participation of managers of the basic enterprise in the final state certification of graduates [14].

In general terms, under the network interaction of the university and the basic enterprise, we mean an integral education that carries out educational and professional interaction aimed at achieving meaningful professional and educational results [11].

In higher education, interaction occurs not only between the participants in the educational process, but also between the customers of the educational service, namely employers, on the one hand and universities on the other hand. The purpose of this interaction is the preparation of the student in accordance with the requirements of Federal State Education Standards of Higher Education of the Russian Federation on the specialty as well as taking into consideration the requirements of a particular enterprise to the qualitative characteristics of a specialist in the professional field. With such interaction the employer as the base enterprise is a party to the training of a specialist along with the university. The possibilities of network interaction are determined and depend on the usefulness of this organization of the educational process for each participant in the network. Network cooperation provides an opportunity:

for the base enterprise, it is to influence the quality of training of the specialist in determining the requirements for competencies, participation in the educational process and assessing the level of the formation of professionally oriented skills, and use of intellectual potential of the university, experience in applied research and methodological work;

for the university, it is to understand the real problems and special aspects of the professional activity of railway transport specialists participating in their decision, and orienting the educational process to eliminate them; enriching teachers with promising technical and methodological ideas and stimulating the creation of new pedagogical technologies;

for a student, it is an active participation in the process of education and professional becoming, the formation of work skills in the labor collective and the acquisition of experience in solving professional problems [16].

The above mentioned determines the need to organize the training of engineering and technical personnel that ensures an effective result by combining theoretical training with the development of professionally oriented skills in production in the context of network interaction between educational organizations and basic enterprises. Satisfaction of the employer's requirements to the training of graduates having professionally oriented skills, as well as working specialties, is a topical task of professional training of future specialists [15].

To justify the tasks set we should proceed from the fact that the result of training will be achieved if the combination and content of professionally oriented skills are classified. This is carried out at the stage of goal-setting with the interaction of the university and the basic enterprise as the main stakeholders of this process. The goals indicated in the form of formation of combination and content of professionally oriented skills, are achieved in the conditions of a specially created professionally-oriented educational environment. The variety of possibilities of this environment is determined by a set of 9 working specialties which is chosen by the student taking into account his or her personal inquiries and projecting of the life situation. Conducted three-level practices (training, station-technological and production) allow the student to present his or her activity in building a personal-oriented educational trajectory in the formation of professionally-oriented skills.

The identification of theoretical prerequisites for the formation of professionally oriented skills has demonstrated that the problem of the formation of this trait of students includes consideration of the possibility of creating organizational and pedagogical conditions providing an impact on this process. These conditions, developed and theoretically grounded, are of orienting, attaching and fixing information. Below there is a brief description of these conditions:

the interaction of the university and the base enterprise in determining the results of training in the form of the combination and content of professionally oriented skills in accordance with the requirements of the Federal State Education Standards of Higher Education of the Russian Federation and the qualification characteristics of the graduate, the extended and fixed normative acts of the parties to the network interaction. Analyzing the formation of professionally oriented skills of students in the process of studying the disciplines of the professional cycle, it is determined that a number of disciplines in the process of theoretical education allow students to gain knowledge and do not allow them to form skills [13]. Based on the activity approach, which determines the priority of active students' activity in education, the curriculum includes three-level programs of practice: *teaching* is for the second year students, *station and production practices* are for the third and the fourth year students. In the process of students passing through the practice at the railway enterprises, professionally oriented skills of students are being formed. Considering the skills in accordance with the qualification characteristics of the working specialties of Receiver of Cargo and Luggage and Shunting Master, consistent skills defined by the Federal State Education Standard in the specialty Exploitation of Railways were identified. That is, the skills that will not be formed in accordance with the requirements of the Federal State Educational Standard are supplemented by the skills that the student receives while mastering working specialties [31]. Students receive a certificate of the relevant working specialty after passing through the station practice at the end of the third year. Getting on the production practice on the fourth year of studies, students are immediately distributed to workplaces, reinforce their theoretical knowledge by practice, form professionally oriented skills and in addition receive a fixed salary. At the same time, the base enterprise can resolve its personnel issues such as: the employer can let their employees take leave for the period of students' work; and students receive the first entry in their work book. After graduation, students are guaranteed employment in this enterprise because the student does not need to be trained and retrained, he knows the specifics of the work of the enterprise like his own, and no time for adaptation is required.

In the process of students passing through the practice at the railway enterprises, professionally oriented skills of students in the specialty are formed;

The creation of a professionally oriented educational environment is determined by the diversity of its capabilities for different subjects of the educational process; integrity in the implementation of a unified educational strategy by the university and the basic enterprise, personal orientation in the construction of the students' educational trajectory; and presentation activity in the broadcast of achievements in the formation of professionally oriented skills. Based on the understanding of the

educational environment (Ushinsky, Makarenko, Lerner [17, 20, 30], as well as Yasvin, Osipova [25, 35] and other scientists), the educational environment of the university is viewed as a system of conditions, methods and means in which this formation will occur most fully with the disclosure of the personal and professional potentials of future specialists.

The professional orientation of the educational environment allows students to get a system of theoretical knowledge, to form the necessary minimum of skills and to develop professional mobility in accordance with the requirements of the Federal State Educational Standard and qualification characteristics of the specialty that affects the competitiveness of graduates [31].

Summarizing the definitions of the educational environment, we can state that they are adequate to all levels of education, and can be applied to university education in the context of the formation of professionally oriented skills;

joint organizational and pedagogical support of students' practices by a qualified specialist-tutor, adapting them to the conditions, content and results of professional activities in the specialty in accordance with the requirements of the base enterprise, which cannot be realized without the first two conditions, expresses the development of ideas for networking institution-based enterprise as regards the earlier research of other scientists. To justify this condition interpretations of the understanding of pedagogical support were used (Asmolov, Anokhina, Gazman) [3, 4, 10], implied as rendering assistance and support in overcoming the problems and difficulties arising in the process of passing the practices. This was ensured by the fact that the organization of support was carried out with the participation of the teacher, pursuing the goal of consolidating theoretical knowledge on the one hand, and an experienced mentor, emphasizing practical skills and the formation of professionally oriented skills on the other hand. For this purpose practical training programs, focused on the named purposes, have been developed; a special selection of qualified mentors motivated to improve the quality of specialist training, adapted to the conditions of real production, was implemented through competitive selection [23].

The implementation of the above mentioned organizational and pedagogical conditions for the formation of professionally oriented skills of future specialists make it possible to train theoretically literate, professional-oriented, motivated for professional interaction, and, as a result, competitive specialist in the labor market in the field of railways operation.

A group of professionally oriented skills is a beneficial characteristic of a future specialist with such indicators as motivation, knowledge and experience of activity, therefore, substantiating the relevance of the indicated organizational and pedagogical conditions the following criteria were determined:

the motivational criterion - as awareness of the performance of actions, preparedness for professional activity and the desire to perform it qualitatively; representing yourself in the profession and building your own career; the idea of personal self-realization in the profession and the vision of one's own professional development; *the knowledgeable criterion* - as the amount of professionally-oriented knowledge which is necessary for a student as a future specialist to perform some action;

meaningfulness of the acquired knowledge with the awareness of the adequacy of their use;

the activity criterion - as the completeness of students' performance, coagulation and automatism, speed of action, generality and strength.

Introduction of the organizational and pedagogical conditions for the formation of professionally oriented skills in the educational process of the training of the specialist in the direction of Exploitation of the Railways was realized in Federal State Budget Educational Establishment of Far Eastern Railway University in cooperation with the branch of OJSC Russian Railways of the base enterprise Far Eastern Railways for six years. The experiment involved 292 people. The evaluation was conducted according to three criteria: motivational, knowledge and activity. In the Experimental Groups (EG), students were passing the practice with obtaining working specialties, in the Control Groups (CG) without them. The evaluation based on the motivational criterion was carried out in the form of questionnaires and included such indicators as: preparedness for professional activity and the desire to perform it qualitatively; representing yourself in the profession and building your own career; the idea of personal self-realization in the profession and the vision of one's own professional development (Fig. 1).

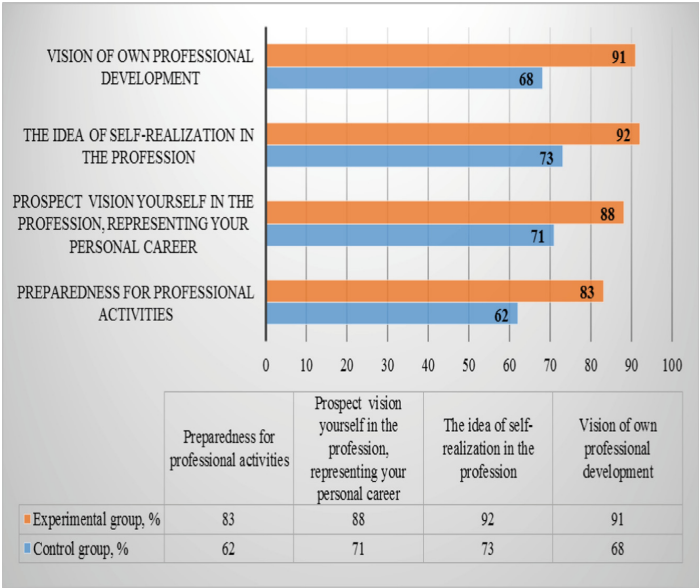


Fig. 1. The results of assessing the professionally oriented skill formation of students on motivational criteria.

The students were offered a questionnaire with the request to answer questions and to expand their comments on their answers. The questionnaire form was developed with the support of Zehner's concept Psychology of the Profession [12]. The questionnaire offered students to assess their preparedness for professional work, presentation of their

personal career and self-actualization in the profession, to assess the impact of practical training in the conditions of the base enterprise on the professional worldview, and motivation for professional activity. Results of assessing the formation of professionally oriented skills of students on the motivational criterion are 91% of the students of the Experimental Group against 68% of the students of the Control Group, which makes it possible to conclude that the introduction of working specialties in the practical training is quite reasonable for future specialists in the field of railways operation.

Assessment of the formation level by the knowledge criterion was carried out after the end of the station-technological students' practice during the qualification examination for obtaining a working specialty. The results of testing students on the knowledge of the algorithms of actions in accordance with the strict requirements of the instructions and the regulations of action for the work of train compiler and cargo and baggage receiver are presented in the diagrams in Figs. 2 and 3 of the Control group and the Experimental Group in the percentage respectively.

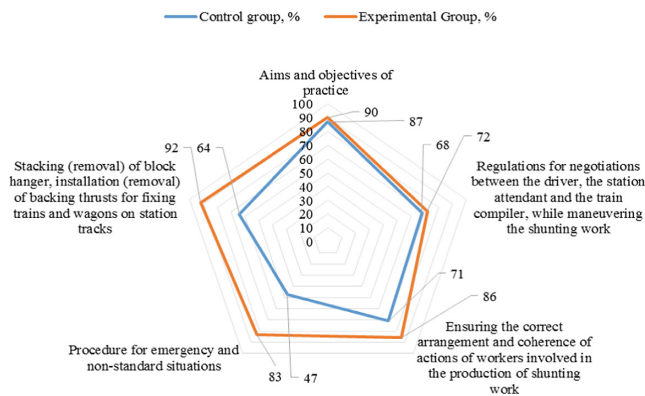


Fig. 2. Assessment of the formation of professionally oriented skills of students receiving a working profession Train compiler and the students of the Control group.

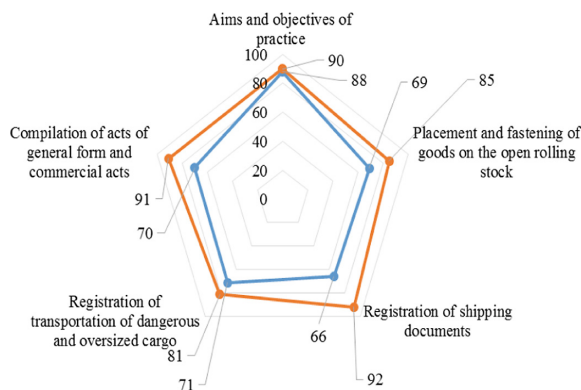


Fig. 3. Assessment of the formation of professionally oriented skills of students receiving a working profession Cargo and baggage receiver and the students of the Control group.

2 Conclusions

The presented results allow us to conclude that students being direct participants of the production process had the opportunity not only to repeat many times and memorize the requirements of instructions and regulations, but also to practice actions for the implementation of these requirements to consolidate the acquired skills.

Evaluation of the formation of professionally oriented skills of students by the knowledge criterion proved the formation of professionally oriented skills in 87.2% of the students who passed the practice with obtaining working specialty of Receiver of cargo and luggage in the Experimental group, and 84% of students who passed the practice with obtaining a working specialty of Compiler of the train. Besides the presented results allow us to make a conclusion that, future specialists being direct participants of the production process, had the opportunity to repeat many times and memorize the requirements of instructions and regulations, practice actions for the implementation of these requirements to consolidate the acquired knowledge. Weak indicators of the formation of students' professionally oriented skills of Control groups for the Train compiler 67.4% and the Receiver of cargo and baggage 72.8% are explained by the fact that students didn't have opportunity to participate directly in the production process, so the learning of the instructions and regulations was familiarized and was not supported by practical actions for their consolidation.

Evaluation According to the Activity Criterion

The activity criterion for assessing the formation of professionally oriented skills of students is an indicator of perseverance, activity and independence in solving problems of a practical professionally oriented nature. The activity criterion makes it possible to evaluate application the types of activity in the formation of professionally oriented skills by students.

Evaluation of the formation of professionally oriented skills of students by the activity criterion was conducted among the students of the Experimental group in the process of the qualifying examination in working specialties, and among the students of the Control Group after the end of their practice. Evaluation was carried out according to the following levels of activity:

reproductive level was to assess strict student compliance with the requirements of instructions, regulations, instructions and technological maps by students in the process of practical activities;

heuristic level was to take into account peculiarities of work of stations in the winter, the activities in case of disruption of the train schedule, non-fulfillment of the plan of loading and unloading of wagons or non-observance of the district traffic speed of trains by the students.

The assessment of the formation level according to *the activity criterion* was carried out by the attestation commission, consisting of the management of graduate chairs and representatives of the basic enterprise. In assessing the activities such parameters as the completeness of implementation of actions, convolution and automatism, speed of action, generality and strength were taken into account. For the members of the Attestation Commission the Evaluation sheet, in which the types of activity which had

to be evaluated, was presented as well as the parameters of professionally oriented skills and indicators of evaluation were presented. They include such indicators as *formed*, *partially formed* and *not formed*. Assessment of the formation of professionally oriented skills of students by the activity criterion (%) is summarized in the diagram in Fig. 4.

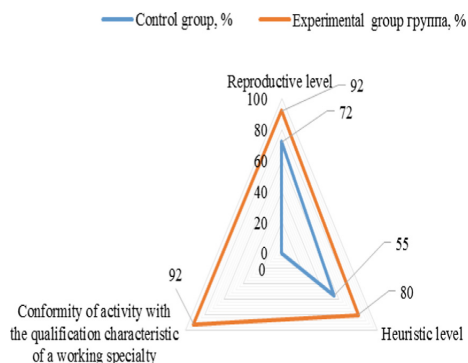


Fig. 4. Assessment of the formation of professionally oriented skills of students by the activity criterion.

The results of experimental work on introducing organizational and pedagogical conditions in the educational space of the university for the formation of professionally oriented skills of students in the conditions of network interaction confirmed the expediency and allowed to recognize the hypothesis proved.

The idea of forming professionally oriented skills of students in the conditions of network interaction between the university and the base enterprise opens the prospect of further searching for organizational and pedagogical conditions that promote the formation of this integrative quality at different levels of education.

One such condition can be the development of an end-to-end program of training of students within the university complex, including institutions of primary, secondary, vocational education, higher education and a base enterprise that will enrich the student's motivational, educational, social and professional potential [16].

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The Influence of School on the Transformation of the Family Institution of Indigenous Peoples of the Far East in the 1920s–1930s

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Abstract. The article examines the problem of the influence of school on the transformation of the Family Institution of Indigenous Peoples of the Far East in the 1920s and 1930s on the basis of unpublished documents and for the first time introduced into scientific circulation (the State Archives of the Russian Federation (SARF), the Russian State Archives of Economics (RSAE), the State Archives of the Khabarovsk Territory (SAKhT)). Particular attention is paid to the issue of reforming the national alphabets, in which the important role was played by the Institute of the North Peoples, the emphasis is emphasized on the transition from the Latin alphabet to the Cyrillic one, and all positive and negative results of this process are shown. The conclusion is drawn about the important consequences of these measures for the further development of Aboriginal culture and life, including for the national family. The article was supported by the grant from the Ministry of Education and Science of the Khabarovsk Territory.

Keywords: Indigenous peoples · Written language · Alphabet · National literature · The Institute of the North Peoples · The Far East, national school

1 Introduction

The survival of traditional ethnic groups in various regions of the world has turned into one of the global problems of our time. The comprehensive pressure of the dominant culture of the postindustrial society leaves less and less opportunities for preserving their traditional way of life, and at the same time the material foundations of indigenous ethnic culture. In 2006–2010 the federal special-purpose program of the development of education was carried out. The main goal of the policy of modernization of Russian education was to ensure Russia's competitiveness on world level due to high human potential and intellectual resources. The modern system of education of the indigenous peoples of the North does not provide a social order for training, it needs to be reconstructed and supplemented. The problem of training highly qualified personnel is especially acute.

2 Actuality

In the national policy of the Russian state aimed at reviving the traditional way of life and culture within the modern society it is necessary to take into account the unique experience of Soviet modernization and draw lessons from a unified approach to resolving socio-economic and socio-cultural development problems.

3 Materials and Methods

The purpose of this scientific work is a comprehensive study of the problems of the influence of school on the transformation of the Family Institution of Indigenous Peoples of the Far East in the 1920s and 1930s. In the process of research the main methods of historical knowledge were used: problem-chronological, synchronistic, comparative-historical, systemic and statistical. Archival materials from the State Archives of the Russian Federation, the Russian State Archive of Economics and the State Archives of the Khabarovsk Territory were used in the work.

4 Theoretical Part

The influence of the North Committee and regional socio-political structures on the life of indigenous ethnic groups of the Far East was carried out in two ways. The first is a general impact on the political, socio-economic and spiritual spheres of public life, the creation of cultural and educational institutions appropriate to local conditions, the formation of new traditions, the emancipation of women, and the organization of services. The second – through targeted assistance directed straightly at the change of individual representatives of indigenous peoples, to the appearance and development of material, social and spiritual components, which included changes in housing conditions, nutrition, and the emergence of new clothes and objects of cultural and everyday use [1].

The North Committee contributed to the difficult task of eliminating the illiteracy of the indigenous population, which was complicated by the shortage of qualified personnel, a weak material base, the lack of suitable premises for schools, and the lack attention of public organizations to this problem.

The concept of school, popular at that time, as a reflection of life, as opposed to the formal educational system of pre-revolutionary Russia, was an expression of the old ethnographers' concern for preserving the culture of the indigenous population. According to their plan, "the activities of schools should not violate the seasonal economic cycle, tear out children from their habitual environment or inspire them with hostility to the traditional way of life. Civilizing work of schools should be gradual and very careful, since a cavalry attack on backwardness could lead to the depopulation of a strategically important region" [2].

In the Northeast of Russia, in Preamurye, Primorye, and Sakhalin, various types of schools were created: temporary, mobile, and nomadic. As the initial general compulsory education developed, a network of incomplete secondary schools evolved. The

process of schooling was complicated by the lack of a material base, a shortage of teachers speaking indigenous languages and the methods of teaching them. The first teachers were newcomer-Russians who had to learn the languages of the indigenous population, since most of the children did not know Russian in those years. Undoubtedly, I.S. Vdovin, S.N. Stebnitsky, P.Ya. Skorik, G.Ya. Kuzmin, E.S. Rubtsova and other teachers-educators played the outstanding role in the education of the Koryaks, the Nanais, the Chukchi, the Eskimos, the Udeges, and others in the 1920s–1930s.

In order to develop the necessary recommendations for teachers of the Far East and increase their activity, the Far East Department of People Education (FEDPE) held a number of meetings and congresses on the regional scale in those years. In order to improve the organization of methodological work with teachers a scientific and methodological council was created under the FEDPE in October 1925. The proposals of the North Committee on school curriculum were discussed at the council and adopted in 1925. The main idea of the program was to keep the population of the northern zone in the homeland, as the economic use of the tundra was impossible without them. During this period, the program was built on the following principle: the education should not be able to tear off the aboriginal from his usual economic activities and everyday life and excommunicate from traditional production. The training system was consistent with local customs and seasonal production cycles.

A significant part of the indigenous population of the North led a nomadic and semi-nomadic way of life, and the one that moved to the settled way of life was located in small villages far from each other. Therefore, ordinary schools were unsuitable in the North. Here another type of school was needed, corresponding to the peculiarity of life and life of the indigenous population.

Boarding schools became the new type of schools where children not only studied but also lived during academic year, receiving free food, clothing, and underwear from the state, having the opportunity to master new cultural skills thoroughly. Since 1925/1926 academic year the People's Commissariat of Education (Narkompros) of the RSFSR began to provide financial assistance to the regions of the Far North for the arrangement of a new boarding system of education. From the state budget 138 thousand rubles have been allocated this year. Six boarding schools were kept on these funds. In 1926/1927 academic year the number of state-funded schools in the North increased to twelve [3].

At the beginning the main goal of boarding school education was the so-called “civilized behavior”, since cleanliness and possession of “household skills” was a peculiarity of Russian urban children. The first necessary step on the way to a new culture was the bathhouse, as an act with enormous symbolic meaning and played a significant role in the transformation of the culture of behavior and aboriginal life. The purification ritual ended with a haircut and change of clothes [3, p. 131]. These elementary rules of hygiene culture caused great resistance among parents who often wanted to take their children from boarding schools.

This was the manifestation of the cultural revolution at the most fundamental level. Indigenous children had to learn over again how to eat, sit, sleep, talk, dress, and be ill, and learn a new understanding of the world and their place in it as well. In addition to “untidiness, in particular, spitting on the floor, behind the stove, under the bed”,

teachers tried to eliminate “propensity for small trading”, “national strife”, religious prejudice and lack of discipline.

An important aspect of the dissemination of education among indigenous peoples was the liberation of aboriginal women from their prescribed statuses in the traditional social structure. This process, which occurred sporadically in the late 1920s, gained impulse after the conference of the Communist Party for Women’s Rights in 1930. In general, “the movement for the emancipation of women made a great contribution to Sovietization and Russification of traditional societies” [4].

In addition to bride’s ransom, the Soviet authorities also considered other practices of the aboriginal society reprehensible; they included polygamy, levirate and marriages in collusion with the participation of young children. Another aim of the reformers there were the numerous taboos that women were subjected to because of their childbearing function. One of the most common taboos was the practice of isolating a parturient woman into a separate hut without basic amenities, where she and her child stayed for several days after the birth.

As a rule, the humiliated status of women, typical not only of northern peoples, but also for traditional Russian society as a whole, prevented access to participation in public and political life as speakers and voters. Thus, since 1929 the Soviet authorities organized women’s meetings, granted women the right to vote on the tribe councils, which eventually led to the obtaining equal rights with men.

This, in its turn, has made indigenous women an important tool for supporting the Soviet system, led to the active participation of women in political life. As a result, by 1931 about a quarter of all the deputies of the Soviets in the national regions of Siberia and the Far East were women.

5 Practical Part

One of the most important results of the activity of the Soviet state in the early stages of its existence was the development of written language for a number of the Far Eastern peoples. In 1927 the northern school received an “ABC-book for the Northern People” compiled by V.G. Bogoraz and S.N. Stebnitsky, and “Our North” a book for reading compiled by N.I. Leonov and P.E. Ostrovsky. These publications, prepared by the largest specialists, were based on local geographic, economic and ethnographic materials. Subjects in reindeer breeding, fishing, forest hunting and sea-hunting industry were introduced. The drawings of the aborigines themselves were used in the books. The drawback of the ABC-books was the lack of material that introduced the children to school environment, as well as hygienic rules and cultural skills. The authors of the textbooks explained this by the fact that “the usual school material, the description of the school room, the blackboard, or such instructions as “clean teeth”, “wash hands” is completely excluded, since it does not correspond to the actual situation of northern life at all” [3]. Naturally, that might be wrong; the school was to help cultivating new cultural skills.

The acute need for textbooks and educational supplies led to the appearance on the ground of handwritten ABC-books in languages of indigenous ethnos compiled by the teachers who mastered these languages. Some of these ABC-books were reproduced in

a primitive way (through carbon paper) and were used by dozens of neighboring schools. About 10 ABC-books are known: the Even ABC-book on Russian basis (the author N.P. Tkachik, 1930) and on the Latin basis (Levin, 1931), Koryak ABC-books by P. Kovalevsky (1931) and a group of teachers N.A. Bogdanova-Bilibina, Kovalenko and Loginova (1931) [5].

According to V.A. Avrorin, the first language that began to teach was Even language; its script was developed on the Latin basis. By 1929–1930 all the major languages were taught in the North Faculty. Simultaneously, the language work was conducted in the Far East. With the assistance of the Far Eastern North Committee the first printed ABC-book of Lipsky-Valrond “Bongo-Bitkhe” (Khabarovsk, 1928) was published in Nanai language for the schools of the first stage, illiteracy elimination posts and self-education [6]. The alphabet was built on the Russian basis. V.G. Bogoraz reviewed this edition and gave a positive reference to it. Despite it, Ya.P. Alkor wrote about the shortcomings of the new Goldic ABC-book, pointing out that it is little adapted for practical purposes. The Lipsky-Valrond alphabet is overloaded with signs, there are 11 extra letters, the graphic script of the Russian alphabet have been completely transferred in it, at the same time a number of letters are taken from the Latin alphabet [7].

A great contribution to the development of written language of the indigenous peoples of the Far East was made by V.A. Avrorin, E.A. Kreinovich, E.P. Orlova, A. P. Putintseva, P.Ya. Skorik and others [8]. The Central Executive Committee (the CEC) appointed K.Ya. Luks as a rector of Leningrad Institute of the North Peoples in December 1929; it greatly improved its work and the organization of the educational process. He paid significant attention to the problem of written language for indigenous peoples. In his article “The problem of written language of the indigenous peoples of the North” (Sovetskiy Sever, 1930) Luks addressed to scientists, graduates of the Institute of the North Peoples, ethnographic students of Leningrad Geographic Institute, asking for help in eliminating illiteracy, in particular, solving the problem of written language for each of the indigenous peoples [9].

The local committees paid special attention to the “rooting” of schools, that is, the translation of education into their native language. In 1935/1936 academic year, an attempt was made to translate into almost all primary classes of national schools in the Nizhniy-Amur Region (43 schools, 1,076 pupils), the Koryak National District (39 schools, 1,377 pupils), the Chukotka National District (43 schools, 1437 pupils) [10].

In general, the Committee of New Alphabet of the Far East (CAN FE) had done a lot of work to popularize literacy, gain experience in interpreter work, train literacy campaign workers, and conduct public and political work among the national population. Naturally, there were shortcomings in the activities of local committees, for example, local committees did not always provide the central commission for the compilation of textbooks with reliable information, which led to linguistic errors, and did not pay attention to work with illiterate Aborigines. All this was worsening by a shortage of personnel and material and technical lack.

The preparation of ABC-books and compilation by Uchpedgiz promoted the introduction of literacy in native languages in 1932. Their authors: V.A. Avrorin – “The New Way” (Nanaian), V.G. Bogoraz and I.S. Vdovin – “Red Literacy” (Chukchi), G.M. Vasilevich – “The New Way” (Evenki), A.P. Kozlovsky and N.E.

Afanasyeva – “The New Life” (Nanaian, for adults), E.A. Krejnovich – “The New Word” (Nivkhsy), E.P. Orlova – “Our Book” (Eskimo), S.N. Stebnitsky – “The Red Book” (Koryak), V.I. Cincius – “The New Word” (Even), E.R. Schneider – “Our Literacy” (Udeisky). Education in schools began in native languages with the compilation of ABC-books, and Russian was studied as an academic subject. The district newspaper “Sovetskaya Chukotka” was created in 1933, in which some articles and notes were published in Chukchi language [11].

In 1936 the Council of Nationalities of the Central Executive Committee of the USSR at the meeting of the Presidium decided to approve the resolution of the All-Russian Central Committee of New Alphabet (All-RCC NA) on the question of the translation of written language of the indigenous peoples of the North on the Russian basis. It was said, “Considering that the indigenous peoples of the North – the Selkup, the Yukaghir, the Ket, the Itelmen and the Aleuts – live surrounded by the Russian population, use the Russian script and speak Russian language partially, consider it inexpedient to introduce the Latin alphabet among the indigenous peoples of the North and recognize it necessary to serve them with Russian written language in accordance with the desire of the population” [12].

Thus, at the beginning of 1937 the Central Executive Committee of the USSR approved the resolution of the Council of Nationalities of December 25, 1936 on the abolition of the documents of the All-Union Central Committee according to new alphabet with respect to the establishment of the Latin alphabet and the translation of written languages of the North peoples from the Latin alphabet into Russian (except for the Yakut ASSR). This act was explained by the petition of local organizations and population; it was also taken into account that the native population closely communicated with the Russians, and to a great extent used Russian language and written language. Moreover, the introduction of languages on the Latin basis had not yet been fully implemented. The CAN FE of the North peoples was abolished, and work on the study of languages and the development of written language was entrusted to the Central Institute of Languages and Written Language of the Peoples of the USSR [13].

On March 7, 1937, the Presidium of the Central Executive Committee of the USSR approved the resolution of the Presidium of the Council of Nationalities of the Central Executive Committee of the USSR of 11.02.1937 on the confirmation of new alphabets for the North peoples: the Luoravetlans, the Evenks, the Evens, the Nivkhs, the Ude, the Uites, the Nanai, the Nymylans, etc. In 1937 it was necessary to prepare textbooks based on new alphabet of the North peoples for I – II classes and to eliminate illiteracy and semiliteracy among the adult population of the North peoples. The organization and control over necessary measures was entrusted to the leadership of the Main Administration of the Northern Sea Route in order to render every kind of assistance in the correct implementation of the approved alphabet in all districts of the North peoples [14].

Anyway, but by the end of the 1930s literary languages were created for the Chukchi, the Koryaks, the Eskimos (Asiatic), the Nanais, the Evenks, the Evens, the Udege; it was a serious achievement of Russian scientists and the item of special study of foreign specialists.

Anyhow, these events made it easier to learn Russian. In this regard the quality of the work at schools had improved. Particularly the progress of pupils from indigenous

nationalities improved. After introducing education in native language in Chukotka the number of repeaters decreased to 10% [11].

The publication of educational, artistic, and political literature in the languages of the indigenous peoples of the Far East began. 19 books with a circulation of 61,600 copies were published in 1931–1932; 141 books with a circulation of 461,800 copies were published in 1933–1934 [15]. The periodical press was widely used. In national districts and regions the newspapers “Sovetskaya Chukotka”, “Okhotsko-Evenskaya Pravda”, “Aleutskaya Pravda” and others began to be published. In the Nizhniy-Amur Region “Nivkhskaya Pravda”, the regional newspaper in Russian (1933, Nikolaevsk), “Sovetskaya Kolyma” in Nivkh language (1935, Magadan), “Taiga Shock Worker”, a regional newspaper in Russian (1931, s. Bogorodskoye) were published [16].

In the Nanay district of the Khabarovsk Territory, since 1932 the newspaper “The Educational Way” (since 1935 – “The Stalin’s Way”) was published widening a new alphabet. In connection with the design of national written language interest in the newspaper significantly increased in the second half of the 1930s. 27 issues of the newspaper with a single circulation of 300 copies were published in 1935, 51 issues with a circulation of 500 copies were published in 1937, 54 issues with a circulation of 650 copies were published in 1938, 83 issues with a circulation of 840 copies were published in 1939, 110 issues with a circulation of 1000 copies were published in 1940; that year the newspaper was published regularly twice a week [17].

In 1942 the Northern Branch was opened in Khabarovsk Pedagogical Institute for the training teachers of Russian and literature in V – X classes of non-Russian northern schools of the Khabarovsk Territory. In the special resolution of the decision-making authorities “On the recruitment of listeners to the Northern Branch of Khabarovsk Pedagogical Institute”, adopted in 1943, the conditions for life of the students of the Northern Branch were determined: they were fully supported by the state, they were provided with a hostel, food, clothing. In addition, yearlong retraining courses for teachers of primary schools of the Far North were organized in Khabarovsk Pedagogical Institute [18].

6 Conclusion

Thus, from the standpoint of goals the cultural revolution in the Far East is difficult to consider successful. Universal primary education was not achieved by 1932–1933, as it was not possible to achieve universal literacy by 1935. Traditional societies demonstrated their viability, neither women nor children showed a desire to revolt against their relatives. But the cultural revolution did not pass utterly. Its most important events did not end in 1932–1934, when the party leadership lessened the revolution and began to stand up for order and stability. Personnel of the national elite continued to grow, women continued to use the new laws, and children – to go to school. “Civilized behavior” continued to spread, although not always in the way the cultural revolution wanted. Images of the new Soviet saints hung next to icons and traditional amulets (a portrait of Lenin, which at one time caused controversy about whether the merchant is or a king, became an object of worship and became famous for his magical properties). The new Soviet holidays joined the old ones. Some imported novelties, especially

movies, radios and sewing machines, brought to life new needs and could be used as means to achieve concessions. Even those innovations that initially provoked the greatest resistance could become important symbols of success: the child's ability to read and write increased the prestige of his family, and in some cases promised advantages in dealing with Russians.

The new policy of Soviet power had brought considerable fruit in the formation of a broad intellectual stratum among the North peoples. First of all, it concerns the national staff of teachers, intended to provide the system of school education in the northern regions. In addition, the national intelligentsia of these peoples included a considerable number of doctors, scientists, writers, poets, managers and representatives of other professions. A significant percentage of heads of local government agencies during this period were representatives of northern peoples. The creation of written language had become a powerful factor in the cultural development of the northern peoples; thanks to written language activities to establish universal primary education, political education, the elimination of illiteracy and the formation of the national intelligentsia became possible.

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The Far Eastern Mensheviks and October 1917

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Abstract. The article examines the history of the Menshevik organizations in the Russian Far East for the period from October 1917 until the end of the year. The attitude of the Menshevik Party to the events of October 1917 is covered and the tactics of the Mensheviks in the first months of the Soviet period are analyzed. As early as in this period the Mensheviks focused on the confrontation with the Bolsheviks and the union with other moderate Socialists: the Socialist Revolutionaries as well as bourgeois parties. However, they also admitted the possibility of the alliance with the Bolsheviks based on the idea of a homogeneous socialist government. Much importance is given to the activities of the Far Eastern organizations of the Mensheviks, starting with the moment when the information about the events in the capital was received until the end of 1917. The article analyzes the alignment of political forces in the region and the role played by the Mensheviks. The attitude of the Mensheviks of the Russian Far East to the events in the central part of the country, as well as their tactics in this period, is considered. The article analyzes to what extent the policies of the Far Eastern Menshevik organizations were in line with the resolutions of the Central Committee of the Menshevik Party and the decisions of the party congresses. Based on the analysis of the program and tactics of the Mensheviks, as well as the activities of their Far Eastern organizations, conclusions are drawn about the reasons for their defeat in the confrontation with the Bolsheviks in late 1917 and early 1918.

Keywords: The Russian Far East · The Bolsheviks · The Kadets · The Mensheviks · The SRs · The Soviets · The Constituent Assembly

1 Introduction

On October 25–26, 1917, the power in Petrograd passed into the hands of the Bolsheviks as a result of the armed uprising in the capital. This event aggravated the split in the revolutionary camp, finally putting the Bolsheviks and moderate socialists, including the Mensheviks and Right SRs, on the opposite sides of the barricades. Almost immediately, the Socialist Revolutionaries and the Mensheviks characterized the October Revolution as a reckless scheme. From the Mensheviks' point of view, the seizure of power by the Bolsheviks disrupted the process of historical development and the transition of Russia to socialism. Protesting against such turn of events, the Mensheviks, along with the Right SRs, left the Second Congress of Soviets that occurred on October 25–27, 1917.

The events of October 1917 led to deeper division among different trends of Menshevism. The Russian Socialist Democratic Labor Party (RSDLP) managed to maintain organizational unity, although the party had a center-left bloc that was inclined to adopt the platform of the Soviet government and to form a coalition with the Bolsheviks. However, the leading posts were taken by the right-wing faction of the party, which was a consistent supporter of the idea of transferring power to the body appointed by the Constituent Assembly. The Mensheviks continued to insist on a coalition with the bourgeoisie, but they did not deny the idea of a “homogeneous socialist government” treating it as a means of peaceful expulsion of Bolsheviks from the government [1].

Following the Second All-Russian Congress of Soviets, the Mensheviks worked in several directions. After the events of October 1917, they engaged in preparations for the convocation of the Constituent Assembly. At the same time, the Mensheviks together with the Right Socialist Revolutionaries started to form organizations in order to protect the gains of the February Revolution and the Constituent Assembly. The “Committee of Public Salvation” that arose in Moscow and united all anti-Bolshevik forces was one of such organizations. Propagandists were sent to the factories and military units of Moscow and Petrograd to hold rallies and meetings demanding the formation of a homogeneous socialist government and the convocation of the Constituent Assembly [2].

At the same time, the Mensheviks considered the question of a coalition with the new government. Thus, on October 31, 1917, the Central Committee of the RSDLP adopted, by a majority vote, the resolution on the need for the negotiations with the Bolsheviks on the establishment of a “homogeneous socialist government”. However, in spite of the fact that the Left Socialist Revolutionaries, a part of the Bolshevik Central Committee and representatives of the trade unions headed by the All-Russian Union of Railway Workers (Vikzhel’) took a stand in favor of it, no compromise was reached [3]. The Bolsheviks’ attempt to compromise with the Mensheviks and Socialist Revolutionaries failed not only because of possible changes in the membership of the Council of People’s Commissars, but also because of the political position of the right-wing socialists, and their sabotage of any compromise attempts until October 1917. When the Bolsheviks took power, the Mensheviks and Socialist Revolutionaries started talking about “a homogeneous socialist government”. That was what the Bolsheviks could not forgive them, since, according to V.I. Lenin, there was a possibility of taking power by the Soviets in a peaceful way both before July and August and in early September 1917 [4].

At the same time, there was a contradictory situation in the RSDLP itself. In November and December 1917, the Congress of the Mensheviks revealed the lack of unity with regard to the Party’s further policy. The right wing demanded the overthrow of the Bolsheviks by any means, including an armed uprising and the alliance with the Kadets. The leftists and the centrists were against open actions. The Congress adopted a resolution stating the impossibility of a socialist revolution in Russia and proposing to inspire the people to fight for the convocation of the Constituent Assembly. The Constituent Assembly intended to defend the idea of an alliance of democratic forces, from the Bolsheviks to the People’s Socialists, in order to create a new government.

There was a quiet period in the Russian Far East for some time after the victory of the October Revolution in the central part of the country. It was connected with the fact that the Mensheviks and the Right Socialist Revolutionaries, who held key positions in local government bodies, did not immediately disclose the information on the victory of the Bolsheviks. In the Russian Far East, the telegrams on the events in Petrograd on October 25–26, 1917 were received by A.N. Rusanov, the Commissar of the Provisional Government. He decided to discuss the information at an emergency meeting of the Khabarovsk Soviet of Workers' and Soldiers' Deputies, together with representatives of the Menshevik Social-Democratic and Socialist Revolutionary organizations. The meeting on October 26, 1917, adopted a resolution condemning the Bolsheviks' militant actions in order to transfer power to the Soviets. The Khabarovsk Soviet, where the Mensheviks and Socialist Revolutionaries had the majority, demanded that all measures be taken to convene the Constituent Assembly at the appointed time. Rusanov was entitled to publish the telegrams provided that the Executive Committee of the Khabarovsk Council received accurate information and passed an appropriate resolution [5].

The Mensheviks, both in the Russian Far East and in the central part of Russia, were against the transfer of power to the Bolsheviks. The party organizations of Vladivostok and Blagoveshchensk, as well as city dumas and zemstvos led by their representatives and the Right SRs, passed protest resolutions. Their common position was expressed by the Far Eastern Regional Conference of Right Socialist Revolutionaries, held on October 31–November 3, 1917 in Khabarovsk. Its participants spoke out against the seizure of power by the Soviets and for the transfer of power to the Constituent Assembly, which must resolve the problems of the war, the land, and others [6]. The Mensheviks and the right-wing SRs both in the central part of Russia and in the Russian Far East did not limit themselves to declarations, but tried to consolidate forces to fight the Bolsheviks. In Khabarovsk, they sought the support of the Amur River Flotilla, but faced the refusal of its representatives at a meeting of the Council Executive Committee. The Blagoveshchensk Council of Workers' and Soldiers' Deputies, which had SR and Menshevik majority, adopted a resolution in which it protested against the seizure of power by the Bolsheviks [7]. On November 8, 1917, the Committee for the Protection of Public Order was formed under the pretext of losing contact with the central part of the country. The military and civil power in Blagoveshchensk and the Amur Region passed into the hands of the Right Socialist Revolutionaries: I.M. Gamov, the ataman of the Cossack army and the deputy of the Fourth State Duma, the city mayor Alekseevsky and the government commissar N.G. Kozhevnikov.

The elections to the Constituent Assembly became a paradox in the development of the political situation in the Russian Far East. While the Bolsheviks were in power in the central part of Russia, the power in the Russian Far East was still in the hands of A. N. Rusanov, the Commissar of the Provisional Government. About 50% of registered voters took part in the elections to the Constituent Assembly in the Russian Far East. The Bolsheviks received 18.3% of the votes (23.4% of the votes in the whole country), the Kadets (8.4%), the SRs got 43.8% (39.4%), candidates from ethnic groups and others accounted for the rest of the votes. Thus, the influence of the Bolsheviks in the region was smaller than in the whole country, and the influence of right-wing socialists

and Kadets was more important. However, the percentage of votes was different in large industrial centers. The Bolsheviks received 33% of the votes in major cities, it was 50% in Vladivostok and 27.3% in Harbin. At the same time, the Kadets received about 21% in the cities, the Socialist Revolutionaries had 20.7%, and the Mensheviks got 13.6% of the votes [8].

Twelve people became deputies to the Constituent Assembly from the Primorsky and the Amur electoral district, including such Socialist Revolutionaries as V.K. Vykhristov, L.I. Zagibalov, M.S. Mandrikov, F.I. Sorokin, A.N. Alekseevsky, V.G. Petrov, N.G. Kozhevnikov, and a Bolshevik, A.Ya. Neibut. The Mensheviks suffered an overwhelming defeat in the elections. Only one Menshevik candidate, N.A. Strelkov, was elected from the Chinese Eastern Railway, where highly qualified specialists and rather well off blue-collar and white-collar railway workers made up the majority of the population that feared foreign policy problems connected with the revolution [9].

In order to isolate the Bolsheviks, the Mensheviks returned to the idea of a coalition with the Kadets. They began to form various committees together to combat 'anarchist elements'. There was even a party in the Russian Far East, whose program was a symbiosis of the Kadets' and Right Socialists' views. It was the Amur Union of Republicans, whose organizations operated in the Amur Oblast. Its platform included not only the Kadets' demands, but also the fourth clause from the right socialists' program, i.e. the formation of the state land fund through compulsory alienation of lands from the royal family, monasteries and the government. The land was to be alienated from landowners for a fair compensation at the government expense and granted to the people for use so that they could work on it. The fifth clause expressed the need for working legislation "on the basis of the minimum program of the Socialist Workers' Party". This symbiosis arose, most likely, because there were no landlords and large private land ownership did not exist in the Russian Far East. It is no accident that the green flag of the Union of Republicans, which they shared with the Kadets, was divided diagonally by a narrow red strip. By April 1917, the Union consisted of approximately 150 people. N.I. Shishlov, the head of the Amur Regional Committee of Public Security, was its leader, its members being mainly entrepreneurs, traders and officers [10].

The first decrees of the Soviet power played an enormous role in increasing the support of the Bolsheviks by the population in the Russian Far East. They became widespread in the province in mid-November 1917. Thanks to this, the Bolsheviks were able to proceed to the bolshevization of the Soviets in the Russian Far East from November 1917.

On November 18, 1917, the Executive Committee of the Vladivostok Soviet, where the SRs and the Mensheviks had the majority, was reelected at the request of workers and soldiers, and the Bolsheviks received the majority. A Bolshevik Konstantin Sukhanov was its chairman. On November 29, the Executive Committee adopted a resolution on the transfer of power to the Soviet and the recognition of the Soviet (Council) of People's Commissars. When a similar resolution was adopted at a meeting of the Khabarovsk Council on December 6, the Mensheviks and the Right SRs left the session. The Executive Committee included only the Bolsheviks and the Left SRs. From November to December 1917, the Soviets were re-elected in the major centers of

the Far East under the influence of armed soldiers' demonstrations. The Bolsheviks and the Left SRs got the majority in most of them. The Mensheviks and the Right SRs could not influence the course of events and confined themselves to protests. On December 26, 1917, the Khabarovsk Far Eastern Committee of Soviets of Workers 'and Soldiers' Deputies, still being in the hands of the Right Socialists, spoke out against the seizure of power by the Soviets and demanded the convocation of the Constituent Assembly [11].

The popularity of the Mensheviks fell catastrophically. Having full power at the local level after February 1917, they, along with the Right SRs, failed to meet the challenges of history. The deterioration of the situation with food in the region accompanied by the inaction of local authorities led to their final loss of credibility among the population. Organizational division began in the ranks of the Far Eastern Socialist Revolutionaries. After the First Congress of Left Socialist Revolutionaries in Petrograd, held at the end of November 1917, the formation of independent organizations of the Right Left SRs began in Blagoveshchensk, Vladivostok and several other places in the Far East.

The issue of power in the Russian Far East was to be finally settled by the Third Regional Congress of Soviets, convened in Khabarovsk in December 1917. However, the Mensheviks and the SRs did not intend to observe calmly how the power would pass into the hands of the Bolshevik Soviets. On December 11, 1917, the former commissar of the Provisional Government A.N. Rusanov convened a meeting of representatives from zemstvo and city institutions. They established the Provisional Bureau of the Far Eastern Territorial Union of Zemstvos and Cities consisting of six people under the chairmanship of a Socialist Revolutionary Timofeev [12]. The Provisional Bureau declared itself the supreme authority in the region and set the goal of holding elections to the Constituent Assembly in the region. However, the Bolsheviks easily prevented this attempt to transfer power to the zemstvos. On December 11, 1917, A.N. Rusanov and his secretary V.V. Grazhensky, a Socialist Revolutionary, were taken under house arrest by representatives of the Regional Committee of Soviets, but later released from custody and they immediately left for Blagoveshchensk, where the power was with the Socialist Revolutionaries. The former commissar of the Provisional Government later tried to participate in the political struggle, but he was not successful and emigrated to China in 1921 [13].

The Third Congress of the Soviets of the Far East, which consisted of representatives of Primorye and the Amur region, began its work on December 12, 1917. The Congress was attended by eighty-four delegates, including forty-six Bolsheviks, twenty-seven Left Socialist Revolutionaries, nine Mensheviks and two non-party members. Three factions were formed: the Bolsheviks, the Mensheviks and the Left SRs. The congress was held under the leadership of the Bolsheviks.

The main issue of the congress was the question of power. Not wishing to surrender their positions, the Mensheviks opposed the transfer of power to the Soviets and demanded that the convocation of the Constituent Assembly be awaited. Their position did not get any support. On December 14, 1917, the Third Congress of the Soviets of the Far East proclaimed the establishment of Soviet power in the region. The Congress elected the Regional Executive Committee of the Soviets (eight Bolsheviks and four

Left SRs). A.M. Krasnoshchekov was elected the committee chairman. The Mensheviks refused to join the district executive committee.

Almost simultaneously with the Third Congress of the Soviets, the Primorsky Region Zemstvo Assembly worked in Vladivostok, where the peasantry demanded its representation in the district executive committee. The chairman of the meeting, the Right SR A. Medvedev, spoke in favor of a coalition of zemstvos and Soviets of Workers' and Peasants' Deputies. On the last day of the work, Dumkin, Shchepetnov and Kucherenko, delegates from the Primorsky Region Zemstvo, arrived at the Third Congress of the Soviets of the Far East. The issue of including representatives of zemstvo and city governments in the Regional Committee of Soviets provoked heated debates. Part of the delegates (representative of the Primorsky Region Zemstvo, such as Kucherenko, Kozlov, and others) proposed that representatives of zemstvos be included in the Territorial Committee of Zemstvo Representatives, since the latter represent the peasantry, who were practically deprived of their own Soviets in the Russian Far East. Another part of the delegates (Bugayev, the chairman of the Vladivostok Council, Gromadsky, and others) were against, allegedly, because it would prevent the execution of decrees of the Soviet (Council) of People's Commissars. Some deputies (e.g. Minaev and Lyubarsky) did not object to the zemstvos, but noted that their policies did not correspond to the interests of the peasantry. It was decided by a narrow margin (twenty-six delegated voted for it, twenty-five were against, and four abstained), to include two representatives from the Primorsky and the Amur Region Zemstvos, one from Nikolayevsk-on-Amur and one from Sakhalin into the executive committee.

2 Conclusion

Thus, the Far Eastern Regional Committee of Soviets of Workers' and Peasants' Deputies and Local Governments was formed. Despite its coalitional nature, the leading role was played by the Bolsheviks and the Left SRs. For some time, there was a Provisional Democratic Coalition of Soviets and Zemstvos in the Russian Far East. A specific feature of the Far Eastern zemstvos was that they were granted not only economic but also political functions. They had the right, under the supervision of the Soviets, to issue normative acts within their competence, to act on behalf of the regional Soviets and local governments, etc. [15].

However, as it turned out later, this coalition was supported by a minority of zemstvos and lasted only for a very short time.

In 1917, the masses were dominated by the ideal of social organization, based on community norms of democracy. This explains the adherence of millions to the Soviets of Workers' and Peasants' Deputies, as well as the popularity of the Socialist Revolutionaries. The influence of these ideals on society is deep and multifaceted, and it is rooted not only in national traditions, but also in spiritual priorities and features of Russia's political culture [16]. However, deep disagreements on the issues of Russia's socialist future, war and peace, and the powers of the Soviets led to the aggravation of relations between the socialist parties and their local organizations.

Changing the attitude of the masses in favor of the Bolsheviks made the establishment of the Soviet power in the Russian Far East painless. The reason for the defeat

of the right-wing socialists was their policy dictated by their position on the issue of Russia's further development. As a result, the majority of the masses followed the Bolsheviks who pursued a policy that at that time reflected the expectations of the masses of people. This led to the temporary victory of the Bolsheviks in the struggle for power and the defeat of the Right Socialists. The stage of peaceful rivalry in local authorities of the Russian Far East ended. The Right Socialists were looking for an opportunity of open actions.

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Cyclical Nature of Financial Crises and Their Impact on the Stock Market

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Abstract. The article substantiates the role of the stock market as a necessary and significant element of a country's economy, which might be, also massively influenced by financial crises. The goal of the research is to study the influence of the financial crisis cycles on the stock market and its financial instruments. The logical presentation claimed its priority rather than the crises advance description, with respect to their unity. Theoretical aspects of financial crises are considered as well, including the crises classification in the context of the budget crisis, banking, monetary circulation, currency and stock crisis. In terms of the classical four-phase economic cycle model, the scientific and practical expediency of crisis research is specifically emphasized. In addition, the crucial role of scientific and technical innovations for the cycle changes is established. The stock crisis stages and their genesis are defined as well. The financial crisis impact on the Russian economy is carefully examined as well as the vulnerability factors are brought out. On top of that, the long-term socio-economic development scenarios are outlined and presented to be chosen from. Additionally, effective investment portfolio recommendations and its valid use in times of crisis are given; this in its turn will be able to reduce risks and neutralize the crisis negative consequences.

Keywords: Economic cycle · Crisis · Stock market bubble · Development scenarios · Financial instrument · Investment portfolio

1 Introduction

In modern economic conditions, the proper stock market development is crucial to its country. Due to economic crises, the stock market's stable operation must be ensured, as well as the ability to recognize the market signals and react to them in a timely manner.

It is understood that the stock market of any developed state is a significant and necessary economic element, which is characterized by both its importance and the volumes of operations. The stock market accumulates cash of credit and financial institutions, corporations, enterprises, states and individuals; as a result, the investment capital is supplied for industrial and nonindustrial purposes.

The stock market is a set of economic relations between the participants regarding the issue and circulation of bonds. Investors purchase securities, which means

additional influx of investment resources into the economic turnover of a country. This in its turn sets the main goal of the stock market and predetermines the importance of this research.

2 Scientific Significance of the Issue

The development of the Russian financial market over the past decade has been going on under the process of globalization, internationalization of the securities markets, cross-border investment transactions increase and intensified competition of the world financial centers [1]. Financial globalization finds its expression in the transformation of local financial resources into international ones, the increase of cross-border investment flows and the expansion of financial markets, respectively [2].

The relevance of the research is determined by the increased stock market importance and the impact of financial crises on it, on the one hand and on the other, by the significant role of the stock market in modeling and spreading shock phenomena in the financial market, which ultimately contributes to the crisis. In this regard, early crisis diagnosis in the stock market helps reduce the negative impact on the economic space.

3 Problem Statement

The aim of the research is to study the influence of the financial crisis cycles on the stock market and its financial instruments.

The tasks to be solved according to the goal are as follows:

1. To study the concept of crises and their main components;
2. To study the patterns of financial crises;
3. To study aspects of crises impact on the stock market;
4. To analyze the causes of crises;
5. To advise on an effective investment portfolio make in times of crisis.

The logical presentation claimed its priority rather than the crises advance description, with respect to their unity. At the same time, there is a continuity of economic categories, structural principles, traditions in the study of cyclical changes, which favor the development of crises.

4 Theoretical Part

Any existing economic system does go through some cyclical changes that might cause crises. The financial crisis is a deep breakdown in the state financial and monetary system, manifested in the sharp inconsistency between budget revenues and expenditures, instability and exchange rate fall of the national currency, mutual non-payments of economic actors, the mismatch of the monetary stock in circulation and the money circulation law requirements, inflation [3].

The financial crisis could be in the form of a banking, budgetary, currency and stock crisis or even combine several forms at a time [4].

The money circulation crisis ought to be mentioned as well.

4.1 Financial Crises Classification

The typical characteristic of banking and credit crises is a sharp loan interest rate increase, the worsening of the banking system, massive loan defaults, as well as a decrease in banks liquidity, capital scarcity and, consequently, massive bankruptcies.

The budget crisis consists of the federal budget deficit, inadequate tax collection, and public debt growth. The currency crisis is a crisis that embraces the external financial sphere. The typical features of this crisis are the state balance aggravation, massive capital migration, currency reserves reduction and uncontrolled depreciation of national currency, all these lead to devaluation.

Stock exchange is the perfect form of the securities market organization [5].

Stock crisis is about a sharp decline in securities rates, predominantly shares. The crisis entails a decrease in the stock market operations; securities issue reduction/termination, as well as companies operating in the stock market going bankrupt.

The need for international cooperation and geographical diversification of activities generates interaction between various politically, legally, historically and territorially separated countries [6].

The crisis of any financial sector rarely remains isolated and most often spreads to foreign markets. This is especially typical for stock crises, since its participants exchange information continuously and tend to follow the same trade trends [7].

The monetary circulation crisis is all about cash payments violation throughout the economy, also the monetary surrogate development and cash shortage.

4.2 Economic Cycle Model

This model is of scientific and practical interest, especially if regarded as a four-phase classical model of the economic cycle. The economic (or business) cycle is the ups and downs of economic activity levels for several years. In other words, this is the timespan between two similar states of the economic system.

There are three main types of cycles: longwave, medium and small. Longwave is repeated every 50 years, small - in 3–4 years. The average or industrial cycles are repeated approximately every 12 years and consist of four phases: crisis, depression and recovery, which represent a kind of market ‘failure’, preceding the production growth to a higher level; as a rule, the rise comes after the so called ‘shocks’ in economy; for example, war aftermath, prolonged agricultural depression or as a result of scientific discoveries. At the same time, a recession in one country can be explained by a rise in another country whose main production most competitive. The crisis structure is shown in Fig. 1.

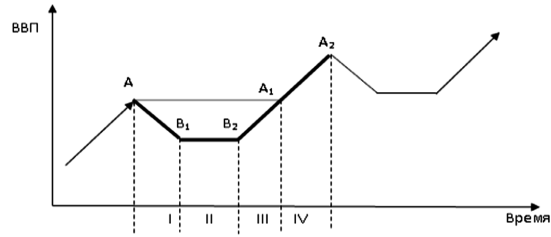


Fig. 1. A four-phase classical model of the business cycle.

Kondratiev was the founder of the economic cycles theory, having analyzed the macroeconomic indicators Western European countries and the USA from 1790 to 1920, and also having constructed and leveled the charts, he found the synchronous movement of these indicators in the long-term period [8].

It should be noted that scientific and technological innovations play a decisive role in cycles changing. The first wave is inventions in textile industry and cast iron production; the second wave is the railways construction and sea transport development; the third wave – the electrical engineering inventions and the massive introduction of electricity, radio and telephone.

Some cycles tend to overlap. Longer fluctuations always include several short cycles. For instance, the cycles are compressed in the second half of the 20th century up to 40 years, whereas in the 19th century their duration was on average 50–55 years. It is all due to the intensive scientific and technological progress. Kondratiev's cycles and typical scientific discoveries for each stage are presented in Table 1.

Table 1. Kondratiev's cycles chronological arrangement and scientific inventions.

Cycle number	Cycle start	Max growth and discovery point that caused development	Minimum production point, cycle end
Cycle 1 (≈64 years)	1779	1814 (textiles, cast iron)	1841–1843
Cycle 2 (≈52 years)	1844–1851	1870–75 (railways, sea transport)	1890–1896
Cycle 3 (≈40 years)	1896	1914–1920 (electricity, radio, telephone)	1929–1933
Cycle 4 (≈42 years)	1933	1960–1966 (synthetics, plastic, computer)	1973–1975 likely, before 1981
Cycle 5 (≈42 years)	1975	Mid 1990s (micro processors, genetic engineering, biotechnologies)	Before (forecast) 2010–2017
Cycle 6, forecast (≈43 years)	2017–2025	2040 (nanotechnology, solar power engineering and nuclear power)	2050–2060

Thus, the crisis is the first stage of the cycle, which is characterized by a sharp decline of several indicators. These negative events contribute to the onset of the next stages, which are to revive and grow to a level higher than the precrisis level. Consequently, the crisis is an objective reality that carries the onset of negative consequences, which should be surmounted. And then comes the time of further development and growth.

4.3 Stock Crisis

To wide extent, the stock crisis is understood as a ‘shock’ in the securities market (i.e. large-scale falls in securities prices, breaks in market liquidity, a sharp increase in interest rates), all these lead to a further expansion of crisis phenomena into a full-scale financial crisis [9], in restricted sense, it is a special phase of the cycle, meaning that the market is being ‘overheated’ and there is recapitalization with a pronounced bubble effect.

A bubble is a market trend, in which the cost a security or merchandise rises to a level that does not have an objective market basis [10].

The bubble, in the context of the stock market, is the continuous speculative growth in asset prices, leading to a deviation of its current price for a long time, followed by a significant sharp drop. There are several stages of a bubble formation:

- The first stage is the bubble formation.
- The second stage is the rational bubble appearance.
- The third stage is the speculative bubble emergence.
- The fourth stage is the critical stage transition.
- The fifth stage is the crisis.

In one of the periods from the point of upward trend, the trend sharply starts moving downwards. In this period, there is a sharp break in the market movement, which includes a bubble collapse, that is, there is a market collapse (Fig. 2):

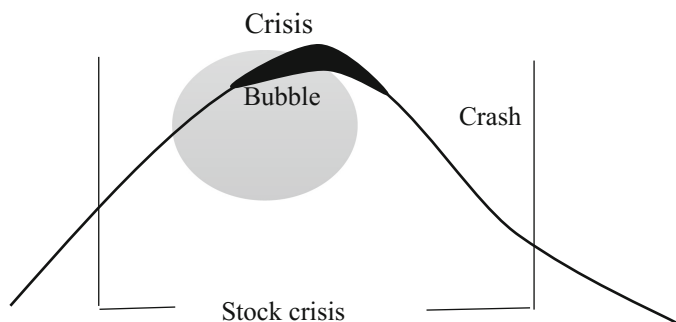


Fig. 2. Stock crisis scheme.

The exchange continues to play an important role in the accumulation and mobilization of money capital [11], in this connection it is expedient to identify an exchange bubble. The exchange bubble is usually a bubble developing in the capital market, and, unfortunately, it is almost impossible to distinguish a growing bubble from an ordinary upward trend. The stock market analysis shows that in most cases bubbles precede crashes, but it should be noted that there is a possibility that the bubble will not burst: in this case, the investors' expectations get reassessed and the asset price gradually decreases, it is now called bifurcation.

The first two global bubbles were in the intensive growth phase and lasted for exactly five and a half years. Rallies 1932–1937; 1953–1956; 1962–1966; 1982–1987 and 2003–2007 are not a bubble, but a restorative attempt after a protracted depression or a market collapse. Although after each recovery rally, followed at least 30% of market correction with regard to inflation. Moreover, after each of these local rallies it took at least 5 years to recover.

The bubble burst had long-term market and macroeconomic consequences. The peak of 1929 was overcome only in 1959 (after 30 years), and the peak of 2000 was surmounted in 12 years; though there were two 50% collapses.

The current rally is one of the most powerful in the market history and is fully classified as the third global bubble. The duration records have already been set for recoilless growth and the lowest volatility.

Nowadays, analysts are expecting a new bubble formation; it is connected with the social networks development such as Facebook, Vkontakte and Twitter. The audience is just enormous and it attracts investors. If this bubble bursts, it is likely to be ten times more destructive.

It is difficult to imagine what exactly will be the actual cause of the collapse, but according to the 84-year financial cycle, the year 2018 will have to be at the same stage as the year 1929.

In the future, one should expect the growth of financial market efficiency, i.e. the transition to a more mature state up to new industrial markets standard [12].

4.4 The Impact of Financial Crises on the Russian Economy

The Russian economy, like many other economies, has experienced numerous war, revolution, new economic policy and planned economy crises. However, the political crisis prevailed over the stock crisis, since the stock exchange was not a significant part of the country's economy at that time. In the post-Soviet period, the crisis phenomena were widespread; for example, the futures market collapse in the 1990s led to the first futures exchange destruction in Russia. The well-known 'Black Tuesday' was a shock, it happened on October 11th, 1994.

The positive consequences of default were increased enterprises competitiveness, export efficiency, economy and monetary system overhaul. However, this short-lived stabilization ended with the onset of a new crisis in 2008, which was the result of a so

called ‘bubble puncture’, forming in the market in the period of 2007–2008. The stock crisis basic causes:

- global financial instability clearly seen by comparing the Russian RTS index and the US NASDAQ index;
- price slump in fuel;
- stock crises of other emerging markets.

Under conditions of the world financial crisis that has brought down the national currency rate, outflow of foreign investors’ funds and deficit of resources are obvious [13].

Thus, the stock crisis stems from the financial instability, or the outside ‘shock’ and the financial instability consequently. The stock crisis can contribute to a full-scale financial crisis, resulting in far-reaching consequences; or it might remain quite particular though.

5 Practical Significance

The stock exchange importance is on a rise in various countries. The reason behind it is that effective securities market functioning contributes to the economy and stimulates the economic growth. In this regard, much attention is paid to the stock market state forecasts. There are a number of external and internal factors, there are three scenarios of socio-economic long-term development, and these are conservative, innovative and targeted (forced) scenarios [14].

The first scenario is a conservative one, characterized by economic moderate long-term growth rates. It is based on the fuel-energy and raw materials sectors modernization in the Russian economy. At the same time, there is still a relative lag in the high- and medium-tech sectors. In the context of this scenario, the economy focuses more on imported technologies and knowledge. GDP growth rates are estimated at the level of 3.0–3.2% in 2013–2030. The economy will increase by 1.7 times by the year 2030, the income will increase by 1.9 times, and the Russian share in the world GDP will decrease from 3.8% in the year 2012 to 3.6% in 2030 [15].

The second scenario is innovative. It is defined by investment trends in the economic growth. This scenario implies the creation of a modern transport infrastructure and a competitive sector of high-tech industries as well as the knowledge economy along with the energy and raw materials complex modernization. Innovative factors become the leading source of economic growth. The annual growth rate of the Russian economy is estimated at 4.0–4.2% in 2013–2030, which will exceed the growth of the world economy and will increase Russia’s share in the world GDP up to 4.3% by the year 2030 [15].

The last scenario is a target or forced one. It is based on the previous scenario. This scenario is about the accelerated economic growth rate, the creation of a large non-primary export sector, which implies an increased private business accumulation rate and a significant inflow of foreign capital. The annual GDP rate is rising up to 5.0–5.4%, which raises the Russian economy share in the world GDP up to 5.3% by the year 2030.

All three scenarios imply price dynamics stabilization for oil and other raw materials. At the same time, there is always the risk of price dynamics and it might get lower for energy resources than initially intended. However, it is worth considering the fact that any operations and calculations, including international ones, are developing in conditions of uncertainty and inability to give a 100% guarantee of achieving a pre-determined result [16].

The main differences among scenarios stem from the internal factors such as the business behavior and state policy.

Seeing this, the conservative alternative shows the dominance of current interests and does not imply a large-scale transition to a new development model.

Innovative and forced scenarios describe a more complex model of economy, which seems to be trickier to implement by the state and businesses. First, these models are associated with a major investment in high-tech projects and human capital, though the payback is well above the medium-term limits. The main barriers are the deficit of competitive staff at both the corporate and public administration levels, as well as the coordination ineffectiveness mechanisms.

Despite the second and third scenarios being complex, they are able to change the country's economic development course drastically; they will contribute to strengthening the value of the stock market in Russia.

6 Proposals and Results of Implementation

The cyclical nature of the economy and crises seems to be risky for investors, so an effective investment portfolio formation is needed.

The main goal of the investment portfolio is to select high-yield and reliable financial instruments [17].

To minimize risks while forming the investment portfolio, it is advisable to use the 'portfolio theory', which is the integrated approach implementation when making an investment decision. The authors of this theory are Nobel Prize laureates Sharpe, Markowitz and Tobin.

The portfolio theory involves a set of methods and approaches for its formation, including the use of economic and mathematical models, which makes it possible to determine its structure [18].

This theory is based on econometric and statistical methods and represents a mechanism for investment portfolio optimization considering its yield and risk level.

The Capital Assets Price Model (or CAPM) is a model that predicts the return on assets. It is interesting to know that Markowitz developed this approach back in the fifties of the 20th century, and it later was generalized and transformed into a Sharpe model.

Sharpe suggested that the stock yield will be affected only by market (or systemic) risks; also, it will assess the general mood of the market. The Sharpe model has only one factor, this is the market risk (i.e. coefficient β).

The model is in the form of a linear regression equation; it shows the linear correlation between profitability (i.e. r) and market risk (i.e. β), where risk is assumed

as the ratio of the standard stock yield change and market profitability change to the variance of market returns.

Investment portfolio formation involves a number of financial instruments, according to the CAPM model; there are four of them: PJSC Lukoil stocks (LKOH), JSC Magnit retailer (MGNT), PJSC GMK Norilsk Nickel (GMKN) and PJSC Rostelecom (RTKM). The β coefficient reflects the stock sensitivity in relation to the market profitability change. Table 3 shows an estimated risk level according to the beta factor. A positive sign reflects that the stock and market profitability tend to change similarly; however, the negative sign shows the multidirectional movement (Table 2).

Table 2. β ratio and its interpretation.

Index	Stock risk	Stocks and market profitability change direction
$\beta > 1$	High	Monodirectional
$\beta = 1$	Moderate	
$0 < \beta < 1$	Low	
$-1 < \beta < 0$	Low	Multidirectional
$\beta = -1$	Moderate	
$\beta < -1$	High	

The β coefficient value for the GMKN stock was 1.02: this means that the asset tends move in the same direction along with the market, i.e. their change correlation is positive, and the risk level is high since it is higher than 1.

The next stage is a risk free rate calculation, which is a guaranteed level of profitability, which an investor would receive if they made alternative investments. As a rule, the risk free rate is regarded as interest rates on government securities. February 9th, 2018, the Russian securities yield is 7.5% (medium-term rate) [19]. The MICEX (Moscow Interbank Currency Exchange) average yield is -0.5% [19], and the average GMKN monthly stock yield is 0.44%.

The CAPM parameters are presented in Table 3 and the calculation of the GMKN yield rate for the next month is shown as well.

Table 3. CAPM, rate return calculation model.

Rf (risk-free rate)	β	Rm (market return)	CAPM
1	2	3	$4 = 1 + 2 \cdot (3 - 1)$
7,5%	1,02	-0,5%	$7,5\% + (1,02) \cdot (-0,5 - 7,5\%) = -0,66\%$

The return on GMKN stocks is -0.66% for the following month. We can say that this is the forecasted price of the future yield for the next month.

Similar calculations have been made for the remaining instruments in the period from January 1st 2014 to January 1st 2018. Look at Table 4 below.

Table 4. CAPM rate return model for all instruments over the observation period.

Instrument	Rf (risk-free rate)	β	Rm (market return)	CAPM
GMKN	7,5%	1,02	-0,5%	-0,66%
LKOH	7,5%	1	0,5%	-0,56%
MGNT	7,5%	0,96	0,5%	-0,15%
RTKM	7,5%	1445	0,5%	-11558%

The investment portfolio will be formed with regard to crisis, so, it is advisable to group the data into two time segments: the first (crisis) - from 01.01.2014 to 01.12.2016, and the second (post-crisis) - from 01.01. 2017 to 01/01/2018. In these intervals, the financial instruments profitability rates are considered. Look at Table 5 below.

Table 5. CAPM rate return model for all instruments over two time intervals.

Instrument	Period	β	Rm (market return)	Rf (risk-free rate)	Comparison	CAPM %
GMKN	Crisis	1,17	-0,01%	10,0%	>	-0,44
	Post-crisis	1,01	-0,54%	7,5%	>	-0,44
LKOH	Crisis	1,05	-0,01%	10,0%	>	-0,39
	Post-crisis	1,01	-0,54%	7,5%	>	-0,59
MGNT	Crisis	0,91	-0,01%	10,0%	>	0,68
	Post-crisis	0,92	0,08%	7,5%	>	0,49
RTKM	Crisis	-5692,6	-0,54%	10,0%	<	42739
	Post-crisis	1	-0,01%	7,5%	>	-0,29

For investment portfolio formation and analysis, it is highly recommended to use the Markowitz model and the Huang Lithzenberger method. This approach allows to estimate the portfolio's profitability and risk, which contributes to the formation of a more efficient investment portfolio for the investor with regard to the stock market. Look at Table 6.

The table shows the difference between portfolios at different stages of economic development. The return is 2% in a month; the portfolio risk, in times of crisis, is approximately 0.1% higher than in the post-crisis phase. For effective portfolio formation in the post-crisis period, less borrowed funds are required only 5.2%. These financial instruments are best used for investment portfolio formation in the times of crisis.

Table 6. Investment portfolio indices for two periods.

Index	01.05.11–01.12.13	Comparison	01.12.13–01.06.16
LKOH (portfolio share, %)	156,5		14,6
GMKN (portfolio share, %)	–71,0		–2,6
SPFB.GOLD (portfolio share, %)	–58,1		15,2
SPFB.Si (portfolio share, %)	72,7		72,8
Portfolio profitability (per month), %	2,00	=	2,00
Portfolio risk (per month), %	3,41	>	3,33
Leverage, %	258,3	>	5,2

The beginning of 2018 brought some optimistic flair to the world stock exchanges. Stock indices showed the best January dynamics in the last six years.

At the same time, it should be noted that the global markets volatility is at its historical lows (the volatility growth rate is higher under negative events rather than positive ones). Macroeconomic situation and decreasing returns on the debt market determine the increased attractiveness of adding stocks to the portfolio for companies with high dividend payout levels compared to the individual bonds purchase [5, 21].

7 Conclusion

The cyclical nature of financial crises has a significant impact on the stock market, which gives rise to a need of studying the crisis nature, understanding the stock bubbles onset, planning development scenarios and effective investment portfolio formation.

The Markowitz CAPM model (Capital Assets Price Model) is used for investment portfolio formation and is the most important tool for stocks and securities valuation, which allows making a profitable investment portfolio too.

The research suggests that the market will not grow broadly from current levels; however, no significant corrections are expected either. All of the above trends should be taken into account while forming an effective investment portfolio by the investor.

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Formation of Regulatory Environment for Returned Leasing Taxation in Russian Federation

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Abstract. *Object.* One of the progressive investment tools that allow to renew the property and manage the working capital is a leaseback. It has some tax risks because the tax authorities pay special attention to leaseback transactions. The taxation of leaseback is the subject of this study.

Purpose of Research. Development of recommendations on amendments to leasing and tax legislation for the formation of a regulatory environment of leaseback taxation.

Methods. We used general scientific methods, including comparison, grouping, analysis and synthesis of theoretical material.

Results. The paper describes the Russian system of leaseback taxation in the context of specific taxes types. The court practice and court decisions on tax disputes about using of the leaseback mechanism are analyzed. Based on the analysis, the author's recommendations on amendments to the current legislation are proposed.

Application Area. The results of the study can be used by the legislator as recommendations for adjusting the leasing and tax legislation, by law enforcement authorities for a deeper understanding of the nature of leaseback, the logic of its taxation, and by researchers in researches on problematic issues of leaseback investments.

Summary. The formation of favorable external conditions which ensure the reliability of leaseback and its clear recognition in the regulatory system will allow to implement the proposed concepts for the development of leaseback in practice. Ultimately, it can intensify the financing of organizations using the leaseback mechanism and the protection mechanism of the tax interests of the subjects of such operations.

Keywords: Financial lease · Leaseback · Taxation · Tax system

1 Introduction

In market conditions corporations need for a long-term investment for the acquisition and renewal of fixed assets. One of the effective investment tools is leasing financing which allows to purchase and update the property without distracting profit.

From the economic point of view, leasing is a long-term rent of cars, equipment, other personal and real estate [18].

In economic literature [7, 9, 19] it is noted that leasing helps to update only non-current assets of the corporation. However, leasing is used to increase the working capital of the organization in addition to the direct acquisition of equipment. This is supported by the conclusions of many authors [4, 5, 8, 16]. Leaseback is used in this case.

The Russian leasing legislation (item 1 of Art. 4 of the Federal Law No. 164-FZ of 29.10.1998 “About Financial Lease (Leasing)”) establishes that the seller of the leased object can also be the lessee within one leasing legal relationship. Thus, this fact indirectly confirms the existence of leaseback in Russian practice.

Sale-leaseback as an economic category is a transaction when the lessee simultaneously acts as a seller of the leased property to the lessor. It allows the organization to receive funds from the sale of property without stopping its operation and use these funds for new capital investments.

In Russian practice there are factors that constrain the development of leaseback:

- (1) the absence of a full-fledged legal framework which regulate the operations of leaseback;
- (2) risks which are associated with the leaseback’s taxation.

The practice of leaseback using in the Russian Federation testifies to its presence under the financial supervision of the tax service.

The attention of tax authorities is focused on the possibility of reducing the tax burden by reducing the depreciation period of the property, the receiving of VAT deductions. If the purpose of the transaction is tax benefit and not the achievement of real economic activities, this benefit may be declared unjustified (paragraph 9 of the Resolution of Plenum of the Russian Federation from 12.10.2006 No. 53 “On arbitration courts assessing the reasonableness of the taxpayer obtaining a tax benefit”).

This measure may influence the activity of taxpayers pursuing a specific goal: to replenish working capital to further direct them for production needs. This is also evidenced by the results the authors’ research [6, 17] which justifies the formation of the concept of the leaseback’s development in the Russian Federation through the prism of organizational and economic aspects. As a result, it was recommended to choose two concepts of leaseback in which there is a tool for replenishment of current assets of the company or a way of restructuring receivables. The documentary and legal registration of relations, elements of the accounting policy of redemption leasing, and the mechanism of taxation are the components of the regulatory environment that make up the logic of the concept of leaseback development. On this basis, the leaseback is considered by the authors not as a dichotomy, but as poles of the continuum of specific relations and elements.

This served as the basis for considering the system of taxation of leaseback operations as the subject of the study. The object of the study is the redemption lease as an investment tool. The purpose of this work is to develop recommendations for amendments to the leasing and tax legislation of the Russian Federation for the formation of a regulatory environment of the leaseback’s taxation.

It is necessary to solve the following tasks for achievement the purpose:

- (1) to consider the system of taxation of leaseback in the context of specific types of taxes;
- (2) to highlight the problems of taxation in the implementation of redemption lease;
- (3) to analyze judiciary practice and court decisions on tax disputes arising from the use of leaseback;
- (4) to develop recommendations for improving the regulatory environment for the taxation of leaseback.

2 Results and Discussion

The interest of economic science and legal entities in the redemption lease is not accidental, because it plays an important role in financial management. But the possibility of tax savings forces the tax authorities to seek only a way to obtain unjustified benefits in these operations.

Let's consider the problems of realization of leaseback through the prism of specific taxes.

2.1 Sale of Leased Property and VAT

Using of leaseback means the future lessee first sells its property and then leases it. Sale of equipment and its subsequent transfer to leasing is made out with two contracts: the contract of purchase and sale and the contract of financial lease (leasing).

According to item 1 of Art. 39 of the Tax Code of the Russian Federation and subitem 1 item 1 Art. 146 of the Tax Code, the future sale of the property to the lessor is subject to VAT. Calculation of VAT and issue of invoice to the buyer are realized by the seller according to the general rule.

VAT refund from the budget is one of the main prerequisites of legal disputes between the tax authorities and the subjects of redemption lease. For example, in a court dispute, considered in the resolution of the Presidium of the SAC of 16.01.2007 № 9010/06, based on the results of a desk audit the tax specialists concluded that the lessor purchased the leased property only for the transfer of fixed assets to his/her property and receive VAT deductions. The tax authorities denied this deduction and imposed a fine by the lessor. Also, the FAS of the Moscow district compared the income from the leasing transaction with interest on the loan, used to realize leaseback.

The Court assesses the difference between the lease payments received and the interest paid to the creditor, compares it with the rate of inflation, and concludes that the company's activities would be deliberately unprofitable in this transaction.

The current legislation does not link the use of tax deductions with the economic justification of expenses including the payment of VAT but determines their presence of a set of grounds: properly issued invoice, the actual payment of tax, the adoption of services for accounting, and payment of transactions which are subject to VAT.

Based on the previous information, we propose a number of measures to protect the interests of bona fide participants in the financial lease agreement.

1. The key point for the further development of redemption lease in Russia is the consolidation of its legal status in the legislation. For this purpose, it is necessary to give determination of essence of leaseback and fixed the main powers of its participants in Federal Law “About Financial Lease (Leasing)”:

“Leaseback is a sublease of the leased asset where the lessee acquires from a third participant (the seller) the property in accordance with the terms of the contract of purchase and sale and transfers the property to the lessee projecting at the same time the seller of the property for possession and using for a fee and for a period in accordance with the terms of the contract of financial rent (leasing) within one leasing relationship”.

This definition will fix the availability of leaseback in Russian practice and legislation directly, and the mandatory presence of two contracts for the participants of the transaction in the implementation of such operations.

2. In 2004 in Russian business there were questions about size of the adoption of VAT for deduction in leasing transactions. For conflict resolution the Ministry of Finance of the Russian Federation issued The Letter No. 03-04-11/203 from 15.11.2004 and The Letter No. 03-03-01-04/1/128 from 22.11.2004 in which it was indicated that the VAT on lease payments is accepted for deduction by the lessee in full regardless of the transfer of property rights to him. The similar reaction of the Ministry of Finance should be realized for the leaseback because it is advisable to issue a Letter (an official comment to the Tax Code) to clarify the possibility of applying tax deductions for payments at the leaseback. In our opinion, the main provisions of this document are:
 - (a) recognition of the fact that there is no correlation between the profitability of a financial transaction and the right to apply tax deductions;
 - (b) recognition of the VAT deductions in case of leaseback in full in the tax periods in which lease payments are paid and according to the conditions of the Tax Code.

The existence of a clear recognition of leaseback in the system of its normative regulation can help to protect the tax interests of the subjects of redemption lease.

2.2 The Implementation of the Leaseback and Income Tax

For purposes of profit taxation lease payments according to item 10 of Art. 264 of the Tax Code of the Russian Federation are considered by the lessee as other expenses connected with production and (or) realization. The Tax Code does not distinguish between types of leasing, so lease payments in case of leaseback are accepted in tax accounting in general manner.

Courts hold a similar position. They support the business community in disputes with the tax authority. Based on the analysis of arbitration practice, it follows that lease payments are recognized as expenses by the lessee, when he acts as seller of the lease assets under the finance lease (the decision of FAS of North-West district from 27.03.2007 № A56-13698/2006, FAS of Volga region district from 24.04.2007 № A65-16414/2005, FAS of Moscow district from 23.01.2006, 16.01.2006 №

KA-A40/13624-05, the Federal Central district from 07.09.2010 with case No. A23-2563/09A-13-48). In these decisions the courts found the lease payments economically justified and pointed that leaseback transactions are aimed at raising funds for repairs and other activities associated with the leasing of property. This allowed the taxpayer to put into operation and use in the production process serviceable equipment at the lowest cost.

This position is justified. It follows from the economic essence of leaseback: its implementation does not indicate that the taxpayer gets unjustified tax benefits as the law allows to take lease payments into account in the costs (subitem 10 item 1 Art. 264 Tax Code of the Russian Federation).

Another point of the formation of the base for income tax is the use of bonus depreciation. Thus, item 9 of Art. 258 of the Tax Code allows organizations to simultaneously write off 10% or 30% of the initial value of fixed assets for expenses in tax accounting depending on their depreciation groups. The organization can use this provision when:

- (1) objects are depreciable assets;
- (2) fixed assets are not depreciated at the time of write-off of the bonus depreciation;
- (3) the application of the bonus depreciation is fixed in accounting policy of the organization for the purposes of the taxation.

The use of benefits within leasing contracts in general is a controversial issue. The Tax Code of the Russian Federation does not contain explanations for the leasing and leaseback transactions. However, at this time only lessors are allowed to apply the bonus depreciation if the leased property is recorded on their balance sheet according to the Ministry of Finance of the Russian Federation (Letter No. 03-03-05/34 from 10.03.2009). This benefit is prohibited for the lessees.

In the Letter from 27.03.2007 No. 03-03-06/1/172 The Ministry of Finance of the Russian Federation explained that bonus depreciation does not apply to property acquired for sale. Along with this, the tax service points out that the application of Art. 259.3 of the Tax Code is unlawful because the acquisition and sale of fixed assets are carried out in one tax period and the depreciation bonus, according to tax authorities, applies only to capital investments.

In leaseback the bonus depreciation is used by the original equipment seller when it acquires the property and begins to amortize it. But the right to apply the bonus depreciation passes to the buyer (lessor) at accounting of the leased object on its balance sheet at sale of property which was acquired not so long ago and did not begin to be amortized (the month following month of acceptance of the equipment to accounting did not come) to the lessor.

It is necessary to express disagreement with the position of the Ministry of Finance considering the prohibition of the use of this benefit by the lessee (even if lessee is the balance holder of the leased property). In our view, in this situation the leased property is the principal means for the lessee and is used in activities aimed at revenue recovery.

In addition, according to the position of the Ministry of Finance of the Russian Federation any subject of leasing relations will not be able to use a tax relief of a

one-time write-off of the value of the property in the case of accounting of leased property on the balance sheet of the lessee. This leads to the discrimination of taxpayers under the terms of the leaseback transaction, which is unacceptable in accordance with Art. 3 of the Tax Code.

In our opinion, the legislator must secure the permission for the use the mechanism of bonus depreciation by the lessee whose balance are taken into account the subject of the leaseback. The amendments of tax law are not required to express the official position on this fact because it is possible to consolidate the provision in the Letter of the Ministry of Finance of the Russian Federation what can act the official commentary to the Tax Code.

2.3 Property Tax (Subject of Lease) at the Leaseback

According to the chapter 30 of the Tax Code of the Russian Federation “Enterprise property tax” the object of taxation is movable and immovable property (including property transferred for temporary possession, use, disposal, trust management, entered in a joint activity or received under a concession agreement) recorded on the balance sheet as a fixed asset. The property tax payer will be on the balance holder of the leased property while using the leaseback.

When the leaseback is realized the tax, authorities can only see an attempt of the seller (lessee) of the property to avoid paying property tax if under the terms of the contract the subject of the lease is accounted for the balance sheet of the buyer of the property (lessor). In addition, the tax inspectorate considers the leaseback as an operation aimed at obtaining unjustified benefits not only in terms of tax evasion, but also in terms of understating the tax base for property tax. Therefore, such transactions may rise claims of inspectors. But if the participants actually execute their obligations under the contract (the leased property is transferred, lease payments are paid, etc.), the courts side with the taxpayer (the decision of FAS of Moscow district from 18.01.2011 № KA-A40/16789-10, FAS of Ural district from 26.01.2010 № F09-11292/09-C2).

However, cost savings is a weighty argument in favor of the economic validity of the transaction as well as the focus on income generation during the leaseback. Therefore, the main author’s recommendation about property tax is based on the fact of fixing the definition and the mechanism of leaseback in the Russian legislation.

2.4 Transport Tax in Case of Leaseback

First of all, in item 2 of Art. 20 of the Federal Law “About Financial Lease (Leasing)” it is noted that the objects of leasing are registered by agreement between the participants in the name of the lessor or lessee if these objects should be registered with the state authorities (vehicles).

If the vehicles owned by the lessor (but not registered to the lessor) are transferred and temporarily registered to the lessee under the lease agreement, the lessee is the taxpayer of the transport tax.

In leasing (including the leaseback) analysis of the practice of paying transport tax did not reveal significant claims to taxpayers, who are the subjects of leaseback. However, we consider the transport tax through the prism of profit taxation with regard

to the inclusion of the transport tax in the expenses. On this base the Ministry of Finance of the Russian Federation (Letter from 04.07.2006 No. 03-06-04-04/28) explains that the amount of transport tax paid to the seller by the buyer (the taxpayer) of the vehicle for the period of registration of the vehicle by the seller is not recognized as income tax expense. The person pays the transport tax if the vehicle is registered to him/her, and it does not matter who owns it.

The authors of this article have a different point of view. Transport tax expenses are taken into account for the profit taxation purposes if the condition of tax refund is established by the lease agreement. The lease agreement is a system of contracts which are necessary for the implementation of sale-and-leaseback. In our opinion, if the vehicle is registered to the lessor, and there is a condition in the contract to include the amount of the transport tax in the lease payments, the expenses for the transport tax refund can be taken into account for profit taxation purposes. In order to avoid disputes with tax authorities, the amount of transport tax should be included in the price of the lease contract.

3 Summary and Recommendations

The modern development of leaseback in Russia was analyzed, and we identified the problem of close attention of tax authorities to such transactions which is caused by a number of prerequisites:

- (1) absence of direct fixing of leaseback as an investment instrument in the Russian legislation;
- (2) imperfection of accounting transactions in the implementation of sale-and-leaseback;
- (3) the absence of a formal review of the Ministry of Finance of the Russian Federation on the problematic issues associated with the taxation of leaseback transactions.

We have formed recommendations the implementation of which can lead to the activation of leaseback transactions:

- (1) introduction of a provision which contains a specific definition of sale-and-leaseback as a subspecies of leasing and economic and legal category to the Federal Law "About Financial Lease (Leasing)";
- (2) suggestions for the Letter of the Ministry of Finance of the Russian Federation in terms of the legality of the VAT deductions in the implementation of the leaseback:
 - (a) recognition of the absence of a relationship between the tax deductions and the profitability of a financial transaction;
 - (b) recognition of VAT deduction in full in the periods of lease payments and in compliance with the requirements of the Tax Code;
- (3) suggestion to the Ministry of Finance of the Russian Federation to issue a Letter which can fix the permission for lessees to use the bonus depreciation, when the tax base for income tax is being formed;

- (4) the official legitimization of leaseback as an economic and legal category and investment tool.

The implementation of these measures at the legislative level will allow the tax authorities to identify leaseback as an investment tool, and the demand for leaseback increases in the financial services market.

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The Study of the Activities of the Far Eastern Revolutionary Committee (1922–1926) in Russian Historical Science

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Abstract. In the article the process of studying the activities of the Far Eastern revolutionary committee in the Russian historical science is being investigated. The object of the study is the Soviet Far East of Russia from November 1922 to March 1926. The authors give an overview of historical literature on the activities of the Far Eastern revolutionary committee as an extraordinary, temporary and transitional government organ created to restore Soviet power and national economy in the region in 1922–26. The authors divide the historiography of the Far Eastern revolutionary committee into two periods: the Soviet and post-Soviet. In turn, the Soviet period is divided into three stages. The initial period, coinciding with the time of the Revolutionary Committee existence, when appeared the first researches on this subject. The second period lasted until the middle of the twentieth century, when the assimilation of the Marxist methodology was proceeding in its vulgar Stalinist version. The third lasted until the liquidation of Soviet power, when monographic historical works, dedicated to the Far Eastern revolutionary committee appeared. And the post-Soviet period is characterized by liberation from the post-Soviet methodology, the expansion of research subjects, comprehensive coverage of the Far Eastern Revolutionary Committee activities. On the basis of an analysis of the most significant works on the research subjects, the authors identify those areas of activity of the Far Eastern revolutionary committee that have been little studied or not studied at all.

Keywords: The Far Eastern Revolutionary Committee ·
The Far East of Russia · Siberia · State machine · State administration ·
Russian historical science

1 Introduction

The relevance of the research subject is conditioned by the fact that the state machine, its functioning requires constant perfection. This process should be focused and based on all the existing experience of state building throughout the entire history of Russian history. The study of the experience of state administration under the specific conditions of the Russian Far East during the existence of the Far Eastern revolutionary committee should be considered in this context.

The study of the activities of the Far Eastern revolutionary committee in the national historical science makes it possible to study the experience of participation of regional authorities in their solution of military and political tasks, the implementation of measures aimed at restoring the national economy, foreign policy and improving the life of the inhabitants of the Far East.

The study of Far Eastern Revolutionary Committee activities in the national historical science can be divided into two periods - the Soviet and post-Soviet. In turn, in the Soviet period it is expedient to single out the following stages:

- 1922–1926 period of the Far Eastern Revolutionary Committee functioning;
- 1926–1956 when interest in this topic was extinguished and it was only indirectly touched upon in general works on the history of the country and the CPSU;
- 1956–1991 when the theme of the FERC receives full coverage in the works of Soviet historians.

For the first time, the term “revolutionary committees” came into use during the French Revolution, when the Jacobin dictatorship was established. These were the organs which protected the bourgeois revolution conquests from the encroachments of the interventionists and internal reaction. This experience was carefully studied by Russian revolutionaries, as is convincingly demonstrated by the work of the outstanding Russian revolutionary P. Kropotkin [1]. The experience of the French was widely used by the Bolsheviks in the first years of the establishment of Soviet power already as far as Russia was drawn into the civil war [2].

The main feature of the Far Eastern revolutionary committee is that it did not arise during the civil war, but only after the Far Eastern region was liberated from the White Guards and the interventionists. Scientific literature on the activities of The Far Eastern Revolutionary Committee appeared at the time of its existence. This covers the period from November 1922 to March 1926. The lower chronological frontier is the liquidation of the Far Eastern Republic and the beginning of Sovietization of the Far East, the upper one is the liquidation of The Far Eastern Revolutionary Committee and the formation in the region of the Soviet constitutional government – the Far Eastern Regional Committee of the Soviets of Workers and Peasants’ deputies. A characteristic feature of this period of historiography is that the first works about The Far Eastern Revolutionary Committee were written not by professional historians, but by participants of those distant gatherings. They can be regarded both as scientific works and as sources for studying the topic. They contain unique documents and facts that have not been postponed in other sources.

The majority of the first publications on The Far Eastern Revolutionary Committee are of an economic nature, in which certain aspects of its activity for restoring the national economy of the region are revealed. Thus, in 1923 the work of M. Alexin [3] was published, in 1924 - the work of I. Cabritskiy [4], P. Mamonov [5] and the works of other authors, in which they wrote about the state of the economy in the Russian Far East, analyzed the prospects for the development of the national economy in the region. The first attempt to generalize the work of The Far Eastern Revolutionary Committee in the economic sphere was undertaken in 1925 by M. Tselishchev. In a small book

“Economic Essays of the Far East”, the issues of trade and state industry development, sources of accumulation of funds for the restoration of the national economy, ways of ousting private capital from the regional economy are considered [6].

In the work “The Soviet Far East, published in 1923 under the editorship of S. Sukhovy, political conditions that caused the necessity of The Far Eastern Revolutionary Committee’s formation are revealed, as well as the facts characterizing the construction of Soviet power in the Far East, the role of the groups of assistance to the Soviet power in the preparation of elections in the rural area Councils, as well as information on holding elections to the Soviets in the region. Prospects for the economy of the Far East of Russia are indicated. The work contains interesting statistical data on the number and social composition of the Party organizations of the region. However, the main attention in this work is paid to the economy of the region and its prospects for the development [7]. In 1924 P. Kobozev (chairman of The Far Eastern Revolutionary Committee in 1922–1923 years) published the work “Colonization of the Far East.” It highlights one of the most problematic issues of the region’s development in the post-revolutionary period it is the attraction of the population of the central regions of Russia to the Far East, for its settlement and economic development [8]. Summarizing the results of the coverage of the study of The Far Eastern Revolutionary Committee in the domestic literature of 1922–1926, it should be noted that the works of that period do not pretend to systematically generalize the problem, information about its activities is fragmentary, assessments about it are subjective and require profound rethinking. Nevertheless, these works have not lost their scientific value, as they were written by eyewitnesses, “hot on the trail,” at times, the facts cited in them are priceless and unique.

After 1926 the problem of The Far Eastern Revolutionary Committee activity was not the subject of a special study. However, newspapers and magazines of this period published information on the internal and foreign policy of the USSR, on the relationship between our country and China, Japan, and the United States. Information was analyzed on the elimination of banditry in the regions, including in the Far East of Russia in the 1920s. There is an explanation for this. Historical science was subordinated to the interests of accelerated modernization. The subject of the Far Eastern Revolutionary Committee, as well as the of new economic policy problems, during which it existed, leaving in the background. In the late 1930s, many leaders of The Far Eastern Revolutionary Committee, including Kobozev, were repressed. The “Short Course of the CPSU (b)” publication made it possible to create a holistic view of the “socialist” modernization of the country in the light of the Marxist historical concept on the one hand, and it opened the way for dogmatism bordering on primitivism on the other. In the extensive multivolume work on the history of the civil war in the USSR, there are certain data on revolutionary committees established in all regions of the country. However, chronologically this capital multivolume work in the spirit of the “short course” is limited to 1922, that is, before the creation of the FERC [9]. A certain surge of interest in the theme of revolutionary committees has been observed after the Great Patriotic War, since during this period the emergence of people’s democracy countries, the political regimes in which were guided by the revolutionary experience of the USSR. In this connection, the appearance of a work, written by M. Mirgodieiev [10] about the revolutionary committees of Azerbaijan is quite understandable.

A new stage in the study of this topic can be conditionally started from the second half of the 1950s, when the “cult personality” of Stalin was exposed and some “taboos” on the study of many problems, among which behind-the-scenes theme was the FERC, were removed. The theme of the revolutionary committees receives coverage in numerous scientific publications in the regions of the country, including in the Union republics of the USSR [11]. At that time, researchers’ access to party and state archives was simplified. Many archival funds, which contain information about the events of the 1920s, become open to all-round research by historians. Moreover, part of the archival materials containing information about the Far Eastern revolutionary committee was published in special collections of documents [12, 13], which contributed to their active involvement in scientific circulation. If earlier study of Russian history centered in Moscow and Leningrad, now there are regional scientific centers, including in Siberia and the Far East.

The revolutionary committees and their struggle to establish Soviet power in the central regions of the country and on its outskirts become an object of study of historians of the national republics and regions of Russia. Of particular value to us are works devoted to the revolutionary committees of Siberia and, directly, to the Siberian Revolutionary Committee. They cover the reasons and conditions for the formation of revolutionary committees as emergency bodies of state power in the conditions of civil war and foreign intervention, the process of Sovietization of the eastern outskirts of Russia. A distinctive feature of Siberian historians is that they disclose the main lines of activity of the revolutionary committees not only in “their own”, but also in the Far Eastern region adjacent to them [14].

Of particular value are the works of the scientist from Tomsk, V. Flerov, dedicated directly to the Far Eastern Revolutionary Committee. At the center of his attention is the formation of elective Soviet bodies in the Far East and the role of the Far Eastern revolutionary committee in this process. Much attention is paid in his works to the analysis not only of the Soviet, but also of local and central bodies of the All-Russian Communist Party of the Bolsheviks, as well as bodies of party control in strengthening the “workers’ power” in the localities.

The achievement of Siberian scientists was the publication of a multivolume work “History of Siberia since ancient times.” The fourth volume of this capital work is devoted to the “period of building socialism in the USSR”, that is, 1920–1930s of the 20th century [15]. Naturally, the authors of the volume could not ignore the Siberian Revolutionary Committee. In addition, according to the prevailing tradition, Siberian scientists broadly interpret the concept of Siberia, including the Far East. For this reason, the volume also highlights the activities of the Far Eastern revolutionary committee [15]. On the one hand, the authors of the multi-volume managed to include the Siberian Revolutionary Committee and The Far Eastern Revolutionary Committee in the context of regional history. On the other hand, the very nature of the scientific work aimed at generalization allowed the authors to give only general information on the main lines of activity of revolutionary committees, often unsupported by concrete facts.

Among the works of Siberian historians should be singled out the publications of V. Flerov, devoted to the restoration (after the Civil War) period in Siberia and the Far East [16]. Most of them directly reveal the activities of the Far Eastern revolutionary committee in these years. The main subject of his works is the process of Sovietization and restoration of the national economy. He did not pass over such important topics

from the point of view of Soviet historiography as labor activity and party leadership of Soviet construction. At the same time, the subject of the Far Eastern revolutionary committee did not become for V. Flerov the subject of a separate monographic study, but was inscribed in the context of the restoration of the national economy of the Far East after the civil war and intervention [17]. His published articles on the Far Eastern revolutionary committee focus on the initial period of his activities.

In 1970, the Institute of History, Archeology and Ethnography of the Far Eastern peoples was established under the decision of the Academy of Sciences Presidium of the USSR at its Far Eastern branch, which undoubtedly stimulated the development of Russian historical science in the region. The same year, in the Dissertational Council of this institute, the candidate's thesis of Isayeva was defended. Her work was dedicated, directly, to the Far Eastern revolutionary committee [18]. In this work, the author, from the Marxist standpoint, tries to reveal the reasons for the formation, nature, and main directions of the Far Eastern revolutionary committee's activities. In her opinion, the Far Eastern revolutionary committee is an exceptionally extraordinary Soviet authority acting in the specific conditions of the Far East. In her publications [18], including the joint works with the well-known Far Eastern scientist T. Sonin, based on the above described thesis, she tried to determine the legal nature of the Far Eastern revolutionary committee [18]. The commonwealth of these Vladivostok scholars is quite logical, since V. Sonin wrote about the Far Eastern republic [19], and T. Isaev - about the Far Eastern revolutionary committee. This allowed them to consider the issue of continuity in the policy of state-building, conducted by the Bolsheviks in the Far East. Nevertheless, in order to draw any conclusions about the political and legal nature of the Far Eastern revolutionary committee, a broader generalization is needed.

A separate direction of Soviet historiography is historical-party research, works on the activities of the Communist Party of the Soviet Union in the 1920s (the All-Union Communist Party of the Bolsheviks). Of course, the party organs played a huge role in creating revolutionary committees in the territory of Soviet Russia, not only during the civil war, but also in the post-war period, and especially in Siberia and the Far East. In 1971–1982 in Khabarovsk and Vladivostok there were published generalized works on the history of the Far Eastern Party Organization, as well as the Seaside and Khabarovsk Territorial Party organizations since their beginning until the publication of the books. On the one hand, the authors do not ignore the activities of the Far Eastern revolutionary committee on the restoration of the national economy of the region, and on the other - these works are full of ideological cliché, in particular, about the leading role of the CPSU (b), but there are few concrete facts characterizing this activity in them. The work of V. Vojshnis is dedicated to party building in the Far East during the “construction of socialism in the USSR” from the end of the Civil War to the end of the Second Five-Year Plan (1922–1937) [20]. The book is full of dates and facts characterizing inner-party life. However, it also shows the struggle of the Party organizations of the region against the Trotskyites - adherents L. Trotsky - a supporter of the “emergency”, and, consequently, the revolutionary committees as universal tools in solving the tasks of “socialist construction”. Unfortunately, this plot in the work of V. Vojshnis did not receive comprehensive coverage. Revolutionary committees

played an important role in national-state construction among the small peoples of the Far North-East and the Far East. In this connection, the works prepared by ethnographic scientists are of interest. In particular, in the book devoted to the Chukchi, on the basis of documents it is asserted that the revolutionary committees in Chukotka were liquidated definitively only in 1931 [21]. This fact substantially corrects the chronology of the existence of revolutionary committees in the Far East and raises the question of a more careful approach to studying the specifics of their activities in the national areas of the region [2]. N. Bugay confirms that the revolutionary committees in the Far North-East were liquidated in 1927, which, of course, is not true to the facts. However, this not a true statement appeared before the book about Chukchi mentioned above was published. N. Bugai sums up a definite result of the study “revolutionary theme” in Soviet historiography study. He distinguishes the following types of revolutionary committees created during the Civil War: 1) Frontline; 2) rear; 3) in the liberated territory Sibrevkom and The Far Eastern Revolutionary Committee. N. Bugay refers to the territorial-intermediary [2]. Thereby two specific moments characterize these revolutionary committees: first, the vastness of the territory they controlled, and secondly, that they acted as a “transfer link” between the center and the party-Soviet bodies of the region. However, the proposed logical construction does not take into account the emergency factor, manifested in the narrowing of collegiality, the absence of electivity in the replacement of leadership positions, inherent in all revolutionary committees.

Post-Soviet historiography of the revolutionary committees in general and of The Far Eastern Revolutionary Committee in particular, strive to critically rethink all the achievements of Soviet historical science. This is manifested, first of all, in the desire to go beyond the framework of the Marxist methodology, in the disclosure of not only achievements, but also shortcomings and miscalculations in the activities of the Soviet and party bodies. This also applies to the study of the practice of Soviet construction and the activities of government bodies in the 1920s in the writings of Far Eastern scholars A. Mandrik, S. Lazareva, O. Sergeev and others [22].

The subject of research is expanding. In this regard, the works that reveal the specific nature of the reconstruction (after the civil war) period in the Far East should be noted, in which of The Far Eastern Revolutionary Committee had to work. They can be divided into two groups. The first includes works devoted to changes in the socioeconomic nature that take place during the period of the restoration of the national economy. The emphasis is not so much on achievements as on the difficulties experienced by the region after the civil war. On the one hand, they characterize various aspects of the economic and social development of the region as a whole during the years of Soviet construction in the interwar period, i.e. from the end of the civil war to the beginning of the Great Patriotic War. In this period also enters the time of the existence of Dalrevkom. In particular, the demographic situation in the region is characterized by a severe demographic [23], the development of transport and communications [24], leading industries [25]. New research subjects appear devoted to the everyday life of the Far East in the 1920s and 1930s [26]. As a rule, the activities of The Far Eastern Revolutionary Committee are mentioned in passing about in these works, but they make it possible to judge more reasonably the results of its work on the restoration of the Far East and the establishment of a normal social and economic life of

the Far Eastern people [27]. The second group includes the works devoted to the socio-political and international situation in the region in the pre-war period. Particular attention is paid to the activities of the state apparatus for ensuring the rule of law and security of the region. Certainly, the emphasis in these works is not on the achievements of the Soviet government, but on the difficulties that it faced in the first post-war years of state building [28].

In S. Tsukanov's monograph in the framework of the study of the two most important aspects of The Far Eastern Revolutionary Committee activity - sovietization and restoration of the national economy, analyzes the monetary and financial system of the region, strengthens the defense capacity, combats banditry, and takes part in the foreign policy of the USSR [29]. The monograph itself is the only generalizing work devoted to the Far Eastern revolutionary committee published in the post-Soviet period.

2 Conclusion

Summing up, we note that Russian historians have done a great and fruitful work to study the activities of the Far Eastern revolutionary committee. Nevertheless, analysis shows that many problems require further work. Let us single out some of them:

- political and legal nature of The Far Eastern Revolutionary Committee;
- the mechanism of interaction of separate parts of the government at the level of the region: administrative, executive and judicial-law enforcement;
- the mechanism of interaction between the center and the region;
- Individual personalities and their role in the work of the FERC.

The existing gaps in the historiography of the topic can be closed only if the research is continued, with the involvement of new, previously unknown archival materials and increasing the theoretical level of the research itself.

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Backward Linkage Value Chains as a Tool for Selecting Promising Production Technologies in Kuzbass Coal Industry

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Abstract. The paper aims at finding the optimal ratio between resource and non-resource development factors, and identifying the most efficient scopes and forms of cooperation between mineral resource and non-resource sectors of the economy. The coal industry of Russia is extremely dependent on external conditions: the main limitation for further growth is not the shortage of coal reserves or production capacity, but the capacity of the external market and the cost of production and transportation. In particular, basing on the theory of value chains, the authors attempt to explain the problems and foresee the trends of coal industry development as well as to identify the promising vectors in searching the ways to diversify the economy of Kemerovo Region. Dynamic development of the economy of the Kemerovo region requires the formation of an effective innovation system with the creation of development blocks. This article was prepared with the financial support of Russian Science Foundation (Agreement No. 17-78-20218, the project “Spatial specialization and holistic development of resource-type regions”).

Keywords: Value chains · Rational mineral resource management · Fuel and energy complex · Territory development · Innovations

1 Introduction

In the coming years Russia will face the need to create a new development model based on the rational interaction of people and nature, people and technology, and social institutions, to find a worthy place in the world economy at the modern stage of global development. Thus, one of the most topical interdisciplinary objectives for contemporary Russian science is finding the optimal ratio between resource and non-resource development factors, and identifying the most efficient scopes and forms of cooperation between mineral resource and non-resource sectors of the economy. This task is especially relevant for the coal industry. This paper aims to identify the promising production technologies in the coal industry based on value chains.

2 The Theory of Value Chains (Some Theory)

Let us start with clarifying the terms. M. Porter is believed to be the author of the value chains (VCs) theory. In his work “Competitive advantage. How to achieve high results and ensure its sustainability” M. Porter described the vertical value chain at the level of individual companies (corporate VC) [1]. Sturgeon suggested the most general definition of the VC as a mechanism of adding value in the process of creating the final product which involves different stages of the development, production, design, and sales of finished products [2]. In the OECD report (2013) the VC is defined as “the full range of activities that firms engage in to bring a product to the market, from conception to final use” [3]. In Russia, VCs are studied by V. Kondrat’ev, T. Meshkova and E. Moiseichev. They argue that the VC is “a sequence of primary business functions of ... design, production, marketing, distribution and after-sales customer service” [4]. In this paper, the authors stick to T. Sturgeon’s definition [2]. Within a chain, two types of linkages can be distinguished: forward linkages, and backward linkages [3]. Forward linkages are usually formed in the export-oriented model of countries’ and regions’ development around process manufacturing industries such as coal mining, metallurgical, chemical, and oil extraction industries. Forward linkage VCs are characterized by low localization of the processing, related and supporting industries in the region. Therefore, the countries where forward linkages dominate in the VCs are exporters of raw materials, manufacturers of parts and components for complex products with high added value [3]. Backward linkage VCs are formed around the production and export of high-tech and innovative final goods and services, while raw materials and services are exported by those countries (regions). The centers of backward linkage VCs formation are major universities, research institutes, modern R&D and engineering centers. Unlike forward linkage VCs, the development of backwards linkage value chains is accompanied by a high localization of the processing, related and supporting industries in the country (region) [4, 5]. The emergence and rapid development of the VCs is primarily due to globalization and activities of multinational companies. That is why value chain theories are also known as global value change (GVC) theories; they are used in studying the impact of globalization on the level and nature of countries’ development. Figure 1 shows the degree of involvement of particular countries in global value chains according to the OECD data. The analysis shows that in most cases the countries where backward linkage VCs dominate are more successful in their development and more receptive to innovations. Researchers of GVCs argue that the level of the country’s/region’s development is influenced not only by the type of linkage (forward/backward), but also by the nature of governance within the value chain itself. Gereffi, Humphrey and Sturgeon) distinguish five types of GVC governance in their work [8].

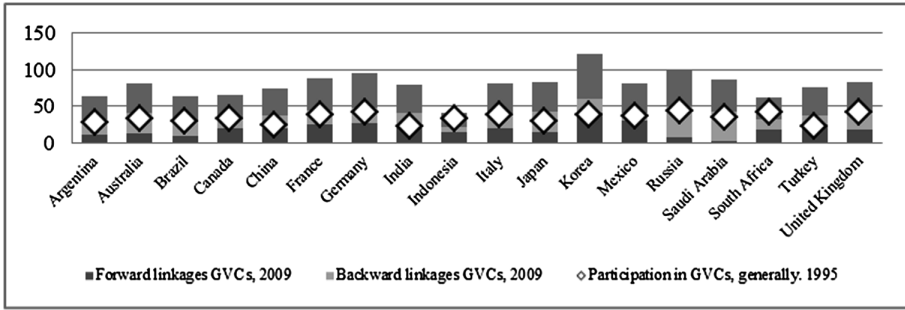


Fig. 1. Participation of several countries in the GVCs in 1995 and 2009 (%) [6, 7, 16].

The approach presented in Fig. 2 is largely based on the theory of transactional costs. The vertical axis represents the major GVC links from suppliers (below) to customers (above). The horizontal axis shows the increase in the degree of explicit coordination and power asymmetry (from left to right). The opposite ends in this model of explicit coordination are Markets (GVCs where actors in different links have equal market power and the governance system is decentralized) and Hierarchies (GVCs represented by single vertically integrated firms).

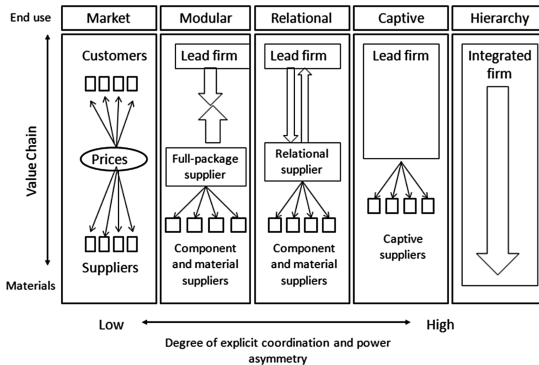


Fig. 2. Models of value chains [8–10].

Type I is market value chains (Markets). The most effective mechanism for creating such VCs in commodity markets is establishing exchanges. Type II is Modular value chains. Such VCs are an effective mechanism for the formation of predominantly backward linkage VCs. They also contribute to the development of the domestic market of the country and the region. In the value chains of Type III (Relational value chains), the relations between counterparties are very similar to the relations between cluster members: they are based on niche specialization and trust. Relational value chains are characterized by long, often informal (including family) relations between two companies. Such VCs are widely used as a mechanism for the formation of territorial clusters. Types IV and V are based on large firms' dictates. The negative effects from

such VCs are most evident where forward linkages dominate. The most rigid control by the major firms is observed in Type V (Hierarchy). Such VCs represent a case of vertical integration and direct managerial control of subordinates by the managers. The most vivid example of such VCs are vertically integrated mineral companies [8–10].

Within value chains we can trace the pattern described by R. Kaplinsky [8], which is illustrated in Fig. 3. The Smile Curve diagram shows the distribution of the added value over different stages of the production cycle, starting with development and finishing with after-sale services.

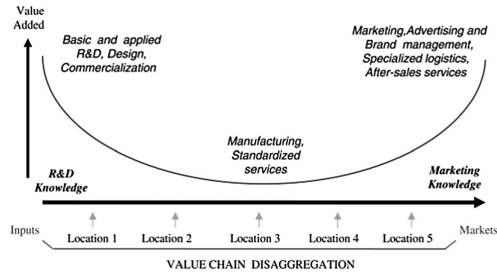


Fig. 3. Conceptual framework of the Smile Curve [10, 11].

It is evident from Fig. 3 that the highest-value input are the segments that are most distant from manufacturing, i.e. R&D and after-sales services. The firms performing R&D within the VC usually receive the higher share of economic rent. Yet, the firms engaged in extraction and primary processing of resources receive the lowest share in the VC.

3 Russia's Resource Export Orientation and Its Position in the GVCs

Russia is the largest resource country and has the largest mineral resource base of energy resources, which is sufficient for meeting the country's needs and rational export. Table 1 shows the Russia's share in the world reserves of energy resources. In 2015, Russia's share of gas reserves amounted 17% of the world's total, and those of oil and coal amounted 6% respectively [12].

Table 1. Russia's share in the world energy resources [12, 13].

Rank	Type of energy resources	Total proved reserves	Russia's share in the world reserves
2	Gas (trillion cubic metres)	32.3	17.3%
6	Oil (billion tonnes)	14.0	6.0%
7	Coal (million tons)	101.5/14.0	6.0%

The fuel and energy complex (FEC) of Russia has always played a significant role in the country's economy. In 2015, the FEC provided over 30% of Russia's GDP and consolidated budget, 56% of its foreign exchange earnings from exports and nearly a quarter of total investments in the national economy [10, 11]. However, in the near future Russia's FEC may face a number of challenges. The decline in world energy resource prices and economic sanctions have hurt the primary industries and forced them to rethink the role of the FEC in Russia's economy. Table 2 below shows the key figures for the changing role of the FEC in the Russian economy in line with the forecasts of the Energy Research Institute of the Russian Academy of Sciences.

The previous decades of extensive development of the FEC have led to a number of problems in the energy sector that have also arisen in recent years: the deterioration of the resource base due to depletion of existing fields, decline in the size and quality of new geological discoveries, and increase in development costs at troublesome sites and in remote provinces. The solution to all these problems seems to be closely connected with the transition from extensive use of natural resources to comprehensive exploitation of mineral resources [15].

Table 2. The role of the fuel and energy complex in Russia's economy – key figures [12, 13].

	2015	2040		
		Critical scenario	Probable scenario	Favourable scenario
Contribution to production GDP, %	31	15	14	13
Share of energy resources in total revenue from exports of goods, %	56	29	26	22
Contribution of energy exports to GDP, %	16	7	6	6
Contribution to consolidated budget, %	30	18	14	14
Share of capital investment in the FEC in GDP, %	5	3.9	3.7	3.8
Share of all capital investment in the FEC, %	24	11	14	13

Russia's coal industry is a key element of the global resource base and is of great importance for socio-economic development of Russia in general and especially of its coal-mining regions. By the end of 2016, coal production in Russia amounted to 385.4 million tonnes. Over 10 years (from 2006 to 2016) coal extraction increased by 26%, while in the last year (2016) it increased by 3% (Fig. 4).

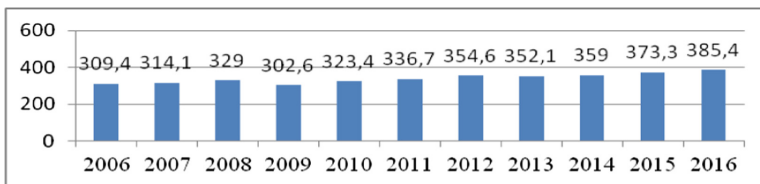


Fig. 4. Dynamics of coal extraction in Russia, 2006–2016 (million tonnes) [13].

The coal industry of Russia is extremely dependent on external conditions: the main limitation for further growth is not the shortage of coal reserves or production capacity, but the capacity of the external market and the cost of production and transportation. Figure 4 shows that the growth rate of coal production in Russia in 2006–2016 was not big, amounting to an average of 3% per year, the growth was achieved primarily due to the expansion of the share of exports in total shipment of coal. A key limitation for the development of Russia's coal industry is the excess of supply over demand, which caused a lasting decline in prices at foreign coal markets.

The share of exports increased from 29% in 2006 to 43% in 2016. Yet, starting from 2014, the volume of exports also started declining. Figure 5 shows that over the period of 2014–2016 the foreign market demand for Russian coal fell by almost 1%. To date, the Russian coal production is supported mainly by the domestic market demand for coal [14]. The statistics clearly shows that the industry has exhausted the possibilities of extensive growth and needs serious restructuring.

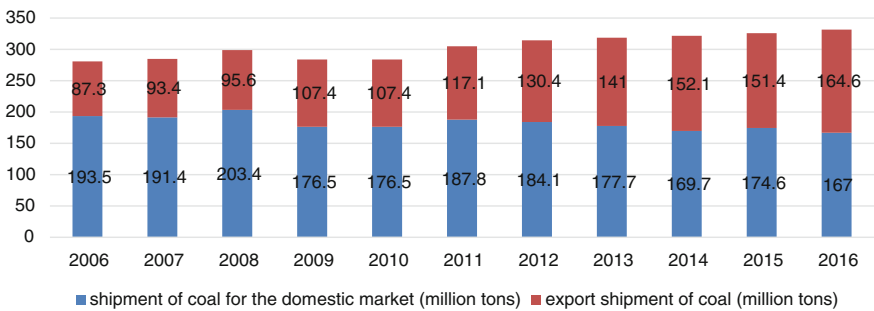


Fig. 5. Dynamic structure of the shipment of Russian coal in 2006–2016 (million tonnes) [13].

Kuzbass (Kemerovo region), which is the main coal basin of Russia, may find itself in the most unfavourable position. The region produces 61% of the country's coal, and exports 76%. In 2015, the region produced 215.6 million tonnes of coal (+1.9% compared to 2014) [15]. Until 2009, resource orientation provided for Kemerovo region's high growth rates and high income levels; however, it limited the opportunities for the development of other industries and strengthened the disintegration processes. In the period of 2010–2015, the amount of the region's public debt increased by three times and amounted to 62.5 billion rubles (almost 80% of the revenues to the regional budget). The situation in the region can be explained by the negative global and national trends (critical drop of world prices for coal and metals, decline in the economy, sanctions, decline in real incomes, reduced investment and entrepreneurial activity). Yet we believe that the fundamental causes are much deeper, and can be explained by the specificity of Russia's participation in GVCs and specificity of the value chains in the domestic market.

Russia is significantly involved in the GVCs. According to the OECD, in 2013, its GVC participation index reached 51.8%, ranking 25th out of 57 countries [15]. Russia's involvement in the GVCs is still mainly linked to raw materials. This means that

Russia is largely involved in forward linkage VCs. The backward linkage VCs where Russia participates are much smaller in volume. According to OECD estimates, the index of Russia's participation in backward linkage GVCs amounted to a total of 13.7%, ranking sixth from the bottom. It is important that most of those GVCs are formed with the involvement of large foreign TNCs acting as the leading contractors and intermediaries CDS and forming vertically integrated GVCs. Such specialization leads to a low share of added value belonging to Russia.

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Table 3. Russia's largest coal extraction companies: production results in 2014–2015 [9].

№	Company	Volume of coal mining (Mt.)		The company's share in total coal production in Russia
		2014	2015	
1	SUEK JSC	98,9	97,8	20%
2	Coal company «Kuzbassrazrezugol» JSC	44,5	44,5	9%
3	Coal company «SDC» JSC	29,7	30,0	6%
4	«Mechel Mining» PLC	23,2	23,2	5%
5	«EVRAZ» PLC	21,8	20,6	4%
6	«Russian Coal» JSC	13,6	14,4	3%
7	«Vorkutaugol» JSC	11,4	13,2	3%
8	LLC «Vostsibugol»	12,1	13,0	3%
9	LLC «HoldingSibuglemet»	10,9	10,8	2%
10	«KTK» JSC	10,6	11,0	2%

Importantly, these large vertically integrated companies have strong forward linkage VCs both in the foreign and in the domestic markets. Most of these companies have branches on the territory of Kuzbass. GVCs have a vertical structure (Table 4).

The economy of Kemerovo region, and, accordingly, the GVCs are formed on the basis of extraction and enrichment of coal. The export-oriented model of development has resulted in the fact that mainly first production stages are concentrated in the

Table 4. Features of the value chains of the largest coal-mining enterprises in Russia [9].

Company	The structure of the enterprise value chain	Company's place in the global and national value chain
SUEK JSC	R&D, extraction, refining and transportation, logistics, sales	GVC&NVC in the coal mining company
«Russian Coal» JSC	Extraction and refining	GVC&NVC in the coal mining company
Coal company «Kuzbassrazrezugol» JSC	Extraction, refining and transportation, logistics, sales	GVC in the coal mining company
Coal company «SDC» JSC	Extraction, refining and transportation	GVC in the coal mining company
«KTK» JSC	Extraction, refining and transportation, sales	GVC in the coal mining company
LLC «Vostsibugol»	Extraction, refining and transportation	NVC in the coal mining company
«Mechel Mining» PLC	Extraction, refining and transportation, sales	GVC in metallurgical holding
«EVRAZ» PLC	Extraction, refining and transportation, sales	GVC in metallurgical holding
«Vorkutaugol» JSC	Extraction	GVC in metallurgical holding
LLC «HoldingSibuglemet»	Extraction, refining and transportation, sales	GVC in metallurgical holding

region, their characteristic features being capital intensity, low demand for R&D, high-performance power, no interest in the development of related and supporting industries. This explains the region's immunity to innovations, the stability of its single-industry structure, and the complication for the diversification of the economy.

4 What Can Be Done for Developing Kuzbass Basing on the Existing and Promising GVCs

It is essential for Kemerovo region's coal industry to develop both forward linkage and backward linkage GVCs, which should complement each other. Currently, four "branches" of coal processing forming forward linkage VCs have industrial applications in the world: pyrolysis (coking) of coal; gasification of coal; indirect hydrogenation of coal; and direct hydrogenation of coal [9].

Analysis shows that the domestic market is self-sufficient in the supply of coal, the basic gaseous organic compounds and primary organic synthesis products. The Russian chemical industry is supported by the developing export of some products (carbon, methanol, xylene). However, as far as complex organic synthesis products and specific carbon materials with desired functional properties are concerned, the Russian market remains import-dependent. So, the potential for import substitution of primary polymers in the domestic market exceeds 300 billion rubles, and that of finished plastic products exceeds 350 billion rubles. In addition to extensive resources of cheap coal

and industrial water, one of the key constraints for developing coal chemistry is the high capital intensity of production. However, in the coal chemical industry a significant amount of investment (1.5 times higher than that in similar natural gas production) provides for acceptable cost of coal refining products and their competitive position in the relevant markets [9].

Nevertheless, the authors share the point of view of some experts (Yu. Fridman, G. Rechko, E. Loginova) who argue that the creation of full-scale coal chemistry production directly in the Kemerovo region or mass inclusion of Kuzbass coal in the industrial chain of coal enterprises outside the region is a question of the long-term prospects. The insufficient level of development of the Russian and global markets of modern high-tech coal chemical products will definitely hamper the active participation of the Russian coal business in such capital-intensive projects [19].

Promising forward linkage GVCs may be based on integrated development of Kuzbass domestic companies and the Siberian regional coal market; among other ways, it may be achieved through developing “small-scale power generation” and housing and utilities complex. Today many coal companies, both large and small, are striving to reach ultimate consumers of coal through supplying their products even in retail markets. The second promising direction for developing forward linkage VCs may be the increase in the volume of beneficiation of the extracted coal. Just over 50% of the coal extracted in Russia goes to beneficiation. By 2030, Russia plans to increase coal production up to 345 million tonnes (by almost 1.9 times compared to 2016). To achieve this goal, it is planned to upgrade the production capacity of all the beneficiation plants built in the 20th century. In addition, the improved processing technologies can contribute to the development of backward linkage GVCs as well.

The alternative “dry” methods of coal beneficiation, which were widely used in the 1950s–1960s, are not used anymore because of the low efficiency of the technologies that existed at that time. The new “dry” beneficiation technology simultaneously solves two problems – those of price and quality. The construction and operation of new plants cost much less than those of traditional plants, so the produced concentrate has a really low cost, while its quality is highest. Final beneficiation allows for the separation of components with at least 96% efficiency. The resulting output products are distributed with a step density of $0.1/\text{m}^3$.

All the companies producing power generating coal from India, Indonesia, Vietnam, Kazakhstan, and other countries are potential consumers of such technologies. Active implementation of “dry” beneficiation can contribute to the formation of backward linkage VCs, including GVCs, through the development of engineering centres specializing in the sale and implementation of new beneficiation technologies. They can become a significant factor in the implementation of innovative models of coal business and suggest opportunities for the formation of the innovative coal products market in Russia and abroad, which will allow Kuzbass to build a viable model of its future development and occupy a strategic market niche.

Today, most technologies used in coal mining determine the extensive way of deposit development and form shortened forward linkage GVCs. The coal which is “unprofitable” from the technological point of view is simply left “until later”. As a result, on average, Kuzbass “loses 500–600 million tonnes of reserves” yearly [18]. The introduction of innovative extraction technologies could help coal companies shift

to intensive development of deposits, thereby reducing the “technological” losses of coal, and having a positive impact on the economy of coal enterprises.

The most promising innovative technologies for the Kuzbass region may be cyclic-and-continuous technologies (CCTs) with steep angle conveyors in coal mines and robotic system-based technologies for efficient extraction of thick steep coal. Application of CCTs is the main tool for reducing the cost of rock mass transportation from the lower levels of deep quarries, and, accordingly, reducing the cost of mining [19, 20]. Positive pilot experience of some enterprises proves the feasibility of CCTs as an effective multi-level high-tech mining and transportation complex for the development of open-pit mining.

Scientists from the Federal Research Centre of Coal and Coal Chemistry of the Siberian Branch of the Russian Academy of Sciences see an effective solution to this problem in extracting steep angle coal beds with the application of controlled release technology as well as in developing mechanization based on the use of unmanned technologies (robotic systems) to ensure the completeness of coal extraction and a significant increase in the level of security. The novelty of the proposed technology lies in ensuring the extraction of minerals from sub-roof or interlayer strata based on the physical effect of the strata destruction under rock pressure power. This effect allows giving the robotic systems additional functions related to the extraction of minerals located above the support or collapsing behind it. The new technology in combination with robotic systems can be successfully used for underground development of large layer mineral deposits, and placer deposits of diamonds and precious metals with controlled drawing of mineral resources from the sub-roof strata.

The suggested technologies open the possibility for the formation of new backward linkage value chains on the basis of machine-building enterprises. It is important to note that these chains do not eliminate the existing forward linkage GVCs but complement them, allowing a significantly bigger number of segments redistributed to the Russian market.

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The Material and Financial Situation of the Russian Orthodox Church in the XIX - Early XX Centuries

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Abstract. The article deals with the problem related to the material and financial situation of the Russian Orthodox Church in the 19th and early 20th centuries.

The material examined by the authors shows us the history of the relationship between the Russian church and the state in the nineteenth and early twentieth centuries, that is, before the era of the Russian revolutions of 1917 began.

The material situation of the Russian parish clergy and the church as a whole in the period of XIX - early XX centuries is of special interest in Russian historiography. This interest is due to the continuing relevance of the issues of the relationship between the Russian state and the Russian Church throughout Russian history. After all, the church was a stronghold of the Russian statehood since the day of the baptism of Rus by Prince Vladimir in 988.

Therefore, the institutional field of interaction between the Russian Orthodox Church and the state has always provoked and will continue to attract the attention of historians until such institutions exist, and, as it is known they are not going anywhere.

The Russian government tried to find funding for the church, and financed it, as far as it was possible for the Russian treasury. However, it was impossible to do this because of the lack of public finances. Therefore, the government was on the way of reforms and cutting back funding for the church, reducing the number of parishes and clergy. It was contributed to the fact that the clergy and society were in a stalemate or deadlock, when the interests of both were infringed. In a word, the government has not been able to resolve the problem of financing of the Russian Orthodox Church.

Keywords: Finances of Russian church · Incomes of priests ·
Government policy towards the church

1 Introduction

The study of the material and financial situation of the Russian Orthodox Church in the 19th and early 20th centuries is of great interest to historians in our time. At this time, the Orthodox Church was the organ of state administration. It was the conductor of state policy among her parishioners. When the practice of electing the clergy ceased, which served to sever the connection between clergy and parishioners, it was necessary for the state to provide materially for the clergy, which, through its activities, solved state tasks.

It was necessary, first, to provide financial base for rural parishes, in cloisters and cities position of the clergy was better off. Commission of theological schools under Emperor Alexander I in 1808 decided to pay part of the clergy state bills, this should have been due to interest from the capital, consisting of 2 million rubles of public money and 5.6 million rubles of economic money, which were the church's income from fees from parishioners and the sale of candles [19].

2 Methodology

In the paper, it was given the theoretical and methodological approach to the problem of the material and financial situation of the Russian Orthodox Church in the XIX - early XX centuries.

Methodological basis of this scientific research work was provided by methods: logical, comparative-legal, historical-legal method, methods of system analysis, method of scientific abstraction.

In the process of working on the article, the authors relied on methods: theoretical analysis, studying the materials of scientific and periodical publications on the problem, documentary analysis. The methodology of the article is based on the use of a comparative analysis of the source database and archival data.

Methods of our research: the methodological basis for this study includes scientific methods that are based on the requirements of an objective and comprehensive factor analysis of the financial state of the Russian Orthodox Church as an institution-organization. Our study was conducted using a combination of methods and methods of scientific knowledge. The abstract-logical method allowed to reveal theoretical aspects of the assessment of the financial state of the Russian Orthodox Church, to determine the main characteristics of processes and phenomena occurring in the sphere of its activity. The system-structural method is used for analyzing the financial state and revealing structural changes in the material situation of persons of spiritual rank.

3 Results

Since 1808, the monopoly of the Church for the sale of candles in churches and monasteries has been restored in Russia. The plan was approved by the highest decree, but the church reform yielded little results, as the fees from candle sale were small, and

parishioners were against withdrawing funds from parish churches, and the state did not fulfill its obligations.

In 1882, in the Voronezh province, a report was prepared on the candlestick diocesan plant, as well as lists of churches that consumed its products. The report said that the diocesan commission for the management of church-owned plants must pay their debts, which in total amount to 3,300 rubles.

In particular, it was said that from January 1 to July 1, 1882, 182 churches of the Voronezh diocese chose more than half of the candles put for them, 240 churches did not choose half of the norm. Thus, each church gave the plant a profit corresponding to the number of candles purchased. The largest number of churches that consumed candles more than an annual rate, was in Bobrovsky, Bogucharsky, Zemlyansky, Korotoyak, Novokhopersky districts («uyezd») [6].

Since the 1820-ies, to help the poorest arrivals the Church received 500 thousand rubles. In the late 1830–1840's the reform was carried out in the Western dioceses under the leadership of the Minister of State Property P.D. Kiselev. The norms of the duties of the parishioners and their donations are indicated, the clergy was transferred to the salary, the parishioners began to build houses for the clergy [17].

Parishioners resisted the new order of reform, which contributed to the failure of part of the reform, however, since 1855, salaries have been received in all the dioceses of the Russian Church. In the 1860's, the salary from the state treasury received half of the clergy, but this salary could not replace the traditional sources of income and played an auxiliary role.

The guardianship for the maintenance of the clergy received less than 10% of donations, collecting huge sums for decorating churches. It was needed to solve this task.

The parishioners believed that the state should provide the clergy and solve the question of the state of the church's utensils, since they saw in the clergy officials who are in the public service.

Such is the case according to the report of Archpriest Pokrovsky Cathedral on the state of spiritual utensils of January 25, 1822. The report contains information from the Voronezh spiritual consistory that the sacristy and all church utensils are in a state of dilapidation, except for a small number of books being sent again [20]. The financial situation of the parish clergy, in connection with the appointment of a certain content to the parishioners, has somewhat improved, but this method of providing clerics often encountered difficulties.

Nicholas I also tried to secure the clergy materially, and this was gradually allocated to the state treasury.

By 1861, the Holy Synod annually spent on the maintenance of the parish clergy to 3,315,000 rubles. The government recognized that there was not enough income from the land to support the clergy. There was also a «ruga», an income, special payment for votes and voluntary parishioners. There were rates of fee for demand. The usual payment for the prayer was 4 kopecks, 6 kopecks for the infant's baptism, 6 kopecks for the funeral of the child, 20 kopecks for the funeral service, the wedding cost 22 kopecks, so the clergy did not have much money from this services (it was called «treba») [1].

In 1859, the income of the three churches in the village of Rasskazovo in the Tambov province, together with the orphans' allowances, was only 645 rubles.

Such rituals as baptism and funeral service, the priest had to perform even without payment; the non-fulfillment of such claims was a grave sin. Services for the wedding gave enough fees. The minimum was 10 rubles, the upper limit - 50 rubles. The opportunity to earn was given to the weddings of the philistines, merchants, noblemen, parishioners of other parishes.

The priests of the village of Rasskazovo did not want to depend on merchants, philistines, peasants, property owners and therefore asked the diocesan authorities to introduce a salary that would normalize the payment of their labor. Despite the moral and material difficulties, the story clergy of the Tambov province corresponded to the rank of pastor. The priests of this parish had successes in turning sectarians, Jews, Catholics and Old Believers into the fold of Orthodoxy.

During the XIX century, the Russian Orthodox Church tried to increase its material well-being in various ways. Her income consisted of six parts.

During the XIX century, the Russian Orthodox Church tried to increase its material well-being in various ways. The income of the Church consisted of six parts.

1. Government subsidies were one part.
2. Land acquisitions at the expense of state property belonged to the second part.
3. Land acquired through donations belonged to the third part. This included also landed property, which consisted of meadows, forests and arable land; fishing, mills and other possessions.
4. The fourth part included income from trade in industrial and agricultural products and income from leasing church property.
5. Interest from capital, which was in banks, can be attributed to the fifth part.
6. Monetary contributions of the parishioners belong to the sixth part. The clergy kept their clergy in state-owned banks, and the spiritual people could receive interest from money capital only with the permission of the diocesan authorities [8].

However, the internal resources of the clergy were not exhausted completely and could bring significant revenues with the skillful use of them. The outlook for the economic development of the Church was very promising, since even in these conditions the Orthodox Church had more than 200 million rubles in income.

In the 1860's church reforms were carried out, the purpose of which was to improve the material condition of the clergy. In addition, in 1861 a qualitative shift took place in the structure of the clergy. In 1860, the economic management of the Holy Synod had 7,831,384 rubles, most of which went to the maintenance of the clergy, and in 1861 the economic management had only 438,800 rubles [5].

In 1859, under the state control, a commission was established to draft rules on the procedure for auditing and reporting. This commission decided that the money that was released from the state treasury for the maintenance of government institutions and clerics should be concentrated in the state treasury, and all the capital formed by 1860 from the previous years should be given to the state treasury.

In 1860, 5,663,920 rubles were allocated from the economic department of the Synod to the state treasury, of which 5,502,837 rubles was passed on to pensions and benefits to the clergy. By decision of the above-mentioned commission, the Holy

Synod established the order of listing of church property. On March 27, 1891, the Voronezh Spiritual Consistory ordered the clergy of the Churches, in order that, when drawing up inventories of church property, the order in each church should be exactly the order in which the plans of church buildings were inscribed in the inventory, and the plans of the lands in land-use books.

In the 1860, the issue of the financial status of the clergy, its role and place was discussed rapidly in society. The society offered various ways of solving this problem. The priests in their letters told of their plight. The Ober-Procurator of the Holy Synod in his reports informed the emperor of the state of affairs in the Spiritual Department, which spoke of the low financial situation of clerics. The subject of discussions was also the uncontrolled expenditure of church money, negative tendencies in the behavior of church leaders, dissatisfaction with the priests because of their plight. The crisis between the pastors and the flock was obvious. In proposals for improving the life of the clergy, the opinion was expressed on the need for the treasury to participate in the matter of material security.

The state worried about the financial problems of the spiritual department, and these problems could be resolved by a special presence in the affairs of the Orthodox clergy, which existed from 1862 to 1885.

In 1863, the Special Envoy for Orthodox Clergy sent a decree: "To improve the life of the clergy, attention should be paid not only to the state treasury, since provision of parish is originally the responsibility of parishioners, and government benefits should only be auxiliary properties" [16].

The government sought to establish a connection between the parish and the clergy. In connection with this, many priests made an estimate of their property, houses, in order to know the value in case of unforeseen circumstances.

The result of the church reform was the reduction of the white clergy, especially the number of the priests. The number of clergy in relation to the number of Orthodox, given the population growth in the period under review, significantly decreased. In 1850, there were an average of 1000 people on one priest, in 1860–1300 people, in 1879–1600, in 1885–1900, in 1890–2200 Orthodox parishioners.

In the Voronezh diocese, there were 2,500 Orthodox parishioners per parish church, 2,000 parishioners in the Kursk, Orel and Tambov provinces [6]. In the middle of the XIX century in Orel province, one Orthodox priest (or pastor) accounted for more than 1 thousand parishioners. It is more than 1.5 times that of Catholics, but less than the Protestant pastor. In 1860, there were 1.4 thousand parishioners per priest, which is 2 times more than that of Catholics, and the same as for Protestants. The number of priests in Russia from 1875 to 1880 decreased by 1.1%, with the exception of Orel province, in which the increase was 0.7% [23].

In the nineteenth century, the primary source of prosperity for most of the parish clergy, at least rural, continued to be donations to agricultural products and laymen's fees for religious services («trebs»). The needs of the clergy increased, the parish fees were small, and to get them was humiliating. Rural clergy was forced to constantly resort to the help of peasants in the household ("pomochi"). On the one hand, it was dependent on its parishioners, especially the well-to-do, and on the other - brought on charges, mostly unfair, in greed, extortion.

In the petitions of the clergy, the diocesan authorities quite often met requests for transfer to urban parishes from rural areas. The most common reason is the impossibility of farming in addition to official duties. As an example, we can see a petitioner of the Dmitrievskaya church in Dorogoscha village of Graivoronsky district of Kursk province Grigory Glumov: “After serving as a psalmist for thirty-two years honestly and unblemished, I quite sincerely and frankly performed my duty, which the local abbot and dean can confirm. Burdened at the present time by a large family who are left behind for lack of money at home, all my free time from work is forced to engage in heavy physical labor, which, due to my advanced years, is not in my power” [6].

Another petition came from the priest Alexander Yastrubinsky, who complained that because of his wife’s poor health, he does not have “any opportunity to farm, and his wife is constantly in need of medical care, which is difficult to find in the village” [6]. As we can see, the living conditions of the rural clergy were very difficult, so many tried to transfer to more affluent parishes or cities.

Meanwhile, it was obvious that the necessary result, that is, the disposal of the clergy from financial dependence on laymen and cares in agriculture for the sake of direct pastoral duties, can be achieved only by creating an unchanging source of income, while this income was to be provided by the Holy Synod.

In 1860, the State Treasury of the Economic Department of the Synod was sent to 5,651,922 rubles, of which 5,402,837 rubles was passed on to pensions and benefits to the clergy. Although from time to time proposals were made to lay the laity, a long-term tax in favor of the bishops, but such a source could only become state salaries. During the XIX century, the government tried to improve the financial situation of the clergy, but did not succeed in completely transferring priests to state salaries.

Since 1864, the Voronezh diocesan administration and the provincial presence have sought to replace the parishioners’ contributions to the clergy with a monetary content. At first, this issue was solved, and half of the parishes on the decisions of rural societies were provided with a salary, but in the future, the parishioners began to shirk their obligations, which they had previously taken upon themselves.

The reason for this was the spreading of rumors that “if the will of the supreme power were the salary of the clergy to resolve the issue of securing the clergy, then it would be ordered, along with the salary, to carry out zemstvo and other duties”.

In 1894, in Tambov province, the head of the Kirsanovsky district wrote that “no one in the district receives official salaries, and therefore the financial situation of the clergy is unsatisfactory.

Local forces could not raise the material level of the parishes. The state benefits were needed. Also, the clergy are obliged to engage in gardening”, as this brings good profits. In 1911 “small parishes experienced great shortcomings on the occasion of a crop failure. The official salary could improve the material condition of the clergy”. In some districts of the Tambov province “the financial situation of clerics was sufficient” [13].

Revenues from religious operations and government loans were the main sources of the existence of Russian churches and monasteries. The untaxed church capital was a sum of 20 million rubles in silver. In the book of record of property and incomes for

1812–1816 states that the churches were obliged to send money to state banks where they were kept at 4% per annum for 15–20 years, so the clergy could not use the large sums that were listed for them, but had only state obligations.

The state treasury had another source of replenishment; the state began to use the money of believers. In the nineteenth century, there were disagreements between the black and white clergy, between ordinary priests and hierarchs, as well as differences in the legal and property status of clerics. The hostility of the parish clergy to the episcopate has worsened since the time of Alexander II's Church reform of April 16, 1869. The clergy did not receive an increase in incomes and was afraid to lose their places and means of subsistence. The circle of duties of the priest was extensive, and from year to year, the duties were multiplied [12].

In addition to liturgical, preaching and missionary activities, he was forced to engage in troublesome clerical work, conduct church records (since 1866), and respond to requests from various departments and institutions. Since 1869, the duty of control over the manufacture of phosphors has been added. The priest also performed a number of functions that were entrusted to secular power: to bring government instructions to the flock, supervise dissent, help the authorities in important events for the country (for example, the population census).

The priest had to pay special attention to financial support to his family, since the issue of financial security was not resolved. This exerted its influence on the relationship with the parish and weakened attention to the basic service duties.

At the beginning of the 20th century, only one fourth of the parishes were transferred to salaries in the Oryol eparchy. Rural priests were financially poorly provided; the sources of their existence were the fees that were held during worship, the teaching of the Law of God in the school, the service of the crowds, the trade in ritual candles, the use of church lands and forestlands. The establishment of a pension for priests and their families was a positive development.

4 Discussion

Church changes in the 1860s–1880s were the head of the subject of scientific and historical works, among which stands out the study of N. Runovsky. In his work, the author analyzed the legislation on the Church, summed up the elimination of the closeness of the clergy in the 1860s, considered questions about the election of the dean and about attempts at local expense to raise the material welfare of the clergy [18].

Historian P.V. Znamensky said that the reform “worsened the relationship of the clergy with the flock and did not solve the problem of material support for the clergy,” and in the late 1870s, the crisis of reform was obvious [23].

In the Soviet period, some historians adhered to the parish clergy. This was due to the fact that in 1930 for the first time the book “The History of the Russian Church” was published, N.M. Nikolsky, which became the key to the Soviet historiography of the Church. N.M. Nikolsky in many respects repeated the conclusions of scientists of the pre-revolutionary period about the plight of the white clergy, primarily rural. The author spoke of the similarity of the position of the parish clergymen with the laity, the bulk of which were peasants [9].

I paid attention to N.M. Nikolsky and the isolation of the spiritual estate and its bureaucratization. After the publication of N.M. Nikolsky problems of the history of the Church of the XIX century and the parish clergy, ceases to interest researchers for about three decades.

Only in 1966 in the journal under the name, “History of the USSR”, an article was published by S.S. Dmitriev, who repeats the separate conclusions of N.M. Nikolsky, in particular, again revealed a difference in the position of various categories of the spiritual estate [3]. The conclusion of these authors indicates that at the end of the century the state sought to shift the content of the clergy to the parishes.

In addition, there are new young authors-historians, such as Belyakova, Yashina, who with keen interest study the material and financial situation of the church of that time [2, 20]. Studies of the Russian church, conducted by B.A. Ershov, cause great interest of the modern scientific community [4].

5 Conclusion

In the XIX century, the financial situation of clerics was difficult. The parish was part of the structural part of the diocese. It included from 70 to 700 households, most often 300 to 400 households. Therefore, it was difficult to maintain such a parish materially. The Ober-Procurator of the Holy Synod K.P. Pobedonostsev for the years 1889–1890 in his report gave a tough assessment of the reforms. “For 23 years of special presence in the affairs of the Orthodox clergy, the number of parishes and the number of clergy has decreased” [16]. This led to an intensification of the split, and there was no improvement in the financial position of the clergy in Russia.

At the end of the nineteenth century, the Synod allocated 7 million rubles a year for the maintenance of the Orthodox clergy, and the state treasury made 18 million rubles a year, not counting the revenues from church lands, property, donations and interest from capitals.

The clergy participated in public life was part of the local government. In the 1865–1867 years, elections took place in 29 provinces, and 65% of priests were elected to county assemblies according to election results [15]. The priests worked also in organizations of local self-government («zemstvo»). They created agricultural societies and served as their chairmen.

Structural changes in the composition of the clergy should have a positive impact on the welfare and social status of clergy. Revenues between individual groups of clergy and individual clergy were distributed evenly, although the income of the clergy was inferior to the nobility.

In the XIX century, Russian society and the Orthodox Church were not a single organism. The wealth of individual church members and churches could be countered by the poverty of a large number of clergymen. The government, discussing the financial situation of the Russian Orthodox Church, tried to solve them in various ways. During the period under review, the Church already had significant material resources, but they were insufficient, so efforts to increase them were not stopped.

Therefore, it can be noted that the basis for the material support of the clergy in the provinces of the Central Chernozem Region was the incomes that clergymen received

from parishioners, from farming on their lands and from their own processing enterprises. The population, for the most part, did not think about the welfare of the priests as a whole, and the fee for the calls, often quite insignificant, created the appearance that the clergy is rich. However, the clergy in their education and position occupied a higher social level, so the priests' vital needs were slightly different from the majority of lay people. Priests of the provinces of the Central Chernozem region perceived their welfare as insufficient.

Many priests, understanding the existing problems, supported the idea of salaries from the state. It is likely that the introduction of state salaries to the clergy, if not completely removed, at least reduced the conflict between the clergy and the laity. However, even by 1917 in the provinces of the Central Chernozem region only 2/3 of the clergy received state salaries, and its scale did not exclude the need to use traditional sources of income.

Undoubtedly, the incomes of the clergy in the provinces of the Central Chernozem region increased during the period under consideration. The share of those sources that did not depend on the laity (interest from capital, state salaries) increased in the income structure, but most of the clergy remained financially unsecured, which could not but affect everyday life of priests, material and living conditions of their life. The Church reform of Alexander II was partly successful in terms of financing the needs of parish priests and improving the welfare of the Russian Orthodox Church. However, it was a half measure, which was not able to solve the entire problem.

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Conceptual Approaches to Territorial Structuring Studies of a Region

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Abstract. The correlative research of territorial structuring is of the greatest interest for political science as it gives a chance to track the placement and the combination of settlements, transport ways and industries in a region in temporal space. However, to understand better the character of their combination and the formation of a basic framework within a certain territory, it is necessary to characterize briefly the theoretical ideas of the construction of the territorial structure.

The **purpose** of the work consists in the complex analysis of theoretical and conceptual approaches to the research of territorial structuring of the region from the position of political, economic, and geographical sciences. In order to achieve the stated goal, the following tasks are fulfilled: study of theoretical approaches to research of conceptual bases of construction of the territorial structure; analysis and assessment of conceptual directions of theoretical constructs in their political, economic, and geographic measurement. Authors have applied an integrated approach allowing using such branches of science as geopolitics, political geography, economy, history, and political philosophy in the research of territorial structure of a region.

As a result of this research, theoretical and conceptual approaches of national and foreign scientists in the field of studying territorial structuring from the position of political, economic, and geographical sciences have been analyzed; three conceptual directions of the research of territorial structuring are systematized and defined: economic and geographical (the middle of the 20th century), political/geographical and geopolitical (the end of the 20th century), and political (the beginning of the 21st century). Moreover, their differences which are characterized by the conceptual and methodological principles upon which this research was based upon were singled out. The analyzed theoretical ideas in disclosing the subject domain of researching territorial structuring of the political direction are of the greatest interest to scientists, including the research of political processes and conditions of development of nodal and linear elements of the region in a spatial-temporal continuum. Finally, conceptual application of special theoretical methods of researching this problem gives a chance to explain regularities and peculiarities of the construction process of territorial structure in general.

Keywords: Territorial structure · Supporting framework · Focal centers · Geostrategic points · Modernization · Political process · Method · Approach

1 Introduction

Territorial structure formation has been studied for a long time as part of economic geography that has regarded its creation and development in terms of an advantageous economic and geographical location. In this context, national scientists formed a considerable database of territorial structure creation and development; but economic geography took into account first and foremost actual economic qualities and the terms of a mutually beneficial contact. Political impact on the formation of a territorial structure in the light of geopolitical and internal environment has recently become a more important issue, and, in the authors' opinion, it leads to the establishment of a politological approach to the studies of territorial structuring in the politological context. The experts' interest in this problem in the light of politics can be explained by the political processes that have been taking place in the recent decades in East Asia. Thus, active Asian policy promoted research of territorial structuring in the light of political dimension.

The **pertinence** of this research results from the following:

- firstly, the necessity of comprehensive study of territorial structuring methodology within the context of the political dimension. In this regard, the existing scientific studies in the field made but a small contribution, as only one of the many aspects of the territorial structure subsystem was analyzed; that is why it seems necessary to add to the methodological basis of structuring studies;
- secondly, the need for further improvement of the Russian political school that aims at the research of subject-matter peculiarities of regional structure formations.

Research experience in territorial structuring is of apparent interest to national and foreign experts that work with manifestations of different forms of political practice of a region in spatial-temporal continuum as well as with creation and development of new nodal, linear and areal elements of a system. Political practice of territorial structuring has not been studied closely enough. In order to provide a solid basis for a politological study, it is essential to analyse a considerable amount of national and foreign scientific publications in the field. The result of using the scientific database that comprises many paradoxical approaches and theoretical ideas can be a solution to quite important scientific and practical problems in economy and politics. It is the formation and classification of major conceptual theories that are important from the point of view of a research in territorial structuring of a region as it gives an opportunity to trace in temporal continuum the impact of political and modernization processes on placement and combination of settlements, transport network, and industries in a region.

The analysis of conceptual approaches to territorial structuring. In order to understand the structure of the framework and spatial placement of industrial and infrastructural facilities as well as the utilities it is imperative to briefly describe theoretical ideas of territorial structuring of a region. The research strategy may comprise three conceptual directions:

- economic and geographical (mid-20th century);
- political and geographical (the end of the 20th century);
- politological (the beginning of the 21st century).

The latest direction has emerged relatively recently when scientists in their works first started to distinguish the relation between politics and territorial structuring or its individual elements. It has been given the major role in determining the content and economic development of any territory depending on geopolitical reality.

The first conceptual direction in territorial structuring was formed in economic and social geography and was evolutionary. Its emergence is explained by the publication of many works in the field. V.E. Den was the pioneer in this sphere as he acknowledged economic geography as an economy science and made a contribution to the establishment of the branch-statistical school [24]. He introduced a country level to study economic industries and their placement in spatial systems: districts, territories, and areas. The industry approach of V.E. Den [9] was used in the research of the composition and groups of production and non-production industries. Its use in branch-statistic school allowed to describe an industrial system of a territorial structure, identify production industries, their development and placement in a country, as well as to find out internal vertical and horizontal production links. The works of V.E. Den formed the basis for his followers studying industry structure.

The industry approach to researching the framework of a country's territorial structure was followed by a socio-economic school (regional school) which is rightly considered to be founded by N.N. Baransky. Within the regional paradigm, a theory of economic regions was formed; it describes the formation and differentiation of regions, their system and interregional relations, regional territorial networks, regional typology, and their hierarchy. This approach, in Baransky's opinion, allows us to regard a region as "a production network with a certain specialization on the national level, not only an object of economic and geographical studies but also a unit of development and renovation of an economy" [2]. This view of territorial structuring lets us study the formation and development of territorial systems from the point of view of an individual territorial entity, a region, or an area; it helps to make the research of establishment and development of a territorial structure more specific and lets it go to a whole new level.

The further study of a territorial structure in terms of the existing socio-economic school encouraged the emergence of the territorial production networks theory and economic zoning theory that were extensively elaborated in the works of Kolosovsky [11]. The production networks theory is based on territorial division of labour and the combination of interdependent agricultural and industrial production companies. Also, in M.T. Romanov's opinion, it is the comprehensive combination of "other urban and rural elements that as a whole form territorial structure of interindustry integration" [18]. The production networks are seen as structural combinations of interdependent production and agricultural companies with the same production infrastructure formed in a certain territory. The concept of economic zoning is in its essence a system of territorial division of a country into economic regions based on production characteristics. Furthermore, Rodoman [17] believes that these regions are in some way interconnected though they have heterogeneous internal structure. Using a comprehensive approach N.N. Kolosovsky identified theories of production networks and a zoning concept to research territorial structures development which has made it possible to form a complete image of a production structure in a certain economic region.

In the late 1960s and early 1970s, when systemic and functional methodology was first introduced into economic and social geography, the term “territorial structure” was coined. [6] Its popularization among the scientists in time led to it becoming a well-developed concept. The major role in the process was played by I.M. Maiyergoiz, Y.G. Saushkin, P.M. Alampiev, G.M. Lappo. The most important contribution was made by Maiyergoiz [14, 15]. He laid the foundation for the geographical study of territorial structures and formed an overall picture of the structures of individual countries and their regions. The further development of the territorial structure study manifested in the emergence of the territorial socio-economic systems theory. Within this theory, economy and its role in development and growth, structuring and systematization of territorial structure elements was researched on a completely new level. It is the territorial structure as a strong connection of elements in space that captures the essence of any socio-economic system and forms its foundation. This conceptual view of internal form of a territorial structure formed within the socio-economic school resulted in active employment of the systemic and functional approach to the research of establishment and development of territorial structure elements in the context of different sciences.

In late 1960s within the socio-economic school new paradigm approaches to the research of a territorial structure were developed, namely constructive and predictive ones. In the recent decades, they have been as widely used as the systemic and functional approach. The constructive approach to the issue of territorial structure and its elements is particularly important; it was developed by Gerasimov [4]. Its pertinence results from the fact that it makes it possible to design territorial systems and conduct a comprehensive analysis of the territorial structure of a region, an area, a city, its part, a production hub, or a resource zone. Such a constructive study of territorial systems helps to do regional planning, make long-term forecasts of political development, and to find the best locations for the utilities, industrial, and social facilities in territorial entities.

In most cases, this conceptual approach to territorial structuring is used along with the forecasting method. This approach yields forecasts for territorial systems that lead to the development of the socio-economic processes planning theory that was implemented in the five-year national economy development plans. Such form of centralized management of territorial structuring made it possible to generally use forecasting based on a systemic analysis, which resulted in the creation of a huge conceptual base in the field. Widespread usage of developed paradigm territorial systems planning frameworks helps to identify the special characteristics of rational and the most effective territorial structure formation. It also gives the whole picture of the creation and development of a territorial structure's elements: population growth and its settlements; industrial and economic territorial development; urban and rural development; territorial organization of transport networks, etc.

In social, economic, and geographical studies, typological approach is used alongside the forecasting and constructive paradigms; it was aimed at systematizing territorial structures based on their common characteristics. Typology and classification of territorial structures into certain types helps to use models and constructions, identify trends towards continued development to be taken into account in forecasting studies. Typology approach's conceptual framework helps to identify important qualitative characteristics of a system based on certain qualities, and, depending on their combination, to find out the elements of a territorial structure and their internal structure

formation and organization relations. With that in mind, Granberg [7], Gladkov [5] and Chistobaev [5] believe that territorial combinations of a system show the main parameters of the elements' development, namely, a regional territory's development; territorial concentration of production and population; localization of production and its individual branches, transport network development. The analysis makes it possible to identify the basic functional irregularities of a territorial structure's elements and, on this basis, to build a hierarchical structure of their development and relations between them.

In the research of territorial structures, the theory of a supporting framework has been the most promising. The term "economic, political and geographical frameworks (framework construction)" was first introduced by Baransky [2]. This theory was further elaborated by Y.G. Saushkin, who underlined the importance of scientific research and analysis of supporting frameworks in order to develop new paradigm approaches and theories to study the central issues of establishment and development of territorial structures on a comprehensive basis. Thus, supporting frameworks that become the objects of economic, social, geographical, and political research, develop as systems in time. Y.G. Saushkin believed that their elements could have far-reaching consequences for a territorial structure as a whole [20]. New conceptual theories of economic, political, and geographical supporting frameworks were proposed by Lappo [12]; based on the systemic approach, he formed a complete image of the supporting construction formation and the special role reserved in it for linear elements of a territorial structure. Paradigm basis of the supporting structure theory in the research of territorial structuring helps to develop a comprehensive picture of a supporting structure's formation and identify interdependent and complementary links between the elements of a territorial structure as a unified system.

The studies of the first direction that deals with conceptual framework formation in the creation and development of a territorial structure within the socio-economic school helped to develop the concept of a territorial system. Such a concept of territorial structuring relies on specific conceptual and methodological principles. They formed the bedrock of scientific research of the creation and development of a territorial structure and are considered fundamental. The presented theoretical views helped to find the foundation of a structure and use it in the analysis of the territorial structure of the south of the Russian Far East.

The second direction that deals with conceptual views of the political theory about the creation and development of a territorial structure was established in the end of the 20th century. It was formed based on the territorial structuring research in the context of political geography and geopolitics. Such studies are aimed at identifying the key factors of facilities placement in space's impact on the geography.

This way many conceptual theories were formed. Their authors in their field studied regularities in the creation and development of a territorial structure. It is essential here to mention the theory of concentric circles, developed by Johann Heinrich von Thünen [23] in the 19th century. He analyzed the development parameters of nodal elements and identified economy specialization zones that took the form of concentric circles (industrial and agricultural zones). In the beginning of the 20th century, this theory was used by Ernest Burgess [21] to describe an urban structure in which he identified the nucleus that comprised all the nodule system's elements and the public authorities.

The theory of polarized development was proposed in the mid-20th century [8]. According to it, there were poles of growth that comprised all the economic activities in innovation distribution that changed territorial structure. I.D. Sanachev believes that in its essence the theory of polarized development “describes a situation when it is possible to gain geopolitical control in economy over a geographical space where poles of growth form the key geostrategic points [19].

The theory of space territorial organization helps to identify economic areas and political centers and to see the world picture of interdependency of states as a whole when it comes to the distribution of power on the planet. This base already allows for the identification of nodal regions [17] that concentrate the majority of geopolitical influence.

When researching the political theory of the creation and development of a territorial structure within geographical political science, a regional approach was widely used; it deals with the irregularities of the formation of a historical, political, and geographical structure of a state around a historical nucleus. In this regard, the nucleus was the structure building and organizing element that accumulated social, political and economic information on neighboring regions that then encouraged the emergence of central mega nuclei. Their engagement with neighboring regions as a result of intense exchange of cargo, passengers, and information lead to the creation of a quite sustainable well-developed supporting framework. The conceptual basis of the regional paradigm helps to identify on a state's territory old industrial economic areas of territorial structuring that have political and economic functions and concentrate the basic information about the neighboring areas. Their analysis makes it possible to find out the distribution of political and economic influence centers and see the heterogeneous and highly hierarchical structure of a territorial structure's elements.

Such conceptual vision within the regional approach forms the foundation for the development of the central location theory, that was founded by August Lösch [13]. This theory considers the law of space location of nodal elements of a territorial structure around a bigger central location. As a rule, cities with various administrative, political, economic, and social rights take the place of such a centre. This territorial structuring construction was described as a hexagon grid, the nodules of which are represented by political and economic centers. When researching political practice of a territorial structure, paradigm basis of the central location theory helps to identify important nodal elements. Their ability to accumulate information about the neighboring areas delegates them the management function.

The theory of the relations between the centre and the non-centre developed by John Friedmann plays an important role in forming conceptual basis of a territorial structuring and supporting framework in the context of political geography and geopolitics [25]. Its paradigm bases are aimed at studying territorial organization from the point of view of an area and a city, a city and a small town, and the city centre and the suburban areas. Such a study of territorial structuring helps to see the heterogeneous dissociation in elements of a territorial structure's location that reminds the concentric theory of J. von Thünen. According to this theory, the centre has highly productive economic industries, political institutions, the administration, and the main transport hubs; the suburban areas show more heterogeneity. This conceptual paradigm of a dissociated structural organization formed within the political and geopolitical direction encouraged the development of this scientific field that looks for the ways to improve this process.

The particular importance in political theory of the creation and development of a territorial structure is attached to the systemic approach, first described by Parsons [16]. Its importance is based on its ability to politically analyze the integrity of a territorial system by the impact of various political, social, and economic innovation processes. In this regard, in a given territorial structure every element has a certain meaning and specific functions; they should preserve the integrity of a system and keep it going.

The conceptual basis for the systemic approach to political processes and their impact on territorial structuring was first introduced by Shvedov [26]. Against the background of the connection between the system and political development of various societies in certain parts of the region, the author describes the internal structuring of historical political and geographical regions. Within the system they were attributed basic and specific elements; in other words, it was the building of linear (nodal) nucleus supporting framework. Thus, V.G. Shvedov identified the Amur historical and political region that he used as an example to show the political practice of forming a territorial structure over a period of three millennia. The researcher made a great contribution to the development of territorial structuring in the south of the Russian Far East.

The regional (geographical) approach seems important in the study of regional political peculiarities; it was founded by Baklanov [1]. Within this direction, he developed an original theory of spatial production systems. It characterizes a state's policy and political processes impact on the location of industrial facilities in a territory. Its conceptual ideas helped to identify: effective ways of regional political development in the light of Russia's interests in the Asia-Pacific; hierarchical structures, development mechanisms, and production characteristics.

The major factor in the territorial structuring research in Russia was the scientific economic and geographical school established by P.Y. Baklanov at the Russian Far East. The school conducts research in different areas, particularly in the field of territorial organization, sustainable nature management in the regions based on a comprehensive evaluation of territorial combinations of land and marine natural resources. The study helps to evaluate the impact of political and innovation processes in the distribution of nodal and linear system elements in a territory. In this context, it is essential to identify the peculiarities in the development of structural components of a supporting structure. It is a unified interdependent connection between settlements and transport networks. Their creation, improvement and utilization shows the historical aspect of the influence of political practice in Russia between the mid-19th and early 21st century that changed the territorial structure of the south of the Russian Far East.

In the opinion of G.Y. Saushkin, the most effective approach to the study of political practice in a territorial structure and its elements on the basis of its parametrical data analysis is the historical one (historical and geographical). This approach helped to form a comprehensive picture of political and modernization processes since the mid-19th century to the early 21st century. Their activities in the period influenced the systemic changes in the supporting framework. It made it possible to describe peculiarities of territorial structuring in the past and its connection to the future. Within the historical approach, such scientists as P.Y. Baklanov, V.G. Shvedov, N.N. Baransky, I.M. Maiyergoiz, S.G. Saushkin researched political system and activities of a state and its regulation, as well as the connection between a political life of a society and territorial structuring in spatial-temporal continuum. Paradigm framework of the

historical approach has a huge toolbox of developed theories and methodology. In the research of the creation and development of territorial structures, they play the central role in political, economic, and geopolitical sciences. Theory framework of conceptual political ideas that has been accumulated for many years is the politological foundation for the study of Russian political practice influence on the system in the past. Its analysis helps to forecast possible ways of the development of the supporting framework under the influence of political and innovation processes. This is why political theories studies and their utilization is a prerequisite to understanding the influence of the politics on various aspects of a society's life. Without the knowledge of the past, it is impossible to analyze and make forecasts for the future.

The research of the second school shows the connection between political and geopolitical processes and territorial structuring. Its comprehensive research helps to see a whole picture of geopolitical territorial structuring in a given geographical area that is of political importance. It was the major reason of heterogeneous dissociation of the territorial structuring. Such understanding of spatial and territorial structuring based on political geography and geopolitics has conceptual and methodological principles that form the foundation of scientific research in the field.

The third direction of conceptual ideas about politological theories was established in the early 21st century. At the time, active political impact on the construction of linear elements of a territorial structure lead to profound systemic changes. They can be seen in the modification of the development model of a supporting framework. At the time, publications on political processes began to appear. The biggest contribution to its development was made by the research conducted using the comprehensive approach. Thus, experts identified major political factors, prerequisites that impact territorial structuring. The degree of their influence depended on the political value, interest, relations and value of a region (territory) for a country.

This conceptual approach helps to use the scientific database accumulated over the years as a whole; it covers political and modernization processes, territorial structure and unites various sciences: geopolitics, politology, political geography, history. This system provides for comprehensive study of paradigm framework of political practice and territorial structuring. This advantage makes the conceptual approach quite a popular one. It was used in the research of the political process of territorial systems by A.A. Tushkov (the analysis of the political process's impact on the creation and restructuring of regional structural entities in Russia in specific historical periods [22]); V. Kolosov and R. Turovsky (spatial territorial organization of Heartland). It is represented by Russia where political processes of territorial structure expansion through building and modernization of geostrategic transport networks and focal centers play the central role [10]. Paradigm basis of the comprehensive approach is in the centre of political, geopolitical and economic sciences and has a wide methodology database that makes them fundamental and popular in scientific research.

Further study of political ideas of territorial structuring was conducted using the political approach. It was used by V.S. Burilova. Based on systemic analysis of strict state regulation policy she showed industrial territorial structuring [3] and the correlation between its location and administrative and territorial changes introduced by the state. M.Y. Shinkovsky researched nodal elements of territorial structure (political, economic, social centres) of Primorye based on political and geopolitical approach.

In his opinion, they can be seen as “windows” overlooking the global world [27] that determine nodal links of political, economic and social, legal, and cultural engagement with the countries bordering the south of the Russian Far East.

The analysis of the third school that deals with conceptual frameworks lead to the conclusion that political processes play a major role in the development of territorial structure. This school is the most promising for the purposes of this study as it helps to find the correlation between political practice and territorial structure development. It is essential to find fundamental irregularities in the location of elements that have political and administrative rights and economic functions and that can provide for close cooperation with the world community. The developed theoretical ideas on territorial structuring based on politology have conceptual and methodological principles that form the foundation of the scientific study of political theories about the creation and development of a territorial structure.

2 Conclusion

The political school occupies the central place among other conceptual models analyzed by the author in describing the subject of political theory about the territorial structure building. This school with the help of systemic comprehensive analysis will make it possible to conduct a research of political modernization processes and political prerequisites for the development of nodal and linear elements in the south of the Russian Far East in space and time.

It is necessary to find answers to the questions related to a territorial structure seen as an integral part of political activity of a state and political and modernization processes. In this context, the article aims at contributing to theoretical studies in the field of political practice and territorial structuring.

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Cross-Cultural Dialogue: Historical-Cultural Heritage and Basic Values (on the Example of the City of Murom)

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Abstract. This article deals with the problems of implementation of international projects and improvement of their efficiency in the conditions of modern intercultural communications. A significant place is devoted to the consideration of historical and cultural heritage (on the example of the city of Murom). The article analyzes the cultural and symbolic potential in order to reveal the basic values of Russian culture and in particular the culture of Vladimir region. It is emphasized that the most effective variant of realization of the identification potential of cultural heritage is the region - the territory, which is supported by various types of objective forms of culture, social institutions, relations and ideological concepts of various social and territorial groups living in its borders. Special attention is paid to the development of cultural dialogue in the framework of the successful implementation of international projects, as well as to the formation of new communication strategies.

Keywords: Implementation of international projects · Dialogue of cultures · Historical and cultural heritage · Territorial identity · Cultural and symbolic potential · Basic values

1 Introduction

The modern socio-cultural situation is characterized by a significantly increased importance of information, communication and intensification of intercultural contacts. Due to the changes in social, cultural and political situation, as well as due to the development of the media, more people are crossing cultural barriers, previously separated them, and entering into a process of interaction with representatives of other cultures. Therefore, various aspects of intercultural interaction, such as the identity of cultures in the era of globalization, dialogue as the goal of culture, strategies for intercultural dialogue, became the subject of study for various fields of scientific knowledge. Dialogue implies partnerships, during which information is enriched and expanded. In the process of dialogical interaction, both participants change, while preserving their own uniqueness. The purpose of the dialogue is not only to transfer information, but also to bring its participants together into a certain community. Since a broad audience is involved in the modern communicative process, one of the most effective and relevant ways of transferring information between representatives of

different cultures is the implementation of international projects that open the possibility of activating intercultural interaction at various levels. So, historical and cultural heritage, which is the basis of the spiritual and intellectual capital of the country, is gained great importance. On the basis of the objects of cultural heritage, the development of human potential is carried out and the formation of basic values is taking place. Historical and cultural heritage makes it possible to realize the unity of the cultural space of Russian cities. Studying the cultural and historical potential is an important aspect of the patriotic education of children and young people, as it determines their respect for their own national culture and continuity for the future generation. A variety of cultural traditions, unique objects of historical and cultural heritage are an inexhaustible source for the creation and implementation of international projects. The purpose of this work is to study the historical and cultural heritage on the basis of traditional values (on the example of the city of Murom) in the framework of effective implementation of international projects. The scientific importance of this article is greatly enhanced in the context of the processes of globalization and other factors that have led to an increase in the intensity of international contacts between representatives of different cultures. To achieve the objectives of this study, a considerable volume of educational literature was analyzed.

2 Main Part

One of the areas of modern intercultural research is the analysis of historical paradigms in order to promote coexistence and cooperation between peoples and cultures. Increasing globalization fundamentally changes the conditions of intercultural interaction. At present, scientists, considering this problem, pay attention to the necessity of forming a space of interaction between civilizations with the aim of understanding their culture and culture of other peoples. Therefore, an adequate choice for the entire world community is dialogue, as a constructive way of intercultural interaction, ensuring the preservation of the cultural identity of everyone and at the same time opening up opportunities for enriching cultures. Dialogue, in its turn, promotes mutual understanding and respect through intercultural interaction, provides a higher degree of cultural diversity and cultural heritage, and leads to an understanding of universal human values. And in this case it is worth to talk about preserving the diversity of the whole system of values accumulated by previous generations. The ability to adequately perceive the cultural values of other peoples takes the central place, since its depth and effectiveness determines the mutual interest of partners, the degree of their willingness to participate in the dialogue of cultures. At the same time, intercultural interaction is carried out only by the direct participation of people with different knowledge and skills of communication with representatives of other cultures.

The process of interaction of cultures can be more or less effective as a result of the combination and mutual influence of many factors. To improve its effectiveness, new communication strategies are formed in order to provide equal access to information, as well as the necessary balance between global and regional programs. International projects are one of the most actual ways of interaction, which allow not only to preserve the cultural heritage, but also to enrich it in the process of forming a dialogue of cultures

between countries, peoples and civilizations. Social, material, intellectual, artistic experience, gained from such projects, creates the conditions for sociocultural development of any society. However, history shows that even isolated ethno-cultural development still includes a certain part of innovations borrowed from the outside. For all the unique value of the experience of each ethnos, its culture is formed from a multitude of elements of a various ethnic origin. The conclusion is obvious: intercultural dialogue leads to mutual enrichment and development, especially if they are connected by very significant common values, mainly religious, where the spiritual and moral foundations, valuable to all living people, are laid. It should be taken into account that the exchange of cultural experience among different peoples should be equitable.

The significance of intercultural dialogue undoubtedly increases for Russia, which preserves all its ethno-cultural diversity. Recognition of cultural diversity is a step on the road to interaction, which will serve as the basis for partnership and cooperation between cultures of different countries. One of the tasks in the sphere of cultural heritage is the wide inclusion of the Russian Federation in the socio-cultural environment of both particular regions and the country as a whole; improvement of organizational mechanisms for the preservation and use of cultural heritage in the framework of international projects. Cultural heritage is something integral, possessing the information potential necessary for development and transfer to future generations; this is what can be considered as one of the most important resources affecting the further development of society, the country, the region. Cultural heritage includes not only monuments of culture and history, but also their environment, unique historical and landscape areas, moral and aesthetic ideals, norms and patterns of behavior, national traditions and customs.

The main sources of cultural potential of the Russian Federation are its territorial formations, with objects of material and spiritual culture placed there. Small towns attract particular interest of researchers. According to scientists, patriarchal and communal way of life in small towns, their remoteness from the center, allows them to preserve the originality and primordality of the national culture. In this regard, it is extremely important to draw boundaries between regional cultures. These boundaries can not be placed arbitrarily. They can be determined only on the basis of a clear understanding of the goals of social development that face each regional culture. These goals differ from the goals of other cultures, and thereby make given culture regional. The historical and geographical environment, which influences the formation of values and way of life of people living in the given territory, is of great regional importance. Studying the cultural and symbolic potential of the city, for example Murom, helps to identify and most fully reflect important aspects of the culture of the Russian people. The cultural potential is determined by the set of the collected resources of culture, sources, reserves and opportunities which, on the one hand, include natural objects or material and spiritual products of human labor, and on the other hand, are preserved as cultural values and cultural heritage. Therefore, in the current crisis situation the importance of this study is the most significant condition for the development of society. The ways to realize the identification, value-orientation potentials of the city's culture are of particular importance here. Certain values, which create the basis of self-consciousness, are formed and developed. They indicate the public and personal significance of various regional processes.

The main traditional values include the elements of the social and cultural heritage, transmitted from generation to generation. They are fixed in the life of the region for a long time, permeating all its spheres. But the preservation and augmentation of cultural potential are related to the degree of effectiveness of the implementation of international projects aimed at developing the sphere of culture.

The core of the cultural and historical heritage of the city of Murom is the identity of the city, which since its foundation has not changed its name or its location. Further it is necessary to include into the value core the estate of the Uvarov Counts located on the territory of the modern city of Murom. It retains material and intellectual-spiritual values, created by noble culture. Museums, whose task is to transfer memory, are also involved in the formation of regional identity. A significant object of culture of the city of Murom is the Historical and Art Museum, where unique collections of paintings and ancient Russian art are collected. It was founded in 1918 in the house of Zvorykins merchant family, which gave us the inventor of television, so today it can be proud of almost a century of history. At the heart of museum's collection are works of Russian and Western European art of the eighteenth and nineteenth centuries and collections of famous Russian archaeologists. Murom has long been considered a "casket of antiquities", where traditions of the Russian people are carefully preserved. Therefore, when speaking about interethnic relations within the framework of international projects, increasing attention is paid to the sphere of tourism as one of the branches capable to change attitudes towards the ethnoses living in it and their cultures.

Also let's not forget that the most important foundation of communicative processes, that determine the substance of the Russian national spirit, is religious faith. A religious person needs an awareness that he lives in a harmonious and fair world where everyone gets what they deserve in the predestination of the God. Orthodoxy have strengthened the spiritual potential of the Russian nation for millennia on an unconscious level. The Russian language itself was subjected to internal Christianization, and at the same time the Russian people received the richest literature of natural-scientific, historical and narrative content. Various programs, involving interaction of all regional cultural institutions, will ensure the implementation of many projects that allow rational use of the resources of traditional culture for the preservation and development of spiritual communication.

The Orthodox Church plays an important role in the revival of Russian traditions. A large number of Orthodox churches and parishes, increasing number of parishioners - all this suggests that religion has a particular value for Russian people. An exceptionally significant place in the process of renewal and growth of the regional identity takes a community of cultural memory, including the restoration and preservation of the cultural history of the native land. The Murom land is full of names that are the pride for entire Russia. Appeal to the images of the Murom Orthodox Saints, as carriers of immense educational and spiritual potential, is in demand at the present time and should receive its theoretical interpretation. The life of holy saints has long been and remains an ideal of moral perfection. The image of the Russian Orthodox saint is an image of the spiritual power of man, and in the lives of Orthodox saints invaluable spiritual and moral potential is hidden for Russian people. The instructiveness of such biographies is clearly demonstrated by the fact that the saints are a vivid example of

courage and loyalty to the chosen path, modesty, tirelessness in their ministry and patience in enduring hardships.

Righteous Juliana Lazarevskaya with her loving and compassionate heart is the standard of piety and virtue. From a young age she lived piously, created charity and daily performed spiritual feats; she helped the needy in every possible way, limited herself in everything; she served the people and sacrificed herself for others. Juliana Lazarevskaya is an image of a selfless Russian Christian.

Let us also remember the holy spouses Peter and Fevronia, the brightest personalities, whose lives reflected national spiritual values and ideals. They became famous throughout Russia by mercy and piety, and the history of their life is the story of true love, true happiness, devotion and sacrificing in the name of the beloved. Representatives of other cultures can learn about the history of their love in the Old Russian story "Tale of Saints Peter and Fevronia of Murom". Life of the prince Peter and the Princess Fevronia, who have passed all the tests of love, expresses value of a family, of love and of faithfulness. They demonstrate the everyday example of family happiness and the loving help, living together both in pleasure and in sorrow, in sickness and in health.

The Trinity convent, where the relics of Saints Peter and Fevronia, patrons of marriage and family, are buried, is unique for the cultural and historical heritage of the city of Murom both in architectural and religious terms. The significance of the relics of Saints Peter and Fevronia is that the worship of them morally enriches a person, since they contribute to fostering loyalty, devotion and a humane attitude to everything around him. At present, July 8th, a day of memory of the Saints Peter and Fevronia, is celebrated as the All-Russian holiday - Day of Family, Love and Faithfulness.

In 1999 a monument was erected to the epic hero Ilya Muromets. He is depicted in a warlike posture - in a helmet and chain mail with monastic cassock beneath it. He holds a cross close to the chest with his left hand, and a sword in the right hand swinging high above his head. At the base of the monument there are symbols of power and victory - mythical birds griffins. The life of the legendary Ilya of Murom presents an example of supremacy of spirit over the physical strength. He possessed a surprisingly strong character, gentleness, humility, great patience and devoted whole his life to serve the people. Ilya also is famous for his numerous exploits and unprecedented power, which he used only to defend the Fatherland. The spiritually rich personality of Ilya of Murom is an ideal of honor, justice and unwavering fortitude; despite being paralyzed, he could overcome his disease in order to live and protect the Motherland.

All this, thanks to the mechanisms for the preservation, translation and demonstration of cultural heritage to representatives of other cultures within the framework of international projects, has led to the formation of the recognizable historical and cultural image of the city of Murom as the motherland of Russian heroism, love and family happiness. Thus, the basis of national values, rooted deeply in the past, remains in the city of Murom to the present day. A huge number of monasteries, temples, museums and other historically important objects, as well as images of the Murom Orthodox Saints, play an important role in shaping the cultural and historical potential of the region. Self-determination and enrichment of the spirituality of the society as a whole occurs through the histories that determine the historical uniqueness that we can

observe on the example of well-known biographies. They create not only special opportunities for the self-development of culture, preserving cultural continuity, but also provide an opportunity for enrichment for other peoples and cultures, demonstrating all the spiritual and moral wealth of the Orthodoxal traditions, which are definitely significant for the Russian people. This variety creates the ground for active interaction with representatives of other cultures, reflected in various international projects, and promotes their effective implementation.

3 Conclusion

Today we are seeing an increased interest of various social groups and ethnoses to a dialogue, which, in turn, is impossible without resorting to cultural heritage. However, intercultural communication should be understood not as an organized communication of mutually interested subjects - representatives of different cultures, but as an objectively demanded social process of shaping the modern integrity of mankind through the rise of the cultural roots and creativity. An exceptionally important aspect of intercultural communication is introduction to the classical cultural heritage. The traditional culture of a particular people exalts a person, revealing and exploring him in the context of ideals. These examples of culture allow to preserve connection with traditions in the development of intercultural communications. Thanks to these features, the contents of intercultural communications can form the participants' attitudes aimed at the ideals of humanism and cooperation.

All of the above allows us to conclude that there is a demand for intercultural communications, resulting in a special combination of the diversity of cultural spaces, where the moral and semantic coordinates of the future of mankind are expressed; a symbiosis of relations that preserves the humanistic orientations of the cultural development of different peoples. This assumption opens an opportunity to look at the ways of implement the international projects and at the intensity of intercultural dialogue in a new light.

Intercultural communications open up for the person an additional and extremely important sphere of activity and creativity. In this case, there are unexpected prospects. Each culture is valuable with its unique forms, but unfortunately, most of them are unlikely to survive if they did not share their ways of development and ordering life with their neighbors. In the modern world, this makes it possible to actively form the background for effective implementation of international projects among representatives of different peoples.

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Future of Civilization

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Abstract. In this paper, we analyze social forecasting methods using ideas that stand in as determinants of social development of civilization. An attempt is made to explain how an image of ideal future is modeled in terms of values and ideals of social order. Potentiality and necessity of a change in the future and aspirations for an optimal social order are seen as a major focus of futures studies. Evolution of social ideals and ways to recognize patterns in history prediction are considered.

Content of values in the composition of social ideal was identified. Research into the structure of social ideal, anticipated dynamics and stages of externalization of ideal was made. We emphasize the role and significance of creative consciousness evolution in a complex and multi-aspect process of advancement of the future of civilization.

In this context, a number of domestic and foreign conceptions providing insights into the risks of global civilization (based on a classification as a tool of scientific inquiry) are analyzed consistent with the strategies and tactics of civilization future prediction. We also pay attention to the issues of integration and differentiation of global processes, and to recognition of real danger to the humans to survive as a species on Earth.

Keywords: Values · Ideals as prediction tools · Future of civilization · Modeling · Global issues · Futures studies

1 Introduction

Prediction is one of the functions of philosophy which is meant to generate reliable forecasts of futures of human civilization. Social forecasting dealing with anticipation of the processes taking place in a society is a specific type of prediction. Unlike futures studies that deals in postulating futures by way of extrapolation (which relates futures studies with history and science fiction), this approach seems more tangible since it explores social processes and futures thereof rather than future at large. A complex exemplar of future civilization is postulated as an ideal of social order and it is to be understood that a social ideal is an exemplar of social and political order of society and as such is included into a public ideal as one of the components thereof.

There are two views on the future of human civilization that are diametrically opposed: a steady progress or an eschatological end. Meaning and purpose of social advancement is a particularly complex and painful issue of our times as people have been nursing belief in the ‘ideal of earthy heaven’ and ‘on-going human improvement’ from time immemorial. So, what are methods of social forecasting and what is the

structure of ideal that stands in as a determinant of social development of civilization? Is the ideal realizable? Is the ideal finite or infinite? Let's try to analyze these matters.

An initial impetus towards the need for social changes is always within the society and originates from the intrinsic demand for transformations. It is only some individuals that are capable of sensing what tomorrow will bring. At one time or another some leaders smart enough to see into the future come to the fore. Initially, it is unconscious mental activity, experience of everyday tension inherent in the majority of people, then it comes to understanding vital interests and making new decisions that imply transition to a new paradigm, idea. As a rule, prominent figures, social activists, scholars, battle captains, writers, critics, poets, moralists, gurus can capture the current changes and, being gifted with foresight, make prediction of the future. If the given image, creation or ideal representation coincides with public mood, feelings and emotions of a lot of people, then the scholar may become a mouthpiece of the new knowledge forestalling a radical turn in the former set-up. The idea of universal happiness and public welfare has always been a determinant of spiritual and social activity. Awareness of the idea is, as a rule, followed by creation of an ideal speculation which then grows with more and more details to turn into some scheme, project, plan, ideal. At an initial stage, the project stands out as a phenomenon associated with emotions, feelings, interests, ideas, and values of people. Further awareness implies a goal-oriented and value-oriented rational action—and this already is conscious reflection pioneering the way to communicative discourse between different cultures, regions and countries. At this stage, the prediction is formalized as a certain structure made up of Knowledge (commonplace, scientific, philosophic, fantastic), Moral theories (commonplace, social, theoretical, axiological), Artistic imagery (folk lore, anonymous, authorial).

At an initial stage, an attribute of the project as an image does not imply a carefully calibrated structure—it is a paradox and specificity thereof, it comes laden with a gap between desired and practicable implementation. For a long time of its development, the mankind has come through various social assumptions—Confucian ideal of benevolence, dictatorship of legists, Plato's ideal (perfect) state, Aristotle's universal balanced structure of polity.

Unlike natural processes, social development is determined by people and, consequently, by ideas and assumptions. The Renaissance era was an era of early bourgeois relations—formal legal equality, consecration of capitalist private property, bourgeois approach to society, rationality and boost of pragmatism in a human being. According to M. Weber, an initial impact originated from the idea of Protestantism. A desire to be saved through hard work that is pleasing to God gave rise to a spirit of private interests, individualism and emergence of the bourgeoisie. Thomas More's and Tommaso Campanella's utopias are dreams of a better future and universal equality, of universal prosperity of people through equal opportunities, living conditions and collective labor. During the Enlightenment, human individualism and struggle for political rights and freedoms coalesced into a concept of 'the state of nature'. Different sociopolitical thoughts of the early modern period complemented each other. Sent-Simon's ideas and, later, Karl Marx's theories gave rise to a law of the defining role of material production in social development, of economic formation of society. Each approach incorporates its own interpretation of history, vision of a human being and its

place in the world, and a scale of values. Liberalism (from Latin 'liber' which means 'free') became popular in the early modern period and grew into a predominant doctrine of the Western civilization. A liberal theory is based on the idea of fundamental and unalienable rights which are human inherency.

In view of the aforesaid, a civilization is seen as having certain logic which is manifested in development of and changes in predictions. Transition from the old to the new is prearranged by the entire course of previous history when an abrupt change in development takes place. "Getting rid of poverty is achieved by evolution presenting as a process when agents cease their confrontation and enter into alliances, ever more complex. Every next level is an invention of a new higher type of social being [6]." History of a society is activities of a goal-oriented human where complex dialectic of social being is actualized, the dialectic of material-ideal, practice-cognition, objective-subjective is objectified. "Material substance is dissolved and transubstantiated in the cosmos of ideas, by virtue of 'ascent' it is gradually surmounted and is left behind as past history [15]."

It is not easy to generate a well-grounded model of the world order to come. For instance, in his day, N.N. Moseev, Russian Academy of Sciences member, developed a concept of sustainable development and it was used as a basis for a computer model to confirm that large-scale impacts on the biosphere would become irreversible and a human being would disappear from the biosphere.

Coevolution process is thought to create favorable ecological conditions for human civilization to survive. Needless to say, concerted efforts of all countries of the world, public awareness of the consequences of civilization development, ongoing monitoring of the biosphere and commitment to environmentalism are required for that to happen.

Firstly, it was A. King and B. Schneider, members of the Club of Rome, who suggested that the global challenges facing humanity should be addressed through ordering and classification of riskogenic and destructive trends of the nonhomogeneous world. In particular, Russian scientists organized the diversity of global challenges into certain classes, e.g. resources and habitat, uneven development of countries of the world, prevention of local and global conflicts and international terrorism. It is only integrated solution of the problems of achieving the power balance in the world, removal of climatic and ecological concerns, environmental conservation, natural disasters, global warming, uneven social development, opposition to drug trafficking and terrorism that will put a new spin on development. Another example of the current global problem classification can be found in A.N. Chumakov's paper [13].

Intersocial problems: Prevention of war and preservation of peace; poverty reduction and sustainable economic growth.

Problems of individual-society system: Population problem; education problem; healthcare problem; problem of human adaptation under current conditions; development of different cultures and interaction thereof; social stability and anti-social phenomena control.

Problems of society-nature interaction: Problems of society and environment relations (ecological problems); sea level rise; ozone holes; global warming; greenhouse effect; climate change; extinction of certain species of plants and animals; threat to human survival.

Problems of nature development by society: Natural resources; energy problems.

New global natural projects: Space exploration, World ocean development. Human civilization should develop new mechanisms of environmental regulation and find resource-saving technology; based on a systematic approach, conduct ongoing monitoring of ecological condition, seismic stability of Earth, chemical properties of water, soil, and atmospheric air. What is needed, rather than outrageous confrontation and extreme hatred on the part of developed countries in their struggle for world domination, is solidarity and commitment to communicative discourse.

The above classification of global challenges has no room for a person with a preset behavior matrix, with a mentality worsening world crises. Mention may be made of futurological novel by A.A. Zinoviev. The novel tells a story of a ‘westernoid’, a good-for-nothing, who has gone downstairs the ladder of development. Social degradation, moral immiseration, all-permissiveness and depravity result in destruction of the institution of family, mental enfeeblement, lack of intellectual development (all logic operations done by computers). Lie, total control on the part of the state, unemployment, social inequality amid technological progress.

Fransis Fukuyama, a famous American political scientist, economist, and author, makes a no less discouraging forecast of the future in his books *The End of Order* and *The End of History and the Last Man* where he argues that biotechnologies may result in our loss of human nature [10]. In his article *Why The Future Doesn't Need Us* Bill Joy provides a pessimistic scenario of human civilization development attributed by him to a breakthrough in nanotech, artificial intelligence and genetic engineering. In the context of negative forecasts, it is worth mentioning that dialectics of positive and negative anticipation of the future is quite natural for science. According to Russian astrophysicist Kardyshev, progress of civilization can be achieved through an increase in energy consumption. So far our civilization is classified as type 0 as we use energy of oil and coal. According to Kardyshev's scale, the value of 0.72 means that planetary civilization of the first type outnumbers our civilization by a ratio of 1,000 to one and we'll need 100–200 years to become a civilization capable of controlling climate, building underwater cities and colonizing the universe.

It seems to us that prediction may be structured as a set of social projects allowing for the idea of designing and modeling primarily at the level of ideal. It is consciousness or, rather, ‘supraconsciousness’ (as defined by H. Bergson) that rests in the origin of life and the last thing one can do is to understate its role in the complex process of advancement of the future of civilization. “But this consciousness, which is a *need of creation*, is made manifest to itself only where creation is possible. It lies dormant when life is condemned to automatism; it awakens as soon as the possibility of a choice is restored [2].” The goal should be specific. “However much philosophic systems differ from each other, whatever society they represent or address—true or illusory philosophic schemes serve to provide rationale for a goal to be pursued by homo socialis.”

Social ideal is an evaluative principle, a paragon of virtue that sublimates human energy, raises the level of consciousness. A system analysis method enables one to have an insight into the polyvariant structure of social ideal which is always a symbol and sense at one and the same time. Ideal has a synthetic nature, it is a complex multivarious phenomenon, which, from a rational viewpoint, is described as a construction, model, scheme, and, from an empirical viewpoint, as an activity objective,

emotional and sensory image, phenomenon of personal and social conscience. It is a whole of cognitive and axiological components where a value paradigm is of crucial importance. Amid the current spiritual crisis, an issue of social ideal is expected to cover the entire historical development of human civilization. The inseparable unity of the esthetic, the moral, the political and the economic serves to aid in determining ways and methods of social forecasting. After all, the ideal fulfills the most important functions: prognostic, perceptive-and-transformative, regulative-and-orientative, communicative, educational-and-ideological, incentive-motivational, representational-and-practical. A social ideal is an ultimate value, a paragon of virtue.

An ideal is put into social practice through values; it is a phenomenon in the conscience of a human being and a society. Values (being a part of social ideal) are a factor of spiritual renewal of society and together with other ideological-and-motivational foundations serve as a direction guide for collective actions. Values are a philosophic and sociological concept denoting “firstly, positive or negative significance of any object as distinct from existential and qualitative characteristics thereof (objective values); secondly, a normative, mandatory-evaluative aspect of the phenomena of social conscience (subjective values or conscience values) [9].”

The dual (biosocial) nature of humans leads to the duality of existence. Division of needs and, consequently, values into material and spiritual accompanies a human being throughout life. Society produces an effect on a human being through the widest range of phenomena and processes, including but not limited to the existing conditions of labor and production, class structure, political and legal systems and institutions, nationwide characteristics, and many others. Unity, similarity, invariance of the most common parameters of individual's social existence do precondition fairly standardized ‘similar’ interests and life values in members of this or that social group, class, nation, country. “We are looking for grounds to make a reasonable choice out of different action opportunities – having in mind a problem we are to solve if we wish to attain a certain objective [11].” Should values be considered as phenomena of conscience, they may act as:

- phenomena of social and cultural existence of which social conscience is a driver. These are universally acknowledged and valid ideals existing independently of the mind (axiological transcendentalism of W. Windelbrand and H. Rickert;
- social standards (M. Weber, sociological conception);
- phenomena of subject world as an ontological basis of identity (conception of M. Scheler).

The supreme values – the good, truth, beauty, holiness – are suprahistorical in character and define human history as an out-of-nature process. Validation of common values by H. Rickert is not founded on nature, rather on culture seen as a set of values opposed to instincts and physical needs. The domain of values is transcendent. Culture is a part of reality coupled with values. “The spirit of people for us is culture of people [7].” Values do not fall under objects nor under subjects. They are organized into a kingdom of their own. Accordingly, from the axiological viewpoint, culture is a system of values, a complicated hierarchy of ideals and senses, significant for the given social period, for the given socioeconomic formation.

Whenever values are used in the capacity of a standard, law or imperative (as is the case with Max Weber's conception), they act as standards of social life. For Weber, values are an impetus for social action. Social action may be correlated with a goal, i.e. to be feasible, goal-oriented and value-oriented rational action [3].

When considering values as a phenomenon of person's subjective world (in M. Scheler's teaching), it should be noted that, for Scheler [14], values are an a priori ontological regularity, objective qualitative phenomena which make up a kingdom of transcendent beings and show up in sensory experiences. Scheler believes that conscience is intentional, focused on values, and in his acts of love and hate an individual each time makes a choice and gives preference to these or those values. According to the philosopher, "the true place of any a priori value is "moral knowledge." It is moral knowledge that moral act and moral behavior are based upon.

A contemporary society steeped in utilitarianism and pragmatism, where an individual is selfishly comfortable with gaining benefit and profit, is to be challenged with high value of love, support, doing good, self-sacrifice ability. A change in spiritual paradigm is required. The effect of moral degradation consists in that an individual comes to place more value on money than on friendship, honor, creativity, love, duty, and forget the true meaning and purpose of life. Research into the issue of ideal is always an indication of academic interest in the Good, Truth, Justice, Happiness, Faith, Beauty, Meaning of life. Any analysis of a situation, time, existence should begin with an individual who is a point of departure in the given historical, social, psychological, existential situation. "Civilization destiny in the recent decades is very much dependent on values and the way they are to change as well as on the policymakers that will assume responsibility for the accomplishment of objectives of progress [8]."

"Ideal (from Greek) is a model, a norm, a paragon that determines a manner and nature of behavior of an individual or social class. Ideal applies to all spheres of social life [9]." Closeness of ideal to the categories of 'idea', 'goal', 'feasibility', 'perfection' is in the correspondence of the process to certain complete state whose ideal or material model serves as a goal. In Latin language, it is the term 'absolute', i.e. 'accomplished', 'complete', 'whole', 'full', 'flawless', that corresponds to the concept of perfection. The thing is perfect when it has attained good end [1]." Sociologists P. Berger and T. Lukman argue that a man constructs his reality by means of meaningful symbols, meanings. Ideal is always a meaning. Ideal is a goal which does not exist in the present, it is that which is foreseen and anticipated in the future. But ideal is also an action, accomplishment of idea. Specific-historical objectives—class-related, ethnic, social and group-related, universal and individual—should be explained, justified and have an underlying logical foundation [5]. "Invisibility of idea means nothing as compared to its indubious *efficiency*, which so far is *reality* by itself [15]."

"After all, to understand means to act, - says Chaadaev [12]. The objective of the world process is to establish an actually perfect moral order to be accomplished by a new mankind. The idea of the necessity to "compile the Universe into an idea" is observed in philosophic essays by P.Y. Chaadaev, G.G. Shpet, V.S. Solovyov, S.L. Frank.

Ideal is a complex multifaceted process, a point of departure for action. Therefore, externalization of ideal may be the name of the game here. In his paper *On Finite Ideal*

[4], Russian thinker N.A. Setnitsky proposes to pay attention to the following stages of externalization of ideal:

Stage 1. “Naming of ideal as denotation and imperative”. “In its primary description, ideal is a name, designation and identification of goal, and this is nothing else but a call to pursue the goal [4].”

Stage 2. “Formation–concretizing” is resolution of uncertainties, specificity.

Concretizing of ideal taking the shape of an ideogram is to proceed from an external aspect to presentation of certain inner content, i.e. to *concrete* determination of a form of an object. Determination of form is, first of all, determination of size and, in this sense, determination of size is validation of proportionality and harmony of portions making up the determined whole. Integration of multiple parts into a whole is nothing else but arrangement of parts round the center which serves as a uniting point [4]. Ideal is obedience of elements to a common goal, and concretizing is nothing else but individualization of multiplicity since a limiting unity does not only unifies, i.e. integrates, but also unitizes.

Stage 3. “Orientation” or insight into the ideal. Orientation is one’s ability to locate oneself in respect of the starting and finishing points

- (1) An initial stage of orientation is to get to know a discrepancy between the reality and the ideal mental image. One should not divorce ideal from reality. Therefore, the next stage consists in search for similarities between the ideal and reality.
- (2) Search for similarities. The problem of attainment of ideal is a problem of finding ways leading thereto. One should draw threads from every point of ideal image to the fabric found in reality, identify and calculate means and efforts required for making changes in the fabric, envision ways and time for the transformations needed.
- (3) Irregularities of ideogonic process result in an inevitable crisis of an underdeveloped ideal. “Ideal is a goal and any goal is made up of individual efforts that require relevant actions [4].”

One cannot but agree with N.A. Setnitsky in that the ideal of infinite perfection is an incomprehensible and boundless ideal that leads only to uncertainty, dissipation of one’s energy, and despair, since there is no specific content therein, which is inherent in the true, authentic ideal. From this viewpoint, “infinite perfection is not an ideal as such, but, depending on these or those prerequisites, may only be recognized as the way to this or that ideal. As for the ideal of “finite perfection”, i.e. ideal of fullness and entire life, complete and being completed creative life and motion, it may and must be contrasted with a perfect end, i.e. cessation of any motion rather than infinite perfection [4]. Meaning behind the concept of ‘meaning and purpose of history’ may be defined through the referral of separate local subgoals to the general course of the entire historical process or to the global supreme goal of history. History loses its meaning if thought as a naturally regular process or movement towards an inevitable end. Social ideal is a result of conscious philosophic work (reflection) meeting social and personal demand in terms of supreme value paradigm, it is an ultimate goal, a driving factor, a regulator of personal and societal activity. Summarizing the above, the following conclusions can be made.

Ideas and social ideals, which determine social development, underlie the historical process. Forecasting of the futures of civilization is inseparably associated with the creative process of production and realization of social ideal. The ideal is necessary in terms of a scheme, model, prospect and on a global scale. Ideal has a synthetic nature, it is a complex multivariuous phenomenon, which, from a rational viewpoint, is described as a construction, model, scheme, and, from an empirical viewpoint, as an activity objective, emotional and sensory image, phenomenon of personal and social conscience. It is a whole of cognitive and axiological components where a value paradigm is of crucial importance. It is the axiological component that is used to address the problem of the meaning of history, both objective and subjective, the problem of the purpose and end of history, the problem of social ideal. A social ideal is an ultimate value, a paragon of virtue.

2 Conclusion

Amid the current spiritual crisis, a problem of social ideal is expected to cover the entire historical development of human civilization. The inseparable unity of the esthetic, the moral, the political and the economic serves to aid in determining ways and methods of social forecasting, since the ideal fulfills the most important functions: prognostic, perceptive-and-transformative, regulative-and-orientative, communicative, educational-and-ideological, incentive-motivational, representational-and-practical. Ideal is a process when the highest, supreme, last, ultimate and final objective is achieved. This is the mechanism of realization of ideal.

Interpretation of ideal as one of the ways and methods to forecast the futures of civilization implies the transfer from an unconscious spurt to a model of future-oriented development of mankind.

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Investment Project Risk Identification and Evaluation

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Abstract. The activities of each company are subject to a wide range of risks, as the market environment is characterized by a high degree of uncertainty and a probabilistic nature. The existence of risks contributes to an intensive economy development, which is due to correlation between the risk level and the scope of expected results. Each project features certain risks; therefore, while implementing any project, there is a need to manage its risks. The paper presents the investigation results of risk identification and assessment for an investment project based on an example of project implementation in the coal-mining sector. The Russian coal industry is one of the most important areas of economic activities, despite the deep decline in the coal industry worldwide over the past decade. Therefore, the main issues and ways of minimizing project risks in the coal mining industry, that are discussed in this paper, are still relevant. The formed comprehensive and holistic mechanism for understanding issues related to investment project risks can be used in practical activities of various companies that implement investment projects.

Keywords: Investment project · Risk · Identification · Evaluation

1 Introduction

Investment project risks are a special category of risks, that is mainly associated with implementation of project investment activities. Such activities are aimed at creating a certain value for a company within a limited period of time.

In the broadest sense, project risks mean a probability of negative deviation of the investment project results from the pre-planned ones, due to incomplete achievement of investment, technical, and economic project indicators. It should also be noted that, in project financing, the bank provides the borrower with debt service benefits until the end of the project construction (investment) stage [7].

Project risks are the subject of a special analysis with companies engaged in production expansion and modernization; with investment funds that attract capital for projects; with banks that provide credit facilities. For financial institutions, the project risk is mainly understood as the probability of an event where the borrower is unable to service the loan at the operational stage of an investment project.

Project risks include (in terms of their attribution to a category):

1. Information risks. These risks have the greatest impact in the major project implementation, and their occurrence leads to a revision of previously made decisions due to significant changes in project implementation environment. These risks are associated with the inability to assess the probability of changing the project parameters due to failure to take into consideration some influencing factors.
2. Technological risk can be divided into two large sub-risks:
 - risk of discrepancy between the technology implementation results and the expected results. The occurrence of this risk leads either to the inability to manufacture products in the pre-planned amount, or to the inability to manufacture products of the expected quality. Ultimately, this leads to failure to achieve the planned level of the project profitability;
 - discrepancy between the used technologies to the scale and content of the investment project. In practice, the occurrence of this risk leads either to the absence of entire facilities in the project documentation, that are required for the most complete processing of raw materials or for achieving the required product quality.
3. Risk of violating the investment project timelines due to violating the deadlines for the critical path under the project.
4. Risk of exceeding the project capital expenditures budget. The occurrence factors of this risk are the insufficient study of contractors' commercial proposals, violation of project documentation, lack of survey.
5. Regulatory risk. This risk is related to changes in regulatory or legislative documents affecting the timing or effectiveness of the project implementation. Examples of such risks include changes in the environmental requirements that require building more expensive and more large-scale treatment facilities. Reducing the investment part of the tariff, which lowers the investment attractiveness of modernization; for example, utilities systems, etc. This risk can also include tax risks [10].
6. Environmental risk. The risk is inherent mainly in chemical, extractive industries and is usually calculated in the design work. However, despite the adopted state standards to assess the environmental impact of different industries, as well as measures taken to reduce this impact, the identified risks can cause significant social resistance to the project implementation [1].
7. Social risk. First of all, it is not so much related to the environmental component of the project as to the people's resistance to the same due to an aesthetic change in the landscape, population movements (attraction of workers, shift workers), mass layoffs at manufacturing enterprises (introduction of robotics, other innovations).
8. Risk of non-fulfillment of obligations by project participants. First of all, this risk is related to the project participants' default on their obligations to provide the necessary funding or facilities to be used for construction purposes under the project. These risks include obligations to provide funding under loan agreements; failure to perform dredging or preparatory works for supply of materials; failure to connect the necessary utilities, etc.

9. Price (market) risks related to fluctuations in prices for products manufactured under the project. This risk has a massive immediate impact, and it does not always affect the implementation of an investment project only [8]. However, it is crucial in investment project for which financing was attracted. This risk can be divided into several sub-factors:
 - Incorrect price forecast;
 - Inflation risk.
10. Currency risk. The most frequent risk is recorded in case where the proceeds of a project are generated in one (usually national) currency, whereas the cost of purchasing equipment and its installation supervision, in another one.
11. Financial risk is associated with changes in interest rates (when applying a floating rate of loans and borrowings).

2 Difference Between Project Risks and Other Risk Categories

Particular attention is paid to project risks when project financing is part of the company's investment activities, i.e. when the source of returning the raised funds are the revenues received from the operation of the completed investment project facilities.

Project work includes investment and operational stages of activities, and with this in mind, the project shall involve various participants: financial institutions, industry advisors, designers and contractors, brokers and agents, customers and other market players [9].

It should be noted that project risks are inherent in any projects implemented by a company, but in practice, in case where the cost of an investment project is incomparably small as compared to the company's income, or the company makes investments as part of its regular financial and economic activities (for example, the replacement of equipment with a similar one), project risks are generally low or so insignificant that they cannot cause any significant damage to the company's activities in case of a project unsuccessful implementation.

3 Features of Design Risks Identification

When identifying project risks, it is common to distinguish the project risk objects, the key investment tasks and, especially, the objects themselves – the investment transactions.

The first step in identifying project risks, that is related to the implementation of an investment project, is evaluating the role of the investment project for the company in general. The evaluation criterion is usually the ratio of the company's own capital or the amount of the company's revenues to the value of the implemented investment program as part of the project. If the project cost is low (significantly less than the company's own funds) and its failure does not affect the company's normal activities, it is assumed that the project risks are insignificant and their analysis is usually not carried out.

If the project has an important role for the company, quantitative and qualitative analysis of design risks shall be carried out, including the risk analysis of the implemented project and the risk analysis of the company itself.

As a rule, the importance of assessing the risks of the company's activities is due to the need for partial financing of the project investment stage out of the own funds of the project risk subject (the company itself). In the future, the impossibility of finding its own financial resources by the company often leads to the occurrence of several project risks. First of all, the risk analysis of the company's activities includes a study of the company's investment activity under other projects; studying the capital structure and the development stages of various projects to assess the availability of sufficient financial resources for the implementation of the investment project under consideration [2].

In addition, the evaluation of project risks, especially related to the final stage of the investment stage (usually, these are the stages of equipment commissioning, providing for the filling of production with initial working capital), as well as to the operation phase, are seriously hindered in view of the following. Usually, companies do not have sufficient source data for the project design, which may require expensive survey (this refers, to a greater extent, to large investment projects, related to extraction of minerals, construction of linear facilities, construction of plants with innovative technologies, etc.). The investment phase of medium- and large-scale projects is more than 2–3 years; in some cases, it can reach up to 5–7 years. Given this timing, any forecast of price (market) risks under the project is very difficult. Risk insurance, hedging of price and currency fluctuations within this period is currently impossible in a major project due to the limited capacity of the market for such services.

Thus, the evaluation of project risks with the course of time when implementing an investment project is subject to mandatory updating.

4 Models and Standards for Evaluating Project Risks

Any result of project risks evaluation should lead to certain managerial decisions in relation to the activities under the investment project. Companies that are more tolerant to project risk tend to participate in more “risky” projects, and vice versa. It depends on the appetite for project risk, which is usually defined by the company's appropriate management body. Nevertheless, the task of classifying investment projects (ranking) in terms of expediency and conditions of the company's participation in them, shall be solved by introducing management standards and models for assessing project risks.

These models undergo regular validation and calibration procedures, thus ensuring an “adequate” project assessment in terms of the project risk level from the point of view of the company's risk appetite.

The project risk evaluation model usually includes quantitative and qualitative risk evaluation criteria. Quantitative criteria are usually based on probabilistic and regressive models of risk occurrence with given initial parameters.

In terms of the correct assessment, it is particularly difficult to include qualitative criteria for the project risk evaluation, which is often reduced to the use of expert opinions. The above opinion is score-based, and in advanced models, the weight of the

qualitative parameter influence increases with a significant increase (or decrease) in the score, thus ensuring more important changes in the project classification (rating) [11].

The aggregated evaluation (ranking) of the company that implements a project is made on the following criteria (Table 1):

Table 1. Evaluation (ranking) of a company that implements a project.

Criterion	Weight	Score	Note
Balance sheet indicators and profit and revenue dynamics	0.3	0.0...1.0	Indicators: financial sustainability, profitability, financial leverage. Source data as per Russian Accounting Standards, IFRS reporting
Expert evaluation of the company's financial situation and its role in the market	0.3	0.0...1.0	Indicators: market share, competitive advantages, support of affiliated companies, etc.
Ratings (international and AKRA)	0.4	0.0...1.0	Mapping rating and agency scores form the final score according to each criterion
Total	1.0	0.0...1.0	

Further, if the company implementing the project is an SPV company, or if the project cost significantly exceeds the company's own funds or revenues, the weight of the project risk evaluation reaches 95% in the overall rating (ranking) assessment; otherwise, the project cost and the company's funds are weighed, and the share of the risk assessment score of the project itself is reduced to 1–15% (including depending on the company's risk appetite) (Table 2).

Table 2. Project evaluation (ranking) criteria.

Criterion	Weight	Score	Note
Scenario analysis	0.5	0.0...1.0	Indicators: evaluation of specific scenarios, as well as the Monte Carlo test
Expert evaluation of the prospects of the project as a whole	0.5	0.0...1.0	Indicators: technical feasibility of the project implementation, market demand for the product, readiness of project participants to implement the project, state support, availability of funds with participants for the project implementation
Total	1.0	0.0...1.0	

The final score allows to rank and classify projects implemented by companies and choose the most suitable one for investment. For commercial banks, this model allows defining, among other things, the project financing limits, to carry out the active management of the loan portfolio in the future, to assess reserves for transactions.

The ranking depends on the size of the scale. In the Russian practice (there is the relevant regulation of the Central Bank of Russia No. 483-P dated August 6, 2015 “On the procedure of calculating the credit risk size based on internal ratings”), a scale of at least 8 steps is accepted. Usually, credit institutions adopt scales of 16, 32 steps (for example, Vnesheconombank and Sberbank, PJSC). The lowest step corresponds to the least risky projects, and the highest one, to the default ones.

5 Project Risk Evaluation Stages

For the most complete risk identification, an approach is used in which the work on evaluating the investment project risk is carried out through several stages. At the first stage, the “front office” employees, who are directly engaged in the project, based on their industry knowledge, study several options for implementing project activities depending on market conditions, structure and participants of transactions who fund the contracts. At this stage, the most acceptable option of project implementation is usually developed in view of strategic and tactical goals. The project file is completed with documents on identified and potentially possible risks, the ways to reduce the same.

The second stage involves the employees who form an alternative opinion on the developed project option; the identified risks are reassessed, their completeness, the assessment reliability and the impact of the risk occurrence on the project outcome are analyzed in accordance with the adopted risk evaluation model. At this stage, employees use an approach in which risk evaluation is performed, including, based on their experience in implementing similar projects. Thus, the company can introduce and control risks, using specially designed limits for its investment operations. The results of projects differentiation and activities for them allow to actively manage the investment portfolio, by reducing or increasing transactions in certain investment segments.

The third stage of risk evaluation is not usually implemented immediately before making investment decisions or investment operations. A feature of the stage is taking periodic measures aimed at identifying the risks that are typical for making managerial decisions, the conformity of the decision-making mechanism with the internal normative documents and the completeness of the source data. In practice, this stage is implemented by subdivisions that are partially responsible for operational risks (i.e. the compliance of the company’s risk management system with the complexity and scale of the projects being implemented; verification and validation of the risk evaluation model), as well as by the internal control service (verification of compliance of the risk identification and decision-making procedures to the established normative documents and orders of the company’s CEO). If there is a discrepancy between the investment project risk occurrence and their evaluation, the model of project risk evaluation is adjusted.

6 Project Risk Identification and Evaluation

At the first stage, to successfully solve the problems of identification and evaluation of project risks, a qualitative selection of staff, who are familiar with the investment specifics, is needed. In this case, for risk assessment, the following materials are examined:

1. Scale and boundaries of the investment project (this is especially necessary for projects that include entire production clusters and a linear infrastructure). Within this material, facilities shall be identified that are not directly included in the project, but are necessary for its successful implementation;
2. Pre-project preparation (survey), if necessary, terms of reference and technical reports of industry advisors for the project in respect of investment facilities;
3. Project documentation;
4. Official opinions and binding contracts with key participants in the investment project; commercial offers of contractors and suppliers; financing agreements;
5. Marketing research;
6. Available company resources for successful project implementation. As a rule, this activity includes an analysis of the organizational structure, the availability of necessary personnel in the team implementing the project, the availability of initial permits and licenses; the existence of signed agreements with relevant state authorities, etc.
7. Insurance programs (property and liability), insurance company reports;
8. Materials and data on the implementation of similar projects, domestic and international practice;
9. Scenario results of the project development (based on the cash flow forecast).

The results of studying these materials allow to identify the main project risks and to develop management tools to control the same; to develop a program to reduce the adverse effects of risk management. At this stage, an opinion on specific risks is formed in terms of their compliance or non-compliance with the company's risk appetite. The most obvious way to present such information is a risk matrix. For example, considering the project risks of the coal company Elgaugol, LLC, we identified the following risks which are shown in the following matrix:

The following risks have been identified with the specified probability level and the influence on the project (Fig. 1).

The value of the circle indicates the obstacles to changing the risk consequences (the *larger* the circle, the *less* the company's ability to change the risk impact) (Table 3).

A special attractiveness of such matrix is additional information on the Company's ability to independently influence the risk mitigation. This was used in making managerial decisions.

At the second stage of project risk evaluation, we used a database of events which had a negative impact on the project risks occurrence in the past for a similar industry. The database for such events is based on the Company's past investment experience, and in the case of major projects, the experience of similar companies is studied (data can be obtained from their IFRS statements, public statements, project passports, etc.).

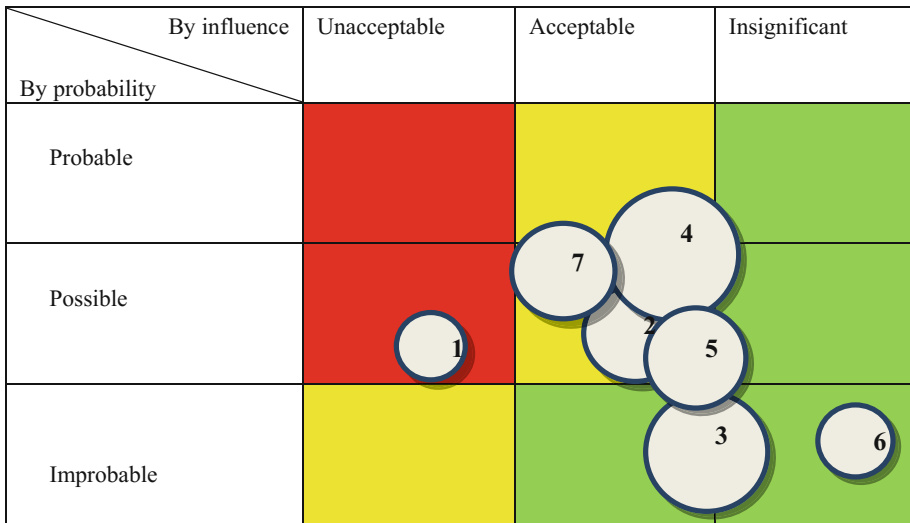


Fig. 1. Risk matrix for a project of Elgaugol, LLC.

Table 3. Risk identification and classification.

No.	Risk (event) description	Room for maneuver of the project company
1.	Probable increase in the project investment budget (by 30%). Due to the lack of a complete set of project documentation (lack of project design for the concentrator plant and for some access linear facilities: railway lines and highways). According to the adviser's report, in the absence of project documentation, the construction cost accuracy evaluation is estimated at $\pm 30\%$. According to calculations made under the scenario with investment increased by 30%, the project becomes inefficient. The feasibility study is under preparation	Reducing the risk is possible if the project documentation is prepared
2.	Postponement of the project operational stage due to delays in commissioning of facilities not included in the project, but necessary for its successful implementation (expansion of port terminals, expansion of transport capacity of the Baikal-Amur Mainline). Port terminals are reconstructed by the company itself, and the BAM expansion, by the Russian Railways, OJSC	The company cannot fully influence the risk mitigation. At the same time, the Company has not provided the status (the current state) for the implementation of the said facilities

(continued)

Table 3. (continued)

No.	Risk (event) description	Room for maneuver of the project company
3.	Risk of error in calculating the coal reserves of proper quality. The reserves are confirmed by the State Commission on Reserves. The inventory reserves exceed 300 million tons, which, subject to extraction to 14 million tons per year, allow the company to operate for more than 20 years	It is impossible to influence
4.	Price risk due to a decline in market environment. Currently, the Russian “GZh” and “Zh” coal brands are traded at a significant discount against world prices for premium coal brands, based on the analysis by experts – industry advisors (AME, Wood McKenzie, IMC Montan) the tendency to a significant increase in prices is unlikely, but possible. A small long-term growth is projected up to \$160–180/ton. The company plans to sell coal for export (not less than 90% of revenue shall be in US dollars)	Influence is impossible due to the low impact of the Company’s supply on the global market
5.	Increase in capital raising rates. The Company received preliminary proposals for financing the project at fixed rates, which confirm the project effectiveness. In addition, the company considers attracting	Essential restrictions on the impact on rates
6.	Currency risk. The company does not plan to hedge this risk completely. The company is considering attracting foreign capital to finance the import of process equipment	Very limited tools of the Company’s influence on risk mitigation due to the lack of a market with the necessary capacity of hedging proposals
7.	Unfavorable reputation/financial impact of shareholders or the holding	Present. However, the holding company has advanced in the negotiation process to restructure the existing debt, and the risk of bankruptcy is eliminated

We used the following event database compiled in the parent holding company (based on their own experience in implementing projects) (Table 4):

Taking into account historical data and previously implemented projects, the risk matrix has been supplemented (new risks are in dotted lines) (Fig. 2).

As Elgaugol, LLC had no data on the current construction progress of the facilities that affect the successful implementation of the project, but not included therein, this risk can be rated as unacceptable (until the relevant information is made available or upon providing information on the stopping the works on these facilities) (Table 5).

Table 4. Events negatively affecting extractive industry projects and their possible impact on the project under consideration.

No.	Name	Importance of influence (based on statistical observations)	Whether it can significantly affect the project, risk evaluation recommendations
1	No preliminary studies, project documentation (feasibility study)	Significant	The company has conducted a survey, but did not obtain a report on the feasibility study and the project documentation in full. The risk is evaluated and marked as “unacceptable”
2	No permit documentation	Insignificant	The Company has the necessary permits
3	No experience of contractors under the project/management team	Significant	None. The contractor has experience in the construction of similar facilities. The management team has extensive experience
4	No report on the up-to-dateness of the technology used	Significant	Not applicable; technology is standard, modern
5	Hard geological environment, difficult mineral dressing	Significant	Can influence. It is necessary to further study the report of the State Commission for Mineral Resources
6	No production cost justification (in full or in part)	Significant (with a small margin)/ Insignificant (with a large margin)	Can influence, however, as the study showed, the estimated production cost corresponds to similar companies
7	The Company and its guarantors are in a state of bankruptcy	Significant	Not applicable. Project participants are existing entities
8	The Company violated its non-payment obligations under contracts	Insignificant	According to the legal due diligence, the Company observes the contractual terms, including its non-payment obligations
9	Unstable/poor financial situation	Insignificant	The Company does have losses; its own capital varies within a wide range. Liabilities are fulfilled out of its shareholders' funds

(continued)

Table 4. *(continued)*

No.	Name	Importance of influence (based on statistical observations)	Whether it can significantly affect the project, risk evaluation recommendations
10	The Company violated the covenants set by the creditor banks	Significant	The company attracted loans from several Russian banks, however, its covenants have not been violated. This event does not affect the outcome of the project implementation
11	Unsatisfactory forecast for the project revenue	Significant	The company did not receive any optimistic market forecast for the project; however, according to the estimates, the project's efficiency is positive, the credit risk is minimal
12	Regulatory changes	Insignificant	No change in the regulatory parameters (mineral extraction tax, royalties)
13	Other projects of the Company are implemented with a delay	Insignificant	Although this influence is marked as "insignificant" in the template, it is necessary to analyze in more detail the construction stage of the facilities that are not part of the project under consideration, but are necessary for its successful implementation
14	Violation of the license agreement	Significant	The license agreement is fulfilled with a time reserve
15	Criminal cases initiated against the Company's beneficiaries/top managers	Significant	Not applicable. There are no criminal cases
16	Other adverse effects of the shareholders/the holding company on the project company (if applicable)	Significant	The risk is already marked

The final stage of the risk evaluation is assigning a rating (ranking) to the project based on the assessment of the project itself and the financial situation of the company implementing this project. For Elgaugol, LLC, the said project, according to the financial situation and the current activities (Elgaugol, LLC is actually an SPV company) is a large one; its unsuccessful implementation will actually lead to Elgaugol, LLC's bankruptcy. Therefore, the weight in the evaluation of the final project risks will be assigned to the project ranking (Table 6).

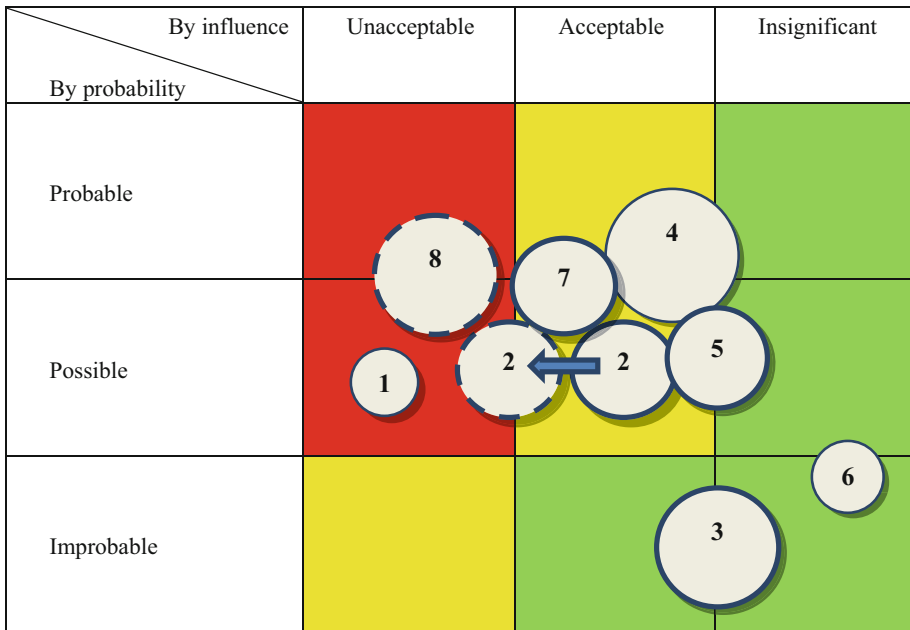


Fig. 2. Supplemented risk matrix for the company's project.

Table 5. Supplemented risks of Elgaugol, LLC.

No.	Risk (event) description	Room for maneuver of the project company
8.	Risk of overestimated production output. The concentrate output may be lower than forecast up to two times. At the same time, the Company has no documents reliably confirming the declared output of coal concentrate. The additional study of materials on coal dressing and concentrate output revealed a serious risk of decrease in the commercial coal amount due to overestimated concentrate output indicator (50%), although it may be 35% or less. According to calculations, if this risk is realized, the project would be unprofitable	This maneuver seems unlikely, since coal is difficult to dress (according to the report of the State Commission for Mineral Resources)

Table 6. Project Ranking according to the Identified Risks.

Criterion	Weight	Score	Note
Scenario analysis	0.5	0.35	Indicators <ul style="list-style-type: none"> • Monte Carlo test – 0.4 (there is a risk of insufficient data to carry out the same) • assessment of specific scenarios – 0,3 (calculations have been made for three scenarios; for two of these scenarios, the repayment period is out of the contractual terms)
Expert evaluation of the project implementation prospects as a whole	0.5	0.40	Indicators <ul style="list-style-type: none"> • technical feasibility of project implementation – 0.8 • market demand for the product – 0.4 • readiness of project participants to implement the project – 0,6 • state support – 0.8 • availability of project participants' funds for project implementation – 0.2 • availability of reliable project documentation – 0.0 • expert evaluation of the attainability of key forecast parameters – 0.0
Total	1.0	0.375	

In accordance with the developed linear ranking scale, a fairly low rating can be assigned to this project - 7 (Table 7):

Table 7. Rating mapping

Ranking	Minimum score range	Maximum score range	Qualitative risk evaluation (risk level)
0 (risk-free)	1.00	–	None
1 (optimal)	0.90	1.00	Insignificant
2	0.80	0.90	Insignificant
3	0.70	0.80	Insignificant
4	0.60	0.70	Moderate
5	0.50	0.60	Moderate
6	0.40	0.50	Increased
7	0.30	0.40	Increased
8	0.20	0.30	Increased
9	0.10	0.20	High
10 (D) – default	0.00	0.10	High or default

Low rating requires measures to mitigate the risks.

7 Making Management Decisions to Minimize the Identified Risks

When reviewing the project, it was taken into account that there are unacceptable and probable risks: lack of project documentation, that are controlled by the Company; lack of necessary information on the construction state of facilities that influence the successful project implementation and are partially under the management of the Company itself, as well as the identified risk (at the second stage) of low concentrate output, that significantly affect the project efficiency and requires a more detailed study as part of conducting the feasibility study by reputable advisors (Fig. 3).

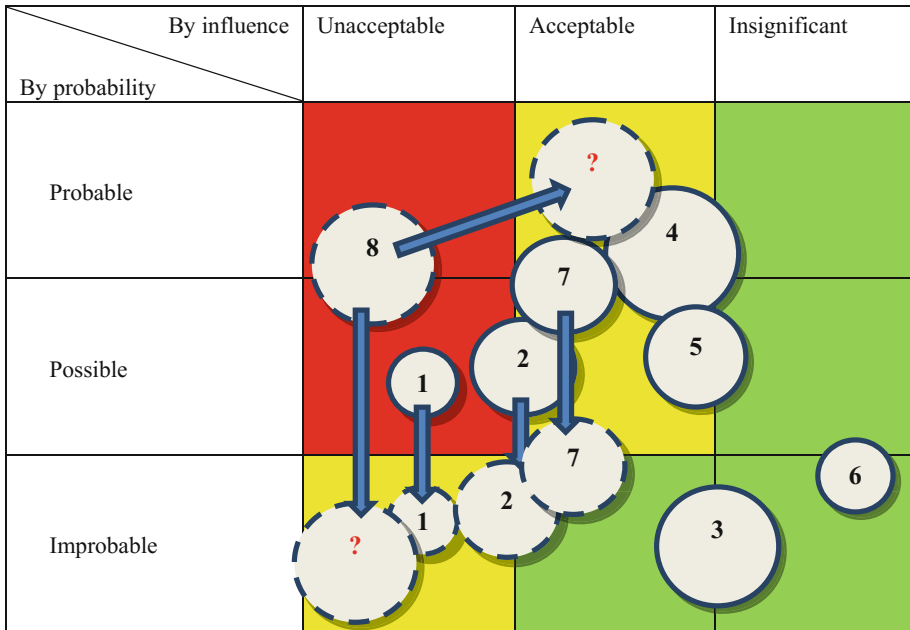


Fig. 3. Risk map after decision making.

In this risk configuration and structure, making a positive decision on the further implementation of the project is likely to have a disastrously effect not only on the project itself, but also on the activities of the initiator – the holding company and its reputation.

Successful completion of negotiations and activities aimed at restructuring the debt of the holding company resulted in reducing the risk of default of the whole project due to the holding's unstable financial situation and the financial institutions' claims to early repay the debt.

Obtaining and analyzing information on the state and timing of completing the construction of facilities that are not related to the project but affect its successful

implementation, made it possible to draw a conclusion that the construction readiness of the additional coal terminal in the port of Posiet is 65% and its commissioning is possible in the next 2 years. The survey work is underway on the reconstruction of the BAM along with budgeting and inclusion in the Russian Railways, OJSC's reconstruction program. Taking into account the mine construction timing and the projected deadlines for implementing the necessary infrastructure programs, risk can be overestimated by probability of occurrence from "possible" to "improbable", and by influence on the project, from "unacceptable" to "acceptable" at the moment.

Reducing the risk of a probable significant increase in the budget is possible after obtaining a complete report on the feasibility study and the project documentation. Based on the obtained amounts of the investment budget and based on the design and estimate documentation approved by the Main State Expert Board, it is possible to estimate the most expected financial result of the project implementation, including for credit institutions already financing this project.

Nevertheless, the main risk, the mitigation of which by the Company's efforts is the most doubtful, is the coal output coefficient from the ordinary one. To reduce this risk, it is necessary to carry out several activities aimed at:

- A thorough study of coal dressing difficulty to identify the factors affecting such dressing;
- Use of R&D in the relevant field and development of measures for the most complete coal dressing in the most effective way, i.e. without a significant increase in production costs and capital expenditures for dressing.

It should be noted that failure to achieve the planned project implementation efficiency is associated with a lower output of marketable (suitable for sale) coal. The project risk evaluation revealed that the low output of marketable coal (the risk of which was assessed as probable) would not allow for achieving the desired results at existing prices; however, it is obvious that, an improvement in the situation and, primarily in international markets, will allow to approach to the planned final parameters of the project even with a reduced concentrate output.

Thus, taking into account the project risks evaluation, the following decisions must be made on:

- continuing the pre-project survey for the deposit development and, in the first place, obtaining the necessary additional analytical and process information;
- continuing the design activities and the feasibility study;
- carrying out the R&D and additional studies in coal dressing;
- designate periodic procedures for assessing the market situation with a view to establish the marginal cost price of coal dressing, the capital expenditure for innovation in dressing, as well as to set the cut-off price for "GZh" and "Zh" coal grades, at which further implementation of the project will be effective;
- strengthening cooperation with financial institutions on additional debt restructuring (in case of delay in the project implementation).

After the activities in accordance with the above decisions, risk No. 8 (probable and unacceptable risk of low coal dressing coefficient) must either remain at the estimated place, that will not allow the further project implementation, or move into the area of

acceptable risks (at a fairly high coal price), or to the area of improbable risks (subject to developing the necessary process scheme for coal dressing, which provides acceptable dressing parameters).

The movement of risks on the matrix will help improve the project position in the rating scale.

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Leadership and Management Styles: Typological Approach to Personal Resources of Change Management

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Abstract. Based on the analysis of the results of research into innovative leadership among managers, we address the problem of the relationship between leadership styles and managerial strategies of managers. We look at the relevance of using the typological approach in assessing the leaders' and managerial resources of the subjects. For our study, we used the MLQ questionnaire by B. Bass, B. Avolio and MSI questionnaire by I. Adizes on 254 managers working at several enterprises of the industrial holding company with various modernization conditions. We presented the results of the implementation of the typological approach to the differentiation of subjects by personal resources: the level of transformational or transactional leadership, the level of expression of strategies aimed at results or effectiveness. We conducted a comparative analysis of 7 typologies obtained, the accuracy of grouping subjects into which varies from 81.9 to 97.2%. We determined the optimal model of personal resources of change management by the ratio of 4 indicators: transformational and transactional leadership, strategies aimed at results and efficiency. This model implies a differentiation of managers into 16 subgroups. We identified the contributions of strategies and leadership styles of managers and determined the development prospects of human resources at each enterprise.

Keywords: Typological approach · Innovative leadership · Transformational leadership · Leadership styles · Multifactor Leadership Questionnaire (MLQ) · Management styles · Managerial strategies

1 Introduction

1.1 Literature Review

Increasing the personal effectiveness of managers when managing changes under uncertainty, pressure of time for actual reforms, risks while decision making poses an urgent problem for developing organizations. The social and cultural context of the solution of this matter is the development of managers as for the influx of ideas, maintaining creativity, non-standard, diversity. The optimal way to increase the personal effectiveness of activity in general and management activity, in particular, is the formation of an individual style of activity [27, 33]. The development of individual and

social creativity is based on the maintenance of individuality, tolerance to personal diversity when working in teams, as the source of creativity is a specific view of people on the world, problems, ways how to solve them [3, 6, 12–15, 17–19, 23, 32].

The purpose of this study is to identify the typological diversity of managers in the management of change, including managerial and creative variables. The study is based on the experimental results of fundamental psychology and is oriented toward the “psychological constructivism” of practical psychology [35].

The typological approach to management is actively used by researchers and practitioners. The popular classification of I. Myers-Briggs, P. Myers is based upon the concept of psychological types of K.G. Jung: the properties that characterize different styles, provide the originality of cognitive and emotional processing of information, which is the basis for making decisions by the subjects of management, ensures the effectiveness of certain types of management activities [26]. The Adizes’s classification starts from the uniqueness of the implementation of universal functions of the managerial activity - “production”, “entrepreneurship”, “administration”, “integration”, - managers of different styles are unequally effective in all management functions, so there is a need for a management team [1].

The typological approach to the theory and practice of creative activity is realized in several concepts. By developing the concept of psychological types of K.G. Jung, researchers specify the specifics of types in creative activity [4, 16]. The research within the dynamic activity paradigm reveals the fundamental parameters of activity - setting/supra-situational or conservation/change oriented activity, which determine the specifics of the types of subjects [5, 17, 20].

The implementation of the typological approach in the innovation activity of managers assumes the integration at the theoretical and practical level of a set of style indicators related to the variety of production development, business processes, human resources tasks solved by the manager; as well as style indicators of subjective choice of priorities of tactics and strategy of transformation and the preferred style of leadership.

The man’s style as a stable system of ways to implement different types of activity; an integral characteristic of individuality, shown in the subject’s preference for a certain form of interaction with the objective and social environment [25]. The integration of various styles in system typological classifications is given as the theory and practice. The research shows the interaction of style features of subjects (such as cognitive, intellectual, emotional, experience, creativity, communication styles) with individual-personal typological properties. This is typology of individual and personal properties as variants of “leading trends” which are integral formations of all individual styles in the fundamental substructures of the personality, as well as levels: from basic psychodynamic properties to attitudes and situational states [29]. These are studies of the relationship between cognitive styles and meta cognitive experience, including the intellectual control, cognitive position, as well as intentional experience, including preferences, beliefs, mindset.

The possibilities of a typological approach in the identification of hierarchical dynamic systems that include different style features of the interaction of subjects with the world, intentional tendencies and experience, and which are genetically related to

the occurrence situation, summarize the system description of the process of differentiation as the formation of new dynamic structures [2].

The empirical studies of “leadership” and “management” as change management styles in the company have been conducted autonomously, from different theoretical perspectives and with application of different methods of operationalization of the basic concepts [1, 9, 10, 21]. The most developed lines of leadership and management research, which have framed theoretical bases and vast empirical facts, are B. Bass’ Transformational Leadership Theory and I. Adizes Management Style Indicator. Bass’ Transformational Leadership Theory considers characteristics of leadership in the situation of company changes as various settings of influence on personnel. Adizes Management Style Indicator studies characteristics of management as management settings by the main management functions.

Bass’ multifactor leadership concept positions “transformational leadership” as most adequate to the situation of change management in the company [7, 8, 24]. Transformational leadership includes such leaders’ basic style behavioral features as broadening of interests of the subordinates, support of their personal growth and self-respect, their intellectual and creative stimulation and inspiration, incentive to go beyond the short-term individual interests, aspiration for changes complying with the team’s new significant objectives. Within the framework of this concept transformational leadership aimed at changing reality in accordance with the values is opposed to another style – which is transactional leadership aimed at an adaptive interaction with reality with varying degrees of success (from an efficient level to “catastrophic”). The concept is aimed at mastering the components of transformational leadership as a universal change management style to the maximum extent possible. This style is confirmed by many empirical studies [11, 22, 28, 34].

I. Adizes Management Style Indicator is aimed at differentiation of different management styles which, on the one hand, correspond best of all to managers’ personal features and, on the other hand, are most efficient in different conditions and cycles of the company development [1, 31, 36]. Universal management functions – “production,” “entrepreneurship,” “administration,” “integration” – are expressed differently in different managers. This excludes style universalism, but assumes a different approach for outlining individual management priorities or value orientations. These management functions are based on the four parameters which make these priorities identifiable. These are strategic management settings (“short-term prospects,” “long-term prospects,” “results,” and “effectiveness”). These parameters of management priorities and, accordingly, prevailing management functions of the managers with different styles are combined differently. Within the framework of this management style indicator, I.K. Adizes discusses development of leaders through understanding and evolution of the individual management styles with the relevant dominating management settings: “producer,” “administrator,” “entrepreneur,” “integrator.” The concept is aimed at optimization of interaction between the leaders with different styles within the management team [1].

1.2 Design

For studying of transformational leadership and strategic settings of managers we carried out the correlation and cluster analysis of the quantitative data of the psychological diagnostics. The analysis covered the entire sample group and subgroups of managers to outline interconnections of the leadership styles and the management styles, as well as interconnections between structural components of the styles. All the calculations were made by means of IBM SPSS Statistics statistical package.

1.3 Participants

254 managers from 3 enterprises of one industrial association took part in the research. These enterprises are located in different cities of one region and perform modernization with a various degree of successfulness.

1.4 Research Techniques

Multifactor Leadership Questionnaire (MLQ) of B. Bass and B. Avolio was used for psychological diagnostics of the leadership structure [7, 8, 30]. This questionnaire contains three independent scales: “Transformational leadership”, “Transactional leadership” and “Self-assessment of the leadership effectiveness” interpreted subject to B. Bass’ multifactor leadership concept.

Transformational leadership (TFL) is described by the psychological content of the five scales of the technique: (a) leader’s influence giving rise to the experience of involvement in a case II(A); (b) leader’s influence inducing agreement of objectives and behavioral values II(B); (c) inspirational motivation IM; (d) intellectual and creative stimulation IS; (e) leaders’ individualized consideration of employees IC.

Transactional leadership (TSL) is described by the four scales: (a) contingent reward CR; (b) active management by exception (application of fines and sanctions) MBEA; (c) passive management by exception (situational management) MBEP; (d) laissez-faire LF.

Self-assessment of the leadership effectiveness (SEL) is described by the psychological content of the three scales: (a) mobilization of the team for an extra-effort EE; (b) collective efficacy EEF; (c) self-esteem and feeling of self-importance SAT.

The current version of the MLQ (form 5X, Copyright©1995 by Bernard Bass and Bruce Avolio) was used. The Russian version of the MLQ was developed based on a translation-back-translation procedure. The original English was translated into Russian and then back-translated into English by a Russian translator. After that, the Russian translator checked the equivalence of the two English versions of the instrument. The items of the Russian instrument were formulated with the same contents as the items in the original instrument, taking into account the cultural features.

For psychological diagnostics of the management styles we used I.K. Adizes’ Management Styles Questionnaire (MSI) [1, 31, 36]. This questionnaire contains four independent scales characterizing different management styles: “producer” (P), “administrator” (A), “entrepreneur” (E) and “integrator” (I). These management styles are diagnosed by 4 components – strategic management settings.

Management style “producer” P is characterized by the settings for results “Res” and “short-term prospects” Stp. Management style “administrator” A is characterized by the settings for “effectiveness” Eff and “short-term prospects” Stp. Management style “entrepreneur” (E) is characterized by the settings for results “Res” and “long-term prospects” Ltp. Management style “integrator” (I) is characterized by the settings for “effectiveness” Eff and “long-term prospects” Ltp.

2 Results and Discussion

To identify the typological diversity when managing changes, including managerial and creative variables, options for differentiating managers were analyzed.

The final version of the typology is represented by sixteen types of managers, who are differentiated according to two style leadership parameters: transformational and transactional leadership, and to two management parameters: efficiency and resulting quality strategic attitudes. The results are shown in Table 1. You can see from the Table that each type is unequally represented in the sample to be examined: the “universal leader, resultative manager” and “effective manager” types are maximally represented, with “leader of “transactions”, “universal manager” and “absolute leader-manager” being minimally represented. This is consistent with studies of the Briggs Myers’ typology, with the one type representation is dispersed from 1% to 16%.

Table 1. The typology of managers in the management of changes.

No.	Type of manager-leader	TFL	TZL	Eff	Res	Quantity per group	
						Persons	%
Types of leaders							
1	Universal leader	max	max	min	min	15	4,2
2	Leader of “changes”	max	min	min	min	5	1,4
3	Leader of “transactions”	min	max	min	min	13	3,7
Types of managers							
4	Universal manager	min	min	max	max	6	1,7
5	Effective manager	min	min	max	min	33	9,3
6	Resultative manager	min	min	min	max	25	7,1
Types of managers-leaders							
7	Absolute leader-manager	max	max	max	max	4	1,1
8	Effective manager, universal leader	max	max	max	min	21	5,9
9	Resultative manager, universal leader	max	max	min	max	37	10,5
10	Universal manager, leader of “changes”	max	min	max	max	10	2,8
11	Effective manager, leader of “changes”	max	min	max	min	14	4,0
12	Resultative manager, leader of “changes”	max	min	min	max	26	7,3
13	Universal manager, leader of “transactions”	min	max	max	max	2	0,6
14	Effective manager, leader of “transactions”	min	max	max	min	22	6,2
15	Resultative manager, leader of “transactions”	min	max	min	max	9	2,5
16	Specialist	min	min	min	min	12	3,4

To identify the insights and to clarify the types identified, various options for differentiating managers by individual MLQ and MSI scales were analyzed.

The correctness of each differentiation was tested by means of discriminant analysis, which included the following stages: (1) the division of the general sample into groups according to the MLQ and MSI style parameters and the identification of different types of managers; (2) the assessment of the correctness of the attribution of managers to the selected groups (%); (3) the analysis of the main discriminant function and significant contributions of style parameters of leadership and management as the basis for type differentiation; (4) the analysis of the typology of managers obtained and clarification of groups. The results of stages 2 and 3 for each option of differentiation are presented in Table 2.

Table 2. The results of the discriminative analysis for each option of manager differentiation.

Criterion of manager differentiation	The main discriminant function, according to which the classification of managers is described	The evaluation of the correctness of assigning managers to groups, %
TFL	$F = -12,015 + 0,217 \cdot \text{TFL} + 0,036 \cdot \text{Stp} + 0,145 \cdot \text{SAT}$	96,9
TZL	$F = -8,568 + 0,359 \cdot \text{TZL} + 0,016 \cdot \text{I} + 0,008 \cdot \text{E} - 0,298 \cdot \text{Ltp} - 0,069 \cdot \text{EEF} - 0,065 \cdot \text{CR} - 0,006 \cdot \text{A}$	95,3
TFL и TZL	$F = -13,935 + 0,181 \cdot \text{TFL} + 0,144 \cdot \text{TZL} - 0,132 \cdot \text{SAT} - 0,012 \cdot \text{SEL}$	90,9
Eff	$F = -3,3 + 0,402 \cdot \text{Eff} + 0,059 \cdot \text{IC} + 0,017 \cdot \text{I} - 0,142 \cdot \text{Ltp} - 0,067 \cdot \text{MBEA} - 0,048 \cdot \text{MBEP}$	97,2
Res	$F = -4,453 + 0,581 \cdot \text{Res} + 0,143 \cdot \text{Stp} + 0,010 \cdot \text{E} - 0,041 \cdot \text{MBEP} - 0,018 \cdot \text{P}$	96,9
Eff и Res	$F = -1,653 + 0,519 \cdot \text{Res} + 0,285 \cdot \text{Ltp} + 0,113 \cdot \text{MBEA} + 0,070 \cdot \text{MBEP} + 0,038 \cdot \text{Stp} + 0,008 \cdot \text{A} - 0,269 \cdot \text{Eff} - 0,052 \cdot \text{TZL} - 0,017 \cdot \text{I} - 0,014 \cdot \text{P} - 0,011 \cdot \text{E}$	86,6
TFL, TZL, Eff и Res	$F = -9,583 + 0,738 \cdot \text{Res} + 0,330 \cdot \text{Ltp} + 0,309 \cdot \text{Stp} + 0,053 \cdot \text{TFL} + 0,040 \cdot \text{TZL} + 0,0364 \cdot \text{Eff} - 0,032 \cdot \text{P} - 0,024 \cdot \text{I} - 0,015 \cdot \text{E} - 0,010 \cdot \text{A} - 0,007 \cdot \text{SEL}$	81,9

Legend: TFL – transformational leadership; IC – leaders’ individualized consideration of employees (TFL); TZL – transactional leadership; CR – contingent reward (TZL); MBEA – active management by exception (application of fines and sanctions) (TZL); MBEP – passive management by exception (situational management) (TZL); SEL – self-assessment of the leadership effectiveness; SAT – self-esteem and feeling of self-importance (SEL); EEF – collective efficacy (SEL); Stp – strategic management settings for “short-term prospects”; Ltp – strategic management settings for “long-term prospects”; Eff – strategic management settings for “effectiveness”; Res – strategic management settings for results; I – management style “integrator”; E – management style “entrepreneur”; A – management style “administrator”; P – management style “producer”.

2.1 The Manager Differentiation by MLQ

TFL level differentiation: one identifies the leaders of “changes”.

The sample is divided into two groups according to the level of transformational leadership: Group 1 of managers “TFL_{max}” (n₁ = 132) with a TFL level higher than the average value (58 or more); Group 2 of managers “TFL_{min}” (n₂ = 122) with a TFL level less than the average value (less than 57).

The differentiation obtained makes it possible to identify “leaders of changes” who are able to transform the real world. Besides the TFL style parameter which was taken as

the basis for the manager differentiation, the parameters of the self-esteem and a sense of self-worth and the short-term strategic attitude significantly contribute to develop the typology.

TZL level differentiation: one identifies the leaders of “transactions”.

The sample is divided into two groups according to the level of transactional leadership: Group 1 of managers “TZL_{max}” (n1 = 123) with a TZL level higher than the average value (32 or more); Group 2 of managers “TZL_{min}” (n2 = 131) with a TZL level less than the average value (less than 31).

The differentiation obtained makes it possible to identify leaders of “transactions” who are able to agree and to establish contacts. Besides the TZL style parameter which was taken as the basis for the manager differentiation, the parameters of collective efficiency, long-term strategic attitude as well as three styles of management (“integrator”, “entrepreneur” and “administrator”) significantly contribute to develop the typology.

TFL and TZL ratio differentiation – One identifies universal leaders.

The sample is divided into four groups according to the transformational and transactional leadership of ratio: Group of managers “TFL_{max}, TZL_{max}” (n1 = 77) with a high level of transformational and transactional leadership; Group of managers “TFL_{max}, TZL_{min}” (n2 = 55) with a high level of transformational leadership and a low level of transactional leadership; Group of managers “TFL_{min}, TZL_{max}” (n3 = 46) with a low level of transformational leadership and a high level of transactional leadership; Group of managers “TFL_{min}, TZL_{min}” (n4 = 76) with a low level of both transformational and transactional leadership.

The differentiation obtained makes it possible to identify, in addition to managers who are either “leaders of changes” or leaders of “transactions”, managers-universal leaders who combine functions of “leaders of changes” and leaders of “transactions”, as well as managers who do not have style leadership parameters and who are not leaders at all.

Besides the TFL and TZL style parameters which were taken as the basis for the manager differentiation, only the parameters of the MLQ Questionnaire (self-esteem and a sense of self-worth and self-feeling of leadership effectiveness) significantly contribute to develop the typology. The MSI parameters turned out to be insignificant when differentiating managers by the level of style leader parameters.

2.2 The Manager Differentiation by MSI

Eff level differentiation: one identifies the effective managers.

The sample is divided into two groups according to the level of the efficiency strategic attitude: Group of managers “Eff_{max}” (n1 = 112) with a high Eff level (9 or more); Group of managers “Eff_{min}” (n2 = 132) with a low Eff level (less than 8.5).

The differentiation resulted makes it possible to identify effective managers, with the efficiency and long-term strategic attitudes and the associated management style: the “integrator”, which can be realized through an individual approach to employees and the management that depends on deviations from norms and standards, being the significant contributor to the confirmation of the classification.

Res level differentiation: one identifies the resultative manager.

The sample is divided into two groups according to the level of the resulting quality strategic attitudes: Group of managers “Res_{max}” (n1 = 119) with a high Res level (7 or more); Group of managers “Res_{min}” (n2 = 135) with a low Res level (less than 6.5). The differentiation obtained allows us to identify resultative managers in the short term, who are able to be producers through the passive management to eliminate deviations from specified standards, by managing the situation.

Eff and Res ratio differentiation – One identifies universal managers.

The sample is divided into four groups according to the ratio of efficiency and resulting quality strategic attitudes: Group 1 of managers “Eff_{max}, Res_{max}” (n1 = 22) with a high level of efficiency and resulting quality attitudes; Group 2 of managers “Eff_{max}, Res_{min}” (n2 = 90) with a high level of efficiency and a low level of resulting quality attitudes; Group 3 of managers “Eff_{min}, Res_{max}” (n3 = 97) with a low level of efficiency and a high level of resulting quality attitudes; Group 4 of managers “Eff_{min}, Res_{min}” (n4 = 45) with a low level of efficiency and resulting quality attitudes.

The differentiation obtained allows us to identify universal managers who can be both effective and resultative at the same time, but with minimal creative and leader resources. Besides the efficiency and resulting quality strategic attitudes that were considered as the basis for the manager differentiation, the short-term and long-term strategic attitudes are the significant contributors to develop the typology.

2.3 Differentiation of Managers by MLQ and MSI Parameters – One Identifies the Types from Absolute Leaders-Managers to Specialists

The sample is divided into sixteen groups by the ratio of four parameters: transformational and transactional leadership, efficiency and resulting quality strategic attitudes. The description of each group and the quantity of people there are presented in Table 1. The typology obtained makes it possible to identify sixteen types of managers with different leader and management resources. The style management parameters, all the strategic management attitudes as well as transformational and transactional leadership styles contribute the most to this differentiation. Other variables of leadership, included in the scales of transformational and transactional leadership, are not significant contributors.

3 Conclusion

1. Based on the manager differentiation by groups according to the style MLQ and MSI parameters, the typological diversity of managers when managing changes was obtained. In total, sixteen types of managers were identified who differed in the ratio of style parameters of leadership and management. The maximum and minimum types of managers represented in this sample were identified. The “universal leader, resultative manager” and “effective manager” types are maximally represented, the “leader of “transactions”, universal manager” and “absolute leader-manager” are minimally represented.

The evaluation of the typology correctness. i.e. the manager differentiation by style parameters of leadership and management, was carried out using the discriminant analysis of the data of psychological diagnosis.

Based on the results of the discriminant analysis, the optimal model of leadership and management resources was obtained to differentiate managers by sixteen groups and to identify both absolute leaders-managers and just specialists.

2. The mathematical formula, approved on a large sample to identify the types of manager-leaders permits to identify the type of manager based only on the data of individual psychological diagnosis. The private typologies due to the revealed insights allow us to more accurately differentiate managers for various tasks of changes within the company, to carry out the professional selection.

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Modernization of the Russian Economy on the Basis of Resource Recycling and Eco-economic Balance of Business

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Abstract. Today, the world and Russia have entered a period of a multifactorial crisis: declining economic growth, terrorism, etc. There is a global resource and environmental crisis. All other negative consequences are derivatives from it. The analysis logic of the current situation shows that there is need to modernize the Russian economy on the basis of resource recycling and the eco-economic balance of business. Its goal is to ensure the eco-economic balance of society development oriented on a long-term perspective.

The main provisions of the Russian economy modernization based on recycling of resources and eco-economic balance of business as a new level of management are formulated. Usage of the obtained results will allow improving the system of management of economic processes.

Keywords: Modernization · Crisis · Resources · Economy · Ecology · Technology · Resource recycling · Closed resource cycle · Eco-economic balance · Business

1 Introduction

At present, the world in general sees almost new conditions of economic development, which cannot be taken into account anymore. We live in the circumstances of generally declining economic growth, in the conditions when, firstly, the global raw material crisis is becoming more noticeable both for the whole world and for Russia, when the raw materials base in the world is really coming to an end and something has to be done about it [1]. Secondly, the current ecological crisis also has a global nature. These two factors have changed the world, which will never be the same again. There are military clashes over the last resources on the planet. The situation is extremely critical, which is evidenced by the fact that in his last speech at the UN meeting in March 2016 devoted to the settlement of the situation in Syria, concluding his speech, Russian President V.V. Putin made a proposal to devote one of the next UN meetings to the issues of exhaustibility of natural resources and ecology. All this dictates the need for crucial changes and urgent response to the challenges of time.

2 Justification of the Need to Modernize Economy by Resource Factor

Modernization of the Russian economy takes place in difficult conditions. Firstly, the sanctions against Russia imposed by a number of countries, to some extent, has disturbed the existing external relations and the development opportunities of the country. But it has also served as an impulse for internal self-development. Secondly, virtually new conditions for economic development formed in the world in general, which cannot be ignored any more. We are living in the conditions when there is widespread reduction in economic growth, in the conditions when the global raw material crisis is becoming more and more noticeable both for the whole world and for Russia, when the raw materials base in the world is really depleting and something has to be done about this. The situation dictates the need for crucial changes and urgent response to the challenge of time. The change of these circumstances should become one of the objective factors of the need to modernize the Russian economy.

In our opinion, the situation is crucial to a degree when it is necessary to propose a new solution to the problem: now there is a fundamentally new, superglobal task for the society, which is not completely recognized yet, but which requires urgent solution on the basis of “new industrialization”, innovative “Technologies of the VI Technology Paradigm” and the most active participation of business. This is an objective to create a new raw material base, on the basis of industrial reproduction of raw materials, an objective to go beyond the limits of natural restrictions [2]. This will be the largest project of the 21st century. Here we are talking about a new resource base for reproduction of the economy. This project can be carried out only through the efforts of progressive business and state.

The basic provisions of the fundamentals of the “new industrialization”, “technologies of the VI Technological Paradigm” are now being elaborated as new directions for the development of future technologies [3, 4]. The task of creating a new raw materials base calls for new technologies, new economic solutions and must be solved in the technologies of the future and, in general, in modernization of the Russian economy.

In the modern conditions of geopolitical instability, Russia, as a part of the global economy, cannot be independent from the world processes. Analyzing the prospects for the development of the global raw materials market, special attention must be paid to a number of important conditions.

First, the global economic crisis, which is now affecting all countries of the world, has caused the need to review the fundamental basics of the civilizational development model.

The current model of the world economy is based on the use of natural resources, characterized by exhaustibility of many of their types in the nearest future [5, 6]. Simultaneously, this process is accompanied by further intensification of competition in the global raw materials market. The deficit of raw materials, threat of their complete depletion, and the society striving for further economic growth in the conditions of its real slowdown have entered into complete contradiction. The events in Iraq, Iran, Syria, Libya, Ukraine and other countries are the links of one chain: forcible takeover of

resources. The contradiction in the current situation has already led the world to economic and political crises and shocks and formed the fear of the future [7].

Now there is a tough confrontation: the society has many ambitions, but nature has fewer opportunities. When there are not enough resources for everyone, wars begin. In this regard, in the conditions of the resource crisis, the new grounds are needed for further economic development of resource supply. The existing natural-raw material model has exhausted itself [8].

A new long period of economic growth can only be provided by transition from a natural-raw material model of economic development of the society to an industrially-reproduced type of raw materials. This is a fundamental task which is hard to solve. But there is no other way to “normalize” the situation.

There is an alternative to the solution of a large-scale civilizational task by the society: the society managed to withdraw from the natural food supply, having “destroyed” the natural food base in the form of wild animals. An industrially reproducible food base was created long ago. Now it is time for transition to industrially reproduced type of raw materials. It should be noted that this objective is much more complicated. According to historical data, the transition from a “natural” to an “industrial” food base was long and very painful – due to famine the world population decreased by ten times [9]. The level of technological progress which is currently achieved makes the forthcoming transition to an industrially-reproduced type of raw materials possible without such sacrifices. But for this it is necessary to start implementing forthcoming work right now. A delay in transition to an industrial type of raw materials may cause a catastrophe.

What will become the basis for industrial reproduction of raw materials? The material basis of industrially reproducible raw materials will be production and consumption waste. The reserves of the new raw materials base in the form of unused production and consumption waste are enormous. Currently, only 2% of the total volume of world-produced resources is used, 98% is wasted. Virtually all resources taken from the earth are on the surface of the planet.

3 Basic Principles of a Non-closed and Closed Resource Cycle

As a result of the process of production and consumption of goods, waste is generated in large quantities, which basically represents unused raw materials. But in the modern conditions of thinking, technology and production organization, these waste resources are thrown out, destroyed. The technological progress of society is mainly based on primary resources. Consequently, the technologies which are used have an unclosed cycle. Economic progress of society in the form of multiple growth of production and GDP is only possible if based on such technological principles - the principles of an unclosed resource cycle. Now it is time to pay for the wasted raw materials. It is necessary to create new technologies that would work on new principles, create new enterprises whose target will be the industrial (re)production of raw materials. Business reacts quickly to novelty. This is a favorable investment area for business.

Waste is a valuable resource [10]. Even in his time, D.I. Mendeleev wrote that chemistry has no waste, there are unused raw materials. In modern conditions, these

raw materials should be returned back to economic circulation. We should note that these reserves of raw materials have a specific feature - they are renewable, unlike natural: all goods, which are produced, have a short period of use. They generally live from half a year to 5 years and then go into waste. The question is: what is humankind doing? The answer is simple: it is engaged in the production of waste, but does not take care of waste after it is produced.

This production and consumption waste must be turned into raw materials again, and raw materials must be again turned into good. That is, raw materials here enter into a multiple cycle of movement: raw materials₁ → product₁ → waste₁ → raw materials₂ → product₂ → waste₂ → raw materials₃ ... etc. Thus, a closed resource cycle is formed: resources complete a cycle of transformations. It is quite obvious that the end here is connected with the beginning. The process of transition is complete, the circle is closed, a new cycle of resources starts [11].

Here, in our opinion, we are dealing with a new economic category - “waste resources”. “Waste resources” as an economic category is a specific form of resources and the process of their transformation, where the movement of material essence of resources goes in parallel, as elements of nature, cost and consumer value. As a matter of fact, waste is resources that have an incomplete form of consumption. Therefore it is more correct to call them “waste resources” [12].

No matter if we take care of waste or not, the unity of the two forms of movement - resource (tangible) and economic (cost) always takes place: waste is always a resource. It always requires costs either to obtain raw materials and products (taking into account their use Cost) from it repeatedly or to “fight” it. Thus, these two forms represent a single process. Now this single process is broken, so we have a linear model of the economy, where it is necessary to bring into the economic circulation new natural resources repeatedly. It is necessary to close the resource cycle, to close the economic cycle. This can be done on the basis of industrial reproduction of raw materials.

4 Recycling of Resources: Business Cycles and Business Areas

The process of industrial reproduction of raw materials is not yet terminologically defined. In fact, this is the process of industrial creation (production) of raw materials from production and consumption waste. Given the scale of the forthcoming work on the creation of a new raw materials base and its importance for characterizing this specific process, in our opinion, it is necessary to introduce a new term into economic circulation, which reflects the essence of this process - “resource recycling”. The term “resource recycling” [13] shows that the target is not to extract new resources from nature, but to produce (reproduce) them industrially from those resources that humankind already has, but at the moment they (resources) have a different form, the form of waste, as a result of their (resources) primary consumption. This process of targeted transformation of one form of resources into another, as a result of their (resources’) industrial reproduction of raw materials, should, in our opinion, be terminologically defined as resource recycling. The Latin prefix “re” is a prefix, which means renewal, repetition of actions. Cycle (Greek *kyklos* - wheel, circle, circuit)

means the manifold of any phenomena, work, processes, completing a full circle of development during any period of time; Cycle of production is a full scope of work, the implementation of which gives a complete, finished product, a complete series of some phenomena, united by a common theme. And now, from the position of the proposed term “resource recycling” and understanding its meaning as a process of industrial reproduction of resources (raw materials), we will trace the process of waste management in general, we will specify where and what business can do [14].

According to business interests and organization of its activities in the sphere of resource recycling, one should pay attention to the following point. The cycles of movement here can be different in terms of their intended purpose - they can have 3 models depending on their form and content:

1. The product cycle. This is the cycle of product movement: $\text{product1} \rightarrow \text{waste1} \rightarrow \text{raw materials2} \rightarrow \text{product2}$. Its purpose is to track the movement of the product and ensure continuous manufacturing of a new product (product2). “Product” is the keyword here.
2. The cycle of waste flow: $\text{waste1} \rightarrow \text{raw materials1} \rightarrow \text{product1} \rightarrow \text{waste2} \dots$ Its purpose is to monitor the movement and formation of waste, given its (waste) reproduction (waste2). This is waste recycling. “Waste” is the keyword here.
3. Resource (raw material) cycle. This is a cycle of resource flow: $\text{raw materials1} \rightarrow \text{product1} \rightarrow \text{waste1} \rightarrow \text{raw materials2}$. Its purpose is to track the movement of raw materials, production of new raw materials (raw materials 2), that is, reproduction of resources. This will be resource recycling. “Resources” is the keyword here.

In order to organize a business it is important to know where its (entrepreneurial) cycle begins and where it ends. Cycle is the keyword in its business activities. The fact is that any of the 3 types of models can be handled: collect information on waste generation, be its “holder”, sell it, classify it by the amount, composition, regional affiliation of this valuable raw material. It is possible to take a direct part in the very process of resource recycling, that is, industrial (re) production of resources, be a holder of “new technologies”. Business began to work actively on this front. But given the required (necessary) volumes of waste recycling, especially with the prospect of switching to an industrially reproducible raw material base, we can say that this process is only beginning to form, to develop. Here is a wide field of activity for business and really great prospects for its development.

In modern practice there is no clear terminological definition in the field of waste management and its directions. Terms such as “waste management” are used. However, this is abstract, general information about the problem, it does not specify what is the essence. The term “waste management” is not correct in principle, Waste cannot be managed, you can only manage something that moves. The widely used term “waste recycling”, established long ago, have a rather narrow focus, but it does not correspond to the promising tasks of creating a new raw materials base. Literally, the term “waste recycling” means “waste reproduction”. It is incorrect in its meaning, since it is impossible to reproduce waste purposefully. In addition, one must also bear in mind the fact that not all waste is suitable for industrial reproduction of resources. There is a so-called “dead zone” of waste (about 10%) for which there is no processing

technology [15]. However, it is possible to deal with the accumulation and movement of waste, which is an independent sphere of activity. Therefore, we can say that the proposed term “resource recycling” supplements and expands the concepts of this field of activity, corresponds to its direct purpose, specifically points to the set goal and sphere of business - industrial reproduction of resources and manufacturing products from them - raw materials.

In the conditions of transition to a new resource channel of the economy and development of market relations, we should now begin to form a market model of the cost of raw materials, oriented on creating conditions for circulation of reproduced raw materials - resource recycling. It should be noted that new approaches to solving other economic problems will be required here. It can be said that serious work has to be done in terms of resource recycling to create a new economic mechanism, innovative methods of economy as a means for result achievement.

Innovative technologies are certainly the means for achieving the result of resource recycling. In this regard, we should note the specific feature of the model for formation of the new raw materials base. It is about the fact that not only industrially reproduced raw materials will be represented on the market, but an independent segment of the technology market will be created in the sphere of industrial recycling of resources, which will be in ever increasing demand.

5 Modernization Prospects of the Economy Based on Resource Recycling. “Second Industrialization” of the Country

The prospects for the formation and development of the innovative technology market in the sphere of industrial reproduction of raw materials are unlimited. First, new technologies, which are not available today, must be created in the nearest future. Second, these technologies will call for constant further improvement. Third, there will always be need for them, and it will be only increasing in the future. Here is a large field for activity for creative progressive business. Innovative, supernovae innovative technologies must be created in a wide range of fields aimed at industrial reproduction of raw materials. Given the large scale of the upcoming events, it can be said that it will be necessary to carry out the high-tech “second industrialization” of the country [16, 17]. In terms of scale and significance, this project is similar to the development and implementation of the GOELRO plan, the plan for electrification of the country.

The economy of a closed resource cycle is a real economy of the future. It will be the basis of the 21st century economy. It will entail rapid development of all branches and spheres of economic activity and living of society as a whole. First, it will affect the creation of a large number (counted in millions) of jobs. Second, one must bear in mind that all goods made as a result of industrial reproduction of raw materials are already high-tech products and, in the conditions of an actual advent of the non-resource economy, they will be highly competitive.

6 Eco-Economic Balance and Business

Another important reason dictating the need to modernize the economy based on resource recycling is the urgent need to solve environmental problems: the ecological situation is directly dependent on how resources are used. Two of these factors should be in balance. This balance can be provided by resources recycling technologies.

The essence of the ecological and economic balance is in the achievement of balance: economic growth, on the one hand, and the absence of environmental pollution on the other. Only this approach can provide a solution to this dual task.

We have been living in technological civilization for a long time. To solve the emerging problems, humankind has repeatedly invented ways, algorithms and technologies to get what it wanted to meet its needs, without taking nature into account. These methods and technologies have shaped the image of the modern technological civilization, economic and ecological crisis [18, 19].

How can we get out of it? First, we need to cast a new critical look at the past, identify the underlying causes and problems. Second, the adoption of promising solutions must be based on a new mindset, which should be based on the idea of eco-economic unity, consideration of these two spheres as a whole.

The outlines of the new reality allow us to state the following:

1. There is awareness and understanding of the need to solve environmental problems at all levels of management;
2. There is a macro-shift in the environment - the transformation of civilization, in which technology is the driving force. This shift is started by the economy;
3. Environmental problems cannot be solved only "via environment". There is a fixation: it is bad, it is bad. And what is good? What should be done? Where is the path? There is no answer;
4. Business (small, medium, large) and resources recycling, as a basic link in the realization of the production process, are the real basis for eco-economic unity.

At present, the society is in a state of bifurcation (separation). There is a split, branching: ecology is seen on its own and economy - on its own too. However, ecology and economy is a single process. Ecology is the consequence of economic activities. The result of the disjointed approach is instability of the system as a whole. For controlled objects, which are all objects of economic activity, the point of bifurcation is the moment of making strategic decisions, which determine the future destiny of an object. It is through business that a strategic decision is taken about the issue of eco-economic balance as a model of the future.

7 Conclusion

The resource factor is in the epicenter of the factors of the current crisis and at the same time it remains as if in the shadow of the ongoing modernization of the country's economy. New technologies are being sought for extraction of the last natural raw materials at the time when it is necessary to start diversifying the economy [20].

There is movement from the raw material economy to the development of manufacturing industries [21, 22]. In recent decades, innovative development has turned into a decisive factor of historical development. The world economy is going into a new phase, namely, into innovative one. In these conditions, the modernization of the Russian economy based on recycling of resources and eco-economic balance of business should become one of the top priorities.

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Innovative Approaches to Solving Modern Challenges of Water Supply (as Exemplified by St. Petersburg)

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Abstract. The article analyzes current challenges of the water supply system in St. Petersburg and innovative approaches to solving problems, which have arisen in the modern development conditions. Object of the research is the water supply system of the large city. Water supply system is a complex of engineering constructions, which contains water treatment plants and water pipelines to provide consumers with high quality services of water supply. The city's water supply system requires modernization for the purpose of customers' provision with quality water supply services - namely portable water for the population and industries. It is proposed to perform modernization with the closed-cycle resource technology implementation in the sphere of water supply. Economic research and forecasting methods are used in this work. Environmental, social and economic effects will simultaneously be achieved in the innovative development conditions as the proposed technology implementation outcome.

Keywords: Water supply system · Water treatment plant · Modernization · Innovative development · Closed-cycle resource technology · Portable water · Environmental effect

1 Introduction

Water supply of large cities, provision of population with portable water and industries demand satisfying water supply services, has the federal level strategic importance. With this regard, this area of activity has been and continues to be given constant attention. Regular repairs are carried out to ensure a reliable technical condition of the water supply system, and modernization, in particular water pipelines sections replacement (networks re-laying), is carried out. However, at present there are modern challenges of the water supply system modernization, related to the requirement for a more comprehensive application of the water supply system generated wastes [1]. These new challenges are on the one hand caused by the need to enhance the rational use of all the water treatment process elements, and on the other hand, to achieve ever-increasing environmental requirements. In the present day innovative development conditions, this can be achieved through the resources closed-cycle technology implementation [2].

2 Up-to-Date Challenges of Water Supply System in Russia and St. Petersburg

Today many cities of Russia have a number of common water supply system challenges that affect the customers portable water quality [3]. This derives from the following main factors: contamination of surface water sources in large cities, significant deterioration and emergency condition of the water supply system fixed assets (production equipment, water treatment facilities, etc.) and application of obsolete and inefficient water treatment technologies. This indicates the demand for a large-scale modernization of water supply in large cities, in order to prevent the most important life-supporting system collapsing [4].

It seems relevant to consider the current water supply condition challenges using the example of the water supply system in St. Petersburg, which shows the extreme importance of this issue in relation to water supply systems of large cities throughout Russia.

The water supply system is one of the most important components of any city infrastructure, its life support and development, which in turn determines the population well-being level [5]. The water supply system development importance is clearly defined by the society's demand for the provided services quality, which is enabling population and industries access to the guaranteed quality water [6].

The main factors determining the requirement for the water supply systems modernization in large cities (pollution of water sources, equipment heavy wearing and application of inefficient water treatment technologies) were analyzed in detail with the example of the federal city, St. Petersburg, water supply system, which shows the challenge relevance throughout Russia.

St. Petersburg is the federal city and administrative center of the North-Western Federal District and Leningrad oblast, and for this very reason, the water supply system challenges of the five million city should be discussed and decided at the federal level. "Today, the conversation on environmental problems must be conducted in a proactive and practical manner and bring environmental protection to the level of systemic daily responsibilities of all levels public authorities", - noted the President of the Russian Federation Vladimir Putin in his speech dedicated to the national year of environment [7]. These once again emphasize the scale and significance of environmental pollution problems and its impact on all spheres of population life.

It is proposed to consider the main features of the St. Petersburg water supply system arrangement and therefore highlighting the negative ones that affect the quality of water supply services, will enable offering of a comprehensive modernization of the water treatment plants system in St. Petersburg through the resourced closed-cycle technology implementation [4].

A resources closed-cycle is an innovative approach to the industrial production organization. It is based on achieving of an optimal balance between economy and environment through the full involvement of wastes in the production process [8].

This technology focuses on the beneficial use of the maximum amount of wastes generated during the production process. Taking into account that the specific production type considered in the article is water supply, wastes will be backwashing water, formed during the water treatment process [9].

The current state of water supply systems in large cities is stipulated by the high percentage of depreciation of fixed production assets and the rapidly deteriorating quality of portable water sources [10]. The majority of water treatment facilities are in an emergency condition; a comprehensive modernization of the water supply system is required, which will be defined not by repair of existing facilities, but by the introduction of a fundamentally new approach to the water treatment process.

As it is well known, because of anthropogenic impact on the environment, in particular on water bodies, the quality deteriorates of surface water sources, which subsequently affect the quality of treated portable water [11]. The level of Russian freshwater reserves is large, but it is annually exposed to external pollutants, discharges of industries and settlements [12]. Therefore, it is necessary to rationally use natural water sources and minimize the amount of water lost during water treatment, and this is possible only through the new water treatment technology implementation, namely the resources closed-cycle technology.

3 Specific Features of St. Petersburg Water Supply System

St. Petersburg, being a large, industrial, topmost economic, scientific and cultural center of Russia, has its own peculiarities in the sphere of water supply, which are primarily determined by environmental, geographical, historical and cultural reasons [13].

In further, the article discusses in detail the St. Petersburg water supply system main features, which should be taken into account in the long-term implementation of integrated programs for the city water supply facilities modernization, taking into account the resources closed-cycle technology implementation - the only feasible technology for achieving economic, social and environmental positive effect in the innovative development conditions.

Specific features of the St. Petersburg water supply system arrangement are presented below.

The St. Petersburg water supply organizational specific nature is as follows:

1. The source of portable water supply in St. Petersburg is the surface source (the Neva River), which can provide a relatively stable source water quality.

The Neva River water, which is the source of water supply in St. Petersburg, refers to colored and low-turbidity waters with low mineralization, low alkaline reserve; it contains complex humic substances, as well as iron-containing compounds of soil origin [14].

Seasonal changes in water quality are mainly determined in terms of turbidity, color, oxidation characteristics and alkalinity. These changes occur in the spring freshet (March–April) and in autumn (October–November). A big impact on the water source water quality is provided by storms on the Ladoga Lake, and North-Eastern winds can cause an increase in turbidity at any time of the year. However, despite the above-mentioned, the Neva River, as a water source of a large city, is able to provide a relatively constant quality of raw water in terms of physicochemical parameters. This is because a large water flow in the Neva River provides a high multiplicity of water exchange and thus the influence of pollutants discharged into it due to anthropogenic

activity or natural phenomena is leveled by dilution with large volumes of water carried by the river. Thus, in combination with extensive volumes of fresh water in the Ladoga Lake, Neva can be considered as a relatively stable source of the city water supply [13].

2. Lack of an alternative source of water supply.

The issue of new sources of the city water supply discovery was actively discussed since the end of the XIX century, and direct water supply from the Ladoga Lake was considered as the only alternative arrangement for water supply of St. Petersburg. In 1914–1917, preparatory works related to the construction of water conduits from Ladoga were carried out. Unfortunately, the October Revolution of 1917 ruined these plans [13]. Present day options of this project implementation are being actively developed, but are not under implementation due to the high level of costs. In the event of the project implementation the city will be able to receive the same water in terms of basic quality indicators, but significantly different for the better from the Neva water in terms of turbidity and microbiological contamination level.

The groundwater share in St. Petersburg provision with portable water is less than 3%. Groundwater main reserves are in Kurortniy, Krasnoselskiy and Petrodvortsoviy districts of the city, as well as in Lomonosovskiy and Gatchinskiy districts of Leningrad oblast [14].

Depending on the territorial features of the groundwater occurrence, they can be characterized by different indicators, often exceeding the established sanitary and hygienic standards in terms of iron and manganese content, increased hardness, etc. [11]. Increased concentrations of these components are characteristic to groundwater of the entire North-Western region and determine their background.

The limited availability of groundwater resources and their quality makes it impossible to use this source as alternative water supply source for the entire city.

The Neva River, being a surface source of water supply of St. Petersburg (more than 97% of the city water supply) has become a strained transport route over the last few years of intensive development of the city and coastal areas. Almost every year major accidents with cargo and oil tankers occur in the Neva-Ladoga system and highly toxic materials are transported along the Neva River [13]. Thus, while it is important to use groundwater as the main city water source, it is necessary to eliminate discharges of pollutants into the water system of the Neva-Ladoga basin in order to preserve the existing quality of the original Neva water.

3. The presence of significant microbiological contamination of the Neva water - the main surface source of water supply in St. Petersburg.

Contamination of the Neva water in terms of microbiological indicators is primarily not due to the natural quality of the source water, but namely to the wastewater discharges received by the Neva waters both in an effluent form and completely without treatment. Along 74 km from the river source to St. Petersburg 35 large industrial enterprises and 14 settlements (other 15 settlements discharge sewage into the Neva tributaries) discharge wastewater to the Neva River. In the course of long-term observations, it was noted that the microbiological parameters of the Neva water deteriorate significantly with the river flow from east to west. For example, in 2006, the index of TMC (total microbial count) was from 41 to 272 CFU/cm³ at the water intake

of water treatment plant located at the highest river course point from all the city water intakes (water intake of the Kolpino Water Treatment Plant), whereas at the water intake of the Main Water Treatment Plant, located below all other plants of the city, it varied from 100 to 3300 CFU/cm³ [13]. This statistical example also indicates demand for untreated wastewater discharges elimination.

4. Most water treatment plants of St. Petersburg apply a single-stage water treatment process.

A single-stage water treatment process assumes the combination of two basic technological processes: coagulation and filtration. Coagulation of contaminated substances occurred due to the hydrolysis of the coagulant (aluminum compounds) is carried out in a filtering media layer in the case of a single-stage process [14]. In this case, there are no clarifiers with large footprint, which enable initial basic sedimentation, in order to improve the water treatment quality [9]. The absence of clarifiers in the single-stage water treatment process leads to the inevitably increasing load on the existing filtration facilities, which in turn leads to the filter cycle duration reduction and an increase in the number of backwashes of the water treatment filters.

In the 1960s, such facilities allowed to obtain treated water that fully complied with requirements of effective regulatory documents under condition of 50% coagulation (only 50% of the water supplied to the city network was treated with a coagulant) [13].

At present, the sanitary and epidemiological services of Russia are upgrading existing standards and considering new sanitary and epidemiological rules for the quality of water in centralized portable water supply systems, since the requirements for physicochemical and microbiological indicators are increasing [15].

In order to provide the population with high-quality portable water, it is necessary to be sure in efficiency of applied water treatment technologies. Taking into account the fact that almost one half of the water treatment plants of the city use one-stage water treatment technology and that standards for portable water today are being tightened quality, it should be concluded that it is necessary to carry out system and complex modernization of water treatment facilities using close-cycle resource technology [4]. That is why the task of improving the quality of portable water is of particular importance not only in St. Petersburg itself, but also for the North-Western region as a whole, thus, acquiring a regional character, it must be actively addressed at the governmental level.

5. Lack of production capacities of water treatment plants in St. Petersburg.

Due to the tightening of treated water quality requirements, the water treatment technologies used must provide 100% chemical treatment of water at treatment plants [14]. This leads to a decrease in the filtration rate, an increase in the time and number of backwashes (the volume of wash-water increases), and therefore, a decrease in the amount of water supplied to the urban network. But, for today all these actions are the only possible way of supplying really high-quality and epidemiologically safe portable water [13].

In addition, over the past 10 years, there has been an increase in the population of St. Petersburg and, accordingly, the city population and developing enterprises demand for quality and uninterrupted supply of portable and technical water is increasing, thus

requiring the renovation of existing capacities of water treatment plants [16]. Figure 1 shows the population of St. Petersburg trend in 2001–2015.

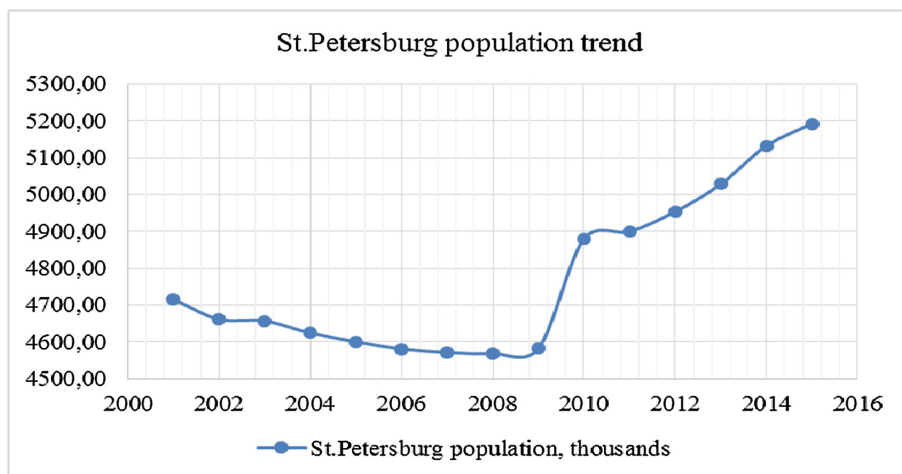


Fig. 1. St. Petersburg population trend.

After analyzing the change in St. Petersburg population according to the diagram, we can present the following data. Since 2009, there has been a positive trend in the city population. In 2015, 610 000 more people lived in St. Petersburg compared to 2009. This indicates that in the future, even more consumers will require high-quality water supply services, which will inevitably lead to the need to increase the capacity of water treatment plants.

- Existing water treatment facilities undergo significant obsolescence and physical deterioration.

The designing of waterworks in St. Petersburg with the use of technologies for treatment and disinfection of water began in the 1930s [14]. Since then, many different water treatment technologies have been implemented, depending on the quality of water source, portable water demand, and applied chemicals.

But all these innovations do not save the existing water treatment facilities from a critical condition requiring a comprehensive modernization. In case of changes in the quality of water in the Neva River - the main source of portable water supply in St. Petersburg (for example, in connection with the spring and autumn freshet period or storms on the Ladoga Lake), water treatment plants have to work in forced mode, which can cause emergency situations, thereby limiting the uninterrupted supply of portable water to the city consumers [1].

However, despite relatively stable quality of water in the water source, the city's water treatment plants perform water treatment, providing its quality normative indicators compliance with the requirements of SanPiN 2.1.4.1074-01 "Portable water. Hygienic requirements for water quality of centralized portable water supply systems. Quality control" [14]. Nevertheless, over time, the load on treatment plants increases

due to the growing demand for portable water, and the portable water quality standards remain the same, if not upgraded. As early as 10 years ago, tap water supplied to the network could be cleaned only by 50% from the total volume of water supply, whereas now 100% treatment of the portable water volume is required [13].

Therefore, the water supply system in St. Petersburg needs comprehensive modernization by creating new capacities for the production of portable water with the use of closed-cycle resource technology in order to stop pollution of the surrounding water basins and satisfy consumers with high-quality portable water that meets the regulatory requirements.

7. The need for a comprehensive accounting of environmental and economic factors in the implementation of long-term measures for the introduction of new capacities in the water supply system in the innovative development conditions.

Water bodies are the most important components of environment, a limited and vulnerable natural resource, without which it is impossible to ensure economic, social and environmental well-being of the population. The development of industry, housing construction, and urbanization of the regions' population - all these factors are the cause of environmental degradation [17].

The existing approach to the water treatment process in St. Petersburg does not fully meet the most important requirements of the sustainable development concept in the field of water use, and therefore requires early changes based on the introduction of innovative technologies for resources closed cycle. The backwash sludge formation issue adversely affects both the state of the environment and the efficiency of water supply companies, due to fees and penalties for negative impact on the environment [18].

Unfortunately, carrying out such complex measures as modernizing the water supply system of a large city requires huge investments [19]. In 2011, the Neva Water project was initiated within the framework of which a tender was announced for the modernization of the Northern Water Treatment Plant (one of the five largest water treatment plants in St. Petersburg) with an increase in its reduced capacity to 800 thousand m³/day (a new modern water treatment technology implementation). This project was planned for implementation through the public-private partnership approach. Capital expenditures for the initial construction in 2010 prices amounted to 8.082 million rubles. Due to the absence of the contest (that is, only one application went to the final), this project was not implemented [14].

4 Comprehensive Modernization of the City Water Supply System

Implementation of project on modernization of water supply system in major cities of Russia with the introduction of closed resource cycle, taking into account the above-mentioned specific features of this sphere and using the example of the St. Petersburg water supply system is the only possible solution in the innovative development conditions. The emphasis here is not on reconstruction of existing water supply facilities using the currently used water treatment technology, but namely on the introduction of a fundamentally new concept of closed resource cycle that allows the

water treatment facilities to be completely renewed, thereby comprehensively solving the problem of providing city consumers with quality water supply services and elimination of water body pollution with wastes from water treatment process [4].

Considered challenges of the water supply system of St. Petersburg can be solved only by taking into account application of closed-cycle resource technology, which will allow to take into account economic, social and environmental aspects simultaneously.

It is proposed to carry out comprehensive modernization of the water supply system of large cities using the concept of resources closed cycle, which aims to maximize the use of production wastes. This innovation will contribute to improvement of the environmental situation in the regions, by stopping the pollution of reservoirs with wastes from the water treatment process and will significantly ameliorate the quality of portable water, which, in turn, is a guarantee of epidemiological safety of the population. For resource-supplying enterprises fees for pollution of the environment will cease, which in turn will reduce the cost of the water treatment process due to reduction in costs according to the relevant article, which will increase the competitiveness of enterprises.

The forecast of the economic effect of the complex modernization of the water supply system through the example of the city of St. Petersburg will be presented as 70.98 million rubles per day, an average of almost 26 billion rubles a year. This shows the scale of the modernization effect for the water supply system in St. Petersburg with the use of closed-cycle resource technology and emphasizes the need for such measures on the territory of Russia to achieve a comprehensive national scale effect.

If closed-cycle resources method is applied in the water supply system of St. Petersburg as a whole, it will allow to get the result of a total capacity of 2.5 million m³/day for the system of water treatment plants (to date the total capacity is 2.3 million m³/day) [14]. This scale effect can be obtained only on the condition of targeted orientation of the activities of all parts of the water supply system – water treatment plants – to achieve the desired result. This is the goal of introducing a closed-cycle resource in the water supply system of St. Petersburg in innovative development conditions, where new advanced technologies which can achieve an economic, ecological and social effect in aggregate come to the fore.

This study showed that the use of closed-cycle technology in the water supply system of such a large city as St. Petersburg will achieve simultaneous social, environmental and economic benefits by improving the quality of water supply services, eliminating discharges of untreated backwash water into water bodies and reducing fees for negative impact on the environment [20, 21].

5 Summary

We can draw the following conclusion: in order for the water supply of large cities of Russia to meet the quality requirements in conditions of constantly growing anthropogenic pressure, a large-scale modernization of the water supply system, should be carried out today while taking into account the introduction of closed resource cycle.

The introduction of such an innovative water treatment technology will make the new production more efficient in the framework of a comprehensive improvement of

the economic, environmental and social effect, which will be obtained in the course of implementing the required measures in the innovative development conditions.

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Methodological Approaches to the Inclusion of Environmental Factors in Human Development Index

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Abstract. Human Development Index (HDI) is a widely known and used index of living standards and quality of life that is able to compare quality of life in different countries. HDI is an integrated index and it includes three base factors of human development: a long and healthy life, education, and revenue. Nowadays the ecological situation has a more lasting influence on quality of life. On the one hand, condition of ecology is the result of human activities, but on the other hand, human within the course of time is experiencing an increasing influence, as a rule this influence is negative, due to ecological situation changing. Consequently, it makes sense to develop the methodology of ecological factor including in HDI that will improve the HDI due to reflecting the quality of life in a full picture.

In the scientific environment the attempts have already been made to introduce the ecological factor in the HDI. Various approaches for ecological factor assessment have been studied in the articles of Ch. Togtokh, K. Danielyana, and Soshnikovoi L.A. The necessity of HDI modernization is obvious, the attempts to its modernization have been made, but there is no mutual agreement upon HDI modernization.

The objective of the article is in methodology development of ecological factor including in HDI, it will reflect the influence degree of environment contamination on quality of life.

The developed methodology by the authors based on the standard HDI formulae, i.e. the calculation of index as a geometric average of health, education and revenue, including the fourth cofactor, i.e. ecological factor (ecological index). The last-mentioned factor is based on the indicators that reflect the amount of emissions in the atmosphere from stationary and mobile pollution sources, and also the value of caught and decontaminated substances that contaminate the atmosphere. The developed methodology was applied for the calculation of the updated index of human development in the Russian Federation regions, especially in those regions where the enterprises of ferrous metallurgy are located, that allowed to use the most adequate assessment of the quality of level in these regions.

Keywords: Human development index · Ecological factor

1 Introduction

The relevance of the study is stipulated by the assessment necessity of living standards as one of the most important indicator of country's social-economical development, and also for the determination of economical and social development in each region of the Russian Federation.

Human Development Index is an integrated indicator that allows us to compare inter-country and interregional living standards. It is an aggregative composite index that determines a summary measure of country's achievements by three basics dimensions of human development that are the following: a long and healthy life, being knowledgeable and have a decent standard of living [1].

Ecological pollution and depletion of natural resources have a significant influence on life expectancy, and it forces us to take a fresh look on standard living indicators.

That is why the necessity of the theoretical study of interrelation the ecological development of the country and constituents of living standard predetermine the relevance of the presented research and its practical significance.

The objective of the research is to develop the methodology of including ecological (ecological) factor in HDI that adequately reflects the extent to which ecological pollution affects the quality of life.

To achieve the presented objective, it was necessary to solve the following tasks:

- (1) to analyze the current methodologies of including ecological (ecological) factor in HDI;
- (2) to develop an ecological index that reflects the amount of emissions of pollutants into the atmosphere from stationary and mobile sources, and also the value of captured and neutralized pollutants that contaminate the atmosphere;
- (3) to conduct an integrated assessment of living standards in the Russian Federation regions using the modernized index in HDI, in those regions where one can find lots of ferrous metallurgy enterprises.

2 HDI as an Integrated Indicator of Living Standards

2.1 Scientific Development Current State of the Research Problem

Please note that the first paragraph of a section or subsection is not indented. The first Ecological deterioration has defined the presentation of scientific researches upon the assessment of living standards taking into account ecological and economical indicators [2–4]. Including ecological factor in HDI was suggested by a number of authors. Mongolian scientist Chulun Togtokh added in HDI the forth index that reflects the ecological condition. The indicator characterizing the ecological component is carbon dioxide emissions per capita [5]. Bogdan calculates the additional ecological index by the determination principle of profitability in HDI structure on the assessment base of economic damage from the incident of disease caused by ecological pollution [6]. Ryumina E.V. calculates the ecological conditions of life index as an arithmetical mean value of water and air indices. For the indices calculation there were used the values of

proportions of samples that exceeded the maximum permissible concentration in the total number of samples [7, 8].

Including an integrated ecological factor to the overall HDI was suggested by Professor Danielian [9]. The integrated indicator is defined as an arithmetical mean value of the two components: the indicator of the region ecological state and human activity ecological state. The indicators of the region ecological state are indicators of air basin state, water and land resources; the indicators of human activity are investment in ecology, cleaning the emissions into the atmosphere and so on. A large set of components make it difficult to calculate the integral indicator.

A number of authors suggest modification of the one component of HDI for the ecological component. The example of it is the approach of Poleshchuk, proposing modification of GDP for the ecological index [10]. However, the lack of official statistics upon a number of values of this methodology leads to assumptions and reservations in the calculations.

2.2 Methodology of Calculation for the Ecological Well-Being Index

Despite the great interest to the introduced research the problem of selecting the ecological values and methodology of their calculation is still in discussion. During working on an ecological index there is a necessity in selecting statistical parameters, transformation of the values into comparable form, aggregation of received variables. The important criteria of selecting parameters are their informational value and availability. The ranking of countries and regions for the living standards monitoring is better to conduct basing on official statistics data.

The suggested methodology is based on the standard HDI formula – indicator calculation as an arithmetic mean value of health, education and income indices [11], that includes the fourth multiplier taking into account ecological factor (ecological index).

Traditionally HDI is calculated upon the following formula:

$$\text{HDI} = \sqrt[3]{I_{LE} \times I_E \times I_I}, \quad (1)$$

where

I_{LE} – Life Expectancy Index;

I_E – Education Index;

I_I – Income Index.

The value of this index fluctuates within the scope from 0 till 1. If the HDI value approaches 1, so the human potential development is much higher in a country or a region.

Input data for the calculation of ecological component for human development index in this methodology were the indicators of the amounts of air polluting components and specific gravity of trapped and rendered harmless substances.

Sources of air pollutants can be both stationary and movable. Depending on the purpose of the research, it is better to take them both together and separately. An integrated recording of countries' ecological well-being and individual regions implies

the including of all sources of air pollutants into the calculation. If it is necessary to assess the activity of traffic flows or the damage to the ecological of the region (country) from industrial enterprises, it is better to take into account only movable or stationary sources in the calculation.

Ecological component of HDI is calculated upon the following formula:

$$I_{EWB} = \sqrt{I_{AP} \times I_{TRH}}, \quad (2)$$

where

I_{EWB} – Index of Ecological Well-Being;

I_{AP} – Index of Air Pollutants;

I_{TRH} – Index of trapped and rendered harmless substances.

Index of Air Pollutants is calculated upon the following formula:

$$I_{AP} = \frac{\overline{AP_{max}} - \overline{AP_{min}}}{\overline{AP_{max}} - \overline{AP_{AQ}}}, \quad (3)$$

where

$\overline{AP_{max}}$ – maximum quantity of air pollutants (thousand per 1 km²)

$\overline{AP_{min}}$ – minimum quantity of air pollutants (thousand per 1 km²)

$\overline{AP_{AQ}}$ – actual quantity of air pollutants in a concrete region (country) (thousand per 1 km²)

In order to determine the appropriate assessment of pollution amount for any territory in the index calculation one should take spec. gravity of air pollutants per 1 km². The index volume of trapped and rendered harmless substances, polluting the atmosphere:

$$I_{TRH} = \frac{AP_{TRH}}{AP_{AQ}}, \quad (4)$$

where

AP_{TRH} – quantity of trapped and rendered harmless substances, polluting the atmosphere, thousand tons.

AP_{AQ} – actual quantity of air pollutants in a concrete region (country), thousand tons.

HDI including ecological factor (index of ecological well-being) will be the following:

$$HDI_{EWB} = \sqrt[3]{I_{LE} \times I_E \times I_I \times I_{EWB}} \quad (5)$$

2.3 Evaluation of HDI Aggregates: Indices of Life Expectancy, Education, Income and Index of Ecological Well-Being

In the process of the presented research, the HDI was calculated in the traditional calculus and taking into account the ecological factor for 2010–2016 years. As objects of the presented regions of the Russian Federation were elected, where the largest centers of ferrous metallurgy are concentrated, Lipetsk region (PJSC NLMK - Novolipetsk Steel), Vologda region (PAO SEVERSTAL - Cherepovets metallurgical plant), Chelyabinsk region (PJSC MMK – Iron and Steel Works).

Here we introduce the initial data and the result of calculations of the traditional elements of HDI.

To calculate life expectancy index (I_{LE}), it is necessary to know the expected life expectancy in each of the elected regions of the Russian Federation (Table 1).

Table 1. The expected life expectancy in each region in 2010–2016 years.

Year	Lipetsk region	Vologda region	Chelyabinsk region
2010	68,59	67,08	68,41
2011	69,87	68,36	68,79
2012	70,03	69,21	68,97
2013	70,66	69,35	69,52
2014	70,6	69,74	69,71
2015	71,07	70,4	69,90
2016	71,62	70,24	70,50

Reference: composed according to Rosstat statistic centre [12].

According to the official statistics the highest expected life expectancy during the analyzed period was in Lipetsk region in 2016 – 71,62: the average expected life expectancy in this region exceeds for 1,38 years similar indicator in Vologda region, and for 1,12 years in Chelyabinsk region. The lowest is 67,08 years in 2010 in Vologda region.

Consequently, the value of the life expectancy index will be the highest in the Lipetsk region (Table 2).

Table 2. Index of expected life expectancy in each region in 2010–2016 years.

Year	Lipetsk region	Vologda region	Chelyabinsk region
2010	0,7688	0,7449	0,7660
2011	0,7891	0,7652	0,7720
2012	0,7916	0,7786	0,7748
2013	0,8016	0,7809	0,7835
2014	0,8006	0,7870	0,7866
2015	0,8081	0,7975	0,7896
2016	0,8168	0,7949	0,7991

Reference: composed according to Rosstat statistic centre [12].

As a result of the abovementioned calculations it was figured out that index of expected life expectancy fluctuated in the range from 0,7449 to 0,8168.

The next component of the HDI is the education index. It includes 2 indices – average duration of education and expected duration of education. There are no statistics researches in this field on the regional level, so index is going to be the same for each region (Table 3).

Table 3. Educational index in 2010–2016 years.

Year	Average duration of education, in years	Index of the average duration of education	Expected duration of education	Index of expected duration of education	Education index
2010	9,4	0,7121	15,7	0,7621	0,7747
2011	9,5	0,7197	15,7	0,7621	0,7788
2012	9,5	0,7197	15,8	0,7670	0,7812
2013	9,5	0,7197	15,7	0,7621	0,7788
2014	9,6	0,7273	15,7	0,7621	0,7829
2015	9,6	0,7273	15,7	0,7621	0,7829
2016	9,6	0,7273	15,7	0,7621	0,7829

Reference: composed according to statistics book of National Research University “Higher School of Economics” [13].

Average duration of education has increased from 9,4 years in 2010 to 9,6 years in 2016. The expected duration of education has not been changed and was on the level 15,7 years. Education index was characterized by a low volatility index and was on the level 0,78.

The third component of HDI is income index that it based on gross national income per capita upon Purchasing Power Parity (PPP) in USD. Gross region product (GRP) and population size were the base for the calculation (see Table 4).

Table 4. Gross regional product and population size in regions in 2010–2016 years.

Year	Lipetsk region		Vologda region		Chelyabinsk region	
	GRP, bln. rub.	Population size, thousand people	GRP, bln. rub.	Population size, thousand people	GRP, bln.rub.	Population size, thousand people
2010	248,55	1177	262,43	1208,4	652,87	3481,818
2011	287,82	1172	323,07	1201,2	774,40	3475,634
2012	293,30	1165,9	355,29	1198,5	841,97	3480,142
2013	315,69	1162,2	346,23	1196,2	882,34	3485,272
2014	398,46	1159,9	387,21	1193,4	993,90	3490,053
2015	448,99	1157,9	478,89	1191,0	1209,24	3497,274
2016	470,24	1156,1	486,21	1187,7	1260,72	3500,716

Reference: composed according to Central base of statistics data of Rosstat [12].

If one can judge only by absolute indicators, the volume of manufactured goods is 3 times larger than in Lipetsk and Vologda regions. This is also due to population size in Chelyabinsk region is higher than in two other regions.

Gross regional income upon Purchasing Power Parity was calculated taking into account unit weight of gross national income (GNI) from GDP off the whole country and the relation between GDP and GDP upon PPP. The final results you can see in the Table 5.

Table 5. Income index in region in 2010–2016 years.

Year	Lipetsk region		Vologda region		Chelyabinsk region	
	GRP upon PPP per capita, thousands, USD	Income index	GRP upon PPP per capita, thousands, USD	Income index	GRP upon PPP per capita, thousands, USD	Income Index
2010	12,49	0,4931	12,85	0,4963	11,09	0,4796
2011	13,74	0,5039	15,05	0,5142	12,47	0,4928
2012	13,21	0,4994	15,56	0,5180	12,70	0,4949
2013	13,50	0,5019	14,38	0,5091	12,58	0,4939
2014	15,62	0,5184	14,75	0,5119	12,95	0,4971
2015	15,69	0,5189	16,27	0,5230	13,99	0,5059
2016	17,15	0,5291	17,26	0,5298	15,19	0,5152

Reference: composed according to Central base of statistics data of Rosstat [14–16].

During calculation of relative index – GNI upon PPP per capita in thousands USD – Chelyabinsk region appeared to be on the last place during the analyzed period. Its GNI upon PPP increased from 11,09 to 15,19 thousands USD per capita, while as the similar indicator in Lipetsk region changed from 12,49 to 17,15 thousands USD per capita, and in Vologda region from 12,85 to 17,26. Consequently, Vologda region has shown the highest income index in 2016 year – 0,5298, further Lipetsk region – 0,5291. The last place is for the Ural region – its highest income index was equaled to 0,5251.

Standard human development index, it was calculated on the basis of the above-mentioned indices, is indicated in the Table 6.

Table 6. Human development index in regions in 2010–2016.

Year	Lipetsk region	Vologda region	Chelyabinsk region
2010	0,6647	0,6591	0,6577
2011	0,6765	0,6742	0,6667
2012	0,6759	0,6805	0,6691
2013	0,6792	0,6765	0,6704
2014	0,6875	0,6807	0,6739
2015	0,6898	0,6886	0,6788
2016	0,6968	0,6908	0,6856

As you can see, the results of calculation of HDI of analyzed regions differ slightly. In analyzed period Lipetsk region has shown the best indicators of HDI. Chelyabinsk region vice versa turned out to be an outsider. However all three regions are characterized by the upward trend.

Now we are going to calculate the modified human development index that considers ecological index and we will define how this index will characterize living standards in these regions.

The amount of pollutants from stationary sources of pollution and the square of the concrete region were used in order to calculate the index volume of air pollutants into the atmosphere. Statistical population from all Russian Federation regions was used in order to determine maximum and minimum pollutants volumes. Minimum value of pollutants volumes was in the Republic of Kalmykia (0,035305 thousands/km²) and the maximum value was in the city with federal status in Saint Petersburg (125,5493 thousands/km²). The data concerning the volume of trapped and rendered harmless substances from stationary sources were used in order to calculate the index volume of trapped and rendered harmless substances. Basic data is indicated in Table 7.

Table 7. Basic data.

Year	Lipetsk region			Vologda region			Chelyabinsk region		
	Square, thousand km ²	Volume of air pollutants from stationary sources of pollutants, thousand tons	Trapped and rendered harmless substances thousand tins	Square, thousand km ²	Volume of air pollutants from stationary sources of pollutants, thousand tons	Trapped and rendered harmless substances thousand tins	Square, thousand km ²	Volume of air pollutants from stationary sources of pollutants, thousand tons	Trapped and rendered harmless substances thousand tins
2010	24,0	1501,78	1134,15	144,5	2247,00	1773,00	88,5	5443,50	4694,65
2012		1544,46	1199,55		2078,00	1609,00		4582,10	3888,29
2013		1757,02	1418,28		2036,00	1562,00		4550,60	3872,61
2014		1699,52	1352,84		1746,64	1247,49		4460,77	3794,06
2015		1821,71	1511,81		1601,85	1190,02		4095,55	3442,14
2016		1823,53	1495,84		1787,10	1325,86		3763,24	3136,36

Reference: composed according to data [17–20].

Chelyabinsk region is characterized by the highest volume of polluting substances. However it's necessary to point out that polluting substances volume has decreased steadily: for the period under the study their value has decreased for 30,87% (from 5.443,5 thousand tons to 3.763,2 thousand tins). The similar situation was in Vologda region, the polluting substances volume has decreased from 2.247,0 thousand tons to 1.787,1 thousand tons. Lipetsk region has demonstrated a negative result, polluting substances volume has increased for 21,42%: from 1.501,8 thousand tons in 2010 to 1.823,5 thousand tons in 2016.

The meanings of indices that are the base for the calculation of ecological indicator and ecological well-being are indicated in the Table 8.

Table 8. Index of ecological well-being in regions in 2010–2016 years.

Year	Lipetsk region			Vologda region			Chelyabinsk region		
	Index of volume of air polluting substances	Index of volume of trapped and rendered harmless substances	Index of ecological well-being	Index of volume of air polluting substances	Index of volume of trapped and rendered harmless substances	Index of ecological well-being	Index of volume of air polluting substances	Index of volume of trapped and rendered harmless substances	Index of ecological well-being
2010	0,5017	0,7552	0,6156	0,8764	0,7891	0,8316	0,5102	0,8624	0,6634
2012	0,4876	0,7767	0,6154	0,8857	0,7743	0,8281	0,5878	0,8486	0,7062
2013	0,4170	0,8072	0,5802	0,8880	0,7672	0,8254	0,5906	0,8510	0,7090
2014	0,4361	0,7960	0,5892	0,9040	0,7142	0,8035	0,5987	0,8505	0,7136
2015	0,3955	0,8299	0,5729	0,9120	0,7429	0,8231	0,6316	0,8405	0,7286
2016	0,3949	0,8203	0,5692	0,9017	0,7419	0,8179	0,6615	0,8334	0,7425

Reference: composed according to data [17–20].

Lipetsk region is characterized by the lowest meaning of ecological meaning (0,5692 in 2016) due to its small square – as a result emission concentration on this region is the highest. The best results are in Vologda region and Chelyabinsk region – 0,8179 and 0,8334 respectively.

In Table 9 you can see the calculations of modified HDI with ecological well-being index including.

Table 9. HDI including ecological well-being in region in 2010–2016 years.

Year	Lipetsk region	Vologda region	Chelyabinsk region
2010	0,6520	0,6986	0,6591
2011	0,6607	0,7098	0,6763
2012	0,6506	0,7141	0,6789
2013	0,6555	0,7062	0,6810
2014	0,6569	0,7138	0,6872
2015	0,6575	0,7189	0,6942
2016	0,6666	0,7218	0,6993

The forth factor of HDI has changed the regions positions. The best satisfactory region turned out to be Vologda region, than Chelyabinsk region and the last place was for Lipetsk region.

2.4 Comparative Test of Classical HDI and HDI Including Ecological Component

In Table 10 you can find comparative test of HDI changing.

In Lipetsk region the HDI has decreased with ecological index including. Two other regions have improved HDI meaning due to ecological factor in HDI including. Consequently, ratings of regions have been changed during the move from traditional index to ecological one.

Table 10. Comparative test of traditional HDI and HDI including ecological well-being component in regions in 2010–2016.

Year	Lipetsk region			Vologda region			Chelyabinsk region		
	HDI	HDI _{EWB}	Δ , %	HDI	HDI _{EWB}	Δ , %	HDI	HDI _{EWB}	Δ , %
2010	0,6647	0,6520	−1,90	0,6591	0,6986	5,98	0,6577	0,6591	0,21
2011	0,6765	0,6607	−2,34	0,6742	0,7098	5,28	0,6667	0,6763	1,45
2012	0,6759	0,6506	−3,75	0,6805	0,7141	4,94	0,6691	0,6789	1,46
2013	0,6792	0,6555	−3,49	0,6765	0,7062	4,40	0,6704	0,6810	1,57
2014	0,6875	0,6569	−4,46	0,6807	0,7138	4,86	0,6739	0,6872	1,97
2015	0,6898	0,6575	−4,69	0,6886	0,7189	4,40	0,6788	0,6942	2,27
2016	0,6968	0,6666	−4,33	0,6908	0,7218	4,49	0,6856	0,6993	2,00

3 Conclusions

1. Ecological conditions, state of environment are indicators of living standards. For the assessment of living standards it's necessary to apply modified human development index that includes ecological factor.
2. Calculation of human development index for the Russian Federation regions, where one can find lots of ferrous metallurgy enterprises, has changed fundamentally the positions of the regions. Including ecological factor in HDI changes rating of regions that do not pay enough attention to ecological development.

The suggested methodology of including ecological factor in HDI can be used for monitoring of economic and ecological development of every territory, and also as a criterion of effectiveness of regional governance.

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Behavioral Engineering Model to Identify Risks of Losses in the Construction Industry

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Abstract. An important aspect of risk assessment in construction is the development of a method by which the results of a risk analysis can be converted into recommendations for the admissibility of complex systemic risk. And also the degree of expediency of taking measures, the safety, necessary to reduce this risk in the construction industry. The Behavioral Engineering Model (BEM) developed by Gilbert provides us with a way to systematically and systemically identify barriers to individual and organizational performance. The BEM distinguishes between a person's repertory of behavior (what the individual brings to the performance equation) and the environmental supports (the work environment factors that encourage or impede performance). By means of the Gilbert model this article will consider the risk criteria, determine the most significant risks of losses in the construction industry, and give suggestions on their minimization and elimination. In essence, the risk assessment is used to determine the measures that need to be taken to control the management or completely eliminate the risks that arise as a consequence of hazards. Qualitatively conducted engineering risk assessment and implementation of measures to prevent and minimize risks at the enterprise allows to reduce the probability of occurrence of dangerous events, thereby increasing security, and to reduce unprofitability. Engineering risk assessment can become one of the key links in the formation of the enterprise's risk management system in construction.

Keywords: Behavior engineering model · Gilbert model · Risks of losses · Risk management · Risk assessment · Teaching risk management · Construction industry

1 Introduction

Systems for risk management aim to minimize exposure to risk by lowering the probability that losses occur and by mitigating the severity of any losses that actually occur. Risk management involves assessing risks through identifying, analyzing, and prioritizing risks and controlling risks through planning, resolution, and monitoring actions [1]. Minimizing risks promotes fiscal responsibility, budget control, and on-time delivery. Losses in the construction industry occur for many reasons. However, injuries and illnesses account for significant losses in the construction sector [8, 10].

A recent review of peer-reviewed literature published in Russia concluded that:

“The occupational safety system in Russia has severely deteriorated in the last 2 decades, with legislators tending to promote the interests of industry and business, resulting in the neglect of occupational safety and violation of workers’ rights. The majority of workers are employed in conditions that do not meet rules of safety and hygiene. More than 60% of OAs [occupational accidents] can be attributed to management practices, violation of safety regulations, poor organization of work, deficiency of certified occupational safety specialists and inadequate personnel training. Research aimed at improving occupational safety and health is underfunded. There is evidence of widespread under-reporting of OAs, including fatal accidents. Three federal agencies are responsible for OAs recording; their data differ from each other as they use different methodologies. The rate of fatal OAs in Russia was 3–6 times higher than in Scandinavian countries and about 2 times higher compared to United States and Canada” [2].

Although the rate of occupational injuries per 1,000 workers in the Russian construction industry declined between 2004 and 2010, the injury rate for the construction sector was exceeded only by rates in agriculture and mining. However, fatalities per 1,000 workers between 2004 and 2010 were higher in construction than any other major industry for all but one year. Higher incidence and severity of construction injuries are evident specially in Russia’s Arctic regions, presumably owing to the risks compounded by complex and difficult interactions among workers, equipment, and physical geography in cold and remote environments [2, 7, 8].

In this paper, we review briefly the construction sector in the Russian economy, highlighting the significance of losses due to occupational accidents in the country’s construction industry. Then, we outline potential for use of a Behavioral Engineering Model (BEM), originally developed by Gilbert [3], to identify losses due to occupational accidents and injuries in Russia’s construction industry. And, last, the applicability of the BEM to identify risks of losses in the construction industry is discussed and considered within the scope of the field of injury epidemiology.

2 Background: The Construction Sector in the Russian Economy

The construction industry is an important sector in many economies in the world because it sets the pace for economic development. The performance of the construction sector in most countries, however, is sensitive to changes and events in the world economy. In 2016, the Chinese construction industry comprised the highest share of gross domestic product (GDP) (7%) of any world economy, with the construction industries in the United States, Turkey, and the United Kingdom providing greater than 5% of GDP in their respective countries [4].

The share of construction in the Russian economy is less than 3% of GDP. The Russian economy as a whole is characterized by a decrease in investment activity due to an outflow of foreign capital, as well as by a reduction in investments by domestic financial organizations. A high level of inflation has led to relatively high interest rates for loans, rates so high that they imperil the profitability of construction projects.

The construction industry in Russia is capital-intensive, contains a large number of jobs, and creates a product that serves the basic needs of society with housing, urban infrastructure, roads, and other structures. Therefore, the construction sector's scientific and technical prowess and production potential contribute to optimal technological solutions and innovative technical developments, which affect the efficiency of the entire economy as a whole [7].

Yet, the Russian construction industry is heterogeneous, complex, and composed of a variety of organizations, enterprises, and labor organizations. This variation within the industry leads to fragmentation and difficulty with coordination, also. In such an environment, strategic action is necessary to reduce losses due to injuries and fatalities in construction industry activity [8, 10].

In the next section of this paper, we describe the structure and components of Gilbert's BEM.

3 Gilbert's Behavioral Engineering Model

3.1 Structure of the Behavioral Engineering Model (BEM)

In 1978, the late Thomas Gilbert published *Human Competence: Engineering Worthy Performance* [3] that included the first specification of the BEM, a model which has become the foundation for the field of practice called Human Performance Improvement Technology. This field of practice uses principles of behavioral psychology to identify and analyze components of human behavior that is directed toward attaining worthy accomplishments and, then, applies principles of instructional systems design to affect the improvement of human performance to attain worthy accomplishments.

The BEM is engineering, not science. Gilbert described the BEM as an engineering approach because its aim is to solve practical problems within fixed time and cost constraints. The BEM is not a scientific, academic approach in which one, best, generalizable answer is sought independent of time constraints.

As portrayed in the six-celled, two-by-three matrix in Fig. 1, performance in the BEM is considered to be the product of the interaction between the personal characteristics of an individual (i.e., in behavioral terms, the "repertoire" of the individual) and the environment in which behaviors occur. Both the individual and the environment are affected by conditions of information, instrumentation, and motivation related to the individual and the environment. More specifically, data, instruments, and incentives are factors that condition, respectively, the information, instruments, and motivation evident in the environment. And, knowledge, capacity, and motives are factors that condition the information, instruments, and motivation affecting the individual.

Information	Instrumentation	Motivation
<i>Data</i>	<i>Instruments</i>	<i>Incentives</i>
<p>Does the individual know what is expected of them?</p> <p>Do people know how well they are performing?</p> <p>Are people given guidance about their performance?</p>	<p>Do people have right tools for performance?</p> <p>Are tools and materials designed to match the human factors of performance?</p>	<p>Are adequate financial incentives that are contingent upon performance available?</p> <p>Are nonmonetary incentives available?</p> <p>Are career development opportunities available?</p>
<i>Knowledge</i>	<i>Capacity</i>	<i>Motives</i>
<p>Do people have the skills and knowledge needed to perform as expected?</p> <p>Is well-designed training that matches requirements of performance available?</p>	<p>Is performance scheduled for times when people are at their best?</p> <p>Do people have the attitude and physical ability to perform the job?</p>	<p>Has a motivation assessment been performed?</p> <p>Are people willing to work for the incentives?</p> <p>Are people recruited to match the realities of the job?</p>

Fig. 1. Gilbert's Behavioral Engineering Model showing conditions that affect the performance of individuals who interact with the environment.

3.2 Analytical Uses of the BEM for Performance Improvement

Exemplified by the questions listed in the six cells of Fig. 1 are the potential analytical uses of the BEM. All six intersections of environment/individual conditions for performance are important and are required for and performance to occur. Analysis of information about each of the cells in Fig. 1 can reveal aspects of deficiencies that affect performance. Performance improvement involves, however, influencing the conditions that afford the greatest leverage for attaining worthy performance.

Within the character of the engineering approach taken in the BEM, improvement strategies are preferred that can provide the greatest performance improvement with the lowest cost, not necessarily the strategies that have reached a high level of scientifically verifiability. Scientific approaches to problems emphasize development of knowledge that is found to be generalizable over large classes of people, a diversity of places, and over time [9]. For instance, the validity of lawful relationships implied by equations in physics does not depend on who applies the equations and where or when the equations are applied. However, engineering solutions are, by their nature, local, tailored to specific needs and conditions, and are applications of scientific principles and realities.

For example, the Rainbow Bridge that spans the Niagara River at Niagara Falls deals with different geologies, supply chain, climate, or conditions of use than, say, the Alexander Nevsky Bridge that crosses the Neva in St. Petersburg. The same science governs both bridge projects, but making these two bridges work effectively and safely in their unique environments, within budget, and when needed represent two distinct engineering solutions.

Many analysts believe that improvements to environmental conditions generally offer good leverage for performance improvement [9]. Cost-effective changes include providing clear expectations for performance and feedback on performance, ensuring the right tools for the job, and establishing appropriate rewards and recognition for performance. Directly influencing the qualities of an individual to improve performance is inherently more costly and difficult due to the wide variations among individual performers. The capacity and motives for individual behavior are conditions that might be best tailored for performance when performers are recruited and selected. Interventions designed to improve performance might represent a least cost-effective implementation once after performers already have been selected.

In the next section of this paper, we extend the BEM to application to identify losses in the Russian construction industry.

4 Applicability of the BEM to Identify Risks of Losses in the Construction Industry

Much can be learned about identifying and preventing losses that occur as a result of injuries in the construction industry by applying an epidemiological approach. Epidemiology is a branch of science that examines the nature, causes, and consequences of disease states. Epidemiological principles and techniques, initially applied in the scientific investigation of infectious diseases, have been adapted to identify risks of injury and to prevent injury [5, 26].

In the epidemiology of disease, a host acquires a disease from an infectious agent delivered by a vehicle or vector. For instance, a human host might acquire malaria (the agent) delivered during a blood feeding by an *Anopheles* mosquito (the vehicle/vector). Prevention strategies, then, can include: separating the host from the vector (e.g., installing mosquito netting, moving potential hosts to higher altitudes where mosquitos do not breed); modifying the host to reduce the susceptibility to the agent (e.g., taking anti-malarial medication); removing the vector (e.g., eliminating the mosquito population); or reducing the virulence of the agent (e.g., making modifications to genetic factors in sporozoan parasites so that they cannot multiply in the host's liver and emerge later to invade red blood cells to eventually cause vital organ dysfunction).

An epidemiological model is applicable in identifying the risk of and preventing occupational injuries. The core concepts of this model include the host (the person injured), the agent of energy that injures the host, the vehicle that brings the agent to the host, as well as environmental factors that affect the probability of agent-host interaction. Agents involved in human injuries include various forms of energy—kinetic, mechanical, thermal, chemical, electrical, ionizing radiation—or too little energy, as in the case of asphyxiation. For instance, a driver (host), with a high blood alcohol level

(increasing the probability of driving incompetence), loses control of the speed and direction of a cement delivery truck (vehicle) on a slick road and hits a tree directly at 30 km/hr, converting so much kinetic energy (agent) during rapid deceleration that sufficient force is applied to cause blunt trauma to the driver or collision of the driver with components in the truck's cab.

In many ways, results from analysis of injury risks using the BEM are similar to those obtained through epidemiological analysis. The questions exemplified in the six-celled BEM matrix shown in Fig. 1 could result in loss prevention strategies that effectively separate or mitigate the confluence of the host/agent/vehicle/vector constellation to result in an injury. However, a BEM analysis goes beyond an epidemiological approach by answering deep contextual questions that drive to the core of causality of occupational injuries and, therefore, provide a better way to identify and reduce specific risks of occupational injury in the construction industry.

A mix of epidemiological and BEM approaches has proved successful in reducing losses due to occupation injuries in industries other than construction. There is no reason why these same approaches cannot identify and reduce losses in the construction industry. During a USA project to reduce injuries in underground coal mining [6], for many years the most unsafe industry in the USA, researchers, first, analyzed data on the entire population of underground coal mine injuries. This classic epidemiological approach identified situations at the macro-level that represented the highest incidence, most severe, and most costly injury scenarios. Then, analysis turned to more intensive BEM analyses of almost one dozen situations that represented a cluster of the highly frequent, severe, and costly underground coal mine injuries. These intensive analyses were implemented in varied underground mining locations, coal extraction technologies, and coal site geologies and focused on understanding the types of individual/environment interactions exemplified in Fig. 1. The result was a set of recommendations that were meant to improve underground coal mine safety. Only a few of these recommendations dealt with training or re-training coal miners. Rather, most recommendations focused on work site and equipment improvements as well as on changes in work rules.

5 Conclusion

Increase safety, reduce the likelihood of hazardous events and reduce unprofitability allows a qualitative assessment of engineering risk and the implementation of measures to prevent and minimize risks in the enterprise.

The risk assessment can be performed at the Customer's request in respect of property, construction and installation objects, breaks in production activities (receipt of rental payments, deferment of commissioning) associated with damage or destruction of property, liability for causing damage to third parties. Engineering risk assessment allows: to identify and assess the risks of the enterprise; evaluate the effectiveness of protective measures; determine possible maximum losses; to develop measures aimed at minimizing existing risks; using the "outside view" to assess the state of property and means of production; optimize insurance coverage.

An assessment of engineering risk may be one of the key links in the formation of the enterprise's risk management system in construction. Risk assessment can be performed at the request of the client in respect of real estate, construction and installation, interruptions in production activities related to damage or destruction of property, liability for causing damage to third parties.

Assessment of engineering risk allows: to determine and assess the risks of the enterprise; to assess the effectiveness of defense.

Gilbert's BEM, accompanied by standard epidemiological analysis, has promise for identifying the relatively high losses experience in the Russian construction industry due to occupational injuries.

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Sustainability Risk Management: The Case for Using Interactive Methodologies for Teaching, Training and Practice in Environmental Engineering and Other Fields

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Abstract. Improving the quality of life and the world we live in for our posterity and ourselves is both a goal and a responsibility of engineers the world over. Forces and factors such as population growth, urbanization, technological advances and climate change pose challenges to conventional wisdom and practices for growth and development of enterprises, communities and states. While engineers typically employ risk management strategies as a routine component of projects, the complex and dynamic interrelationships between the natural environment and the human impact on it call for greater attention to risks and their management not only in discreet projects, but across the larger domains of enterprises and the communities in which they operate. Engineers and management officials in business and government can benefit from familiarity with globally tested methodologies of sustainability risk management (SRM) so that they can apply these principles and techniques to the businesses and social systems they interact with and manage. This paper will (i) put forth SRM as a recognized discipline, describing techniques for identifying and managing various categories of risk and (ii) provide illustrations of and theoretical support for interactive teaching techniques which enhance the development of insights and skills for engineers, risk managers, community leaders, and others. This paper will build upon and advance the concepts and methods introduced in a paper by these authors, Interactive Teaching of Risk Management in the Russian Construction Industry. These interactive pedagogical techniques can be effective in either academic settings or within professional training programs.

Keywords: Project management · Interactive teaching · Risk management · Risk assessment · Teaching risk management · Experiential learning · Environmental engineering

1 Introduction

The discipline of “Enterprise Risk Management” evolved and matured in the late 20th and early 21st centuries as a fundamental element of prudential strategic business planning. Led by seminal thinkers in the industrial and insurance sectors, and accelerated by preventable and widely-publicized catastrophes, from the Space Shuttle Challenger disaster to Chernobyl to the sub-prime mortgage crisis, leadership of both private and public enterprises embraced and refined both the qualitative and quantitative processes of identifying, assessing and mitigating risk [1].

During the same period, an intellectual phenomenon of broader scope was emerging that linked a spreading cognizance of environmental degradation, global climate change, and the complex interconnections between biological, chemical and financial systems and processes. Overlaying this scientific and public policy “awakening” during this era were pressures from human rights, labor and political forces bringing to light—and, in some countries, into law—new understandings of social justice, in areas from worker health and safety to sexual orientation and racial equality. The term “Sustainability Risk Management” has been applied in both the business and public policy contexts to this systematic integration of “traditional” enterprise risk management with environmental [8] and socioeconomic policies promoting sustainable resource management, a healthy eco-system and an ethical social justice landscape [2].

Running any enterprise, whether a business or a political entity, where sustainability is one of the core governance principles, requires acculturation throughout the leadership and management structure of scientifically and ethically sound decision-making, based on data and analytics that withstand robust peer review, experimentation and application in real-world situations. Nowhere is this kind of discipline more critical than in the field of engineering. The engineering profession services industries and undertakings that have profound potential to promote sustainability, or to further compromise it, in areas as diverse as toxic chemicals, management of water resources and hydro-power, the petroleum industry, heavy construction or nuclear power [10, 13, 17].

The authors maintain that the acculturation of values such as sustainability risk management that are critical to responsibly performing the duties of a profession like engineering, requires consciously-designed learning methodologies, just as one would design a teaching module on the principles of fluid mechanics. In each of these fields of study, cognitive science points us to the effectiveness of experiential learning.

2 Case Study and Hypothetical

Please read the following case study (newspaper article) and hypothetical problem (memorandum) with its memorandum and four short assignments. To simulate the experience of an interactive lesson, please undertake at least one of the four assignments briefly, making notes of your responses.

2.1 Fact Situation (Actual Events): Chinese Man Sues Hometown Over Air Pollution

A resident in a polluted city in northern China has become the first person in China to launch a case against the local government over high levels of pollution. He is also seeking compensation for those affected by the smog. The local environmental authorities should “perform their duties to control air pollution according to the law,” believes Li Guixin, a resident in Shijiazhuang, the capital of north China’s Hebei province.

He wrote the complaint to a district court, demanding the Shijiazhuang Municipal Environmental Protection Bureau “to ease the pollution, to pay the plaintiff 10,000 yuan (US\$1,600) for economic losses.” Li Guixin is also demanding compensation for Shijiazhuang residents who suffered from extreme pollution. “The reason that I’m proposing compensation is to let every citizen see that amid this haze, we’re the real victims,” Li said, as quoted by the newspaper. According to Li, he began suffering from pollution since December, 2013 (when the smog was extremely choking across Northern China). He started coughing and had to buy face masks as protection an air purifier and a treadmill for indoor exercises.

“Besides the threat to our health, we’ve also suffered economic losses,” the plaintiff told Yanzhao Metropolis Daily, “These losses should be borne by the government and the environmental departments” [15].

The provincial and city courts already rejected Li’s case. However, his case is still being examined by the district court.

Hebei, a major industrial region which surrounds Beijing, is considered a “major source of noxious smog that hung over Beijing a year ago” by the China Academy of Sciences. Shijiazhuang, its capital and largest city recorded “beyond index” measurements of particulate matter in early 2013 [26] (Fig. 1).



Fig. 1. Air pollution in Shijiazhuang, China [26].

2.2 Student Interactive Assignment: Memorandum

To: Special Assistant, City of Shijiazhuang Environmental Bureau.

From: Qin Jiushao, Mayor, Shijiazhuang Municipal Government.

Re: The Li Guixin lawsuit.

As you know, our city is the focus of alarming worldwide headlines as a result of Li Guixin's recent pollution lawsuit, the first ever Chinese citizen lawsuit against a government agency arising out of dangerous air quality. In just the past few days these articles have appeared:

- Russia Today. Chinese Man Sues Hometown over Air Pollution
- Calcutta Telegraph. First case in China against poison air
- Hong Kong Standard. Pollution sufferer raises legal stink
- Chicago Tribune. Man becomes first to sue Chinese government over severe smog

As you know, the Chinese Central Government began on January 1 requiring factories to publicly report details on their air emissions and water discharges. We cannot deny the facts regarding our pollution problem, but we do not deserve to be singled out in front of the entire world for poor air quality. The Chinese air quality problem cannot be fixed overnight. Our economy – and even the world's economy – depends on continued Chinese growth and requires massive energy consumption.

But we need to immediately develop a comprehensive response to the Li Guixin lawsuit, including a public relations response. Although the Institute of Public and Environmental Affairs in Beijing has said that citizens do have the right to take action should a government agency fail to fulfill its duties, I disagree strongly.

We have not failed to fulfill our public duties. You are aware of the many legal and policy steps the Central Government and my Administration have been taking to address this problem in Hebei province and in Shijiazhuang.

As our principal assistant on this matter, your assignment is to:

- Please draft a list of possible arguments we can make to defend our City in the Li Guixin lawsuit.
- Please provide a brief list of persons (witnesses) we should interview, and types of data you recommend we gather, to establish the facts regarding the air quality in Hebei province.
- Please develop a list of risks (for example, legal, economic, political and public relations) we face arising out of this man's lawsuit [27].
- Please provide a list of steps you recommend that I take as a mayor to demonstrate to Chinese citizens and to the Court our commitment to improving air quality.

3 Interactive Methodology

At its core, interactive methodology aims to shift the cognitive and expressive work of learning to the learner, in contrast to lecture or direct instruction by the teacher. Learners build their cognitive structures or frameworks for organizing information and concepts as they move along a spectrum from novice to expert within and among

different domains by actively engaging with materials, other learners and teachers in creative and integrative ways. In learners' minds, lightbulbs should be going on [30].

This section on interactive methodology is intended to build upon what these authors set out in their previous paper [1], hereafter indicated as Paper 1. There, we used two hypothetical situations to illustrate basic principles of interactive learning at the beginning stage of the learning trajectory that stimulates the learner's thinking on a matter by engaging and investing them in learning, connecting with their prior knowledge, and situating the matter in their existing cognitive structures. In this early stage, learners are asked to give opinions and brainstorm ideas. The teacher is less concerned with "correct" answers than introducing the learners to new ideas uncovering where the learners are (which will invariably be diverse).

In this paper, we endeavor to show how to help the learner move into new terrain, to conduct more complex cognitive, analytical, expressive and analytical processes, and to integrate diverse knowledge and concepts into coherent principles and systems. How is this accomplished?

In an actual class, we would precede this activity with a short warm up to stimulate thinking and expression. Then, after providing learners with copies of the 2-page combination of news article and hypothetical, we would ask them to work in pairs or small groups to undertake one or more of the assignments. In this small group work the learners can also read the material referenced in the links in the hypothetical to access more information. After allowing appropriate time for the groups to develop their responses to the assignments, the teacher conducts a discussion with the class as a whole.

What are the methodological principles at work here, and learning value that results? The first element, is the creation of the activity itself. One favored approach to activity planning is "backwards design." There are three basic steps:

- "identify desired results" (i.e., the set of learning objectives the teacher has in mind for the learners – what the instructor wants the learners to know and be able to do as a result of the lesson),
- "determine acceptable evidence" (i.e., how the learners will demonstrate or express the desired outcomes) and
- "plan learning experiences and instruction" (i.e., the lesson plan and activities). (See [3]) from <https://cft.vanderbilt.edu/understanding-by-design/>, which sites to [4, 5].

The activity is flexible and can be used at several different points in an RM course, depending on the course trajectory and how much information/substance on the principles of ERM or SRM are developed when it is employed. In other words, it can be used with little up front instruction on the principles of RM as an introductory activity to introduce the concepts surrounding those principle (as we do in this paper) or later in the course as a synthesis or application type of activity after the students have discovered the principles of RM. Rich substantive topics in sustainability risk management abound [9, 11, 12].

Advantages of interactive methodology over conventional lecture include a wider range of learning outcomes, such as analytical and communications skills that the learners engage in during the activities, a variety of rich and diverse substantive

viewpoints and ideas, and the ability of the instructor to observe the learning as it happens rather than in a subsequent evaluation or test. The activity should also be engaging, do-able, and worthwhile/challenging, as described in Paper 1.

What are the engagement and learning values of the activity used here? In the news articles cited in the exercise, air pollution, its harm and its regulation are matters that touch us all and greatly impact the quality of life. The act of a lawsuit against a municipality captures one's attention. It is brief and to the point. The hypothetical creates and places the learners in the role of special assistant for environmental matters, which engages the learners and opens discussion to both practical and theoretical possibilities.

Particularly noteworthy are the carefully considered and constructed assignments, which evoke a range of important and realistic areas for exploration from law to science and from policy to practice. Most significantly, they shift the action to the learner. The assignments are open ended, leaving room for creativity and exploration from the learners. There are no set answers, yet some answers may be better than others. The assignments are enriched by the embedded links to other sources of information that the learners can and should draw upon. This activity goes beyond simply asking for opinions by additionally challenging the learners to draw on sources beyond their present knowledge. In the learning trajectory, it introduces the element of evidence and its evaluation. The lesson also introduces and simulates research (on a small, manageable scale) and requires the learners to integrate and apply new knowledge to resolve the issues.

This exercise, created by Professor Bardenwerper, gives students an opportunity to experience what it would be like to be responsible, in a highly visible government post, for developing a multi-faceted response to an unprecedented event involving sustainability in a highly controversial context. The events underlying the simulation were real; the cause of the controversy was physically palpable to any resident of most large Chinese cities; the context—the use of the Chinese court system by a citizen in an entirely novel way—was intentionally provocative for the students [15].

A second dimension of the activity is the utilization of small groups as preparation for a full class discussion. The learners are given the opportunity to develop their learning in collaboration with other learners, which both facilitates learning and is a skill in itself, and allows them to practice their ideas before putting them forth to the instructor and the group as a whole. During the small group work, the instructor should circulate to listen the groups in order to monitor progress, provide assistance when needed, and to gather information that can be useful in conducting the subsequent large group discussion.

A third element is the large group discussion. Small groups can report their findings for comparison, comment and questions by the other groups and the instructor. It is beneficial to record participants' main points on the board or large paper, not only to highlight key points but also to acknowledge the contributions of the learners, providing positive reinforcement. Look for positive ways to respond to learner comments. We are not suggesting false praise (e.g., saying a comment is on point when it isn't), but rather valuing the comment in some way, i.e., "Thank you for that thought." You can ask students to explain their idea, i.e., "Tell me more." or help them and the class place the comment in the overall context, i.e., "Your comment represents views on one

side of this matter. What are other possible views?” or “Look at the data - are there other possible interpretations?”. One key to discussion is focusing on the process of the discussion, the give and take, the use of evidence, etc. rather than correctness of particular answers.

Fourth, interactive methodology can elevate the relation of the readings to the discussion. Through the interactive nature of the activity, the instructor does not directly “cover” the reading by discussing it directly as factual knowledge, but rather arranging for the learners not only to know the content of the readings but also to apply it, and in the act of applying it to make meaning of it and assess its worth. Thus, the instructor can move the learners through the full range of learning objects, from knowledge to comprehension, application analysis, synthesis and evaluation, the components of Bloom’s Taxonomy described in Paper 1.

4 Teaching Sustainability Risk Management

Today entire courses are being developed that include a substantial element of interactive, experiential learning, designed to enable the learner to discover—rather than simply be told—the criticality of sustainability. For example, the University of Wisconsin School of Business has offered a course entitled “Sustainability, Environmental and Social Risk Management” that covers a wide range of sustainability risks, from Superfund Liabilities to Environmental Epidemiology, which utilizes (i) a “Point-Counterpoint” student exercise to dissect the actual application (in light of the Deepwater Horizon oil catastrophe) of BP’s articulated commitment to sustainable development; (ii) a team project to study in depth, and report in detail on, the sustainability/corporate responsibility programs of various actual companies (selected by the students) and how those programs do, or do not, actually support sustainability in practice [6].

In his full course on Enterprise Risk Management, Professor Bardenwerper employed other interactive exercises involving sustainability risk policy that could be adapted to any discipline, including engineering. In one exercise, he introduced his students to the catastrophic erosion into the sea of the Alaskan village of Kivilina, which led to seminal (though ultimately unsuccessful) public interest litigation against many of the world’s largest oil companies [7]. In this exercise, he required the students to (i) evaluate the efficacy of law as a tool for determining accountability and potential remediation for the consequences of climate change, and (ii) compare the potential for the use of legal process for climate change damages in the United States’ legal system vs. China’s.

In another exercise, he had the students examine the actual terms of a Civil Liability Insurance Policy issued by global insurance giant AIG as applied to a hypothetical claim involving corruption of a Chinese provincial government’s environmental quality database arising from a defect in vendor software. The students had to analyze the claim made under the insurance policy and determine whether the damages suffered by the ultimate (governmental) user of the defective software were covered by the AIG

policy language. Every element of the exercise was drawn from actual policy language and events, and required students to develop a position based on their own process of collaborative discovery.

Each of these exercises involved one or more interactive, experiential learning processes: (i) role-playing, where students adopt the responsibilities of various professionals grappling with a real-world practical application of sustainability risk management; (ii) team evaluation and decision-making, replicating the primary mode of action required in almost any business or governmental organization; (iii) analysis of actual events, facts, or documents at the center of an event or controversy, requiring students to weigh competing interpretations and arguments; (iv) oral advocacy of a decision or position in the face of counter-arguments. The common methodological thread running through these exercises is the process of discovery—wherein lessons involving risk and sustainability emerge from the learner's own endeavors, rather than being delivered to the learner by a putatively authoritative teacher or professional superior.

5 Conclusion

The importance of sustainability risk management is well documented. For example, Professor Borkovskaya delineated the following quality of life factors [19–25, 27, 29]:

- the degree of cleanliness of the habitat: water, air, water, etc.;
- environmentally friendly food products (within the limits of the standards of the country, the world);
- personal, ecological, economic and legal security;
- public health and guarantees of its maintenance;
- the provision of housing, personal goods and property;
- the opportunity to have healthy children and to educate them;
- freedom to choose a profession and place of work;
- the possibility of cultural rest and treatment; and
- direct dependence of personal well-being on labor efforts, etc.

This paper emphasizes two dimensions in the teaching of or training in sustainability risk management. First, in the successful operation of any enterprise or political organization, it is highly valuable to conduct continuous training of real case situations through interactive teaching methods and basic management principles. These should be scientifically and ethically grounded in decision-making on the basis of data and analytics that comport with reliable expert application and evaluation in real situations.

Civil involvement is one of the most important dimensions of the field of sustainable development. Civil involvement requires full-fledged opportunities for individual citizens, collectives, enterprises and business circles to participate in the development of decisions concerning natural resources, the environment, the development and management of projects, and the economy. This paper suggests that the professions with the most impact on future sustainability should develop practical awareness and acculturation of how they can incorporate sustainability risk management in their projects and enterprises.

Second, we suggest that interactive, experiential teaching and training are essential components of that evolution. Interactive teaching methods are among the best practices for teaching and learning. Moreover, the process of interactive learning promotes discourse that brings rich and diverse viewpoints and ideas from a wide range of participants. Both the learning process of this diversity of engagement and the resulting learning and decisions coincide with and support purposeful and intelligent sustainability risk management.

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The Influence of a Large Family on the Development of Human Capital

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Abstract. The authors assess ways and means of human capital development in the aspect of the phenomenon of a large family. The purpose of article is the systematisation of information about the peculiarities of the influence of a large family on the development of human capital. Theoretical base is a concept of life-course and fertility, three factors theory and the reproductive-economic approach.

Research methods: analysis of the theoretical literature, secondary analysis of the data on the theme (all-russian or regional).

The results of the study made it possible to assess the potential of the participation of many-child families in Russia in the development of its human capital. The main factors on which it is possible to estimate (measure) the contribution of large families to human capital have been identified and classified. Based on the results of the study, a model for assessing the influence of families on the formation and development of human capital was proposed, and recommendations were made for improving the state social and economic policy.

It is assumed that the main positive factor in the formation and development of human capital is stable value orientations and a stable motivation of parents towards children. This factor, in turn, essentially depends on the state conditions of support of the large families. The main negative factors affecting the development of human capital are the parents' orientation toward material values (including the attitude to children as a source of income/expenditure).

Keywords: Large family · Human capital · State policy

1 Theoretical Issues of Studying Human Capital

1.1 Introduction

Human capital is a phenomenon that does not lose its relevance among scientific researchers of many areas. And this, despite the fact that more than 70 years have passed since its appearance and registration as an independent section of economic analysis, and so far there is no unambiguous understanding and attitude to this phenomenon among scientists. The scientific and applied uncertainty of his status nevertheless continues to inspire further study of his possibilities of influencing many

spheres of society's life, ways and technologies of his development, formation and improvement.

Today, analyzing the scientific publications in the Scopus and Web of science databases devoted to the topic of human capital, we can note an annual increase in their number, as well as the largest representation of materials in the section of social sciences, management and economics. However, many publications in the field of computer, medical, art science also confirms the importance of human capital in modern conditions. Economic sciences are no longer considered determinative in its understanding and interpretation.

The beginning of the development of the theory of human capital as an independent section of economic analysis was laid by the work of J. Mintzer [1]. As a section of economic analysis, the theory of human capital was established in the 50's and 60's of the twentieth century in the works of T. Schultz and G. Becker.

D. Bilsbury under human capital understands the stock of economic goods owned by man and inextricably linked with the carrier of labor, valued and able to generate income for both the person himself and the entity that funds the creation of such goods. Such economic benefits are knowledge, spiritual and social products. On the other hand, capital refers to the relationship between people about the appropriation and alienation of economic goods - the products of capital [2].

Human capital is considered at several levels - macro (at the level of public-legal entities), meso (organization) and micro (family).

A lot of interpretations of the structure of human capital are presented in the scientific literature. Thus, Kolesnikova believes that human capital at the micro level includes vital capital and social capital. Vital capital is understood as the aggregate of intellectual capital (abilities, vital energy, time, knowledge) and social capital (properties for interaction with other people, a certain level of socialization, reputation), which each person has to a certain extent [3].

In a number of other studies, the structure of human capital includes three basic components: mental, physical (level of physical development and state of health) and spiritual. The intellectual component includes the innate ability of a person, as well as all the knowledge, experience and skills that he acquires in the process of life activity, his education is primary, secondary and higher. The spiritual component implies the environment in which the person is formed and grows, his culture, behavior, moral principles, as well as the microclimate in which he lives: family, kindergarten, school, street environment, technical school, university, collective. Under the physical component, we are talking about the heredity that a person receives at birth, his age, environmental conditions and, of course, his way of life.

M.E. Bespaev in the assets of human capital includes the health capital; capital mobility (migration); intellectual capital; capital training in production and capital of entrepreneurial activity (competitiveness) [4].

The human capital of the individual is formed throughout the life of the individual and is represented as a continuous process, proceeding with different intensity in different periods of the individual's life. According to T. Schultz, all the resources and abilities inherent in the individual can be either granted to him from birth, or acquired during life. This means that at birth each person with nature is given a certain set of genes, which determines his innate potential. At the same time, directly human capital,

in addition to innate qualities, includes also valuable qualities acquired in the course of life by the individual, capable of being increased by appropriate investments [5].

The formation of human capital by time periods, based on the stages of human socialization, can be divided into three basic stages: (1) pre-labor period; (2) the labor period; (3) post-labor period [6].

Basic human capital is formed to a certain level, in which it can be used by both the owner and the employer to extract the minimum benefit. The base capital is the capital received by the person by the age of majority, and the developed human capital is formed for the rest of life. Thus, the formation of basic human capital takes place at the stage up to 17–18 years before the labor period of the formation of human capital. Here, the main role in the formation of human capital is played by such subjects as the family, nurseries, kindergartens, schools [4].

Methods. The analysis was based on Rosstat's statistical data for the period 2011–2016, including on specialized data sets for the family, motherhood and childhood. According to Rosstat's methodology, households with 3 or more children up to 16 (18) years were considered as a large family. A number of statistical data was obtained from Sample Household Budget Surveys. Also secondary analysis of the data on the theme (all-Russian or regional) for the period of 2011–2017 was used.

The scientific novelty of the research is presented by the contributions of the authors to the analysis and synthesis of contemporary international and all-Russian studies on the influence of large families on the development of human capital, revealing both regional and all-Russian features of the functioning of a large family in Russia.

1.2 The Role of the Family in the Development of Human Capital

The family performs functions for the reproduction of human capital, its formation, use and accumulation. The initial theoretical provisions concerning certain aspects of the process of intrafamily formation of human capital can be found already in the classics of political economy. L. Thurow argued that for the formation and development of human abilities, only one investment is enough, and the creative qualities of man will appear automatically, by themselves [7]. But in fact, the processes of creating and recreating such qualities are much more complex and deeper. Their content is not just an investment of means, but a real, conscious and purposeful labor activity of the immediate bearer of these qualities, of his family and of the whole society, i.e. these processes form, although specific, but genuine production.

V. Matersheva singles out a number of basic directions of the household's activity in the formation of human capital:

- Creation of conditions for the production of human capital (the formation and use of the budget, housekeeping, recreation, etc.);
- production of human capital (appearance in the family of children, primary socialization, etc.);
- the formation of human capital (the social and status function of the family, the function of transferring accumulated human capital, and the function of the possibility of obtaining education);

- Realisation of human capital (organisation of family business, individual or corporate participation of households in the economy);
- cost recovery and the accumulation of human capital [8].

U. Tsyrenzhapova believes that the family acts as an active investor in the formation and development of all elements of human capital, while at the same time forming the individual human capital of its members, forms the human capital of the family. From this point of view, the role of the family is manifested in several directions. First, in the formation of health, the investments of the family are connected with such components as heredity, physical and psychological potential; the relationship within the family to health and physical activity; investment in health physical culture and sports.

In the upbringing and education, the accumulated knowledge is transferred from the older generation to the youngest during direct communication, and the family provides non-formal education for the whole life, investments in education and investments in the formation of spiritual and cultural level. In the formation of the social resources of the individual, the social status and social capital of the family is the determining factor, and in the formation of motivation for work, the total investments of the family [9].

Parental upbringing is seen as the main indicator of the human and social capital of children. A number of authors argue that at the initial stages of the formation of the individual's human capital, there is an accumulation of his physical and intellectual potential at the expense of upbringing and education received in the family.

Children are a special economic good, because they represent not only the source of the needs of the family, but also the object of its long-term investments. Carrying out such an investment process, the family hopes to compensate for its costs in the future due to the increased income stream or for the family as a whole, or for the child himself. It should also be taken into account that the quality of the formation of the child's human capital will depend on the number of children in the family, and the contribution of parents in this process is different.

All components of human capital are acquired and increased through investments that the family invests in their child to ensure that these costs are offset by a significant increase in income in the future, if not for the family as a whole, then at least for the child. Consequently, the family bears the costs necessary for the physical formation of a person, the costs of his upbringing and education, which are investments that reduce the current consumption of parents in the present [10].

Investments in human capital are divided into three main groups. The first group includes the costs of education, including general and special, formal and non-formal education, self-education, and on-the-job training. Investments included in the second group include spending on health, including the development and maintenance of a person's physical and psychological state. This includes the costs of medical care, diagnosis and prevention of diseases. The third group includes the costs of mobility, through which migration occurs [11].

G. Becker as the main factor affecting the level of education, available for children in the family, distinguished the level of material well-being of parents. Proceeding from this interpretation, the family will act as the main channel for the distribution of

financial resources that have the opportunity to become investments in human capital. The income received by family members fully forms the conditions for the production, formation and reproduction of human capital. It is the family who decides exactly what amount and on what terms will be used as an investment in the human capital of children, at the family level, the demand for public institutions is determined [8].

The most important factor that determines the ability of the family to form human capital is the number of children. In the study of U. Tsyrenzhapova proves that the fewer children in the family, the greater the contribution it can make to the human capital of each of its members. Based on calculations of the cost of human capital for the average household, as well as for households with one, two, three, four or more children, an inverse relationship was found between the number of children in the family and the level of investment in human capital per individual child. Even in a family with one child, the cost of human capital is lower than the average for all families. Thus, the cost of human capital per family member with one child in 2007 exceeded by 2.7 times the value of human capital of one family member with four or more children [9].

This circumstance is confirmed by studies of modern authors. Thus, in large families, the distribution of parental resources is uneven, parents have to choose between the number of children and their quality. Other things being equal, children from large families have a lower level of education [10].

Of no less importance is the change taking place in the institution of the family itself in modern conditions. These include the change in the importance of family-marriage relations, the growth in the number of childless and incomplete families, the transformation of gender roles in the family (convergence of the coefficients of labor participation of men and women due to the increasing role of women in the production sector).

2 Studies of Large Families in Russia in the Context of Human Capital

2.1 Overview of Statistical Data on Large Families in Russia

Consider the characteristics of large families in the Russian Federation. In general, as of January 1, 2017, the Russian Federation had 1,566,863 large families with 5,354,440 children, thus the average number of children in a large family is 3.3 children. Among families with children in Russia only 5.8% are families with three or more children.

The prevalence of large families in Russia has a distinct regional character. Unlike most regions of Russia, a number of subjects within the North Caucasus Federal District are traditionally characterized by a high level of large families. Thus, in the Republic of Ingushetia, the share of large families among all families is 28.9% (38.6% among families with children), in the Chechen Republic - 27.2% (37.1%), in the Republic of Dagestan - 14, 7% (21%). The lowest prevalence of large families was registered in the city of St. Petersburg - 0.9% (among families with children - 1.9%). In such areas as Ivanovo, Smolensk, Tula, Murmansk, it does not exceed 1.2%. The prevalence of large families in the city of Moscow is 5.4%. In these families 17.4% of children from all children's contingent of a megacity are brought up [13].

According to a sample survey conducted by Rosstat in 2015, in large families an average of 100 households had children under the age of 18, from 1 to 5 - 114 and at the age of 7–15 - 184. At the same time, the level of education of members of large families lower than in other categories of households. Thus, people with higher education in large families were only 64% of households, in families with one child this figure is 91% [14].

Large families in accordance with the existing typology of social risk are referred to families in which social functioning is difficult, and they are almost inevitably in a difficult life situation. Due to the higher dependency load and the smaller relative number of employed family members, they are allocated among other categories of families for all social and economic indicators of the standard of living [15].

According to Rosstat, the share of low-income households with 3 or more children under the age of 16 (18) in the total number of poor households increased from 6.5% in 2011 to 8.8% in 2016 [14].

Resources of all households in the Russian Federation for the period 2012–2016 per person increased by 30%, but the resources of households with children under the age of 16 increased by 24.8%, but the resources of households with 3 or more children increased by 47%. However, the resources of large families per person are 1.8 times less than the average for all households.

At the same time, consumer spending per person in families with many children is almost 2 times lower than the average for households, despite some reduction of this ratio in recent years (see Table 1).

Table 1. Consumer characteristics of large families.

	2012	2013	2014	2015	2016
The share of poor households with children under the age of 16 (18) in the total number of poor households, %	62,2	64,0	62,9	62,6	62,4
Of them, having three or more children	7,5	9,0	8,6	7,9	8,8
Number of large families registered as needy in dwellings at the end of the year, units	125198	124971	127194	131213	129207
The number of people receiving monthly cash payments at the birth of the third and subsequent children before the child reaches the age of three	-	108836	254419	421490	499780
Available household resources					
All households	18582,3	21198,5	22890,1	23084,8	24209,8
Those with three or more children under the age of 16	9041,7	12535,6	11945,9	12512,1	13300,3
Consumer spending of households					
All households	12623,9	13706,7	14629,6	14712,7	16085,7
Those with three or more children under the age of 16	5636,7	8639,2	7312,4	8533,9	8698,4

In the structure of expenditures of large families, 36.7% is spent on food, which is slightly lower than the average for all households (37.1%), but higher than for families with 1 child (34.6%). Expenses for non-food items of large families make up 43.1% of their final consumption expenditure, which is higher than the average (35%) and in single-child families (38.2%) [14].

Significantly worse in families with many children, the situation in the provision of housing conditions. So, for one person living in a large family in 2015, there were 10.2 m². m of the total area, while on average in the Russian Federation this figure is 18.5 m². m, and in a family with one child - 15, 4 m². m. In 2016, the size of the living area for 1 person in a large family was 9.96 m². m, which is much less than in the whole for households (15.9 m²). More than half (53%) of large families lived in a separate house or part of it (on average in the households this indicator is 29%), have 3 or more rooms (63%). Every fifth large family indicated that it was experiencing more constraint [14].

As of the end of 2016, 129207 large families were registered as needy in housing.

It is natural that the self-assessment of the financial situation of large families is much lower than that of other types of households. In general, 45% of respondents in the Russian Federation chose the option "they can not afford the purchase of durable goods", in large families only 35%. At the same time, the shift occurred in the direction of deterioration - 27.3% of large families chose the answer "it is difficult to buy clothes and pay for housing and communal services.

According to the Federal State Statistics Service, 671248 families with children received regular payment in 2015, 671248 of them were poor. In 2016, the number of beneficiaries from low-income families fell sharply - by 4.8 times (to 139321 people). At the same time, the average size of a regular cash payment per month per recipient increased from 1279 rubles. up to 1545 rubles.

The number of citizens from families with children who received a one-time cash payment increased from 194,221 to 244,442 people, incl. from low-income families from 94416 to 132470 people. The average amount of a one-time cash payment per one recipient fell from 17299 to 11,254 rubles, and for low-income families it increased from 3489 rubles. up to 3598 rubles [16].

2.2 The Results of Research on the Problems of Large Families

Researchers have tried to identify the dependence of the parameters of the human capital of children on the level of education of parents, mother's employment, the number of parents and the size of the family. The results of the research showed that children of highly educated parents spend more time on their education and less watch TV. It has been proven that the children of mothers who work part-time work significantly less watching TV than the children of mothers who are full-time workers. As a result, we can conclude that parental upbringing is the main indicator of the human and social capital of children [10].

A sociological survey conducted in the Saratov region showed that the rating of the values of a large family is headed by material well-being (32%), followed by health (19%), happiness in the family (16%), education (15%), love (14%). Career was in last place (4%) [17]. However, the main problems of families remain material, and the

value of health in general can not be supported. The state of poverty and the disadvantaged social and economic situation of large families creates additional threats to the health of children in such families. It's about both physical and mental health. Pastorova points out that children of different age groups from large families are significantly behind children from small families in all quantitative and qualitative indicators of physical development [18].

Thus, it was found that children of primary school age from large families have lower rates of intelligence, school performance and self-esteem than their peers from small or single-child families. Reduction of cognitive abilities was most often detected in the 3rd, 4th and subsequent children. The presence of a large number of young brothers and sisters entails a decrease in the social age of older siblings, which does not depend on the property and educational status of parents [19].

Children from large families had problems with peers in their early school years, emotional problems in boys and behavior problems in girls. In adolescents, the combination of many children and low-income forms pro-social behavior [19]. The increased level of anxiety, frustration of the need for attention from adults allowed them to be classified as a risk group for social maladjustment, so they need a prolonged psychological support [20].

A number of studies have noted that in a comprehensive assessment of health, its level in children from large families is lower than in control families, and the frequency of disability of children in such families is almost 1.5 times higher [20]. Among children from large families, the proportion of people who are often ill is higher. Parents from large families are much less likely to treat medical and preventive institutions with children, while diseases in young children are more frequent in complicated and severe forms, as a result of which their hospitalized morbidity rate is 2.3 times higher [18].

A low indicator of the health of children from large families is the result of various reasons: a decrease in the reproductive health of a mother with many children; late appeals of parents for medical care in case of a child's illness, self-treatment; lack of opportunity to carry out preventive health improvement measures at home; inattentive, carefree attitude of parents towards the state of health and the development of their children. There was a significant increase in the risk of congenital malformations after the birth of the 3rd and 4th children [19].

It is possible to single out the types of large families by their contribution to the development of human capital. Thus, the first type of socially responsible families, having many children in their families, was consciously planned and who most responsibly approach the formation of the family and the individual. They experience many difficulties, but parents have a motivation for raising children. In such families, one can note strong family traditions, a high degree of cohesion, which leads to the highest rate of capital development: children from such families usually find themselves in life and profession, also creating strong families.

The second type of family, formed as a result of the second and subsequent marriages of one of the parents, is also characterized by sufficient responsibility. Children born as a result of the second and subsequent marriages of the mother (less often - the father) often experience a feeling of an incomplete family. Motivation for raising

children in such families is much lower, but the level of conflict is higher. The contribution to human capital is not always effective and effective in such families: children usually form a family at a later age and are not oriented to large families, have problems with psychological stability, professional and personal orientation.

Families of the third type, where many children are unplanned (55%), accidental (birth of twins or the birth of a child as a result of ineffectiveness of contraception or the impossibility due to the state of health of a woman to resort to abortion, etc.) are not always adequately prepared for it and more often than not they can not adhere to a normal way of life. In these families, not always well-being, both parents and children are more likely to be at risk for health. They have more pronounced problematic characteristics, higher level of conflict in the relationships in the family, and leisure is characterized by passivity. Older children are more likely to have a syndrome of premature social growth. The contribution to the development of human capital in such families is ambiguous and usually has two options - effective (action from the opposite) and inefficient (following the parent model).

Large families of the fourth type, situationally formed as a result of parents' irresponsible behavior, differ in their disadvantage, sometimes against the background of intellectual degradation, alcoholism, and an antisocial way of life. In such families, parents have a lower educational, property and social status. Children from such large families are often instrumental and especially need help, rehabilitation, suffer from diseases, underdevelopment, social disadaptation.

3 Conclusion

The analysis allows us to conclude that the formation of human capital in large families is less effective than in small children, which is associated not only with the lower economic status of these families, but also their socio-psychological characteristics - a lower level of education of parents, less attentive attitude parents to each child.

There is a tendency to increase the negative attitude towards large families, whereas positive examples of well-off, financially stable large families exist, but are generally ignored and hushed up. Thus, according to the results of the all-Russian study "The way of life of a large family in Russia and the tasks of the demographic policy", the attitude towards the family is good for the first and second children and is characterized by a positive, approving mood [21]; When a third child appears, some misunderstanding arises, although approval also occurs; With the fourth and subsequent children, disapproval and sharp criticism from others is intensified. The deeper degree of having many children (the birth of the fifth, sixth and subsequent children) occurs according to internal beliefs (value orientations for children and the family, for religious reasons), thus, external evaluation by others is not so acute and not very significant. Given the low-income lifestyle that exists in the society, the birth of the third and subsequent children is often perceived contrary to the norms and social standards of small children, causes caution and misunderstanding. It is obvious that in the conditions of modern social norms of one-child and two-child families, families with three or more children turn out to be a social minority.

The main positive factor in the formation and development of human capital is stable value orientations and a stable motivation of parents towards children. This factor, in turn, depends significantly on the state conditions for supporting families. In Russia today, more than 10% of large families need better housing conditions, more than 8% - are poor. At the same time, 92% of large families have virtually no other form of economic support from the state (in some regions, there are one-off payments for the birth of third and subsequent children, compensation for kindergartens, food and transportation, however, most families that do not fall into the category of “forced to take care of themselves on their own”). This format in many cases leads to instability of the family, its disintegration, the desire of the children to gain independence faster and other adverse consequences.

In society, the attitude towards large families is also very contradictory. A large area of social disapproval, and even rejection, continues to exist around large families. Families with many children are often regarded as “social dependents,” profiting from the state [22]. However, the deeper degree of having many children (the birth of the fifth, sixth and subsequent children) occurs according to internal beliefs (value orientations for children and the family, for religious reasons), thus, external evaluation by others is not so acute and not very significant.

The main negative factors affecting the development of human capital are the parents’ orientation toward material values (including the attitude to children as a source of income/expenditure). This is supported by the peculiarities of the economic stimulation of the birth rate in the Russian Federation. Thus, the maternity capital allowed, first of all, to stimulate the birth rate in disadvantaged and needy families, who, with the birth of the second and subsequent children, expected to receive support from the state. Today this is supported by an additional measure - the birth of the first child from 2018 enabled the poor to receive monthly cash payments from the state, and families that start second or third and subsequent children from 2018 to 2022 change their living conditions. Thus, the state itself contributes to the material motivation of families for the birth of three or more families, but Russian realities often lead to the impossibility of achieving the original material goals and children are “at a loss”.

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Regional Peculiarities and Differentiation of Socio-Economic Development of the North-East of Russia

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Abstract. The North-East of Russia is one of the most extensive and specific macro-regions of the Russian Federation. The definition of regional specific features is of great important for theory and practice of the regional economy. The aim of the research is to give a modern interpretation of the determination of the given concept using general scientific system analysis methods, methods of statistical analysis and synthesis. The economic and geographic, business, as well as social and economic specific features have initial and production character, and also discover the presence of horizontal and vertical interconnections. Employing the analogue method of their influence on the development of economy and scientific-technical progress, it was determined that about 2/3 of regional social labor expenses per unit of manufactured product and major construction is connected with the business retardation of North-East. It is established that most of the unfavorable regional characteristics are of a relatively temporary nature, which, in the process of economic development and scientific and technological progress, can change or even disappear. This long-lasting dynamic process of regional socio-economic development policy can be regulated with the application of special methods of strategic planning and innovation development policy.

Keywords: North-East of russia · Living standards · Regional economics · Macro-region · Differentiation · Regional specific features

1 Representation of the Concept «Regional Specific Features» and Its Familiarization

In the market economy conditions of the North-East of Russia it is impossible to determine the typology of the regions of the country and to achieve rational spatial organization of the national economy without a scientific study of the essence of regional specific features and their classification. The North-East of Russia is one of the most extensive and extremely specific macro-regions of the Russian Federation. Modern scientific researches and published works often contain the notion of “regional features” without disclosing the economic essence of this category of regional economy [1]. Theoretical and methodological foundations of the regional economy, institutional

concepts, as well as of regional specific features, have changed dramatically in the system of regional relations, categories and laws.

The question of classification of regional specific features of the North was first considered by Slavina S., then Prudinsky G., Parashchenko G. More detailed classification and economic evaluation of factors and their specific features of North-East are described by Melnikov V. [2]. In case of country's planned economy we've studied the regional specific features of the North-East more deeply and classified them in accordance with a more significant feature of the effect on the efficiency of industrial production. Based on the results of this study, we will make a comparative analysis of the theory and practice of the regional specific features utilization in the planned and market economies. Using this classification, we took into account 44 features, including 12 natural, 11 economic and geographic, 12 business and 9 social and economic specific features.

The modern interpretation of the concept of «regional characteristics» will be the next:

Regional specific features are specific significant differences in natural, geographic, historical, economic, social and demographic conditions of socio-economic development of the territories typical for large and macroregions, which have a significant impact on the qualitative indicators of their economic activities and, therefore, create the need for implementing state regional policy.

The prevalence of positive or negative regional features in economic practice causes territorial differentiation of levels of efficiency of public production and socio-economic development of the region. In case the cumulative impact of negative specific features predominates in regional economy, then there is a regional appreciation of production and population's living activities. This phenomenon is more peculiar for eastern and northern regions of Russia. Here it is several times higher than in the central and southern regions.

In accordance with our scientific researches [3, 5, 17] regional appreciation is the most significant negative feature of the economy of the North-East of Russia. Perhaps, in all its sectors, except for mining industry, regional appreciation is estimated at 1.5–3.5 times. The cost of population's living increases 1.7–2.5 times [4, 13]. The estimates of these indicators in the Arctic zone increase 3.5–5 times. As a result of regional appreciation of production, capital construction, transport and population's life activities, the northern regions remain underdeveloped and underpopulated. Due to this, and because of the severe climatic conditions, agriculture, and arable farming in particular, is not developing in many northern regions [10, 12].

2 Analysis and Evaluation of Economic Substance of Regional Specific Features

It is necessary to analyze and evaluate the current economic content of regional specific features in order to implement their modern classification.

2.1 Natural and Climatic Regional Features

Natural and climatic regional features of the North-East of Russia determine the need for:

- to build long-distance transport communications, to perform high expenses for their maintenance and repair;
- to carry cargos and passengers for long distances. As a result, high transportation costs, reaching an average of 50–70% in the cost of products, works and services, reduce the efficiency of production. The immenseness of the territory is an appreciating factor in relation to the transmission of electricity, maintenance of land lines and other production processes;
- more intensive and prolonged heating of residential and industrial premises with spending significant amount of material and financial resources;
- use pile foundations and other complex technologies during the capital construction of buildings, structures, roads, pipelines due to long-term permafrost, which significantly increases the cost of objects by 15–20% [20];

The peripheral nature of the northeast macroregion is its most characteristic feature, which means its greater remoteness from developed industrial, cultural and administrative centers, as well as relative socioeconomic backwardness and market isolation compared to the central and middle regions of the country [11, 13].

We can assess the negative impact of periphery on macroregion's economy:

- high transportation costs for interregional cargo and passenger transport;
- decline in managerial efficiency, as well as financial and economic assistance from federal authorities;
- limiting population in meeting the needs for high-quality material, cultural and medical services produced in the central regions of the country.

Seasonality, limitation and irregularity of import and export of cargos continue to have a great negative impact on the socio-economic development of the regions of the North-Eastern macro region.

Ships and oil-loading tankers go along the northern rivers of Yakutia with one-sided loading. Tynda – Berkakit - Tommot is the only trunk railway line in the North-East that has a load in both directions only up to the station Berkakit. It will be loaded only by 30–50% to Yakutsk. In the opposite direction the load will be only 10% [10].

An important regional specific feature of the North-East of Russia is its involvement in geo-economic space. This specific feature is presently limited but in perspective it will be rather broad and widespread with due account for the expansion of trade and economic relations with the APAC countries, as well as with Southeast Asia.

2.2 Organizational and Economic Regional Features

In all regions of the North-East of Russia economic development continues to be raw-materials-oriented. In the long term the raw material orientation will even expand in all regions, especially in Yakutia, due to the increase of the volumes of coal, oil and natural gas extraction, creation of new mining industries, including rare-earth and iron ore.

The underdevelopment of manufacturing industries is connected with the influence of appreciating factors, such as high cost of capital construction, expansiveness of labor and electricity, limited local market of production distribution, high goods shipping costs, in many cases the lack of effective engineering and technology adapted to local conditions.

Poor development of production infrastructure is one of the main regional specific features of the North-East of Russia.

However, according to expert assessment [7, 15, 18], the regions of the North-East of Russia are characterized by low levels of overall competitive ability as a result of:

Firstly, difficult adjustment of all sectors of the local economy, including agriculture and the social sphere, to market conditions;

Secondly, negative impact of many regional specific features of production and vital activities of the population;

Thirdly, underdevelopment of market mechanisms for strategic planning and regional economy management, taking into account regional characteristics.

2.3 Social and Economic Specific Features

The population decreased significantly of the North-East of Russia in 1990s of the 20th century of all regions, but especially in Magadan region, Kamchatka Territory and Chukotka Autonomous District. The paucity and poor territory population can be considered its constantly existing regional specific feature. Regional specific features of the North-East of Russia include the existence and habitation of the indigenous peoples of the North, such as Yakuts, Evenkis, Evens, Dolgans, Chukchi, Yukagirs and others. The indigenous peoples of the North of Yakutia played a large positive role in the economic development of the severe northern region and in the establishment of Russian statehood. During the socialist construction and the post-Soviet period, the indigenous peoples of the North of the republic met the needs of the population's in meat, fish, dairy products, vegetables and potatoes by about 30–50% [10].

Internal migration of the population has intensified in the post-Soviet years. It is more intensive in the Republic of Sakha (Yakutia) and the Kamchatka Territory, which is most connected with the displacement of the rural population [17]. As a matter of fact the territorial mobility of the population witnesses the development of freedom of residence, profession and place of residence of the population, as well as changes in production location and populated areas in progress. Therefore, human migration at large is a positive factor for the macroregion development

Human resources deficiency, as well as the deficiency of highly qualified specialists and regular labour force, is an essential regional specific feature of macroregion. It appears as a result of: first, paucity of population, its external migration and pioneer commercial development of new regions; second, irrational utilization of existing human resources, specialists and regular labor force under the conditions of economy disproportionality, including its imperfect sectoral distribution. As a result of human resources deficiency in there is the unemployment that appears in macroregion remains stably high.

Poor development of social infrastructure is one of the characteristic regional specific features of the regions of the North-East of Russia. This lag is difficult to identify on the basis of an analysis of the average of the provision of the population with social facilities. For example, in 2016 the total area of residential premises per person on the average was: in the Republic of Sakha (Yakutia) - 21.7 m², in the Magadan region - 29.8 m², in Kamchatka Territory - 25.5 m², in the Chukotka Autonomous District - 25.6 m² against the average 23.5 m² for the Far East Federal District and the whole Russian Federation - 24.9 m². However, some regions are at the same time lag far behind in terms of the level of housing stock (for example, availability of water pipelines in housing in the Republic of Sakha (Yakutia) is 54%) compared with the average 81.9% for Russia [14].

Severe natural and climatic, unfavorable economic and geographic, as well as difficult socio-economic conditions of the regions of the North-East are the factors, which form the high cost of population's life. It depends on the number of material, financial and other expenses required for continuous functioning of human life and activities, his/her physical and mental ability to work, study, rest and do other activities valuable to the community. These expenses include expenses for food, clothes, accommodation, paying for educational, medical, cultural, communal, transport and other vital services. All these per capita expenses vary widely region-wise and are objectively higher in the North, including in the North-East. Despite economic and social significance of the cost of population's living it lacks an integrated aggregate measurement (index). Therefore, different methods and indexes are used for its analysis and evaluation [8, 9]. These methods and indexes include consumer food basket, consumer non-foods basket, minimum cost of living, consumer expenditures at the average per capita and other. Therefore, in order to ground the consistency of the increase of the cost of population's life in the North-East it is essential to provide sample calculations performed with due consideration of additional expenses excluded from the minimum cost of living.

Table 1. Appreciation of social and economic conditions of the living environment of the population in the regions of the Asian North in 2016 (in factors towards Moscow region 1:1).

Types of expenses	Latitudinal zones of the North		
	Arctic zone	The Far North	The Close North
Minimum cost of living	1.7–1.9	1.4–1.6	1.3–1.6
Subsidies for paying for housing and public services per 1 person	2.3	1.8	1.1
Cost of minimum set of foodstuff	1.7–2.44	1.4–1.7	1.2–1.4
Cost of housing construction per 1 m ² of the total area	5.4–5.7	2.4–3.8	1.8–3.8
Logistic expenses for the delivery of provisions	2.7–5.6	2.2–2.8	1.6–2.6
Logistic expenses for construction cargos	8.3–8.8	3.2–5.7	2.6–3.2

As can be seen from Table 1, the indices of the northern appreciation of the cost of living in the Asian North were as follows: minimum cost of living 1.3–1.9 times, the cost of the minimum set of food products 1.4–2.44 times, the cost of housing construction 1 m² of the total area 1.8–5.7 times, logistic costs for food delivery 1.6–5.6 times and construction cargos 2.6–8.8 times. We have calculated the total costs for all these indicators, and then the integral appreciation of the cost of living of the population in the Asian North is estimated at the level of at least 3.0–3.8 times in comparison with the Moscow region (see Fig. 1).

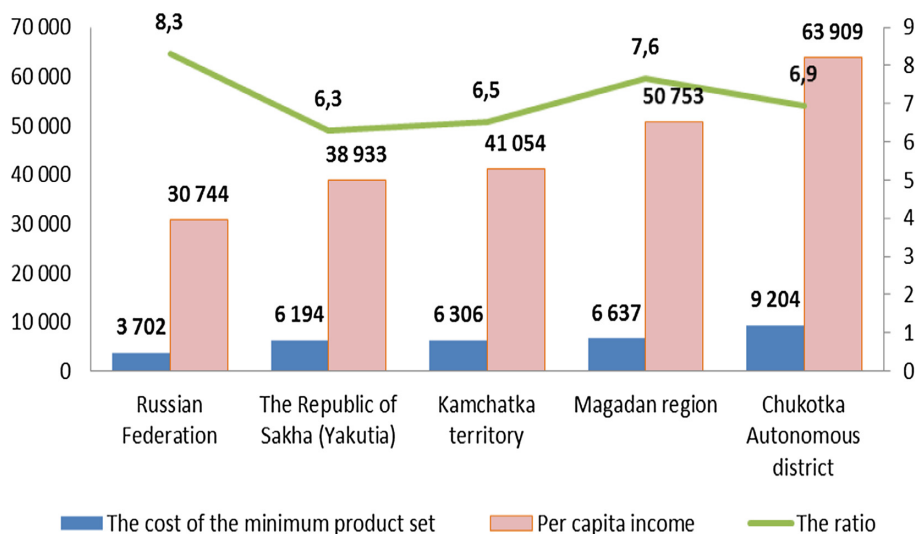


Fig. 1. Comparison of individual indicators of the cost of living in the Asian North, rub.

In the Asian North of Russia, its extreme eastern vector is occupied by the North-East with three latitudinal zones. It is characterized by more severe natural and climatic, as well as unfavorable economic and geographical specific features if compared with the North of Western and Eastern Siberia [22]. Therefore, it is indisputable that the regional appreciation of the cost of living of the population in the North-East is much higher than it is indicated at an average across the entire Asian North. Multiple regional appreciations of the life activities of the population of the macroregion occurs as a result of high prices of food products, industrial consumption goods, higher cost of housing and communal services, medical, educational, cultural, construction and transport services. Therefore, it is necessary to cardinaly modernize and improve the efficiency of all life-supporting branches of the regional economy in order to significantly reduce the cost of living of the population [20, 21].

The comparatively low level and low quality of life of the population of the North-East of Russia can be considered an integral indicator of the degree of appreciating influence of all negative regional specific features. Ultimately, the high cost of living of the population must be considered a key factor for its low level. Another key reason is a

substantively low monetary income of the population in comparison with its expenses required to meet reasonable needs. In other words, real incomes of people do not reimburse the high cost of their living.

Table 2. The cost of living and per capita income in 2016 are comparison.

Russian Federation, its constituent entities	Life cost appreciation	Money income per capita, rubles (month)	In factors towards the average over the Russian Federation
Russian Federation	1,0	30 744	1,0
North-East of the Russian Federation, including:	3,0–3,8	48 662	1,58
The Republic of Sakha (Yakutia)	2,5–2,8	38 933	1,27
Magadan region	2,8–3,2	50 753	1,65
Kamchatka Territory	2,9–3,1	41 054	1,34
Chukotka Autonomous District	3,5–4,0	63 909	2,08

As can be seen from Table 2, in the North-East, with an average increase of the cost of living of the population in comparison with the Russian Federation in 3.0–3.6 times, the actual per capita monetary incomes in 2016 exceeded only 1.57 times, including in the Republic of Sakha (Yakutia) - 1.24 times, Magadan region - 1.65 times, Kamchatka Territory - 1.35 times and Chukotka Autonomous District - 2 times. Thus, inference should be drawn that the real average per capita monetary income in the regions of the North-East of Russia reimburses the cost of living of the population by only about 50%. It means that the real standard of living is 2 times lower than the scientifically justified indicator.

3 Classification of Current Regional Specific Features of the North-East of Russia

As a result of the transition from a planned to a market economy, the negative impact of the regional specific features on the social and economic development of the macroregion and the population has changed radically [6]. There were new negative processes in people's lives such as increased migration, unemployment, poverty of a significant part of the population. Thus, modern social and economic regional specific features include: paucity of population on the immenseness of territory, presence and residence of indigenous peoples of the North, high level of human migration, human resources deficiency, poor development of social infrastructure, high cost of population's life, low level and low quality of life of the majority of the population.

One should take into account the interrelationship of factors within individual groups (vertical) and between them (horizontal) while making a general assessment of the regional specific features of the North-East and their impact on production efficiency. There are vertical interrelations among the natural and climatic specific features: immense territory - inaccessibility of territory - permafrost - harsh climate - barren soil; presence of many natural resources - their territorial concentration - high quality of raw materials. There is the following interrelation between economic and geographical features: small exploration of the territory - incomplete development of regions - underdevelopment of the transport system - irregularity of import and export of cargos.

The following can be considered as an example of horizontal interrelations of factors: immenseness of territory - paucity of population - optional development - weak habitation; inaccessibility of the territory - self-sufficient nature of the municipal economy - poor development of the social infrastructure [8, 11]. Moreover, regional specific features have primary and derivative character. All natural and climatic specific features, paucity of population and presence of indigenous population are considered to be primary, while economic and geographic specific features, except for peripheral location of macroregion, and business specific features are considered to be derivative. It can be seen from the classification that almost all unfavorable economic and geographic, business, as well as social and economic specific features are relatively temporary. In the process of economic development and scientific and technological progress, some negative specific features may change or disappear. Positive specific features should appear instead of them. However, their appearance is a long-term dynamic process that can be regulated by special methods of strategic planning and technical policy [16, 18].

The technical and economic analysis of the influence of regional specific features on the efficiency of resources utilization shows that almost every feature, depending on the specific conditions of production, has both positive and negative influence. However, taking into consideration the prevailing influence, which is currently manifested, it is possible to roughly outline specific features that both appreciate and cheapen the production. The immenseness of territory, its inaccessibility, large scale of permafrost and harsh climate are the specific features that significantly appreciate the industrial production. The presence of mineral raw materials, which is a resource-related factor, significantly increases the efficiency of production. The impact of its utilization in many branches of mining industry and, finally, region-wise, covers the national-economic losses from the influence of negative factors [15, 19, 23].

The economic and geographic position of the North-East can generally be characterized as unfavorable. Although, so far as there is the complex development of productive forces and transport in particular, it can change radically. Many unfavorable conditions can be largely eliminated. There are only two business specific features of the North-East most fully taken into consideration in order to increase the economic efficiency of industrial production: the advantage of nationwide specialization of the economy and selective development of resources. Meanwhile, according to our rough estimate, approximately 2/3 of the increased regional social labor costs per unit of physical volume of manufactured product and major construction are associated with the business lag of the North-East.

Only presence and residence of indigenous peoples of the North can be considered the factor that cheapens the production, while the rest have an appreciating effect. Social and economic regional specific features, except for the paucity of population and presence of indigenous peoples of the North, exist temporarily. According to our expert assessment, the stimulating factors are: paucity of population, presence and residence of indigenous peoples of the North, human resources deficiency and poor development of social infrastructure, while high level of human migration and low level and low quality of people's life are considered to be the deterrent factors.

4 Conclusion

The economic and geographic, business, as well as social and economic specific features have initial and production character, and also discover the presence of horizontal and vertical interconnections. In the conditions of the North-East, social and economic special features are mainly conditional upon the initial social and economic factors and unbiased difficulties of economic development of the territories. However, certain specific features of social development (small number of permanent population and high cost of population's life) will apparently remain for a long time. As it was proven by science, regional policy should be aimed at a relative reduction in manpower requirement and preferential application of highly skilled labor, the need for increased payment for which becomes even greater.

The change of unfavorable economic and geographic situation and elimination of other negative features of the North-East requires major changes in all areas of economic and social life. They are possible in case of gradual implementation of regional policy, large investment production and social programs. All regional features of macroregion can be divided into two groups: stimulating and restraining the development of the economy and the vital activity of the population. The stimulating effect of regional specific features is that they objectively create the need in search, development and utilization of new innovative technologies, technical means, as well as organizational and economic mechanisms. The restraining influence of regional specific features is the fact that they objectively determine the impossibility or uncertainty of search, development and utilization of innovations.

The modern classification of regional special features of the North-East of Russia has a special scientific and practical importance. First of all, it allows comprehensive and more profound study of the regularity of the development of regional economy by means of organization of fundamental interdisciplinary researches. Secondly, it will contribute to the practical solution of various problems resulting from the effect of regional special features on the basis of differentiated normative approach. Presently regional specific features of the North-East of Russia are drastically understudied by technical, biological, medical and other sciences. There is also a lack of accurate economic assessment of their demonstration and impact on economy and population's life activity. For this reason, integrated scientific researches on the given problem could be considered as of high-priority.

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Migration from Uzbekistan to Russia: Push-Pull Factor Analysis

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Abstract. The paper provides the identification and the analysis of factors that form migration flows from Uzbekistan to Russia. The research goal is to study the factors and define in what way they influence the population's decision to migrate. An integrated approach allowed to reveal the dominating migration factors so that two waves were allocated in migration stream: ethnic and economic ones. Their quantity and quality characteristics as well as conditions of their origin were identified. The findings are proved by econometric analysis. The research allows to understand nature and features of Uzbek migration and can serve as a basis for taking measures on regulation and control of the above mentioned migration flows and be also used for predictive assessments.

Keywords: Migration factors · Migration from Uzbekistan to Russia

1 Introduction

In the world labor market Uzbekistan proved as labor force donor for Russia, Kazakhstan, South Korea and other countries. The most preferred countries for the Uzbek migrants are Russia and Kazakhstan. Migration flows from Uzbekistan to Russia are the most large-scale and their number as well as the total number of this country's population for the last decades tends to growth. However, the role of Russia is gradually reduced, and there is an obvious reorientation of emigration to Kazakhstan, which in recent years accounts for about half of all those who left the republic. Mainly such dynamics are due to the territorial proximity and the similarity of neighboring peoples' mentality. In these conditions monitoring of factors that influence emigration from Uzbekistan which is the most inhabited neighboring country is becoming particularly urgent task. The task solution will help predict the external migration flows to Russia, regulate and control them.

2 Methods

As a methodological framework of our research we took the «push» and «pull» concept which allows classifying factors of migration and developing a multifactor model. A distinctive feature of the concept is use of two-sector approach to the analysis of

migration. According to this concept we divided “push” and “pull” factors between the countries as follows.

Push factors are those that include negative conditions of human vital activity in the country of origin and stimulate emigration.

Pull factors are set of the conditions in the country of destination that make host state attractive to migrants.

To reach the goal we divide migration from Uzbekistan into two stages: ethnic (from the origin of independent state up to the end of 90s of 20 century) and economic (from 2000 to the present day). Since the first migration stage from Uzbekistan had forced character and the most left the republic in essence were refugees, we excluded the stage from the econometric research and analyzed only data of the second stage.

3 Research and Discussion

We start our analysis with push factors. Ethnic, demographic, economic, ecological and administrative factors can be referred to the group in Uzbekistan. Since environmental problems of the country and administrative restrictions lead to worsening of economic conditions of people, we consider the three last factors in their entirety.

3.1 Push Factors

Ethnic Factor. The geographical location, favorable climate and historical processes promoted formation in the territory of modern Uzbekistan of multiethnic community. According to the All-Union population census of 1959 in the territory of the Uzbek SSR Uzbeks made only 62.2%, and other nationalities – 37.8%. After the end of World War II a part of the population which has found a shelter in Uzbekistan returned home. However, the large-scale earthquake in Tashkent in 1966 and the subsequent restoration of the city led to new inflow of the “non-Uzbek” population. In the 1970s it made 35.3% of all Uzbekistan residents.

Nowadays Uzbekistan is a monoethnic country where the vast majority is presented by the title nation. For the period from 1991 to 2017, the share of Uzbeks in Uzbekistan has increased from 73% up to 84%, having overcome the critical threshold allowing to call modern Uzbekistan the monoethnic country (Table 1).

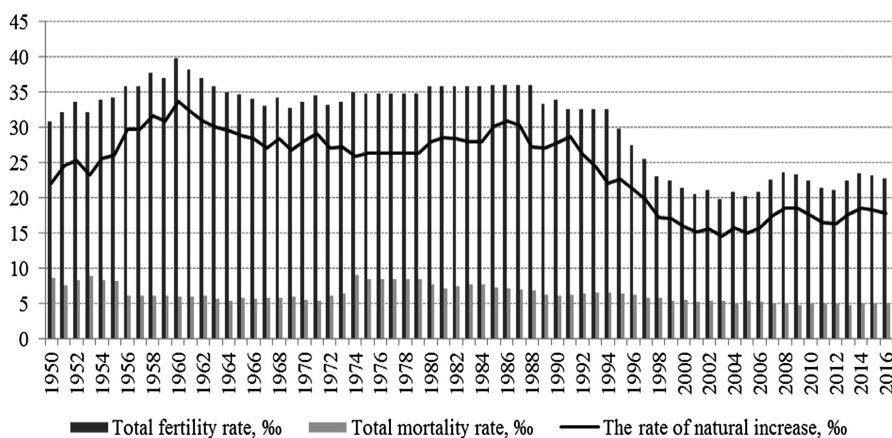
As population censuses show decrease of non-Uzbek share of population in Uzbekistan began in the late 1950s, however after the republic’s exit from the Soviet Union, this process has considerably accelerated. From 1959 to 1989 the share reduced by 9.23%, and from 1989 to 2013 by 11.49%.

From 1989 to 1997 the Russian diaspora in Uzbekistan reduced from 1.7 million people to 900 thousand, i.e. for 40% [1]. So far the ethnic factor practically outlived itself. Among people of non-title nationalities there were mainly those who had no or lost kinship communications with other countries or those who doesn’t want or can’t return to the historical homeland for objective reasons [2].

Table 1. Nationality profile in Uzbekistan 1926–2017.

	1926	1939	1959	1970	1979	1989	1991	2017
General population, persons of which	2439.4	6271.3	8105.7	11959.6	15389.3	19810.1	20607.7	32120.5
The Uzbeks, persons	1842.4	4081.1	5038.4	7733.5	10 569.0	14142.5	14995.3	26917.7
The Uzbeks, %	75.53	65.08	62.16	64.66	68.68	71.39	72.8	83.8
Other nationalities, persons	597.0	2190.2	3067.4	4 226.0	4820.3	5667.6	5136.4	5202.8
Other nationalities, %	24.47	34.92	37.84	35.34	31.32	28.61	43367.0	43147.0

Demographic Factor. Uzbekistan has moderately expanded type of population reproduction and ranks second after the Ukraine among Russia's neighboring countries in population number. From 1991 to 2016, the number of the Uzbekistan's population increased from 20.8 million people to 32.1 million people, or by 11.3 million people (54%). Reproductive behavior brings main contribution to the population growth (Fig. 1).

**Fig. 1.** Changes in births, deaths and rates of natural increase in Uzbekistan, 1950–2016.

The traditional aspiration of the Uzbek families to a possession of many children remains unchanged, especially in rural areas. In 2011 most of respondents expressed desire to have from two to four children [3].

State support promotes maintenance of high level of marriage rate. Despite the fact that the age of marriage tends to growth, it remains rather young that also increases birth rate. In 2010 average age of marriage in Uzbekistan was 26.5 for men and 22.4 for women [4].

However, so far the aggregate birth rate decreased. In 2014 it was 2.5 (in city – 1.9, and in rural areas – 2.4). But this demographic indicator remains one of the highest among the Commonwealth countries. Rapid population growth leads to different imbalances: between city and rural areas, free land resources and requirement of their involvement in agricultural production, demand for work and its offer that in its turn also stimulates migration.

Thus, the demographic factor of emigration from Uzbekistan is connected with the high level of birth rate and growth of able-bodied population number. Based upon cumulative potential of labor resources, the demographic factor will not decline in importance in the short term.

Economic, Ecological and Administrative Factors. According to Ravenstein’s theory economic factors of migration are the main motives and impetuses inducing the populations to leave places of birth [5, 6]. However, in case of Uzbekistan they became prevailing only in the early 2000s, having marked the approach of the second stage of the Uzbek migration.

It is remarkable that the second stage of the Uzbek migration took place against the background of a favorable macroeconomic situation. Since 1996 active economic growth began in Uzbekistan. From 2004 to 2015 the economy of Uzbekistan began to develop actively, showing high rates of economic growth from 7.0% (2005) to 9.5% (2007).

However, sustainable growth in Uzbekistan is insufficient for employment of constantly growing army of labor resources. According to data of the World Bank, from 1990 to 2014 the share of labor resources in the country increased from 59.4% to 61.6% (Fig. 2).

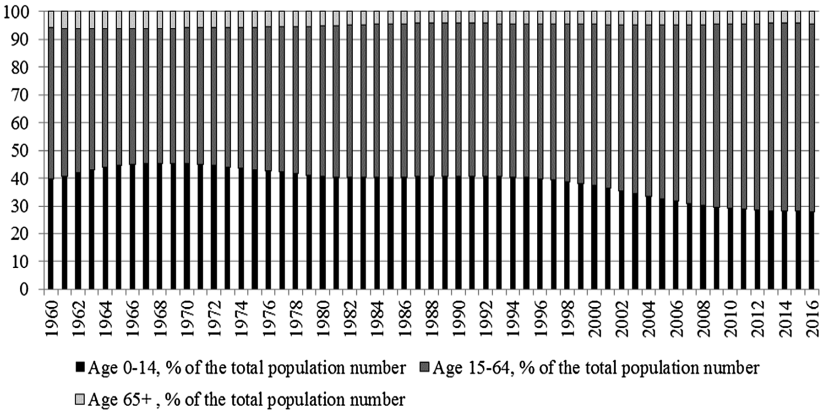


Fig. 2. Changes of age composition in Uzbekistan’s population, 1960–2016.

If for a number of countries labor resources growth is a benefit, then for Uzbekistan it is a problem that requires special state economic policy carrying out.

Policy of job creation is systematically pursued in such areas as Samarkand (72.9 thousand jobs), Fergana (71.2), Kashkadarya (68.5), Tashkent (68.1), Andijan (61.3), Namangan (59.1), Bukhara (56.8) and Surkhandarya 50.9 thousand jobs [7].

The advancing growth of labor force over growth of the job created in the country leads to the unemployment, which is steadily exceeding natural level approximately for 5%. In 2014 according to the World Bank it accounted for 10.6%. Especially high level of unemployment is observed in the rural zone from where the population regularly goes to work to urban areas in job seeking. The basic reason of it is catastrophic deficit of land and water resources that is considerably caused by the remaining monoculture of cotton [8].

The rural working population excess in total with ecological problems and administrative restrictions increases external mobility of the population.

Firstly, environmental problems stimulate urbanization processes. There is a problem of increasing deficit of fresh water and irrigated land resources in Uzbekistan [9]. The competition between Uzbekistan and its closest neighbors for access to fresh water escalates. Its shortage leads to salinization of once arable lands. Ecological trouble interferes with development of the village and has an adverse effect on small income of its inhabitants, forcing them to migration.

Secondly, at the level of urban settlement the administrative measures directed to regulation of urbanization processes and limitation of internal migration of rural population work. From Soviet period, the institute of domicile registration works. It is especially difficult to register in the large cities such as Tashkent, Samarkand and Bukhara. In this connection, a part of flows from the rural zone directs not to the cities of the republic, but abroad.

The employed citizens that have big families sometimes are in a difficult economic situation. The possession of many children raises demographic load of the working population which is provided generally by the men as most of women are traditionally engaged in a household. The share of women employment in social production is rather small and amounts for 51%.

The poverty which was widely spread in the rural zone is one more problem of Uzbekistan that is pushing out the population on the world labor market. So, in 2011 the share of population which is below the poverty line in this country accounted for 16%.

Differentiation of regional social and economic development of the country is aggravated with uneven resettlement of the population. So, the areas located in the fertile Fergana Valley (Fergana, Namangan and Andijan), differ in dense population. For example, in the Andijan region that occupies less than 1% of the territory of the republic, average density of population makes 279.3 persons per square kilometer, i.e. 6 times more than national average. According to the Uzbek researchers the main flows of emigrants are created in these regions, and also in the Samarkand, Bukhara and Khorezm regions [10].

On the basis of the above-stated analysis it is possible to draw a conclusion that in Uzbekistan there is a high potential for development of internal population migration and formation of urbanization processes. Due to various reasons the most part of potential internal migrants becomes the emigrants going for earnings to neighboring countries.

Thus, despite favorable macroeconomic situation, high growth rates of labor force, especially in rural areas, make Uzbekistan an excess working country.

3.2 Pull Factors

As the statistics shows, now Uzbekistan remains the prime supplier of foreign labor force to regions of the Russian Federation, going before the Ukraine, Tajikistan and Kyrgyzstan on migration indicators (Table 2 and Fig. 3).

Table 2. Stock of foreigners and the Uzbeks in Russia, 2007–2016.

Index	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Immigration to Russia, persons	263277	261170	261495	171940	310549	363955	422738	529448	536157	511773
Uzbekistan, persons	52802	43518	42539	24100	64493	87902	118130	131275	74242	60977
Uzbekistan, %	20,1%	16,7%	16,3%	14,0%	20,8%	24,2%	27,9%	24,8%	13,8%	11,9%
Emigration from Russia, persons	47013	39508	32458	33578	36774	122751	186382	310496	353233	313210
Uzbekistan, persons	722	948	677	834	2207	31559	50864	94179	94910	41305
Uzbekistan, %	1,5%	2,4%	2,1%	2,5%	6,0%	25,7%	27,3%	30,3%	26,9%	13,2%
Net migration in the Russian Federation, persons	239943	242106	247449	158078	319761	294930	295859	299990	245384	261948

thousand persons

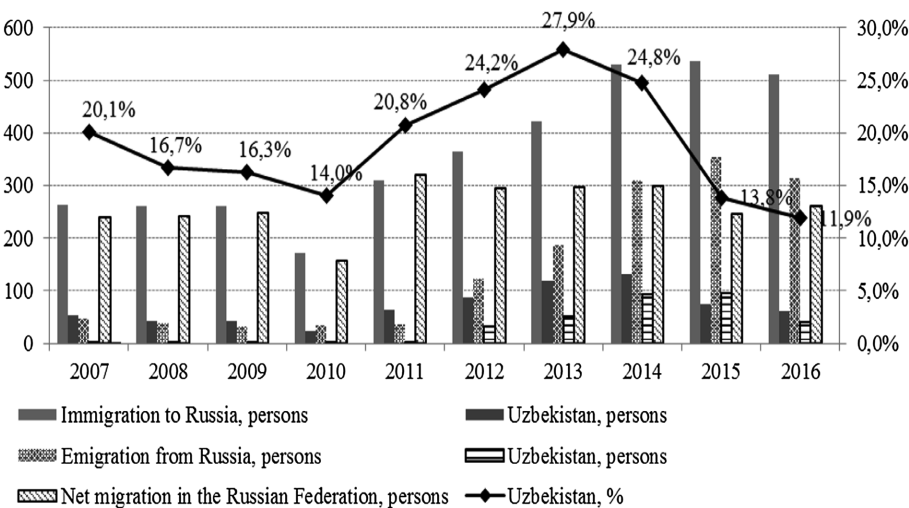


Fig. 3. Dynamics of migration flows in the Russian Federation, 2007–2016.

Growth of the Uzbek diaspora in the territory of Russia confirms the fact of the country's attractiveness for emigration as well. According to the results of population censuses from 1939 to 2010 its number increased from 0.01% to 0.2% (Fig. 4).

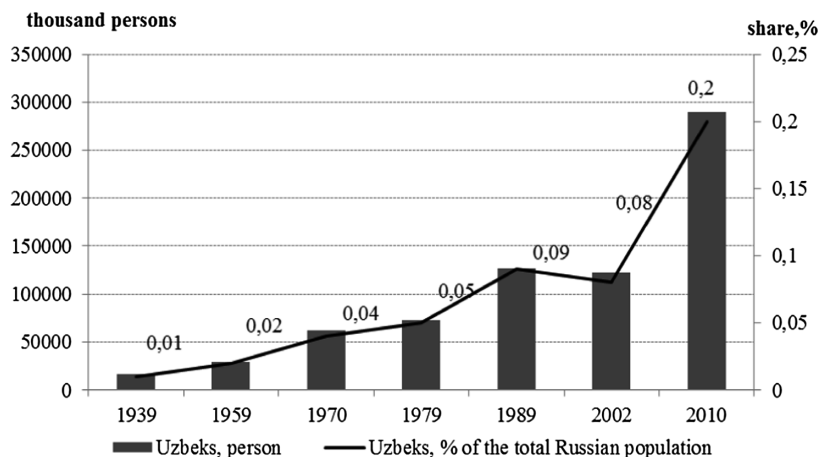


Fig. 4. Uzbek population in the Russian SFSR and in the Russian Federation.

The Uzbek diaspora is also replenished at the expense of displaced persons from the countries neighboring to Uzbekistan. So, as a result of the interethnic conflicts in the southwest of Kyrgyzstan representatives of the Uzbek community in Kyrgyzstan arrived from Osh and Dzhelal-Abadsky areas to Russia in 2010–2011.

If there are push factors in the base of “migration provocations”, then pull factors determine the main directions of migration flows. Further we try to analyze what pull factors take place in modern Russia.

Administrative Factor. An important factor of migration from Uzbekistan to Russia is a visa-free regime between the countries. For this reason, the share of arrived from the CIS countries to the Russian Federation traditionally accounts for 75% and more.

Economic Factor. Analyzing economic factor of immigration, we consider the two most significant ones. They are income difference and available jobs in the recipient country.

People are inclined to move where living standard is higher, an employment is easier and earnings are rather good. Migrants from Uzbekistan to Russia also have these impetuses. At the same time migration has temporary and labor character. Table 3 shows that upon GDP indicator per capita Uzbekistan is considerably inferior to Russia. According to classification of the World Bank, Uzbekistan falls into the group of countries with below average income whereas Russia falls to group with high income.

Incomes per capita during Uzbekistan being as a part of the Soviet Union were on the average twice lower than the income of residents of the Russian SFSR. However, during the first decade after the Soviet Union collapse sharp decrease in level of the population’s income was observed in Russia while economic stability took place in Uzbekistan. As a result of it, at the end of the last millennium there was approximation of these indicators of two countries, so, economic factor of migration originally didn’t work. Migration level during this period was rather small and had mainly repatriation character.

Table 3. Current price GDP per capita in Russia and Uzbekistan, 1990–2016, in US dollar.

	1990	1999	2000	2008	2009	
Russia	3485	1331	1772	11635	8563	
Uzbekistan	651,4	702,5	558,2	1023	1182	
Gap between countries (times)	5,35	1,89	3,17	11,37	7,25	
2010	2011	2012	2013	2014	2015	2016
10675	13324	14079	14487	12736	9329,3	8748,4
1377	1545	1719	1878	2037	2137,6	2110,7
7,75	8,62	8,19	7,71	6,25	4,4	4,1

However, with increase in world oil prices at the beginning of the new millennium the next migratory stage from Uzbekistan to Russia came – economic one. During this period the income of Russians began to grow promptly, whereas in Uzbekistan there was a small decrease in incomes per capita to the subsequent moderate growth. By 2013 the indicator of the average per capita income in Russia exceeded similar one in Uzbekistan almost by eight times as much.

Various approaches of the countries to forming of economic model of development and the choice of priorities led to emergence of an essential gap in the income of the population, that became a basic reason of migration from Uzbekistan to Russia at the beginning of the 21st century.

Another economic factor of involvement of migrants from Uzbekistan into the Russian economy is developed disproportion in the labor markets of two countries. Thus, there is a decrease in number of labor force in Russia, while its surplus in Uzbekistan accrues annually for 1–2% against the workforce productivity (Table 4), [11].

High urbanization level of Russian cities attracts labor migrants with availability with free vacancies. In 2014 according to RF Federal State Statistics Service the intensity coefficient in Moscow labor market made 0.6, and in St. Petersburg labor market 0.5.

Visa-free regime for residents of the neighboring countries and possibility of earnings cause labor nature of migration in case of which a part of the population of the Republic of Uzbekistan regularly leaves for earnings to the Russian Federation for short time. As most of nonresidents are inhabitants of the rural zone or towns then seasonal component of this migration is well traced.

Table 4. Dynamics of economic indicators in Russia and Uzbekistan, 2000–2017, %.

	2000	2005	2010	2011
Russia				
GDP (volume index, %)	110,7	106,4	104,5	104,3
Industrial production	112	105,1	107,3	105
Industry, value added (% of GDP)	37,9	38,1	34,7	33,9
Inflation rate	120,2	113	107	108
Capital investments, %	117,4	110,2	106,3	110,8
Economically active population, %	101,4	100,9	99,7	100,4
Number of employed, %	100,9	100,4	100,2	100,1
Workforce productivity	105,5	103,2	103,8	103,1
Unemployment rate (according to ILO methodology)	10,6	7,1	7,3	6,5
Average monthly nominal wage, \$ US.		303	682	796
Uzbekistan				
GDP (volume index, %)	103,8	107	108,5	108,4
Industrial production	105,9	107,2	108,8	106
Industry, value added (% of GDP)	14,2	23,2	33,4	32,9
Inflation, consumer prices (annual %)	128,2	107,8	107,3	107,6
Capital investments, %	101	105,7	108,7	103,8
Economically active population, %	104,9	102,9	102,5	104
Number of employed, %	101,1	102,9	102,7	102,5
Workforce productivity	102,1	102,1	98,3	-
Unemployment rate (according to ILO methodology)	9,1	9,2	9,1	9,1

(continued)

Table 4. (*continued*)

2012	2013	2014	2015	2016	2017
Russia					
103,4	101,3	100,7	97,2	99,8	101,5
103,4	100,4	101,7	99,2	101,3	101
33,8	32,3	32,1	32,8	32,4	32,5
105	107	108	115,5	107,1	103,7
106,8	100,8	98,5	99,9	99,8	104,2
99,9	99,9	99,9	99,9	99,8	99,9
100,5	99,9	99,9	99,9	99,9	99,9
103,1	100,8	105,5	102,3	102,5	103,1
5,5	5,5	5,2	5,6	5,5	5,5
857	936	856	561	549	671
Uzbekistan					
108,2	108	108,1	108	107,8	105,3
108	110	108	107,9	106,2	107
33,0	33,2	33,6	34,5	32,9	33
107	106,8	106,4	105,5	105,6	109,5
112,7	112,1	110	108,5	107,7	107,1
102,4	101,4	102,9	102,8	102,6	102,6
102,6	102,5	102,4	101,9	101,8	101,8
102,1	105,4	105,6	105,5	105,6	105,6
9	9	8,9	8,8	8,8	8,8

Historical Links, Language Knowledge. Existence of historical links and rather low language barrier also serve as migration factors as they are important condition for migrants' adaptation. However, the majority of sociological researches show that the role of this factor decreases in process of migration flows' youthification [12].

Relatives or Acquaintances in the Country of Emigration. As the residents of Central Asia got used to live in clans (big patrimonial groups), collectivist mentality is inherent for them and kinship plays a special role, then the major factor at the choice of the country for emigration is presence of relatives or acquaintances (migrant networks) in it. This conclusion corresponds to the results of Douglas Massey's [13], as well as our own research conducted in 2011 [14].

New Social Status Obtaining. Migration is resulted by change of the social status and it becomes an incentive for migration, especially for the younger generation. There is an opportunity to move to a city, to see new countries, to leave parental supervision, to join civilization benefits. It is especially concerns women migrant who get large freedom in behavior as a result of migration [15].

3.3 Econometric Assessment of Migration Factors from Uzbekistan to Russia

We estimated migration amount through the indicator of foreign labor quantity from Uzbekistan to Russia. This indicator was chosen because the main objective of migration of the second wave participants was desire to earn in others country and to improve welfare of their families.

To identify the extent of factors' impact on inflow of foreign labor we carried out the correlation analysis. To assess an economic component, we chose two indicators of GDP per capita in the Russian Federation and the difference in the Russian Federation and the Republic of Uzbekistan population's income. An indicator of working-age population of the Republic of Uzbekistan and the total fertility rate (TFR) provided demographic factor of migration as well. Proceeding from the analysis of environmental problems in the country, the ecological factor was provided by means of such indicator as cropland size changes (Table 5).

Table 5. Correlation matrix of labor migration from Uzbekistan to Russia and factors.

	GDP per capita in Russia	Population ratio in Uzbekistan, age 15–64	Cropland size in Uzbekistan	Income gap between Russia and Uzbekistan	TFR in Uzbekistan	Migrant workers from Uzbekistan in Russia
Migrant workers from Uzbekistan in Russia	0,81	0,80	–0,65	0,25	–0,21	1

Research findings confirmed that labor migration from Uzbekistan to Russia is formed under the impact of the following factors: economic, demographic and ecological.

Correlation ratio of connection of foreign labor and an income per capita in the Russian Federation makes 81%. The second by the importance is demographic factor, namely, the employable population of Uzbekistan. High correlation ratio of connection between indicators of foreign labor and indicator of cropland in Uzbekistan (Table 5) bears evidence of the ecological factor importance. The same result testifies a large share of rural population in the researched migration flows as well.

In connection with specifics of migration from the Asian countries, the correlation and regression analysis was added by labor foreigners number indicator of a previous period (model of network structure) and jointly estimated economic and ecological factors (economic and ecological model). Demographic factor with indicator of number of employable population of Uzbekistan (demographic model) was also added. Results of the modeling are presented in Table 6.

Table 6. Results of correlation and regression analysis.

No.	Model	Indicator	Elasticity coefficient	R2
1.	Network structure	Foreign labor (-1)	0,57	34
		Foreign labor (-2)	-0,26	
		Foreign labor (-3)	0,05	
		Foreign labor (-4)	0,15	
		Foreign labor (-5)	-0,02	
2.	Economic and ecological	GDP per capita in Russia Cropland size in Uzbekistan	0,04 -0,02	67
3.	Demographic	Working-age population in Uzbekistan foreign labor (-1)	47,4 0,40	60

The first model allowed to reveal pronounced cyclicity of migration network structure's impact on formation of its flows. In particular, two-year cycle of foreign labor inflow with subsequent attenuation was revealed. At the same time the explaining capability of network structure factor was 34%.

The second model showed the high explaining capability of economic and ecological factors – 67%. According to this model increase in economic wellbeing in Russia for 10% will lead to growth of inflow of foreign labor from Uzbekistan by 0.4% and vice versa. Whereas reducing of cropland in Uzbekistan for 10% increases migration to Russia for 0.2%.

The last model confirmed the importance of demographic factor, having shown that there are 47 migrants among each one thousand employable people in Uzbekistan.

4 Conclusions

The major push factors are ethnic, demographic and economic which amplifies by administrative obstacles that constrain internal rural migrations to residential locations and by the environmental problems that take place in Uzbekistan. Influence extent of these factors was inadequate during various periods of time. So, originally Uzbek migration had mainly ethnic character. So far this factor sputtered out and gave way to economic one. At the same time action of ecological factor and urbanization processes lead to prevalence of villagers in migration flows from Uzbekistan.

The major pull factors are visa-free regime between the countries, difference in the level of incomes per capita, availability of free vacancies in the recipient country, existence of historical links, rather low linguistic barrier, relatives or acquaintances in the country of emigration and possibility of social status change. At the same time, it was revealed that the factor «relatives or acquaintances availability in the recipient country» is the most important for the choice of the country for emigration and has biennial cyclicity in change of impact extent. The factor “availability of historical links and rather low linguistic barrier” gradually loses the value.

The results of econometric analysis also confirmed the high importance of economic, ecological, demographic and network factors in formation of migration flows from Uzbekistan.

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Adaptive Architecture of the Enterprise Accounting and Analytical System

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Abstract. The paper lays bare the theoretical and methodological foundations of the formation and functioning of the adaptive architecture of the commercial enterprise accounting and analytical system based on the engineering methodology of adaptive accounting, the provisions of the evolutionary adaptive balance theory and the theory of architectonically structured support and aggregated modeling in the adaptive accounting and analysis system. Besides, the paper pays special attention to substantiate the possibilities of using the adaptive evolution of structured set of accounts and adaptive engineering tools in the adaptive processes management. The author propounds the formation and usage of the model of architectural systems of structured and integrated sets of accounts and adaptive engineering tools under the conditions of multivariate solution and alternative choice of adaptive change management, revealing its structure and essential elements. The conducted research allowed developing computer software «Implementing Adaptive Models of Commercial Enterprise Integrated Information Architecture» and «Set of Accounts Structural Architecture and Information Infrastructure». The first program is recommended to exploit to diagnose the level of enterprise adaptability, while the second one contributes to the expansion of monitoring and analysis capabilities of the information system in the context of multivariate solutions, alternative situations, assessing adaptation effectiveness, taking into account users' multivariate requests and tasks to be solved.

Keywords: Adaptation · Adaptive enterprise · Accounting and analytical system · Adaptive accounting and analysis · Architectonically structured support · Structured set of accounts · Adaptive engineering tools

1 Introduction

The contemporary economic conditions caused by the globalization of economic processes, computer revolution, hardening competition in all industries and spheres, increased risk and uncertainty raise the question of ensuring effective functioning of commercial enterprises and the need for constant adaptation to changing conditions and factors of the external environment. The shift of the management paradigm towards solving problems in the global economy, electronic technologies, and change management on the basis of alternative development options determines the topicality, relevance and possibilities of creating adaptive management, accounting and analytical systems.

Present-time accounting inherits adaptive attributes and properties due to the increasing role of accounting in management, the enhancement of management functions in accounting, the implementation of its forecast capabilities, the rapid development of information systems and technologies, the decision-making support architectural systems, network systems, the expansion of the accounting dimension boundaries, the ability to determine results of activity on various adaptive criteria (kinds of activity, business segments, market segments, strategic activity directions, links in the value chain, responsibility centers, alternative options and situations, forecasting development scenarios, investment and innovation horizons). The development and effective functioning of the organizational and economic mechanism of adaptive change management leads to the objective necessity to justify the concept of the adaptive architecture of the enterprise accounting and analytical system, taking into account the defining theories of the economic adaptation mechanism functioning (adaptation principles and directions, adaptive enterprise accounting and analytical identifiers, adaptation results); implementation of system, complex and situational approaches to adaptive accounting and analysis, the information approach to the adaptive accounting dimension, engineering methodology of adaptive accounting and analysis, grounding the integration capabilities of adaptive accounting and integration tools, the possibilities of using adaptive evolution of structured set of accounts. The need to address the abovementioned theoretical, methodological and methodological issues determined the choice of the topic, its relevance and assigned task.

The effective functioning of adaptive accounting is based on exploiting architectural systems and models of adaptive architecture of integrated decision-making support information systems, which provides the following: applying adaptation principles (exercising architectural systems and models of adaptive architecture during the integration of adaptive engineering tools into the set of accounts structure, rapid adaptation, sustainable differentiation, separate result evaluation, creation of new processes that respond to new market opportunities); using the principles of evolutionary-adaptive balance theory according to the appropriate opportunities for implementing adaptation directions on the basis of adaptive engineering tools (gradual, forecast, strategic, situational, scenario, structured, evolutionary-adaptive, situational-matrix, situational-strategic, stochastic, transaction, semantic and other derivative balances); assessing the results of adaptation achieved (increasing change resistance, aggregated and disaggregated property values, level and economic nature of adaptation, margin of security); exploiting computer programs and databases of the adaptive accounting and analytical system, built-in into the work set of accounts structure; organizing information support with sufficient analytical level for making relevant decisions on change management based on alternative choice; forming and functioning adaptive accounting systems, control systems of adaptive management; determining, monitoring, and analyzing adaptation results.

2 Theoretical, Methodological, Informational and Empirical Grounds of the Research

The theory of the functioning of the adaptation economic mechanism is emanated from the paradigm shift in management towards the transition to change management on the basis of alternative choice, iterative approximation of the desired results and implementation of the multivariate decisions on changes regarding the level and economic nature of adaptation.

Carrying out enterprise adaptive capabilities assumes that CEO, proprietors and managerial staff make timely considered and weighted decisions from an array of the alternative ones. At the same time, the information field of decision-making is characterized by the multivariate decisions, scenario variants of development, forecasting options, situations, strategic activity directions, a balanced approach to assessing existing or potential opportunities and risks related to them under the conditions of making an alternative choice from the most preferable option [3].

Adaptive enterprises are distinguished by a number of essential features that provide the instant solution development as a response to functioning changing conditions and rapid adaptation to achieve certain success.

Adaptive enterprises are able to develop solutions without delay at the first signs of emerging new opportunities for the ecosystem (market). They immediately implement the developed solution into the business processes of an ordinary office, using the stable links existing in the global architecture [8] based on a flexible information architecture and the varied usage of computer programs integrated into set of accounts, databases of adaptive engineering tools without a radical change in their structure. It allows enterprises to make weighted decisions from a number of the alternative ones: decisions are made on the basis of specific data obtained while using adaptive engineering software; decisions are made being derived from the several alternatives with the choice of the most optimum variant for the given parameters; timeliness of decisions; providing a balanced approach to make decisions on changes [10].

Using adaptation principles provides the formation of an adaptive architecture of the enterprise accounting and analytical system: the basic principle assumes the exploitation of adaptive architecture models based on the integration of architectural systems into the set of accounts structure (computer programs, databases, decision-making support offices) for obtaining and processing information; rapid adaptation surmises timely reaction to changes, new opportunities and threats and the adaptive measures implementation based on the use of adaptive engineering tools – accounting, control, analytical, tax, and network ones; stable differentiation is maintained by the functioning of stable internal self-adjustment, self-regulation and adaptation systems built in the enterprise information system: set of accounts modules and blocks, engineering computer programs, databases, decision-making support systems; growing volatility originated in the use of network capabilities and technologies that provide communication and increased level of interactivity; the principle of separate evaluation involves the identification and evaluation of results in the spheres of adaptive capabilities implementation: activities, internal and external segments, market segments, strategic activity directions, economic situations, forecasting development scenarios and alternatives.

Adaptation involves foreseeing the future, drawing up scenarios aimed at developing customers' needs, competition, external conditions and all that can affect the enterprise [1].

The formation and functioning of the adaptive architecture of the enterprise accounting and analytical system is derived from employing engineering methodology of adaptive accounting, the provisions of the evolutionary adaptive balance theory and the theory of architectonically structured support and aggregate modeling in the adaptive accounting and analysis system.

The development and use of engineering approaches, tools and technologies are carefully considered in [2–5, 7, 9, 10, 12–14].

The engineering methodology of adaptive accounting is based on the enlargement of adaptive engineering tools integrated into the set of accounts structure, and forming the overall architectural decision-making support system on changes, functioning in an interactive mode. The application of the given tool is aimed at ensuring stable functioning, preventing economic collapse and enterprise bankruptcies, achieving the desired results, avoiding potential hazards, i.e., survival in a changing environment, risk and uncertainty, reflecting these processes in the system of adaptive engineering tools based on determination, control and analysis of enterprise value relevant to the current situation, so called property indicators.

The functioning of adaptive engineering tools is based on the management paradigm principles corresponding to changes occurring in the enterprise external macro- and microenvironment, oriented on maintaining and ensuring the dynamics of property indicators – aggregated indicators of net assets and disaggregated indicators of net liabilities.

Reproducing invariant properties of the system is ensured by the adaptation directions implementation in accordance with the appropriate adaptive engineering tools: control on the basis of the alternative choice (alternative development options, strategic alternatives, economic activity directions, economic situations, development scenarios, multivariate solutions, choice of the most optimum variant from a number of the alternatives): scenario, situational, situational-matrix, strategic, alternative derivative balances; providing adaptive predictability (direct forecasting, indirect forecasting, key indicators confirming data): forecast, strategic, innovative, venture, zero and other derivative balances; changes management and control: gradual, strategic, forecast, network, evolutionary-adaptive, transactional-adaptive, and socio-economic adaptive derivative balances; enterprise segmental policy (external and internal segments, market segments, territorial fractals, strategic sites, «soft spots» in the value chain, investment time horizons, innovative time horizons): segmental, fractal derivative balances of different structure and configuration; changes factor analysis assuming the transition from the maximum probability factors to the minimum probability factors: stochastic derivative balances; forecasting the desired future and developing iterative stages of its achievement: transaction, situational, and strategic derivative balances; monitoring and control: monitoring, zero, and semantic derivative balances.

The engineering methodology of adaptive accounting and analysis is derived from the system integration of information systems, business processes, and communication technologies [6, 8, 15–21].

The engineering methodology of adaptive accounting and analytical support of adaptive change management is based on the cardinal provisions of the evolutionary adaptive balance theory. The given theory presupposes the use of engineering tools of accounting, control, analytical, tax, network and financial nature emanated from the hypothetical implementation of assets and satisfaction of obligations in relevant prices to obtain a variety of options for enterprise balance generalizations and their sources, characterizing the level and economic character of adaptation in conditions of change.

The application of the given tool provides the integration capabilities of the adaptive accounting system on the basis of its integration into the set of accounts structure.

Thus, the reasons for using the adaptive evolution of structured set of accounts expect implementing and exploiting architectonics principles while developing the information system of an adaptive type.

The concept of architectonics ensures the stability of the accounting and analytical system by integrating adaptive engineering tools into the computer programs of set of accounts structure, the possibility of integrating various systems of adaptive accounting, control and analysis to solve relevant problems of adaptive change management.

In addition to constructing processes by connecting the components together, the architecture should allow the insertion and removal of certain components. The enterprise obtains the opportunity to design and construct components and use them in such a way that, if necessary, they ensure the continuous successful integration and reintegration of new processes [8]. In its turn, it creates an organizational and methodological ground for the functioning of the adaptive accounting and analysis system based on using architectural systems of set of accounts, adaptive engineering tools, computer programs, and databases.

The theory of architectonically structured support underlies the design of the accounting and analytical system adaptive architecture and is based on general laws, rules and results of architectonics as a science dealing with the system integration of accounting objects, set of accounts, functions, algorithms, tools, obtained results, information technologies, computer programs, databases into a unified system based on architectural systems and adaptive architecture models with the integration of adaptive engineering tools into the set of accounts structure.

According to Tr. Elliott and D. Herbert, the concept of architecture is derived from a symbiosis of business architecture, management and security architecture, architecture of data, software applications, and technological infrastructure aimed at combining business and technical views into a single whole [8].

Agreeing with the abovementioned, E.V. Kuznetsova still expands the list with the architecture of the set of accounts. To the scholar's mind, it makes available to create and function a system of structured set of accounts characterized by considerable information capacity: an adaptive architecture, a structural architecture (structured set of accounts), an integrated architecture (types of integrated accounting), an instrumental architecture (accounting engineering tools) [11], which should be supplemented with accounting, control, algorithmic, situational, fractal, transaction, stochastic, and semantic architecture, that form the basis for designing adaptive accounting and analysis.

The theory of architectonically structured provision of adaptive accounting and analysis is emanated from the organic combination and exploitation of the architectural systems and models capabilities to create a flexible, effective, and self-adjusting accounting and analytical system of information stochastic type that provides timely responses to changes, new opportunities and threats, rapid adaptation and adaptive measures implementation aimed at preserving and ensuring the dynamics of aggregated and disaggregated property indicators: adaptive architecture supplies the expansion of the capabilities of the adaptive accounting and analysis information system to increase flexibility, managing changes based on a multivariate and alternative choice, effective use and integration of data, system adaptation to certain conditions; the instrumental architecture creates the grounding for integrating adaptive engineering software and databases into the set of accounts structure with the appropriate levels of data aggregated; the integrated architecture is aimed at creating integrated accounting and analytical systems of adaptive management based on employing integration tools in the form of structured set of accounts, tools of adaptive engineering accounting, control, analytical, tax, situational, and network nature with obtaining results in an interactive mode; the structural architecture contributes to the formation and binding of the set of accounts to business architecture, technological and information infrastructure, enterprise organizational and managerial structure to form a single information field for managing adaptive processes; accounting architecture is targeted at the formation and functioning of adaptive management accounting and analytical systems, their integrated or disintegrated use in conditions of change adaptation: adaptive financial, tax, managerial, strategic, situational, and network accounting; the control architecture provides adaptive management control systems with multivariate possibilities to form and function in an engineering mode; the algorithmic architecture is oriented on the development and application of adaptive accounting and analysis algorithms, algorithms for compiling and using adaptive engineering tools, control algorithms, separate iterations of algorithms, iterative steps for forecasting and achieving the desired future, that forms the basis for the development of computer programs and databases of adaptive engineering tools; the situational architecture ensures the opportunities for situational management of changes and directions of adaptive capabilities implementation in conditions of high analytical character of structured set of accounts; the fractal architecture is connected with the fractal structure of any business and allows to organize accounting and analytical support of adaptive management processes in the context of territorial structures and time horizons of various duration; the transaction architecture issues situational management and transaction accounting, control and analysis iterativity at stages of approaching the desired future, target results in the conditions of gradual changes and adaptive measures implementation; the stochastic architecture determines the possibilities to design adaptive stochastic accounting and analysis of adaptation factors alongside with indicating probabilistic features, solving a wide range of problems related to assessing factors, gradual changes considering limited status, interval values, and a restriction scheme; the semantic architecture supplies integrated use of semantic analysis and control methods, based on event forecasting in the conditions of integrated information systems to prevent crisis situations and loss of capital and property.

The theory of architectonically structured provision of adaptive accounting is focused on employing block, modular set of accounts structure with computer software and databases of adaptive engineering tools integrated into their information space. Its key purpose is to implement adaptive change management capabilities based on alternative choice by manipulating individual modules and blocks, integrating and disintegrating separate computer programs, installing new modules, programs, databases, algorithms, as necessary, without changing the whole set of accounts structure.

The functioning of the adaptive engineering tool is based on the fundamental provisions of the management paradigm, corresponding to changes in the enterprise external macro- and microenvironment. Besides, it is impossible without the orientation on preserving and ensuring the property indicators dynamics – aggregated indicators of net assets and disaggregated indicators of net liabilities [13]. At the same time, it is advisable to take aggregated and disaggregated property indicators as the key criterion for assessing the level and economic nature of adaptation. They indicate the market value of capital and the effectiveness of adaptive measures in relation to the enterprise equity (net assets and net liabilities).

3 Results and Discussion

The substantiation of scientific significance, theoretical and methodological aspects of the given research made available to develop a certain model for creating and applying architectural systems of structured and integrated set of accounts and adaptive engineering tools in the context of multivariate solutions and alternative choice of adaptive change management.

The presented model allows depicting schematically the iterative process of architectural designing of the adaptive accounting and analytical change management system by staged (stochastic) calculation and accounting procedures aimed at forecasting changes and the implementation of appropriate adaptive measures using architectural systems of structured and integrated set of accounts and engineering tools. Aggregated accounting records are used as the architectural basis to obtain aggregated and disaggregated indicators of net assets and net liabilities, which in their turns are exploited to determine the level and economic nature of adaptation.

The model is implemented in the framework of an iterative algorithm aimed at providing accounting forecast and staged (stochastic) achieving the desired adaptation result using the structured set of accounts as the initial operator of economic aggregates: forecast assessment of changes based on creating forecast gradual balance; forecasting and reflection of adaptive measures in accounting with drawing-up of adaptive derivative balance; adjusting operations of the staged adaptation change considering new conditions and factors and obtaining an adjusted adaptive balance; hypothetical operations of the tie-in sell-off of assets and satisfaction of obligations in a market or fair evaluation and obtaining a hypothetical derivative balance to determine real value. The results are presented in the form of a system of interrelated engineering indicators for determining the economic nature of adaptation (net assets, net liabilities), the aggregated status of property (before and after changes, considering price changes, before and after adaptation), the economic nature of adaptation (active, passive, or neutral).

The aggregated indicator of net assets is defined by the results of implementing various adaptive procedures and processes, alterations, development directions in the system of adaptive engineering tools in a relevant current assessment situation.

The disaggregated indicator of net liabilities is calculated according to the results of implementing hypothetical processes of the tie-in sell-off of assets and satisfaction of obligations in the relevant price system (as a rule, market or fair prices). In compliance with the «Cash/Net Liabilities» approach the given indicator characterizes the ownership structure from the sources of formation perspective by the results of the adaptive management: cash/disaggregated net sources, lack of balance in hand/zero capital, loss/negative capital.

The use of hypothetical procedures of the tie-in sell-off of assets and the satisfaction of obligations in a relevant assessment situation (market or fair) allows determining the enterprise real value and assessing the impact of price, currency, inflation, market and fair prices on property dynamics, including the possibility of obtaining price synergetic effect [9].

Employing engineering indicators of net assets and net liabilities, their various modifications and options allows solving the problem of implementing adaptation directions, organizing changes management based on alternative choice, iterative approximation to the desired adaptation result.

The carried out research demonstrated that aggregate modeling in the system of adaptive accounting and analysis provides the development and use of aggregated accounting records in the adaptive processes management (corrective, managerial, forecasting, strategic, hypothetical, control, situational, scenario, and adaptive) that determine the engineering technology of adaptive accounting and are characterized by appropriate economic content, a system of adaptive engineering tools and economic aggregates of structured set of accounts. The abovementioned issues specify the variability of the proposed model in accordance with the levels of information aggregation: groups of accounts, sections of the work set of accounts, modules of the structured set of accounts, balance figures, balance sheets, aggregates of the main accounting equation, mega-accounts, the system of adaptive strategy implementation indicators.

The economic aggregates of the structured set of accounts act as the initial operator of the engineering technology of adaptive accounting and analysis and determine the directions for implementing the enterprise adaptive capabilities by varying and selecting these or those aggregated indicators considering the current situation and the management information needs. The technology of adaptive accounting based on adaptive engineering tools within the framework of the presented model includes the initial operator, the system of aggregated accounting records in accordance with the directions for implementing the adaptive capabilities, the final operator in the form of a system of interrelated indicators: net assets, net liabilities, economic nature of adaptation (active, passive, or neutral), margin of security (active, passive, or standard).

4 Conclusions and Recommendations

The conducted research made it possible to conclude that aggregate modeling in the system of adaptive accounting and analysis is aimed at creating and developing computer programs and databases of adaptive engineering tools.

Due to the high computerization of accounting and management process, the software and technical implementation of the model proposed in the paper allowed to develop and recommend for practical application the software entitled «Implementation of Adaptive Models of the Commercial Enterprise Integrated Information Architecture» (Patent no. 2016663620).

Its key purpose is to generate relevant information for diagnosing the level of enterprise adaptability, based on a complex system of indicators, including absolute and relative property indicators in terms of the aggregated state of the enterprise resources and their sources (taking into account the adaptive measures, forecasting in the event of an adaptive strategy change, considering various situational factors of external impact, regarding price changes), adaptation zone indicators (active, passive, or neutral). Complex automated diagnostics of the enterprise adaptation level derived from the integrated information architecture allows evaluating the effectiveness of the conducted adaptive measures and can be widely applied in practice.

Like the presented model, the given software is ultimately oriented on property indicators in the form of aggregated and disaggregated indicators of net assets and net liabilities in market and fair prices as the main criteria defining the effectiveness of adaptive measures, i.e. determining the level and economic nature of adaptation, which meets the requirements of adaptive change management based on the alternative choice: before and after the changes, considering price changes; regarding the carried out adaptive strategy, the forecasting aggregated status in case of the strategy change; taking into account conducted operational, tactical, and strategic changes.

Beside, using architectural systems of structured and integrated set of accounts, the possibilities to design the adaptive architecture, considering the organizational and managerial features and information infrastructure of the enterprise set of accounts allowed developing and advocating for practical application the «Set of Accounts Structural Architecture and Information Infrastructure» software (Patent no. 2016663714).

The program is intended to form the relevant structured information architecture of the enterprise data by formalizing and unifying the calculation and accounting procedures for obtaining and reflecting the results of the enterprise economic activities. In our opinion, it significantly expands the control and analytical capabilities of the information system in the context of multivariate solutions, alternative situations, and assessing the adaptation effectiveness occurring in the conditions of changes. The complex automated system forms the information infrastructure of accounting, control and analytical procedures based on the exploitation of the aggregated modeling mechanism of integrated and structured set of accounts database acting as the initial operator, characterized by diverse degrees of aggregation, information analytics, regarding multivariate users' requests and tasks to be solved.

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Algorithm of Development of Motivation System of Industrial Enterprise Personnel

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Abstract. The article discusses the possibility of increase of efficiency of functioning of industrial enterprises through the definition of algorithmic approaches to complex integrated process of development of the personnel motivation system. The basic indicators of algorithmization of management of the personnel motivation system of the industrial enterprise on the basis of which the formula defining the level of motivation of the personnel of the industrial enterprise is received are developed. It is noted that the prerequisites for the creation of a comprehensive system of motivation to work should be the emphasis on human resources management, taking into account the mutual influence of their environment, both near and far. In matters of this direction should take into account the motives of national, regional character, and the motives of human level. The motives are formed within the influence of factors of cultural, social, personal and psychological levels. Each of the proposed indicators should be taken into account in accordance with its significance or “weight”. The advantage of the presented approach is that the indicators of the effectiveness of the process of motivation of the personnel of the industrial enterprise on the basis of specific requirements can be clearly presented. The construction of the proposed algorithm will also reveal the weaknesses of the current system of motivation and carry out a targeted impact on their strengthening, both within the enterprise and in the immediate environment of the studied resources of the enterprise.

Keywords: Motivation · Algorithmization · Personnel

1 Introduction

For the optimal development of the industrial enterprise personnel in the conditions of increasingly *accelerated*. Informatization of the processes of management of various objects, based on big data and the use of blockchain technology, as the initial idea of the development and implementation of the personnel motivation algorithms, it is necessary to use the methodology of the system-target approach. The importance of improving the management process of motivation of industrial enterprise personnel is determined by the fact that, in many ways, the stability of the business, the strength of

positions and stability of the enterprise as a socio-economic system, provide, first of all, people. The personnel of the industrial enterprise should be motivated, including creative activities, be able to adequately assess and implement innovations, to correlate their implementation with the final strategic objectives, achieving optimal end result. In modern conditions, for many types of industrial enterprises it is important to form the group dynamics management. The motivation of the industrial enterprise personnel should be aimed at the systematic achievement of the enterprise development goal.

2 The Relevance of the Algorithm Development of the System of Motivation of Industrial Enterprise Personnel

The important, sometimes determining, influence of the personnel of the enterprise, on its competitiveness and ability of positive strategic development, defines high relevance of development and introduction at the industrial enterprises of algorithm of development of system of motivation of the personnel. The problem of the development of this algorithm must be solved with the use of a systematic approach to the management of the enterprise, and is an element of the optimal control of economic systems, which covers a wide range of issues. To develop an algorithm for the development of the system of motivation of industrial enterprise personnel, it should be noted that the reasonable interaction of all elements of the production system requires the presence and rational use of material and labor resources, both consumed and used in the management and controlled subsystems [1]. Modern information technologies allow to consider the functioning of the system in the social and ethical dimension. [2] in this regard, there is a problem of understanding the system approach and modeling of economic development of social aspects of staff motivation. Considering the basic definitions of the system, we note that in relation to the objects of control under the system is understood an ordered set of elements, dynamically linked [3]. Definitions of the concept “system” in relation to economic objects can be divided into two groups, fundamentally different from each other [4]. The first group includes those that do not allocate the system integrity property. L.D. Hall and R.E. Feiji define a system as a set of objects together with the relations between objects and between their attributes (properties) [5]. The second group of definitions includes integrity as an important property of systems. S.I. Arkhangelsky, Yu.K. Babansky, T.A. Ilina, N.B. Kuzmina and other scientists understand the system as a complex of interrelated elements forming a certain integrity [6].

There are many classifications of systems [3, 7, 8]. For example, open and closed systems are distinguished by the methods of interaction with the environment. The company can be attributed to the informal socio-economic system in which a person sets goals (goals) for each element of the system.

In accordance with the classification of CT. Bira, the company can be attributed to a very complex probabilistic (stochastic) system [9]. Consequently, the motivation system also adopts the features of the senior class, which can be algorithmized, taking into account new technologies of information collection and processing.

In the scientific literature, the system is understood as a set of interrelated elements that have certain common properties and are United for the sake of a certain goal [10].

System approach is called, in which all connections and mediation, elements, functions and management problems are considered in the form of an interconnected whole [11]. Traditionally, the aspects of creating a motivation system at the enterprise level are considered taking into account their normative nature, however, along with the regulatory processes in organizations, uncontrolled or poorly controlled folding processes are essential (“the situation”, although no one “wanted” to develop it this way) [12]. American personnel services devote more than a third of the working time to the development and implementation of various personnel management programs. [13] in modern works, scientists also recognize that high productivity and coordinated management are not possible without a competent impact on the motives of workers [14]. Sociologists confirm the need to increase the role of staff motivation and to develop new tools and methods that can help businesses become more effective. [15] the Motivation of the personnel of industrial enterprises is one of the key problems of increasing the efficiency of management. Sooner or later before the Manager (head of the company) there is a question of how to motivate employees to perform their duties more effectively [16].

3 Statement of the Problem of Development Algorithm of Development of the System of Motivation of Industrial Enterprise Personnel

The increasing importance of the competitiveness of the industrial enterprise, the acceleration of scientific and technological progress, dictates the requirements for the creation of an effective system of personnel development. An important component of this system is the personnel motivation subsystem. For the development of this subsystem it is necessary to determine the main indicators of algorithmization of management system of motivation of industrial enterprise personnel, on the basis of which to obtain a formula that determines the level of motivation of industrial enterprise personnel.

When developing a personnel motivation system of industrial enterprise needs to be mindful of promotivirovat labour behaviour, when their behaviour may be affected by many motives. They may or may not be related to each other, sometimes in conflict. However, usually for each individual employee they form a certain hierarchy, that is, a more pronounced effect on behavior have motives, which are based on the needs that are more important for the person and therefore occupy a higher place in the hierarchy of work motivation. It is necessary to distinguish the influence of objective and subjective factors, under the influence of which the labor behavior of personnel is formed. Objective factors, although external to a person, affect the person, are evaluated by him and form his work behavior. Subjective factors are caused by the peculiarities of the person, his General and professional culture, previous experience. Therefore, within the same objective conditions, people’s labor behavior is different. Labor motivation of the personnel is formed under the influence of many factors, they need to know and use in management. Such factors are the organization of work, material and moral incentives, evaluation and control of work and employee, information, organizational culture, etc.

4 Theoretical Aspects of the Development of the Algorithm of Development of the System of Motivation of Industrial Enterprise Personnel

The process of algorithmization of the development of the system of motivation of the industrial enterprise personnel, in our opinion, is determined by the following main indicators: norms of controllability and optimization of organizational structure of the enterprise management; optimization of labor of managers and division of their powers; psychology of management; style of work of the Manager; remuneration and stimulation of employees of all levels of management and production; culture and behavior of employees; increase of the quality and professional level; other indicators that determine the management of human resources. The proposed indicators do not pretend on exhaustive enumeration. However, they show the possibility of managing the motivation of industrial enterprise personnel and the definition of approaches to the algorithmization of a complex integrated process of personnel management as an element of human resources. Thus, in the process of solving complex-target tasks related to the development of the system of payment and stimulation of labor, it is necessary to proceed with the transition to the criteria of production efficiency. This requires the introduction of other forms and methods into the current system of payment and stimulation of labor, which would purposefully promote the development of creative initiative and entrepreneurship of employees, increase interest in the growth of their performance, increase production and sales, development of new products and technologies. All this ensures the effective functioning of the enterprise in the market conditions.

The proposed set of indicators is not arbitrary, but involves a consistent and rational combination of factors that determine the quality motivation of the industrial enterprise personnel. Thus, one of the most important functions of management is the organization of the management process, in particular the choice of the organizational structure of the enterprise. It is quite clear that the type of organizational structure of the enterprise has a significant impact on the work of employees and their productivity. These issues are solved in a clear connection with the rules of manageability, which are influenced by the qualification of staff, location of work places of employees, the presence of deputies, the type of employee's personality, etc. It should be noted that the lack of rational distribution of powers causes the transfer of activities from the strategic zone to the zone of current execution. There is an unreasonable overload of the upper levels of management of the enterprise, which ultimately leads to a loss of strategic vision of the problems. The study of psychological characteristics of different types of work, motives for preference of one profession to another, factors of workability and fatigue, factors of formation of reference groups (created most often on the basis of interpersonal relations and mutual sympathies), the construction of social matrices make it possible to realize the possibilities of reflexive management, created to solve management issues taking into account the psychological aspects that determine them.

The motivation of work is formed before the beginning of professional work - in the process of socialization of the individual by learning the values and norms of work morality and ethics, as well as through personal participation in work within the family

and school. At this time, the foundations of the attitude to work as a value are laid and the system of values of work is formed, the labor qualities of the individual are developed: diligence, responsibility, discipline, initiative, etc., initial labor skills are acquired.

The prerequisites for the creation of a comprehensive system of motivation to work should be the emphasis on human resource management, taking into account the mutual influence of their environment, both near and far (see Fig. 1).

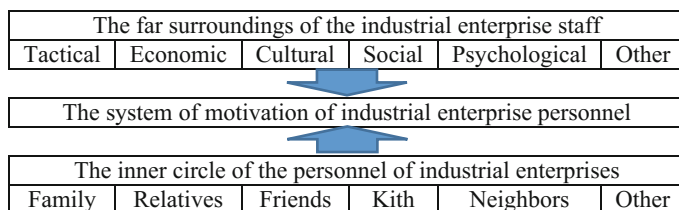


Fig. 1. Possible elements of the near and far environment of the workforce, affecting the development of the algorithm of development of the system of motivation of industrial enterprise personnel.

In addressing these issues, we should take into account the national and regional motives, as well as the motives of the universal level. The motives are formed within the influence of factors of cultural, social, personal and psychological levels.

Thus, the influence of material motives may be more or less significant for people of different nationalities, places of residence, psychological environment, when working with managers of different leadership styles, etc. Any employee experiences the influence of age and sex characteristics, personal dominance, characteristics of character and type of personality, self-esteem, attitude to himself, etc. In addition, have an impact on the management of labor and, most importantly, human resources, scientific, technical, economic, political and other motives. At the same time, we should note the unconditional prevalence of material motives over moral ones in the activities of Russian enterprises of today. Significant influence of material motives has led in some cases to a significant decrease in interest of both employees and more managers to improve the skills of human resources, as the transformed system of training requires significant investments, which are carried out in it only competent and innovation-oriented entrepreneurs. The influence of environmental factors, as in the previous ones, affects the worker with different strength. Each of the proposed indicators should be considered according to its significance or “weight”. In General, the formula for determining the level of human resources management may look like:

$$KM = \sum_{i=1}^n \frac{Ki \times Ri}{n} \quad (1)$$

where, KM is an indicator of the efficiency of the system of motivation of the industrial enterprise personnel; Ki is an indicator characterizing the impact on the motivation

system of the enterprise through the psychology of management, style of work, etc. ($i = 1, \dots, n$, where n is the number of indicators that determine the quality of human resources management); R_i is the significance, or “weight” of the indicator taken into account in the algorithmization of human resources management.

The proposed algorithm (see Fig. 2) is, in turn, the sub-program of General personnel management of the industrial enterprise.

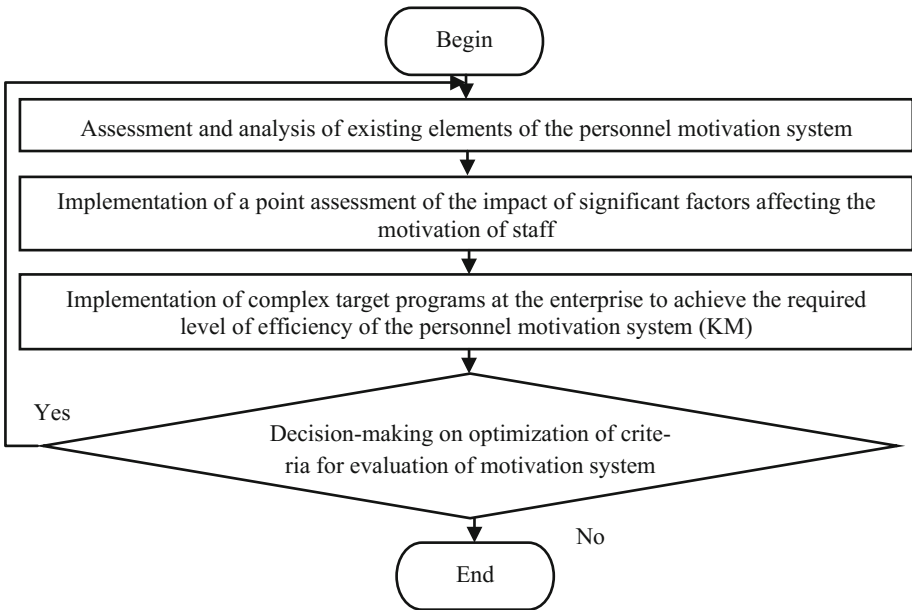


Fig. 2. Algorithm of development of motivation system of industrial enterprise personnel.

It should be noted that the significance of each indicator determining the efficiency of the system of motivation of the industrial enterprise (CM) personnel can be normalized, for example, by experimental and statistical methods. At the same time, the establishment of the maximum limit value is not in doubt: when normalizing the coefficients, it should be taken as 1.0 or 100%. The minimum value of each of the indicators determining the value of KM can be zero in the absence of a specific component of the impact on this coefficient.

5 Practical Aspects of the Implementation of the Algorithm of Development of the System of Motivation of Industrial Enterprise Personnel

Research of various aspects of algorithmization of personnel management of industrial enterprises conducted since 2000 found, including, reflected in the articles [17–20]. A lot of work has been done on the research objects to ensure motivation and interest of

the work performers, including the bonus system, which is based on the final production, which allowed solving the problem of responsibility of the work performers for the final result. The management of one of the industrial enterprises creates an appropriate production environment: a certain combination of human and production factors through registration and conclusion of a collective agreement between the administration of the enterprise in the person of the General Director, on the one hand, and the labor collective in the person of the Chairman of the trade Union Committee, on the other hand. In order to obtain information about the perception of the personnel of the enterprise specialists of the enterprise conducted a survey. According to the results of the survey, a positive trend of employee satisfaction was revealed. High levels of staff satisfaction have been achieved through the implementation of measures aimed at improving staff satisfaction, which include improvement of personnel policy and training policy, social payments and material assistance, repair and construction works aimed at improving production and living conditions, wage growth, continuous improvement of working conditions. The creation of working conditions by the company's management, which satisfy the staff, helps to reduce staff turnover and the influx of young people to the plant. In the process of solving complex and target tasks related to the development of the system of payment and stimulation of labor, it is necessary to make the transition to the criteria of production efficiency. This requires the introduction of other forms and methods into the current system of payment and stimulation of labor, which would purposefully promote the development of creative initiative and entrepreneurship of employees, increase interest in the growth of their performance, increase production and sales, development of new products and technologies. All this determines the effective functioning of the enterprise in the market conditions.

6 Concluding Remarks and Research Needs

The advantage of the proposed approach to improving the motivation system by algorithmization is that its effectiveness can be clearly represented, and therefore it is possible to determine the criteria for the development, operation and achievement of the optimum of the current and future motivation system, taking into account the specific conditions of the enterprise. Construction of the proposed algorithm will also allow to identify weak links of human resources management and to carry out a targeted impact on their strengthening, both within the enterprise and in the near environment of the studied resources of the enterprise. Analysis of the experience of foreign and domestic enterprises allowed to identify and summarize the conceptual methodological provisions on which the system of personnel motivation is based, including taking into account the often multidirectional goals of the personnel groups [20]: since in market conditions the enterprise independently solves social and economic problems, it should be a self-learning and self-improving open system; each member of the staff of the enterprise should learn and improve the level of skills, strive to obtain additional knowledge, to achieve changes and expand the scope of activities, and the company should create all the necessary organizational and economic conditions and opportunities. The high level of professionalism of the employee should

correspond to the high level of payment of his work; should encourage the strengthening of a material interest of workers in increase of manufacture of competitive products and its sales volumes and the establishment of dependence of remuneration of each structural unit of the enterprise and each employee of the final outcome of the production and economic activities of all staff; remuneration system and promotion of labor merits must eliminate egalitarianism and allow to commend those employees who are willing and able to work, deepens your knowledge and enhances the quality of work; the priority in the remuneration of labor should be the main production workers-pieceworkers, whose work is most intense, associated with the manufacture of complex competitive engineering products and has a direct impact on the growth of productivity of workers in the enterprise. It is necessary to establish additional incentives for the development of creative ideas, the manifestation of initiatives and their introduction into production, the enrichment of the mechanism of motivation of non-traditional forms and methods of remuneration and incentives associated with the solution of specific, crucial for the enterprise in a certain period of time the tasks of development of production; successful solution of social problems of workers (possible development and effective functioning of social infrastructure of the enterprise). The management system of labor organization and wages should be included in the corporate information system of enterprise management as one of its main components. The stated conceptual provisions provide an opportunity to create a competitive system of development of motivation of industrial personnel in the strategic plan, which can have a serious socio-economic effect not only for a particular enterprise, but also for the national economy as a whole.

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The Study of Linkage Quality of Life Indicators Within Regional Demographic Parameters

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Abstract. The article is devoted to the interrelationship of two the most important groups of social and economic indicators: the quality of life and the demographic indicators of fertility, mortality and migration. Firstly, the authors proposed to classify quality of life assessing methods into three groups. The practical analysis was carried out on the statistical data basis in Sverdlovsk region, the total population of which is about 4.5 million people. The article analyzes the demographic indicators in the region, reveals that the birth rate in the region is higher than in Russia in average. Further, the main indicators characterizing the quality of life in the region were analyzed. At the last stage, two indicators are determined, according to which a direct link is seen: with the growth of these quality of life indicators, the birth rate increases in the municipalities of the region. Based on the conducted research, the authors have suggested to create such a value system in a society that helps to formulate norms of healthy life and family traditions.

Keywords: Demographic indicators · Birth rate · Quality of life · Quality of life assessing methods · Quality of life indicators

1 Introduction

The main public policy strategic priority in general and in certain regions is to improve the level and quality of life. All other goals, tasks and guidelines should be subordinated. Failure to comply with this principle in practice leads to inefficiency of territorial development strategies (not in the operational, but in the global-strategic sense) [1]. The quality of life is a complex multidimensional phenomenon, which can't be unambiguously characterized and measured by one indicator. The quality of a person's life as a bio-socio-spiritual being simultaneously depends on the level and quality of satisfying his material, social and spiritual needs, as well as on the conditions of his physiological, social and spiritual development [2].

In the socio-economic aspect, the quality of life is usually understood as the evaluation of some conditions and characteristics set about human life, reflecting the material, cultural and spiritual needs satisfaction degree [3]. The assessment can be carried out both by the level of people's satisfaction with their lives according to their

own subjective self-esteem [4], and measured by competent and informed specialists using a set of objective indicators [5].

According to the WHO definition, the quality of life is the perception by individuals of their life position in the context of culture and the value system context where they live, in accordance with goals, expectations, norms and concerns [6, p. 12]. The quality of life is a multicomponent system and is a historical category that changes in the process of the society evolution. It reflects the comfort degree in various spheres for the personal life in a certain historical period. Regardless of the point of view on this category, the assessment of the relationship between the living standard and the living environment is the most important. At the same time, the quality of life is defined as the personal needs satisfaction in a healthy environment and material goods in accordance with the societal value orientation [7].

The natural population reproduction processes have always been the object of focus of economists, demographers, sociologists, politicians, psychologists and all those who realize that the prospects for the any territory successful development depend on the quantitative and qualitative population characteristics.

This article is written with the purpose of analyzing which quality of life indicators, available in statistical bodies, are most closely interrelated with demographic indicators.

2 The Problem Substantiation

The 1990s socioeconomic and demographic crisis reduced significantly the population of most Russia's territories, increased the burden on the economically active population in the second decade of the 2000s [8], and served as the reason for the active measures application in demographic policy. Measures aimed to increase the birth rate in Sverdlovsk region envisage [9, p. 5]: improving the population reproductive health; abortion prevention and assistance to pregnant women in difficult life situations; support for families with children, incl. large families, young parents, students; assistance in providing housing for families with children or making them better; giving possibilities for women to combine the children upbringing with work; ensuring the families' needs in pre-school education services; the family institution strengthening, reviving and preserving the moral traditions of family relations.

The action plan implementation has changed the demographic situation in the region, and as a result, 38 municipalities in Sverdlovsk region (40.4%), overcome the natural population decline in 2013 [9, p. 3].

Despite the positive tendency in general, the population reproduction regime remains narrowed, since there are less than 2.15 children per woman of fertile age, and in the coming years Sverdlovsk region, like a whole Russia, expects a reduction in the number of fertile age women (the 3rd echo of the Great Patriotic War). Therefore, the population reproduction issues are of particular relevance in modern society.

To construct forecasts of natural and migratory population reproduction [10], adequate indicators are necessary characterizing the quality of life, however, the modern municipal statistical base remains rather limited [11].

It becomes clear that interest in the quality of life problems is not weakening; the world community has been paying more and more attention to the states' socio-economic development indicators in recent years [12]. It should be noted that in Russia programs are being developed for solving this problem under the influence of global trends [13].

3 Methodological Approaches to Assessing the Quality of Life

At the present stage of the science development, scientists have elaborated several complex indicators characterizing the quality of life:

1. Human Development Index is an integral indicator that combines 3 types of indicators: life expectancy at birth (longevity); level of education (literacy assessment of population and enrollment in education); the living standard, estimated through GDP per capita at purchasing power parity in US dollars.
2. The quality-of-life index, developed by the Economist Intelligence Unit, [14] which takes into account the following spheres of life and indicators when compiling the rating: health (longevity); family life (divorce rate per 1,000 people); public life (estimated by the level of church attendance or trade union membership); material welfare (GDP per capita at purchasing power parity); political stability and security (stability and security ratings, climate and geography), job security (unemployment rate), political freedom (average index of political and civil freedom), gender equality (the average salary ratio of men to women's wages).
3. The Better Life Index, calculated by the Organization for Economic Co-operation and Development (OECD). This index takes into account such parameters as: housing, income differential, employment, education, environmental protection, health, safety, life satisfaction, and so on.
4. Physical Quality-of-Life Index (PQLI), which is calculated as the arithmetic mean of indexed indicators: infant mortality, the expected life expectancy of one-year-old children and the literacy rate.
5. Gross National Happiness is an attempt to define quality of life standards by psychological and holistic values.
6. The International Happy Planet Index, which is calculated on the basis of three indicators: subjective satisfaction by people with life, life expectancy and the so-called "ecological trace" [15].
7. The Vanderford-Riley well-being schedule is a measure of the living standard that takes into account several indicators per capita: working hours per week, the value of individuals' personal property, the ratio of the number of property owners to the number of non-owners, the ratio of the number of self-employed to the number of all employed, as well as the proportion (%) of people who are able to satisfy their own primary needs.
8. Satisfaction with life level, which is determined on the basis of sociological surveys conducted regularly in the USA, for example, by the Gallup Institute [16], and in the Russian cities by VCIOM and the Strategic Studies Center (SRC) [17].

Authors suggest to divide all these methods into three groups according to the type of data used for the calculation: statistical, sociological-statistical, sociological.

Classification has shown that sociological methods of collecting information for assessing the quality of life are applied more often than statistical methods. This is due to the complexity of collecting reliable statistics [18, 19].

4 Demographic Indicators Analysis in Sverdlovsk Region

Sverdlovsk region holds traditionally the leading positions in the population in the Urals Federal District. According to Russian Statistics Committee, more than 30% of the total population number in the district are residents of Sverdlovsk region; the population density is more than 22 people per square kilometer, which is almost 3 times more than in Russian Federation in average.

There is a slight predominance of the female population in Sverdlovsk Region, and this structural ratio persists throughout the study period from 2011 to 2017. There is a significant decrease in the proportion of the able-bodied population, and the proportion of the population in age older and younger than the able-bodied increases, which leads to an increase in the social and family burden per one able-bodied person [20] and requires active socioeconomic policy measures within the framework of public health, education, social security and protection.

The number of births per 1000 population has decreased; the birth growth rate did not exceed the death rate in 2016, which was the cause of population decline. This dynamics is caused by a decrease in the proportion of fertile age women in the total population and the persistence of a high population mortality rate by a disproportionate increase in the birth rate and death rate.

However, natural growth is expected in the region by 2018 according to the demographers' forecasts, these assumptions are based on a slight increase in the proportion of fertile age women and implemented health promotion programs of the Health Ministry in Sverdlovsk region.

According to official data, about 63 thousand birth were registered in Sverdlovsk region in 2015, most often, the born children were the first in the family. At the same time, during the studied period, there is an increase in the birth of the second, third and fourth child, which contributes to the growing tendency of families with many children in the region.

Most of the children were born of women over 18 years, the main mothers category are women aged from 21 to 30 years. At the same time, there is an increase in the number of older age groups mothers (over 35), and yet there is a underage mothers group, despite the numerical reduction of this group, the issues of continuing education for underage mothers remain urgent.

During the studied period 2011–2017, the number of registered marriages has decreased by more than 16%, so the registration of divorces tends to decrease by 11%.

The death rate per 1,000 people averaged 14 over the studied period in Sverdlovsk region; that is 1.5 points higher than in the Urals Federal District and 0.85 points higher than in Russian Federation in general.

The mortality causes analysis showed the following regularity: the primary cause of death is diseases of the circulatory system per 100,000 people of population, but this indicator value is dynamically reduced in the Urals Federal District and in the whole Russian Federation, whereas in Sverdlovsk region this indicator increased by 8.7% in 2015 comparing with 2012. The number of deaths dynamics from cancer disease is annually reduced by 1.5–2% per 100 thousand people in Sverdlovsk region, but it remains unchanged in the district and in Russian Federation in average.

The number of under one year children's dead per 1000 live births was 5.5 in 2016, which is 18% less than the average in Russian Federation. Maternal mortality remains unchanged at 9.6 per 100 thousand children born alive for the period 2012–2016.

The dynamics of the overall morbidity of 1000 people is an average of 13.5% lower in Sverdlovsk region than in Russian Federation in 2006–2016; that confirms the reasonableness and relevance of the current health policy in the region.

5 Level and Quality of Life Indicators Analysis in Sverdlovsk Region

The socio-economic state of Sverdlovsk region is ambiguous for the analyzed period. Industrial Production Index fluctuations did not affect the dynamic growth of the nominal average monthly wage, and per capita incomes also increased. The average monthly wages of large and medium-sized enterprises workers was about 33 thousand rubles, wages of workers in metallurgy, mining, and several others economy sectors were above this value. Sverdlovsk region Government policy for the regarding the population social well-being has contributed to an increase in the population incomes the last decade.

The consumer goods basket cost increased by 1.5 times for the studied period and amounted to 14 thousand rubles in 2016. According to the sample survey of households, the distribution proportionality of expenditures in the structure of consumer spending on purposes remained for the period. Costs for household items and appliances, clothing and footwear, transportation and means of communications have decreased.

The labor market situation is a reflection of social and economic well-being. The level of registered unemployment in Sverdlovsk region was 1.5%, while the average in Russian Federation is 1.3%.

Despite a number of enterprises liquidation in the region, the level of registered unemployment is small, and the tension coefficient is about one, therefore, the main unemployment causes are frictional and structural, i.e. despite the fact that the level of general unemployment is slightly above 6%, we can conclude that the natural rate of unemployment is observed in Sverdlovsk region [21].

Another important quality of life indicator is the state of the education system. The education system of Sverdlovsk region corresponds to the priorities of state policy at all levels of implementation; this priorities are indicated in the Russian President's decrees, and the state program "Educational Development" for 2013–2020 and the national educational initiative "Our New School".

Financing of the education system from the consolidated budget of Sverdlovsk region was more than 29% in 2016, this indicator has been increasing by an average of 0.4% annually. In 2015, more than 85 billion rubles were allocated for education, which is 5.3% more than in 2014.

The quantitative parameters of the number of students in Sverdlovsk region at all educational levels show a tendency of increase over the studied period. At the same time, the number of pre-school educational institutions is decreasing by 7.8% in 2016 in comparison with 2012, general education by 11.7%, higher education by 33%. Therefore, the quantity of professional educational institutions has increased by 15%, these changes are caused by the reform of the education system, taking into account the labor market needs in the workforce. There has been a decrease in scholarship support for students through budgetary allocations and academic scholarships, however, the number of students receiving government social scholarships has increased 10 times for the period from 2012 to 2016.

The next quality of life element is social policy. According to the Social Policy Ministry of Sverdlovsk Region, we can notice that poorly protected social groups are actively supporting in the region. The number of social services recipients has increased by 40% in 2016 in comparison with 2015.

The budgetary financing volume aimed to population social support is growing, which indicates an increase in the providing social support measures cost by 1.8 billion rubles.

The decrease tendency in the number of privileged citizens included in the regional social assistance recipients register indicates also the effectiveness of the social policy (there were 430.9 thousand people - in 2011, and 395.6 thousand people in 2016).

The number of orphans, who are on family forms of upbringing (with the adopted children), remains almost unchanged about 19 thousand people.

The safety of life, the state of order and the criminal situation reduction is an integral element of regional development, contributing to a positive tendency in the population reproduction.

The criminal situation in Sverdlovsk region is characterized as controlled and has a positive dynamics of a decrease in the total number of crimes during the studied period.

The overall crime rate decreased by more than 12% in Sverdlovsk region; there was a positive tendency in reducing the number of all offenses types in 2016 compared to 2015 (murders - by 7.6%, deliberate serious injury to health by 17%; 37% of hooliganism cases and more than 13% of theft have decreased). The number of crimes has decreased, while the crimes detection and investigation level remains at a high level. The implementation of hardware and software complex "Safe City" contributes to the street crimes prevention (about 1,700 cameras were installed throughout the region).

The population satisfaction with housing and communal services, the reduction of the depreciation communal infrastructure level and the provision of decent and safe equipping of a person's living space with gas, water, sewage, central heating is an important aspect for young people in dealing with the children birth issue.

Within regional government's current program, significant improvements are observed in the housing and communal services sphere during the monitoring period. The total floor area has increased to 6.5% in 2016 in comparison with 2012; a huge living quarter's assortment is represented in the regional real estate market from super

economy class to Luxury. At the same time, the positive dynamics is more characteristic for rural and village real estate, which is also confirmed by a large number of individual houses' construction, for example, the number of the total area of individual construction in 2015 is 1.6 times higher than in 2012.

The total area of dilapidated housing is reduced by at least 3.3% annually, while the number of families who need the social housing has declined by more than 2.5 thousand during the studied period. More than 25% of families received living quarters and improved housing conditions, which affected undoubtedly to the living standards of the whole region.

The level of housing improvement in Sverdlovsk region over the period from 2000 to 2016 changed by no more than 3%, and a significant reduction is observed in gasification (provision of housing with water supply increased by 2%, sewerage - 2.3%, heating - 2.9%, bathroom - 1.5%, gas - decreased by 8.7%, hot water supply - 1.5%).

"The Urals' new quality of life" is the ongoing program to improve the quality of life in Sverdlovsk region for the period until 2018. Within the framework of medical support and development of the healthcare system in the region, activities are carried out to develop and strengthen the medical prevention units network, develop a volunteer movement for developing healthy lifestyles among teenagers and youth, sociological surveys are conducted aimed at raising public awareness of issues related to maintaining and promoting health.

More than 62 billion rubles are allocated annually from the federal, regional and local budgets and the Territorial Fund for Compulsory Medical Insurance in Sverdlovsk Region to finance the healthcare system of the region, for example, there were 14,593.9 rubles per capita in 2015, which was an average 6% more than in the previous period.

Undoubtedly, the further development of the preventive medicine and the medical rehabilitation in remote cities remains urgent. To reduce infant and maternal mortality, it is necessary to develop a child and family intensive care system, which is difficult in remote cities, and to develop mobile high-tech types of care. Despite the number of medical personnel' relative stability during the studied period, and the number of outpatient and polyclinic organizations' dynamic growth, there has been a significant reduction in the number of paramedic and obstetric centers (their number has decreased by 21 units for 5 years period); a decrease in the outpatient clinics capacity is registered (for 11.5 thousand visits per 10,000 people). This suggests that more and more situations arise when the population is left without proper medical care in remote areas.

6 Search for the Connection of the Quality of Life Statistical Recording Indicators with the Population Reproduction Indicators

Comparison of the quality of life indicators in large, medium and small municipalities allows to draw some conclusions. Most of the analyzed indicators characterize minor fluctuations. Only two indicators differ significantly: population density and average wages. The population density per one square kilometer in Yekaterinburg is

significantly (more than 15 times) higher than in other municipalities [22]. It can have its influence on the birth rate increase only when a general positive attitude has been created for the families' creation and preservation and for the children' birth, since people naturally compare each other with the surrounding and nearer they live to each other more identical their lifestyle starts to be.

So, the factor of large families (3 and more children) depends directly on the attitude towards it in the society. The number of large families increases in Sverdlovsk region, so about 48,000 large families live in the region in January 1, 2017, with more than 157,000 children being raised (in 2012 there were 25,000 families with 82,000 children).

A significant factor that influences the families' creation and the natural population reproduction is the income level and its stability. The average wage in the megalopolis is higher than in the periphery cities, but the costs are also higher. For example, the average house rent per one square meter is 3–5 times higher in the megacity. Since the main income source for the majority of population is labor activity, the employment guarantee is important, so unemployment level is its indicator. The unemployment rate in Yekaterinburg is 1.5–4 times lower than in small and medium-sized municipalities in Sverdlovsk region. This is due to the fact that Sverdlovsk region is widely represented by mono-towns with monopsonic or oligopsonic labor markets, and as the marginal monopsonist's costs are much higher, the labor incomes level of population in most municipalities is lower. As a result of the lower unemployment rate in Yekaterinburg, there is a lower crime rate, which also positively affects the demographic situation.

There is a natural population decline in small and remote municipalities, while in the large Yekaterinburg there is a natural increase. Moreover, relative fertility rates differ insignificantly, while relative death rates are 1.3–1.5 times higher in remote and small municipalities. Consequently, along with the promotion of family values, maternity and paternity, it is necessary to reduce mortality by reducing alcohol consumption, quitting smoking and drugs.

7 Conclusion

The authors do not mean the alcohol and tobacco prohibition, but propaganda of their rejection. The authors have not found such propaganda in the programs and measures of municipal demographic policy [23]. Keeping healthy lifestyle is considered doing sports as a whole, but, on the other hand, the combination of sports with alcohol and smoking might only worsen the situation with the mortality from cardiovascular diseases (the main cause of death in Sverdlovsk region).

Thus, the study of assessing quality of life methods available in modern science allowed to classify the main complex quality of life indicators by the types of data used for the calculation.

In addition, the comparative analysis of the quality of life indicators showed that most of them do not have a direct connection with the natural population reproduction indicators. The most sensitive statistical quality of life indicators, which also affect the natural population reproduction, are employment availability, average wages level and population density in the territory.

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Readiness of Russian Regions for Integrated Development of Mineral Resources: Quantitative Assessment

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Abstract. The paper is devoted to identifying the degree of Russian resource regions' readiness for integrated development of mineral resources and transition to the model of balanced development. Data from 35 regions specializing in mining were used for the analysis. GRP per capita, which measured the regions' economic potential, and the share of extractive industries in the value added, which measured the degree of the regions' dependence on the extraction of natural resources, were chosen as economic indicators. The conducted quantitative analysis showed that the regions depending on the extraction of natural resources are "growth locomotives", and most of them have medium and high economic potential. At the same time, the organization of natural resources extraction should be accompanied by a gradual transition to integrated subsoil development, which includes the tasks of effective use and processing of natural resources. The processes of localizing production in the regions will become important aspects of the comprehensive exploitation of mineral resources because they can create conditions for the development of the domestic market and the formation of a single economic space of Russia. The paper was prepared with the financial support of Russian Science Foundation, project № 17-78-20218.

Keywords: Resource regions ·

Comprehensive exploitation of mineral resources · Quantitative analysis

1 Introduction

The problem of resource regions' development of is currently particularly acute, since most countries which have significant reserves of natural resources, including Russia, lag behind the countries that do not have large reserves of natural resources in the pace and quality of economic growth, social development, and political and economic institutions. In both Russian and foreign literature there is no unity in understanding the content of the concept of the "resource region". In modern English-language literature, resource regions are considered from the perspective of the so-called "resource curse" and "resource abundance", which refer to the phenomenon of lower growth rates of the countries that are rich in natural resources, compared to the countries that do not have

such resources. Within this approach, natural resources are considered as barriers to regional development [1, 2].

Despite the presence of numerous works confirming the existence of the “resource curse”, in modern foreign and Russian literature there are quite a few studies claiming that the prospects for the development of resource regions are not so clearly pessimistic and largely depend on the initial economic and institutional conditions and the correctly chosen regional policy, which should take into account both the general trends and the local context.

In the authors’ opinion, the second approach is more reasonable. In the most general form, in this paper, “resource regions” are understood as the regions where the basic industries are export-oriented mining industries, and/or the primary processing industries, producing raw materials and/or intermediate products. Resource regions are characterized by a special development path: a smooth reproduction (replication) of the enclave dual economy. This is manifested in the formation of a hypertrophied high-performance export-oriented sector in the region, isolated from the rest of the economy and represented by large vertically integrated companies (VICs) operating in the mining and intermediate industries. The development of this sector goes beyond the local context and is weakly connected with regional markets. It hinders the modernization of the regional economy and its integration into the all-Russian economic space, and blocks the development of the manufacturing industry and the innovative sector of the economy. At the same time, it is in the export-oriented extractive industries and primary processing industries that resources are increasingly concentrated, and the industries themselves remain the “locomotives” of the Russian economy and determine the direction of its development and its place in the global division of labor [6, 7].

Sustainable conservation and stable “replication” of wealth enclaves in the regions that are rich in mineral resources, do not only increase their resource dependence and limit the investment flows within a narrow circle of the VICs producing raw materials and intermediate products, but also lead to extensive irrational use of the natural wealth of the regions, causing significant environmental damage [7, 8]. The problem of changing the extensive model of Russia’s economic development is directly related to resource regions’ readiness to move to the path of balanced development, based on integrated development and comprehensive exploitation of mineral resources. This trajectory involves high-performance and full (low-waste) economically reasonable extraction of balance reserves of fossil minerals and balance reserves of other minerals; creation of resource-saving technologies and involvement of all associated natural resources in the comprehensive exploitation and skillful use; preservation of mineral resources and large-scale reproduction of subsoil minerals with simultaneous increase of their useful qualities; focus on a closed technological cycle based on the creation and development of systems of combined technological solutions; maintenance of ecological balance within the areas influenced by the development of geo-resources of minerals [9]. Not surprisingly, the willingness of resource-rich regions to move from a dual enclave model to the new balanced path of development has been a key issue in the recent political agenda.

Russia consists of regions that are very different in their socio-economic characteristics, which is reflected in their uneven economic development and increasing gap in the most important indicators of regional production, income and poverty, and

quality of life. Thus, the gap in the share of domestic research and development costs in the gross regional product amounted 143–148 times, and the gap in the number of advanced production technologies used amounted more than a thousand times [10]. All of the above can be fully attributed to resource regions. Moreover, it can be assumed that in the foreseeable future, a significant part of the Russian resource regions will retain the enclave dual model of development and only some of them will be able to move to the formation of a balanced model based on integrated subsoil development. But even in the latter case, we can expect serious differences in the pace and sequence of such a transition. Therefore, it is important not only to identify the regions that are most ready for the transition to a balanced development model, but also to identify in each case the range of available development trajectories. This requires rejecting the space-neutral approach and transitioning to a place-based approach [11–13]. However, the inclusion of the local context in the study of resource regions inevitably raises the question of the limits (degree) and ways of its inclusion in economic research. Place-based approach should not lead to a complete rejection of search for any common patterns. The way out of this situation is to develop typologies that take into account the qualitative and quantitative characteristics of resource regions.

Typological analysis is a method of studying complex natural-geographical and socio-economic objects, which is aimed at identifying significant groups of objects aimed at identifying the common and different groups of objects which are characterized by a homogeneous set of criteria or features [14]. The typological analysis of resource regions proposed in this paper is based on quantitative indicators and is aimed at identifying homogeneous groups of regions that are similar in their readiness to change their development path from the enclave model to a balanced one. As the result this analysis is designed to develop a regional policy both at the national and at the regional levels that would take into account the local context to the greatest extent.

The aim of this work was to develop a typology of resource regions on the basis of quantitative assessment of their readiness for balanced development based on solving the problems of comprehensive exploitation of mineral and natural resources.

2 Data and Methods

The data of 35 Russian regions specializing in mining were used for the analysis. These regions were selected in the framework of the authors' previous studies [15].

The economic indicators selected were: (1) GRP per capita, which measured the economic potential of the region; and (2) the share of extractive industries in value added, which measured the degree of the region's dependence on natural resources. The data were obtained from official sources of Rosstat.

The choice of the indicators is explained by the following considerations. Firstly, these indicators, along with the share of employment in extractive industries, the share of mineral resource exports in the total amount of exports, and the share of the tax on mining in the structure of the total amount of taxes coming from the region to the budgets of different levels, are most often used to identify and analyze the features of resource regions' replication and development. Secondly, the search for models of balanced development of regions based on comprehensive exploitation of mineral

resources is most often associated with sustainable growth and diversification of regional economy. The indicators used in this work are accessible and reflect the most general characteristics of these processes. Finally, the greatest disputes in the studies of the dynamics of resource regions' development paths concern two factors: the rate of GDP growth and changes in its structure.

To assess the economic potential of the region, the K_1 coefficient was calculated, equal to the ratio of GRP per capita in the region to average GDP per capita in Russia. For the studied group of 35 regions, the value of this indicator ranged from 0.26 (the Republic of Ingushetia and the Chechen Republic) to 11.2 (Nenets Autonomous Okrug).

To assess the degree of the regions' resource dependence, the share of extractive industries in the GRP of the region was determined. The indicator characterizing resource dependence was calculated K_2 coefficient equal to the ratio of the share of extractive industries in the region's GRP to the share of extractive industries in the GDP of the Russian Federation. For the studied group of regions, the value of this indicator ranged from 0.107 (the Republic of Ingushetia) to 6.05 (Khanty-Mansiysk Autonomous Okrug).

To date, a lot of experience has been gained in the field of applying various methods of multivariate statistical analysis to studying economic phenomena and developing different typologies based on them [16, 17]. In this case, the problem of dividing objects into classes by the studied group of features is most often solved in two major ways: (1) on the basis of pre-defined boundaries of the values of indicators and (2) by dividing objects into groups using cluster analysis methods. The complexity of using these two methods for studying the regions' readiness for the transition to a model of development based on comprehensive exploitation of mineral resources is associated with the uncertainty and "fuzziness" of boundaries between groups of regions. This was manifested in the fact that when using the first approach, the boundaries of indicators for the regions falling into different clusters were overlapping. The attempt to use the cluster analysis method for the classification of regions did not give positive results either. For example, when this method was used, underdeveloped regions with medium resource dependence and medium-developed regions with low resource dependence, with different structure of the regional economy, different ratio of mining and manufacturing, different reserves of natural and mineral resources and different degrees of their development, fell into one cluster.

Therefore, in this work the method of fuzzy clustering was used to identify the groups of regions that are close to one another concerning the degree of their readiness to introduce the methods of mining and of minerals processing that could be practiced for comprehensive exploitation of mineral resources in their territories.

The advantage of fuzzy clustering algorithms as a method of typology of regions is that they do not rely on the traditional statistical methods of assumptions and can be used even in the absence of information about the distribution of data. In addition, they allow attributing one region to several (or even all) classes simultaneously with different degrees of membership, which makes the typology more flexible. This is especially important when the criteria for attributing regions to a particular cluster are not defined, and many regions appear on the boundary of clusters with similar values. The use of fuzzy intervals and overlapping ranges can reduce the degree of uncertainty in the determination of the boundaries of clusters and improve the quality of the typology.

The practice of the last decades has shown the need to apply the methods of fuzzy set theory for studying regions [18]. This is because a fuzzy set is an effective tool for the formalization and definition of “blurry”, loosely structured, and sometimes latent variables, which is especially vividly manifested in attempts to carry out a complex typology to address the general and specific objectives of the regional policy. In our view, one of the most productive approaches for dividing regions into groups is the approach based on the application of fuzzy clustering algorithms. The literature [19] presents the first attempts to use it.

3 Results and Discussion

At the initial stage of the study, the criteria were presented in the form of linguistic variables (LVs) with the corresponding term sets: “the region’s economic potential” {T1e-low, T2e-medium, and T3e-high} and “the region’s resource dependence” {T1r-weak, T2r-medium, and T3r-high}. The functions of triangular and trapezoidal forms were used as the membership functions (MFs) of terms. The advantage of such MFs is that determining them requires the smallest amount of information compared to other functions [20].

Tables 1 and 2 present a fragment of the analysis of the studied group of resource regions, containing the initial (crisp) and fuzzy values of indicators obtained as the result of fuzzification.

Table 1. Crisp and fuzzy values of criteria for assessing resource regions.

Region	Economic potential of region (K1)			
	Precise meaning	T1	T2	T3
Kursk Region	0.675	0.416	0.584	0
Nenets AO	11.24	0	0	1
Republic of Karelia	0.753	0.155	0.845	0
Republic of Ingushetia	0.261	1	0	0
Republic of Tatarstan	1.069	0	1	0
Tyumen Region	1.407	0	0.741	0.259
Kemerovo Region	0.697	0.342	0.658	0
Krasnoyarsk Kray	1.273	0	0.908	0.092
Tyva Republic	0.338	1	0	0
Republic of Khakassia	0.721	0.263	0.737	0
Tomsk Region	0.992	0	1	0
...

The basic concept of cluster analysis is that of the distance between objects [17, 18]. In the fuzzy approach to calculating the distance between objects the concept of

Table 2. Crisp and fuzzy values of criteria for assessing resource regions.

Region	Resource dependence (K2)			
	Precise meaning	T1	T2	T3
Kursk Region	0.766	0.053	0.947	0
Nenets AO	6.01	0	0	1
Republic of Karelia	0.735	0.1	0.9	0
Republic of Ingushetia	0.107	1	0	0
Republic of Tatarstan	1.927	0	0.716	0.284
Tyumen Region	1.291	0	1	0
Kemerovo Region	2.284	0	0.477	0.523
Krasnoyarsk Kray	1.562	0	0.959	0.041
Tyva Republic	0.871	0	1	0
Republic of Khakassia	1.152	0	1	0
Tomsk Region	2.631	0	0.246	0.754
...

fuzzy similarity between objects based on some grounds can be used. The similarity between two objects A and B based on one criterion is determined by the formula (1):

$$d_{AB} = \frac{1}{2} \sum_{i=1}^k |\mu_{iA}(x) - \mu_{iB}(x)| \quad (1)$$

where **k** stands for the number of LV terms.

The distance between two objects based on n criteria is determined by the formula (2):

$$r_{AB} = \frac{1}{n} \sum_{i=1}^n d_{AB} \quad (2)$$

When assessing the degree of cluster membership, the distance of the object to the reference point (r_j) is calculated.

The degree of membership is then determined by the formula (3):

$$Cl_j = 1 - r_j \quad (3)$$

The procedure of fuzzy clustering of resource regions included two stages. In the first stage, the initial possible number of clusters was determined. Since the criteria have three levels, the maximum possible number of clusters is nine. A reference point was identified for each cluster. Each resource region's distance from the reference point and degree of membership in the appropriate cluster was determined. If the cluster does not contain any elements, it can be excluded from further consideration. If the fuzzy coordinates of a resource region match the coordinates of the reference point, that region can be considered a reference for that cluster, which is another advantage of this approach.

Table 3 shows the results of the division of resource regions into clusters depending on the degree of their readiness to move to a new balanced model of development and assessment of the degree of their membership in that cluster. The table also shows the cluster weights (degrees of readiness), varying from 1 to 10, obtained on the basis of expert survey data.

Table 3. Fuzzy clustering of resource regions based on the degree of their readiness for integrated development of mineral resources.

Economic potential	Resource dependence		
	T1r-weak (1; 0; 0)	T2r-medium (0; 1; 0)	T3r-high (0; 0; 1)
T1e-low (1;0;0)	Degree of readiness: 1 Republic of Kalmykia (0.956), Republic of Ingushetia (1), Chechen Republic (1), Republic of Buryatia (0.671)	Degree of readiness: 2 Transbaikial Kray (0.495), Republic of Buryatia (0.523), Republic of Kalmykia (0.044)	Degree of readiness: 3
T2e-medium (0;1;0)	Degree of readiness: 5 Republic of Bashkortostan (0.717), Arkhangelsk Region (0.763), Volgograd Region (0.523), Kaliningrad Region (0.053), Republic of Buryatia (0.468), Republic of Karelia (0.1), Khabarovsk Kray (0.734)	Degree of readiness: 8 Arkhangelsk Region (0.237), Volgograd Region (0.478), Transbaikial Kray (0.505), Irkutsk Region (0.56), Kaliningrad Region (0.25), Kemerovo Region (0.477), Krasnoyarsk Kray (0.726), Tyumen Region (0.282), Kursk Region (0.947), Republic of Karelia (0.9), Belgorod Region (0.926), Murmansk Region (0.686), Irkutsk Region (0.78), Astrakhan Region (0.503), Samara Region (1), Perm Kray (1), Republic of Bashkortostan (0.283), Republic of Buryatia (0.329), Republic of Tatarstan (0.765), Republic of Khakassia (1), Amur Region (1), Tomsk Region (0.591), Republic of Udmurtia (0.495), Khabarovsk Kray (0.747)	Degree of readiness: 7 Astrakhan Region (0.497), Irkutsk Region (0.44), Komi Republic (0.341), Republic of Tatarstan (0.549), Orenburg Region (1), Republic of Udmurtia (0.505), Kemerovo Region (0.523), Krasnoyarsk Kray (0.267), Tomsk Region (0.845)

(continued)

Table 3. *(continued)*

Economic potential	Resource dependence		
	T1r-weak (1; 0; 0)	T2r-medium (0; 1; 0)	T3r-high (0; 0; 1)
T3e-high (0;0;1)	Degree of readiness: 10 Khabarovsk Kray (0.253)	Degree of readiness: 9 Belgorod Region (0.074), Krasnoyarsk Kray (0.733), Magadan Region (0.285), Murmansk Region (0.314), Republic of Tatarstan (0.451), Tomsk Region (0.155), Tyumen Region (0.719), Khabarovsk Kray (0.266)	Degree of readiness: 6 Krasnoyarsk Kray (0.275), Magadan Region (0.715), Nenets Autonomous Okrug (1), Komi Republic (0.659), Republic of Sakha (1), Republic of Tatarstan (0.235), Sakhalin Region (1), Tomsk Region (0.409), Khanty-Mansiysk Autonomous Okrug (1), Yamalo-Nenets Autonomous Okrug (1), Chukotka Autonomous Okrug (1)

Analysis of Table 3 showed that one of the potential clusters was empty. According to the results of cluster analysis, no region was classified as a region with weak economic potential (T1e – (1; 0; 0)) and high resource dependence (T3r – (0; 0; 1)). Only one region – Khabarovsk Kray – fell into the cluster with high economic potential (T3e – (0; 0; 1)) and high resource dependence (T3r – (0; 0; 1)) with a degree of membership equaling 0.253. In general, this is a fairly accurate reflection of the fact that in Russia the regions that depend on the extraction of natural resources are “growth locomotives”, most of them having medium and high economic potential. The “un-filled” second potential cluster shows that the enclave dual model is gradually exhausting itself, and the high amounts of natural resources extraction are unable to maintain the high economic potential of the regions.

In four out of the nine clusters the leading regions were identified.

It is significant that most of the regions (22) were concentrated in the cluster with an average economic potential (T2e – (0; 1; 0)) and high resource dependence (T2r– (0; 1; 0)). At the same time, the regions belonging to this cluster turned out to have different in dynamics and prospects for the development of extractive industries. For example, the cluster some includes regions that are at the stage of exhaustion of the old model of development based on extensive extraction of natural resources. These include: Kemerovo Region (0.477), Krasnoyarsk Kray (0.726), and Tyumen region (0.282). In addition, this cluster included the regions which are at the stage of start-up development of their mineral deposits: Khakassia (1) and Amur Region (1). It also included the regions in whose development some features of the development model based on integrated development of mineral resources can be traced: Kursk Region (0.947), Belgorod Region (0.926), Tatarstan (0.765), Samara Region (1), Perm Krai (1), etc. it is

remarkable that the degree of these regions' membership in this cluster is different, and a number of them could also be attributed as members to some adjacent clusters to varying degrees. This fact indicates the possibility implementing a wide range of development paths for these regions and requires an additional quantitative assessment of the degree of resource regions' readiness for the transition to a balanced development model based on the integrated development of mineral resources.

At the second stage of the study an integral indicator characterizing the region's readiness for a balanced development on the basis of comprehensive exploitation of mineral resources was calculated for each region basing on the acquired data on the degree of the region's membership in a cluster and the cluster's weight coefficient. The integral indicator was presented in the form of a factored additive valuation, i.e. it was calculated by multiplying the weight of the cluster by the degree of the resource region's membership in the cluster.

Table 4 presents a quantitative assessment of the resource regions according to the degree of their readiness for integrated development of mineral resources.

Table 4. Quantitative assessment of resource regions based on the degree of their readiness for integrated development of mineral resources.

Region	Degree of readiness for integrated development of mineral resources	Region	Degree of readiness for integrated development of mineral resources
Tyumen Region	8.718505	Magadan Region	6.854531
Murmansk Region	8.314166	Volgograd Region	6.432392
Belgorod Region	8.07358	Komi Republic	6.34095
Amur Region	8	Nenets Autonomous Okrug	6
Perm Kray	8	Republic of Sakha (Yakutia)	6
Republic of Khakassia	8	Sakhalin Region	6
Samara Region	8	Khanty-Mansiysk Autonomous Okrug (Yugra)	6
Krasnoyarsk Kray	7.958581	Chukotka Autonomous Okrug	6
Kursk Region	7.841851	Yamalo-Nenets Autonomous Okrug	6

(continued)

Table 4. *(continued)*

Region	Degree of readiness for integrated development of mineral resources	Region	Degree of readiness for integrated development of mineral resources
Republic of Tatarstan	7.715557	Republic of Bashkortostan	5.84921
Republic of Karelia	7.701004	Kaliningrad Region	5.75
Irkutsk Region	7.560286	Arkhangelsk Region	5.709743
Astrakhan Region	7.502865	Transbaikali Kray	5.029613
Republic of Udmurtia	7.495099	Republic of Buryatia	3.365686
Kemerovo Region	7.477396	Tyva Republic	2
Khabarovsk Kray	7.284379	Republic of Kalmykia	1.043956
Tomsk Region	7.24589	Republic of Ingushetia	1
Orenburg Region	7	Chechen Republic	1

4 Conclusion

The industries related to the extraction of minerals and their primary processing are the drivers of resource regions' development. This situation is likely to continue in the foreseeable future. However, at present the extraction of natural resources, primarily hydrocarbons, should be accompanied by a gradual transition to the integrated subsoil development, which includes the task of effective use and processing of natural resources, utilization of associated components, development of a rational system of subsoil use, and reducing the external environmental impact. This process should include the following aspects: reproduction of the mineral resource base and improvement of technological development in the field of exploration, production, delivery and processing of natural resources. Localizing production in the regions should become an important aspect of the integrated development of mineral resources because it can create conditions for the development of the domestic market and the formation of a single economic space of Russia. However, because of the major regional differences, this process will be dissimilar and uneven in different resource regions, for its speed and trajectory strongly depend on the degree of the region's readiness for comprehensive exploitation of mineral resources.

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Spatial Development Concept of the Far East of Russia

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Abstract. Studied processes influencing a spatial development of the macro region the Russian Far East in a mid-term period. Analyzed problems of the current allocation structure of the economy and its accompanying systems of the settling. Considered parameters of a spatial framework, which contains the main elements - points of accelerated growth, a system of networking links facilitating their integration, and linear vectors (directions) of development. Made a conclusion regarding economic macro units - the areas of advanced development that set economic basis of a spatial framework along with largest investment projects that, through networking, contribute to formation of the over whole economic space in the Russian Far East. Made an assumption about emergence of territorial industrial complexes with a new industrial specialization connected to implementation of large-scale investment projects within the boundaries of the territories of advanced development and in the territories referred to the free port of Vladivostok. Development of the territorial industrial complexes contributes to setting of polycentric agglomeration structures in the zones adjacent to the transportation corridors. This, in a long-term view, allows eliminate the disproportion of the spatial distribution of the economy activities and its associated residential structures.

Keywords: Spatial economy · The Russian Far East · Economic macro unit · Agglomeration effect

1 Introduction

Strategic goal of spatial development in the Russian Far East is identification and support of the economy growth spots, which to facilitate the agglomeration effect, influence emergence process of the population settling, and determine the residential areas location and limits within the region. Key processes that influence the emergence of a spatial conceptual model of the macro region until 2025 are the next:

- (1) implementation of large-scale investment projects within the territories of advanced development and the territories classified as the free port of Vladivostok,
- (2) realization of the cross-border intermodal projects and largest development projects such are the Russian Island and the Bolshoy Ussuriysky Island, and cities, e.g. Komsomolsk-on-Amur, Svobodny, Tsiolkovsky.

These projects set a pre-condition for expansion of the settlement system accompanying the economic activity zones and contribute to development of transport and engineering infrastructure. In order to form a balanced model of spatial development, the Federal government contributes assistance in establishing links between the points of economic growth in the Russian Far East regions, which set a precondition for emergence of a unified economic model.

2 Problem Statement

Analysis of the economy system and existing spatial framework along with a system of settlement in the Russian's Far East regions indicates the following main problems:

- (a) regional imbalance of the existing economy allocation caused by uneven distribution of population and labor resources in the provinces of the Russian Far East, which occur the problem of professional unemployment in depressed territories, and, on the other hand, make a shortage of qualified specialists in the points of economic growth;
- (b) poor transportation and energy infrastructure make low attractiveness of the region for investments and economic activities. This cause unbalanced nature of the spatial development, when growth points and the associated them settlement system are concentrated mainly in a fewer economic and geographical zones of the south of Primorye and the Amur region, and the economic development belt of cities Khabarovsk and Komsomolsk-on-Amur.
- (c) disparity of population concentration (also mean a labor force) and the rate of economic development between the bordering areas of the Russian Far East and the provinces of the North-East of China. Taking into view increasing competition within the North-East Asia, the imbalance poses a threat to the innovation and technological lagging, and consequently, the disintegration of Russian Far East off the economic space of North-East Asia is likely.

To study parameters of a spatial development model of the Russian Far East, it is necessary to identify a functional role and characteristics of its key elements and justify the composition, territorial allocation and sectoral specialization of prospective territories (macro units) that make a meaningful contribution to economic growth and improvement of life quality of the population.

An optimal model of spatial development of the Russian Far East should resolve the next issues:

- (a) elimination of imbalances of the existing spatial system due to economically sound allocation of the industry and setting conditions for their innovative and infrastructural development;
- (b) activation of inter-regional and cross-border ties taking into account the advantageous economic and geographical position of the macro region, concentration of labor resources, the commodities and transport flows;
- (c) diversification of economic activities in the mono-functional (sole specialization) municipalities to prevent degrading the social tensions;

- (d) set a comfortable condition for settlements and consolidation of a qualified labor source through allocation of residential structures, associated to zones of economy and investments activity, and the development of transport, energy and engineering infrastructure.

Concept of spatial development of the Russian Far East reviewed in context of the phenomenon of agglomeration effects (agglomeration economy). Used the method of structural and functional analysis of basic elements of the spatial structure of the macro region. Analyzed the next spheres:

- (1) the economy system as a part of the spatial framework (points of the accelerated growth which generate the economic agglomeration effect);
- (2) the settlement areas related to the economic activities;
- (3) linear infrastructure objects, especially transportation ways, which set vectors of spatial development;
- (4) a system of networking interaction of economic entities, which integrates elements of the spatial framework into a single one.

3 Analysis of Studies and Publications on the Subject

The process of spatial development is not spontaneous. It generates the agglomeration effect, which occurs in settlement zones due to expansion of economic relations. Emergency of a residential subsystem of spatial framework considered as a positive external effect of concentration of companies operating in the same industry or engaged in the same activities. The various industries and activities, interacting and expanding, affect a concentration of population in the points where a skilled labor force is required [1, 2]. Thus, a scale of economic growth and the geographical vectors of its development affect parameters of a settlement system and determine its location and borders within a region. Worth to note that the scale effect occurs at the level of economic entities. Centripetal forces forcing industry to concentrate in one region result a three-way interaction of economy's scale, transport costs and a factor of mobility [3]. Accordingly, firms tend to focus production due to economy's scale nearby markets and suppliers due to transport costs, while access to markets and suppliers is better where other firms are concentrated due to the effects of a market volume [4].

The optimum model of spatial development of a region assumes localization of enterprises in certain geographical points and boundaries. It is a justified variant of location taking into account a high level of costs for delivery of products of the specialized industries in the territory of enterprises specialization in some region [5]. Consequently, due to the rational location and concentration of companies, prerequisites for the emergence of integration links are justified. It contributes to optimum of transportation and transaction costs at point of view of the "market potential" theory, which refers to an optimum model of the economic system of a spatial framework under other equal condition, when a company seeks to place its production in geographical areas with good access to market. Worth to note that the well-developed industrial regions have a high market potential, because industrial zones concentrate a

significant population and production, and, therefore, the regions included in this belt, initially have better access to the market [6]. Results of studies represent a fact that concentration of production causes the function of reproduction. Firms set production in regions with good market access, but market access improved consequently in regions where production is concentrated [7, 8].

Model of spatial development of a region considered at point of view of the concept “poles of economic growth”. There is an assumption regarding a dominative economic micro unit that define a nature and content of the competition. Points of economic and investment development considered as “poles” of economic growth. They cause effect of agglomeration when the economy, investments and industries combined into a single complex. The poles of growth, which represented by an entity, or industry, or a complex of industries, have significant agglomeration effect. Further, the growth point transformed into territories and development vectors in a region or country set a macroeconomic framework [9]. Therefore, an important aim of the state policy in sphere of spatial development of regions is stimulation of emergency of “growth poles” and rational management of the directions (development vectors) for their effective expansion.

Setting of growth points allows establishing economic relations with other economic entities in the specialized and related industries, which creates conditions for emergence of innovative or industrial clusters. Stressing a link between the occurrence of cluster structures and competitiveness, Michael Porter notes that the factors of competitive advantages of geographical regions more significant, when companies operating in specific industries concentrated within a single space [10, 11]. Consequently, the theory of competitiveness point to the form of spatial organization of economic activity in a region, which creates the possibility of ensuring competitiveness at the macroeconomic level, or at the level of the global economy. Macro units – “poles of growth” growing and transferring into territorial clusters vary within geographical boundaries within a national territory, and adjacently to the territories of neighboring countries, set preconditions for emergence of international and cross-border clusters. The presence of many interacting zones of economic activity creates opportunities for internal competition between companies and optimizes transaction costs by using a unified transport, logistics, engineering and technological infrastructure [12, 13].

At point of a concept of Michael Enright’s regional clusters, the economic system of spatial framework of a region represented in form of agglomeration of companies specializing in a particular economy or sphere of economic activity. Set of macro units includes a chain of interacting companies of a region, united by a similar production method (technologies), and integrated with large national or international companies. Considering the links between competitiveness of a national economy and the geographic scale of competitive advantages within individual regions, competitive advantages not formed at the level of the global or a national economy, but at the level of regions [14].

System of spatial development of a region observed at point of view of Paul Krugman’s concept of the total causation. The conception assumes the companies are more active in a concentrated economic space. The economic space has also a tendency for agglomeration at points where concentration of enterprises occurs. At position of economic geography, two types of forces influence to a prospective spatial frame.

Centripetal activities move towards agglomeration and centrifugal activities aimed at destroying or limiting the size of agglomerations [15, 16]. In context of this conception, there are prerequisites for three possible models of spatial development of a region:

- (a) a polycentric model, or model of the balanced spatial development, based on appearance of many spots of economic growth, and related to them a wide network of settlement;
- (b) a monocentric model, which based on a single “pole of growth”, for example, agglomeration structure of a large city and the peripheral areas of moderate development;
- (c) a mixed model engaging a number of significant growth points in terms of their scales and characteristics and associated agglomeration structures.

Characteristics of spatial development of a region determined by the geographic concentration of growth points and the strength of their interaction. We can note a number of forms of networking interaction at position of innovative system:

- (1) geographic interaction, where the main factors are location and costs to overcome a distance between enterprises. A rational location provides benefits for the knowledge sharing and efficient process of mutual learning of organizations;
- (2) cognitive interaction as a part of the unified knowledge base and intentions of the main companies to create innovative products and services. Anchor companies are considered as the supporting base for forming a micro unit, and the others depend on them, because they may not perceive and use external sources of knowledge;
- (3) organizational interaction, in which companies move from informal to formal relationships within a hierarchically organized construction of a region;
- (4) institutional interaction when economic actors are subject to same rules and regulations. The rules are described formally subject to the provisions of the law, and informal, taking into account cultural norms and values. They form the mechanisms that provide stable conditions for effective interaction within a spatial mechanism [17, 18]. Consequently, co-building of the network interaction mechanism gives a greater synergetic effect. It appears in strengthening of inter industrial ties, and increase the economic efficiency of territorial location of companies.

4 Concept of Spatial Development

The main objectives of the spatial development of the Russian Far East in mid-term period are the next: elimination of imbalances in allocation of industries and the associated them settlement areas, integrated development of emerging centers of the economy, expansion of the urban environment, primarily adjacent to the state border of the Russian Federation.

The factors contributing to formation of a prospective model of spatial development of the macro region considered as the next:

- (a) formation of a hierarchical network of macro-units – different-scale, rationally located economic agglomerations, which create opportunities for improving producing process in the value added chains;
- (b) inclusion into the economic agglomerations the servicing and innovative enterprises, allowing them gradually improve the production process through transferring of the knowledge;
- (c) formation of stable channels (vectors) of spatial development considering flows of raw materials, commodities and including elements of engineering, energy and transport infrastructure;
- (d) inclusion of companies of a macro region into the added value chains at the national or global level as their innovative competence grows, that creates pre-conditions for emergency of regional and cross-border clusters;
- (e) allocation of the growth points in areas with cost-effective market access that starts transferring the processing industries to the coastal zone, adjacent to ports or places, which provide proximity to markets of consumption, for example, to the border area.

Economic system of the spatial framework of the Russian Far East represents a number of “growth” points within the limits of economic and geographical zones. The results of study indicate a potential for establishing of the next following economic agglomerations:

- (1) in limits of Vladivostok agglomeration which connected cities Vladivostok - Trudovoy - Artem points for economic growth are: industrial complex “Nadezhdinsky”, logistics complex “Yankovsky”, located nearby to the international airport “Knevichi” (Vladivostok), the integrated entertainment complex “Primorye” and the technology park on the Russkiy island. This concentration of anchor companies, along the projects in boundaries of the free port of Vladivostok, perform basis for economic growth in the southern economic and geographical zone of the macro region.
- (2) in the belt of economic development Khabarovsk - Komsomolsk-on-Amur, the growth points are the territories of advanced development “Khabarovsk” and “Komsomolsk” with specialization in the aircraft and shipbuilding, as well as complex projects of development of the territories such are city Komsomolsk-on-Amur and Bolshoy Ussuriysky island. Taking into account the construction of a railway bridge over Amur river at Nizhneleninskoye (Russia) - Tongjiang (China) will prospectively be provided a direct access from the north of Heilongjiang province to the Trans-Siberian railway near the Khabarovsk junction. It rises role of seaport Vanino as a transit port for Chinese goods. In long term, taking into account sustainable transport links, assumed development of a cross – border cluster nearby Khabarovsk (Russia)-Fuyuan (China) with a specialization in transport and logistics services. This belt of economic development, along with the Southern economic and geographical zone, appears as an “entrance gate” in the South of Russian Far East facilitating inflow of foreign investments, innovative technologies and high-quality market services.

- (3) within the Nakhodka territorial development system, based on agglomeration Nakhodka - Wrangel – Livadia the points of growth are projects of extension the port zones and terminals of ports Vostochny, Kozmino, Nakhodka, as well as the project of an oil refinery and petrochemical complex within the boundaries of territory of advanced development “Petrochemical”. Implementation of these projects provides active development of residential structures and engineering infrastructure within the boundaries of Nakhodka city district and Partizansky municipal district.
- (4) in the southern economic and geographical zone of the Amur region, the growth points are the territories of advanced development “Svobodny”, “Belogorsk” and “Priamurskaya”, along the projects of construction the space launching complex near the city of Tsiolkovsky and construction of the natural gas processing and gas chemical industries within the Amur gas chemical cluster. Construction of a road bridge across Amur river nearby Blagoveshchensk (Russia) - Heihe (China) enhances the value of the economic zone Blagoveshchensk - Belogorsk as a major transport and logistics center adjacent the border of China. Prospectively, it is possible to assume development of cross-border cluster within these limits with specialization in the chemical industry, production of the composite materials and agriculture.
- (5) within the boundaries of agglomeration Ussuriysk - Mikhailovka, the growth points are anchor projects in the territory of Mikhailovsky agricultural advanced development complex. It specializes in the agriculture, transport and logistics, warehousing and processing of goods coming from provinces of China. In the area adjacent to this economic agglomeration can be attributed the peripheral areas located close to the border crossings in the settlements Pogranichny and Poltavka.
- (6) in the southern Yakutia economic-geographical zone (Neryungri, Aldan and Olyokma regions) a growth point is priority development area “Southern Yakutia” where under way is the construction of mining and processing complexes “Inaglinsky” and “Denisovskoye” for extraction and processing of coking coal. It represents a large industrial area on basis of hydropower facilities and a complex of industrial plants, which associated with deep processing of natural gas, apatites, coal, iron, uranium ore, and timber processing. This establish conditions for development of the settlement belt in the southern Yakutia engaging cities of Aldan, Neryungri and Tommot. In the central economic and geographical zone of the Republic of Sakha (Yakutia), a growth point is territory of advanced development “Kangalassy Industrial Park” (specialization in chemical production, mechanical engineering, agriculture).
- (7) within boundaries of a territory of advanced development “Bolshoy Kamen” growth point is a project of construction the shipyard “Zvezda”. It is going to be a modern shipbuilding cluster based on the sectoral cooperation between enterprises of the industrial complex, such as “Komsomolsk” and “Khabarovsk”. The shipyard construction project contributes to a large-scale development of housing construction to accommodate qualified specialists, which, in the future, establish conditions for emergency of a large settlement system of city of Bolshoy Kamen. This project is example of development of an inter-regional sectoral structure that

provides interaction of residents of the territories of advanced development of the Far Eastern regions, and set preconditions for a unified economic space in the Far East of Russia.

- (8) the Russian port of Zarubino in Trinity Bay considered as an important point of economic growth in the South of Primorsky Krai and a prospective cross-border transportation and logistics complex at the junction of borders of the Russian Federation, China and North Korea. The project aimed at expansion of the port facilities and berthing capacity of the Zarubino port. In long-term period it represents opportunities for construction of a multifunctional commercial port in the South of Primorsky Krai. It will be able to establish an entire network of ports within the framework of the free port of Vladivostok, which can actively cooperate to ensure competition in global markets as interconnected and mutually reinforcing links.

Territories of advanced development in remote (isolated) geographical locations, e.g. “Beringovskiy” (Chukotka) and “Nikolaevsk” (Khabarovsk Krai), are considered as starting points of spatial development, because it has an impact on the emergence of economical agglomeration and lead to creation of sustainable settlement systems within its geographical boundaries. The parameters and boundaries of these growth spots are determined by concentration of economic activity, mainly at coastal zone and the areas adjacent to a few transportation routes. These points of growth due to the remote allocation (isolation) represent a closed system; their development is constrained by mono specialization of territories and a lack of sustained integration that may affect low investment and innovation activity of economic entities. To resolve the problem, the government should assist establishing links between the “island” points of growth and the economic agglomerations of the Far Eastern regions, which, in the future, will help to eliminate the imbalance in the spatial distribution of economic activities and the associated residential structures.

The results of the analysis indicate to following vectors (directions) of the spatial development of the Russian Far East:

The direction along the transportation corridor “Primorye-1” as a part of the international route from Harbin and Suifenhe (China) through Grodekovo station (Russia) to the ports of southern Primorye with access to ports in Southeast Asia. This vector connects a unified transport-logistics system, which include ports in the Russian Far East and the railroad route from the station Nakhodka-East, via border station Grodekovo to Suifenhe and Harbin (China) with access to the Trans-Siberian railway. This corridor allows exporting industrial and agricultural goods from the provinces of Heilongjiang and Jilin of China through the ports of Primorye to the ports of southern China, Japan, and the Republic of Korea. The basic elements of the economic framework here are transport and logistics centers at the stations Grodekovo, Artyom-Primorsky 1, Nakhodka, and Ussuriysk.

The direction adjacent to the transport corridor “Primorye-2” in the framework of international transport corridor “Tumen” which relies on the axis through the international route connecting cities Changchun, Jilin, Hunchun (China) via station Kraskino (Makhalino) to port of Zarubino (Russia) with access to the ports of the Asia-Pacific region. Development of international transportation along this route will

contribute to emergency of a large transport and logistics cluster in the North-East Asia region, including port infrastructure facilities, transport and logistics centers and economic zones in the territories of the Russian Federation, China, the Republic of Korea, North Korea, Japan and Mongolia. This represents opportunities for formation of a unified economic space in the Far East of Russia and in the region of North-East Asia. It allows companies of the macro region to be included into the international integration chains.

Direction adjacent to the Trans-Siberian transport corridor integrated into the Eurasian transport corridors links ports of Primorsky and Khabarovsk territories and the Baltic coast of the Russian Federation. Structural elements of a spatial network along the route of Trans-Siberian transport corridor are logistics centers planned for construction by the Russian Railways federal company at the stations Artem-Primorskiy 1, Nakhodka, Ussuriysk, Komsomolsk-sorting, Komsomolsk-Cargo, as well as port areas and terminals of seaports Vanino, Vladivostok, Nakhodka, Vostochny.

Taking into account the plans for construction of the Berkakit - Tommot - Yakutsk railway line with the automobile and railway bridge across the Lena river, development of the Central Yakutia is ensured, and taking into account the construction of cargo railway lines (Ulak-Elga, Khani-Olekminsk) and southern Yakutia will be undertaking. In order to ensure a year-round communication with the North-Eastern part of Yakutia and the Magadan region, and to provide exit of these areas to the all-Russian railway network, work will be carried out on the construction of a railway line in the direction of Yakutsk (Nizhny Bestyakh) - Moma - Magadan. In the first phase the route Nizhny Bestyakh, Megino - Aldan to be completed. That provides access to the North-Eastern part of Yakutia and the Kolyma mining areas as areas of prospective economic development. Thus, a new vector of spatial development is under way, integrating prospective projects in the Magadan and Amur regions and the Republic of Sakha (Yakutia) into a unified economic space.

The Far East of Russia is home for a number of large companies of the related industries, such as transport and logistics, aircraft building, shipbuilding, agriculture. This can stimulate exchange of ideas and knowledge both within industry and between companies. Intensive cooperation of enterprises makes it possible to set a network open to innovative development of the spatial framework on a basis of active interaction between economic structures at the national and global levels. Structurally, the network model of the spatial framework represents a set of territories or companies within the economic and geographical zones of the Far East actively cooperating to create competitive advantages at the macro level as interrelated and mutually reinforcing links of technological chains. In economy of the region should be noted the prospective network structure (cluster) on basis of cooperation of residents of free port of Vladivostok and industrial territories of advanced development “Komsomolsk”, “Khabarovsk”, “Bolshoy Kamen”. They could be integrated into a single chain of technological and cooperative ties within the framework of industrial specialization. Accordingly, the economic policy of the government aims on establishing links between the “poles” of economic growth in the regions of the Far East, as well as stimulating the promotion of competitive goods and services in the domestic and foreign markets.

5 Findings of the Study

The concept of the spatial emergency follows to a mixed model assuming presence of a number relatively equal in scale and characteristics points of economic growth and the associated settlement systems. Structure of the spatial framework of the Russian Far East represents a set of points of the accelerated growth (micro units). They mainly allocated in the southern zone of Primorsky region, zone of economic development Khabarovsk-Komsomolsk-on-Amur, the southern economic and geographical zones of the Republic of Sakha (Yakutia) and the Amur region. Concentration of investment and economic activities within boundaries of these territories assumed formation of large agglomeration zones (zones of population high density) – Vladivostok (Vladivostok, Artem and peripheral settlements), Khabarovsk (cities Khabarovsk, Amursk, Komsomolsk-on-Amur), and Amursky (Blagoveshchensk, Belogorsk and peripheral settlements). Localization of growth points will occur in the zones adjacent to international transport routes and nearby port territories of the seaports Zarubino, Vostochny, Nakhodka, Vanino and Vladivostok, nearby the territories of advanced development, within the limits of the regional investment projects and close to the state border areas. Thus, there are opportunities for emergence of large territorial and industrial complexes a new technological specialization: shipbuilding, automotive assembly, production of automotive engines, gas processing and gas chemistry, oil refining and petro chemistry.

Prospective extension of the territorial economy complexes sets a preposition for emergency of agglomeration structures in the zones adjacent to transportation and infrastructure corridors, which, in a long term, eliminate the current imbalance in spatial distribution of industrial zones and population density. At the same time, the existing spatial structure caused by uneven distribution of the population and labor resource, will have impact on the spatial development of the Far East in a long term period. The scenario of “isolated spots” in the northern and northeastern economic-geographical zones of the macro region seems likely. Economic activities here associated mainly with extraction and processing of mineral resources, recreation and environmental tourism. Another constraining factor for emergence of a balanced spatial model is mono specialty of a number of municipalities, specialized in resource-extracting sectors, which cause a competitive disadvantage for the Russian Far East at the national and global level.

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Organizational and Financial Problems of Functioning of the Free Port of Vladivostok

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Abstract. Many developing countries face low levels of socio-economic development, both in individual regions and the country as a whole. The use of special economic zones nowadays is one of the best methods to solve this problem. In the far East of Russia, the main problem for the entire period of its existence is the low level of social and economic development. Solutions to this problem in our country also implement a special economic policy, one of the tools for its implementation is the creation of the free port of Vladivostok on its territory. On October 12, 2015, the law on the Freeport of Vladivostok entered into force and the special economic zone began its work with it. Since the beginning of the special regime, there have been problems and shortcomings in its implementation and operation. And since the process of this project is very dynamic, there is a need for constant monitoring, analysis of the current situation, adjusting the conditions and actions to improve the efficiency of the regime.

Keywords: Free port Vladivostok · Special economic zone ·
Fiscal concessions · Efficiency of the mode of special customs zone

1 Introduction

One of the economic instruments used as an activator of investment and innovative development of the region is the creation of a special economic zone on its territory. One of the varieties of the special economic zone is a Free port. The regime of the free port of Vladivostok extends to the port areas of five subjects of the far Eastern Federal district: the Primorsky, Khabarovsk and Kamchatka territories, the Sakhalin region and the Chukotka Autonomous district.

The Main task of the free port of Vladivostok is the establishment of special measures of state support for entrepreneurship, which are regulated by article 18 No. 212-FZ.

The aim of this research is to substantiate the recommendations on the formation of the stages of development of Vladivostok in the conditions of the Free port regime.

Research task:

- to analyze economic indicators of the Vladivostok free port project;
- to reveal organizational and financial problems of functioning of the free port of Vladivostok at the present stage;
- to define ways of development of Vladivostok in the developed conditions.

The subject of the research is the development trends and features of functioning of Vladivostok city under the conditions of the free port of Vladivostok.

The validity and reliability of the study is achieved by the use of General scientific methods of analysis.

The decision to implement this regime on the territory of Vladivostok to improve the socio-economic climate in the far East is not accidental, for a long time it is Primorsky region that is the main driver of the region's development. Vladivostok has many characteristics necessary for the implementation of this regime. The city is located at the intersection of many transit sea routes, making it an ideal candidate for the development of trade, entrepreneurship and production on the basis of Maritime transport. The idea of using this regime in the far East and for the country as a whole is not new. The port-Franco regimes have already been implemented throughout the far East region, as well as in the Crimea. However, it should be noted the specifics of the use of these modes, first of all, they were used to simplify the supply of distant regions with essential products. In that historical period, the state simply did not have the opportunity to provide, so far from the center of the regions, all the necessary goods. To achieve this goal, the relevant policy of simplifying customs regimes and reducing most customs duties was carried out, which allowed to quickly fill the market with foreign goods [3].

The use of this historical experience nowadays can be not only ineffective, but also detrimental to the economy of the region. The main example in the creation of the free port of Vladivostok (FPV) was the foreign experience [5, 6]. One of the first zones in the world practice, specializing in the production of export products, from the date of its Foundation is Shannon export-production zone in Ireland, which was formed in 1959 in the area of the airport of the same name, located in the Western part of the Shannon estuary. Thanks to convenient transportation, as well as providing a number of benefits for potential investors – in particular, duty – free import of raw materials, semi-finished products and components, low rent for factory premises and warehouses, simplified procedures for investment and comfortable living conditions-Shannon area quickly managed to achieve impressive results. The enterprises located in Shannon produce electronic equipment, industrial diamonds, well drilling equipment, consumer goods and much more. During the years of existence of this special economic zone, the volume of exports has increased dramatically. Shannon has become a thriving industrial hub in Western Ireland. The successful operation of the Shannon zone has gained worldwide fame and served as an example for many developing countries, which began to actively use this experience. There is also a similar experience of creating special economic zones in the United States, where the largest number of zones appeared in the 70-80-ies, which was due to the growth of US foreign trade and the strengthening of competition in the domestic market. During this period, a large number of similar zones appeared in cities that do not have access to the ocean, but at the same time play an

important role in the foreign economy. This is due to a number of factors, the most important of which are the sharply increased volume of US trade, the intensification of activities of foreign corporations in the domestic market, the rapid growth of various types of export transactions. In the future, such a policy led to the creation of a new trade infrastructure in the United States. Among developing countries, Taiwan has been a pioneer in the organization of free zones. Taiwan's experience has been so successful and impressive that it has since become a model for free economic zones for developing countries. The first such zone in Taiwan was established in 1966, and in the mid-90s there were already 240 enterprises with a total number of 76 thousand people employed. The total volume of investments in enterprises exceeded \$ 1 billion [4].

2 Discussion

Today's draft law of the free port pursues other goals, in addition to customs procedures, it covers almost all economic activities not only in the Vladivostok city district, but also in the entire Primorsky Region. The main idea of the regime is to create a special economic zone in the territory of Primorsky Region, which provides special benefits to enterprises operating on its basis, that is, they are residents of the free port. In order to be able to establish an enterprise on the basis of a free port and use special tax benefits, the future resident must submit an application to obtain the status, as well as pass the selection according to special criteria.

One of the main tools for attracting residents to work under this regime is the provision of special benefits by the state. The analysis of the current tax benefits for residents of FPV, conducted on the basis of the initial regulations, as well as taking into account the changes made to the legislation of Primorsky Region, is summarized in Table 1.

Table 1. The Main financial benefits for taxes and fees to residents of the free port of Vladivostok in comparison with the standard rates of tax collection.

For residents of the free port			
The amount of insurance premiums for 10 years	Income tax for the first 5 years	Property tax for the first 5 years	Land tax for the first 5 years
7,6%	0% (the next 5 years 12%)	0% (the next 5 years not more than 2,2%)	0%
For non-residents of the free port			
The total size of insurance contributions	Income tax	Property tax	Land tax
30%	20%	2,2%	0,3–1,5%

Table 1 provides a brief overview of the main financial benefits of the main taxes and duties, which are presented to residents of the free port of Vladivostok in the implementation of their activities in comparison with the standard tax rates in force at

the moment. These tax incentives designed to attract to the operation of the free port of new residents and further accelerate socio-economic development of the whole far East region by reducing the cost to the resident for the payment of taxes and duties at the beginning of its activities. The money released can be used to improve the state of the enterprise and create a more economically developed environment [1, 2, 9–12].

To assess the results achieved to date, the free port regime considered the main statistical indicators of its activities during 2016 from official sources, namely the data provided by JSC “Corporation for the development of the Far East”, reports on the activities of this organization, as well as the register of residents of the free port [7, 13–15]. The results of the analysis are presented in Tables 2 and 3.

Table 2. Key performance indicators for the 2016 FPV regime.

Indicator	The first quarter		The second quarter		Third quarter		The fourth quarter	
	Fact	Execution of plan %	Fact	Execution of plan %	Fact	Execution of plan %	Fact	Execution of plan %
Number of new resident applications (PCs.)	56	101,8	93	143	148	185	235	156,7
Number of concluded agreements with residents (PCs.)	15	100	40	100	94	188	118	168,6%
The volume of investments stated in agreements with residents (billion rubles)	28	100	101	112,60	126	120	188	134,2
Number of jobs already created, (PCs.)	0	100	200	50,00	285	59,00	-	-
Number of jobs being in the process of creation, (PCs.)	-	-	-	-	-	-	23000	124,3

It should be noted that during the two years of the regime, there is a constant excess of the actual figures over the planned ones, with the exception of only 2 and 3 quarter of 2016 in which the number of jobs created reached only 50–60% of the existing plan. This figure is not critical and is associated with a decrease in the number of jobs in the company “Aviapolis Yankovsky” at the time of the opening of the enterprise. Assessing the overall dynamics, we can see an increasing rate of growth of indicators

Table 3. Key performance indicators of the FPV regime in 2017.

Indicator	The first quarter		The second quarter		Third quarter		The fourth quarter	
	Fact	Execution of plan %	Fact	Execution of plan %	Fact	Execution of plan %	Fact	Execution of plan %
Number of new resident applications (PCs.)	245	117	330	115	442	155	630	213
Number of concluded agreements with residents (PCs.)	156	107	229	170	318	159	432	198
The volume of investments stated in agreements with residents (billion rubles)	257	120	-	-	-	-	366,4	121
Number of jobs already created, (PCs.)	886	206	-	-	-	-	1889	126
Number of jobs being in the process of creation, (PCs.)	24700	105	-	-	-	-	35900	133

by 2017, which indicates the development of the regime and the growth of interest in it on the part of the business community. The continuation of this dynamics is expected in 2018, which indicates the good development of the regime and the readiness of the region to develop in this direction.

To study the main problems and shortcomings in the work of the FPV, the reports of customs services on the activities of the regime were studied [8, 20]. The analysis of opinions of specialists and experts allowed to divide the existing problems into two main groups:

- territorial;
- technological.

To date, territorial problems include such problems as:

- providing residents with land plots;
- implementation of the special customs zone procedure.
- poor preparedness of customs infrastructure

Providing residents of the free port with land plots is one of the key factors of the regime's operation. Earlier, there was a weak preparation of administrative structures for the work on the issuance of land, there were no accurate cadastral maps and information on specific land plots [16]. At the moment, work is underway in this direction, more accurate data have been prepared, but they are still not enough, residents are still not available full information on available land. And also negative factor is lack of any structure on the issued sites. To solve this problem, it is necessary to continue to collect information and provide residents with full access to this information through electronic information resources. Electronic resources «FEDC» can serve as a platform for placing this information.

The problem of residents preparing their land for the implementation of the special customs zone (SCZ) also has a great impact on the progress of the project. The problem is that the current requirements are still insufficiently developed, lack transparency, and residents refuse to use them. According to Sergei Fedorov, the first Deputy head of the far Eastern customs administration, the customs part of the law is not fully used, it works extremely poorly and today there are only two residents who apply the procedure of SCZ [20]. It should be noted that at the moment, there are developed incentives for the preparation of the site for those enterprises that use the electronic accounting system on the plot of land, however, in order to completely solve the problem, it is necessary to develop more accessible and simple requirements for residents.

The development of customs infrastructure is a necessity for the normal operation of the FPV, from the very beginning of the regime, the administrative authorities are faced with a complete lack of readiness of customs to work in a free port. To date, a lot of work has been done on the development of customs infrastructure, but as noted by customs officers, this is still not enough. According to opinion Sergei Fedorov, there are problems on the land border, it is not equipped and not ready to work, and Chinese colleagues are not ready to move to the round-the-clock mode. While the FPV regime has not yet fully operational, the burden on customs authorities is not critical, but if the problem is not resolved in the near future, it can have a significant impact on the work of the entire regime. To solve this problem, it is necessary to connect the administrative authorities and work together with foreign partners.

The technological problems of the free port project include:

- high administrative burden for residents of FPV
- use of the complex of software «Portal seaport»,
- the use of an automated accounting system in the implementation of the resident procedure SCZ.
- the need to adjust the principles of accelerated VAT refund.

The problem of high administrative burden has existed since the very beginning of the regime, but until recently has been relegated to the background of the primary problems of the regime [18]. Today, this problem is increasingly heard among residents. According to Alexander Shumatov, the General Director of LLC “center for children's health” the development of restrictions on verification is important for us, because a lot of labor goes to fill out documents and prepare for inspection. Work to solve this problem is ongoing, but in the opinion of the residents, the solution to the problem is to reduce bureaucratic procedures and the transfer of documents in electronic form.

The increase in cargo turnover is an absolute factor that accompanies the development of the free port regime and obligates the customs authorities to develop special tools to simplify their work [17]. This tool was a set of software tools “Portal sea port”. It allows the resident to perform the necessary complex of operations for transportation, control of their cargo in the territory of the FPV from any computer with Internet access. According to L. K. Pulina, if we talk about the ongoing experiment in seaports to implement the portal, we can note both positive and a number of negative comments to his work, allowing us to make a General conclusion that the portal today is not ready to perform the functions and tasks that are assigned to it and requires significant refinement. In turn, the chief state customs inspector, Department for implementation of promising customs technologies service of the customs control organization of the far Eastern customs administration O. V. Gavrichkov notes that the work to improve it constantly, and the portal will continue to work. In our view, despite the existing shortcomings in the system, and taking into account the expected volume of cargo turnover of the free port in the future, a similar set of software tools is necessary for the full operation of the regime. At the moment, it is necessary to conduct studies aimed at identifying shortcomings in its work. In the future, thanks to this complex, the customs authorities are expected to make a full transition to the use of electronic document management in their work.

The system of automated cargo accounting was proposed for use by residents as an addition to the organization of its site under the procedure of SCZ. As the head of Department of Head Department of the organization of customs registration and customs control of FCS of Russia T. p. Denisova notes, the use of this system allows to reduce the number of requirements imposed to residents at arrangement of the territories. This reduction allows to simplify procedure of arrangement of the territory and to open access to creation of similar territories for any enterprise. Today’s problem is the procedure of implementation and use of this system by some residents. Residents currently lack the experience to create and actively use such a system. In our opinion, to solve this problem it is necessary to reconsider the process of implementation and realization of this system, it will ensure not only development, but also its more active use, which will further lead to simplification and acceleration of the procedure of SCZ for the majority of residents of the free port.

The possibility of an accelerated VAT refund is one of the fundamental principles of FPV. However, in practice this principle is not perfect. According to Eugene Panin, General Director of LLC «Vostok LPG» [21], the Corporation does not have a Fund to provide support and issue any guarantees, documentation is being developed, the creation of such a Fund will improve both the speed of the regime and its reliability and prestige for future residents.

Thus, according to the analysis of the considered economic indicators, as well as the main problems of the project, it can be concluded that the impact of the special zone on the economy of the city today is insignificant, but the regime has already begun its work. Based on the results of the research, it is possible to identify several stages of the development of the city Vladivostok in the operating conditions of the FPV regime.

3 Conclusion

The first stage includes the work on the implementation of the mode and the launch of the project in full force. The main problem of this stage is unfinished infrastructure elements, as well as the problems considered in the implementation of the regime. The majority of the problems in the FPV are the result of insufficient experience, both for residents of the free port and for Supervisory authorities. Taking into account the peculiarities of the implementation of the FPV regime, as well as the novelty of its use for the whole country, this suggests that such a situation is natural. The main problem of this period is the unpreparedness of the FPV infrastructure, which hinders its development and discourages possible residents from participating in the project. By the end of 2017, the main volume of construction of priority infrastructure facilities was completed, so at the moment the final works on commissioning of these facilities are already underway [19]. Taking into account the work on the existing problems of the project implementation and the completion of infrastructure works, the first phase is expected to be completed by early 2018.

The second stage includes the actual launch of the project, the start-up of the main enterprises in the FPV mode and primary economic growth. Today we are at the very beginning of this stage, large residents have already started working at their enterprises, but this has not yet brought significant economic growth. During 2018–2020, the main production facilities will be launched within the framework of the regime, which will lead to the primary growth of the main indicators and honing the operation of the regime.

The third stage represents the main period of development of the city in the status of FPV. According to forecast data of Corporation of development of the Far East by the moment of the beginning of this stage in the territory of the special zone more than 600 enterprises will already work in full force. At this stage, both economic and social indicators of the city's development are expected to increase.

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A Proposed Approach in Estimating the Profit of Coal Mines Under Fluctuating Prices

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Abstract. The price is one of the most important external factors affecting the effectiveness of coal mining companies. The prices for many commodities, including exported coal, form in the financial speculative market which often have nothing to do with the real sector of the economy. In this difficult, frequently unpredictable terms coal companies have to conform both under periodic and chaotic fluctuations of annual and subannual prices. Periodic price instability of coal process and variability of the most important indicators of geological, mining, technological, organizational, ecology and economy conditions of exploitation of the deposits cause inevitable fluctuations in profits. Profit in the proposed model of the relative change in profit in coal mines equals the algebraic sum of relative changes in seven factors (coal reserves in block, extraction ratio, losses, dilution, price per unit, total costs per unit, integrated factor taking into account mining emergencies caused by all the most important reasons, respectively). The impact of relative change price on the relative change in profit is always more significant than a similar relative change in any of the above factors. The article analyses the pace and scale of change of world market prices for coking coal. A 27% price of coking coal drop will result in a decrease in a coal company's profit by 55% if the cost/price ratio is 0,5 and by nearly 135% if it is 0,8. This paper identifies key reserves of increase of profit of coal mine for price change of coal by improving coal quality, more extensive processing.

Keywords: Profit · Effectiveness · Coal prices · Coking coal · Relative change · Fluctuations

1 Introduction

A large number of external factors influence the efficiency of mining companies, such as: fluctuating prices, change in the taxation system and exchange rate, innovations in numerous standards, legal norms and guidance documents of subsoil etc.

Prices for both coking and thermal coal, which is supplied to the world market, are subject to constant adjustments including taking into account their qualitative characteristics for ash content, moisture content, volatiles yield, caking and coking capacity, content of harmful components (sulfur, phosphorus and other). At certain intervals, the prices, for example, for thermal coal can have a close relationship with oil prices [1]. In a number of studies, stochastic models have been proposed and

considered to determine the price of coal supplied to the power plant under long-term contracts [2–6]. Wilmoth demonstrates the importance of GARCH models in the study of sharp fluctuations in coal prices [7].

The price is the most significant factor affecting the efficiency of mining companies. Change is cyclical, often difficult to predict, in which rapid growth can be replaced by a prolonged fall. For cycles that have a long period (several years), short, associated, for example, with seasonal fluctuations in demand, the occurrence of various kinds of force majeure circumstances of natural and man-made character may be imposed. Changes in the price for final products by 10% or more occurs almost every year and several times a year, and falling prices, up to two or more times in the life of a coal mines occurs repeatedly. This situation in pricing leads to the fact that companies often unable to get expected (planned) profit because of price fluctuations and to develop a system of preventive and strategic (rational) measures to eliminate the negative impact during their decline, and prepare for the subsequent period of a possible drop in prices in the period of growth.

2 Model and Methodology

The development of mineral deposits is characterized by risks mainly due to the instability of prices for mining products and the high degree of geological uncertainty of the quality and volume of coal reserves. Criterion [8, 9] can be used to estimate the efficiency of extraction block of a coal deposit:

$$Pr = QJ(1 - L)(1 - D)(P - C)(1 - W), \quad (1)$$

where Q – coal production per an extraction block; J – recovery factor in run-of-mine (ROM) coal dressing; L , D – losses and dilution, respectively, in share of units; P – price per unit of final product; C – total costs per unit of final product; W – integrated factor taking into account mining emergencies caused by all the most important reasons (mine performance reliability).

Based on the formula (1) a model of the relative change in profit $\Delta Pr/Pr$ is proposed to estimate the efficiency of coal company for mining of the deposit (or extraction block), which, with a satisfactory approximation the solution to the problem can be represented in the following form [9]:

$$\frac{\Delta Pr}{Pr} = \frac{\Delta Q}{Q} + \frac{\Delta J}{J} - \frac{\Delta L}{L} f(L) - \frac{\Delta D}{D} f(D) + \frac{\Delta P}{P} f_p(K) - \frac{\Delta C}{C} f_c(K) - \frac{\Delta W}{W} f(W), \quad (2)$$

where $\Delta Q/Q$, $\Delta J/J$, $\Delta L/L$, $\Delta D/D$, $\Delta P/P$, $\Delta C/C$, $\Delta W/W$ is the relative change of the considered factors, Q , J , L , D , P , C and W respectively. Coefficients $f(L) = \frac{L}{1-L}$ at the losses factor; $f(D) = \frac{D}{1-D}$ at the dilution factor; $f_p(K) = \frac{1}{1-K}$ at the price factor; $f_c(K) = \frac{K}{1-K}$ at the cost factor; $f(W) = \frac{W}{1-W}$ at the factor W ; $K = \frac{C}{P}$.

The model (2) is created for one type of coal (for example, coking or thermal), it is monoproduct and, like all models by definition, is a «simplified description of reality or an accurate description of a simplified imaginary economy» [10, 11].

Using expression (2), it is possible to estimate the degree and nature of the influence of the relative change of each individual base factor or any combination of factors from all the above (two, three) on the relative change in profit. This parameter ($\Delta Pr/Pr$) as a rule is linearly dependent on the relative changes in factors such as Q, J, and non-linear dependence on the change in factors: L, D, C, P, W.

In terms of the degree of influence of the change in the underlying factors on the change in profit, P may be in the first place, C, W, D and L in the second place. The degree of influence Q and J depends on a number of factors, including the quality of the raw materials base, and may be in third place or higher.

3 Discussion

The price is the most significant factor affecting the efficiency of many mining companies. The coefficient at $\Delta P/P$ is always greater than one and more than the values of the coefficients with relative changes of other factors. The impact relative price change on the relative change in profit is always more significant than a similar relative change in any of the above factors. In addition fluctuations in prices are very significant and are uncontrollable (for the companies) environmental factors.

The basic price level for many commodities including exported coal actively traded on organized or stock markets and commodity futures, is often formed in a financial speculative market which often has nothing to do with the real sector of the economy [11–13]. In such complex, often unpredictable conditions coal companies force to adjust for both periodic and chaotic fluctuations per annual (Fig. 1) and subannual prices (Fig. 2).

Enterprises that participate in the coal supply chain to consumers should coordinate their production activities in connection with volatile price changes, move from the long-term contracts (year, quarter) to the binding of spot prices with their multiple changes even in short periods of time [13–15].

Here are some examples of such chaotic changes observed in recent years. According to metcoal.ru, within two weeks of April 2017, spot prices for premium low-ash coking coal concentrate almost doubled, reaching \$314 per ton. Natural cataclysmic events associated with cyclones in March 2018 led to the shutdown of a number of coal companies in Australia, the largest supplier of coking coal to the Asia-Pacific region markets. The decrease in exports contributed to a 65.6% price increase, from \$160/t in March to \$265/t in April.

It should also be noted there are nuances such as the different economic efficiencies of coal supplies by Russian coal companies to the domestic and foreign markets. In recent years, the export share in the coal total volume in the country has steadily increased at a high rate. This shows both the high demand of foreign consumers for the products of Russian companies and the interest of the latter in the export of coal due to, as a rule, higher prices in foreign markets and a fall in the ruble's exchange rate against the dollar. At the same time, other price collisions are possible. According to Metal

Expert and BCS in January 2018, thermal coal cost \$37–40/t in Russia, and export prices were \$106/t based on FOB Far East, coking coal concentrate, in contrast, cost \$170/t, and on CFR basis China – \$153/t.

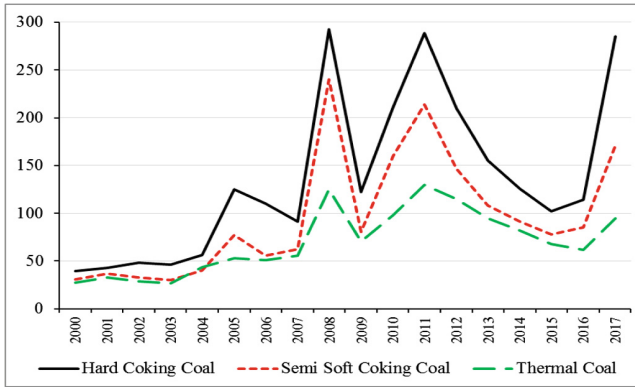


Fig. 1. Annual dynamics of prices for certain grades of coal (FOB supply), USD/t [16].

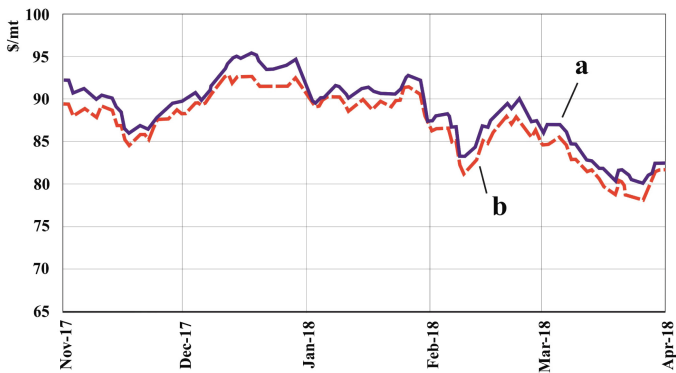


Fig. 2. Subannual price changes (FOB) for thermal coal: (a) Newcastle (Australia), (b) Richard Bay (South Africa). [Source]: <http://www.globalcoal.com>.

Returning to (2), we note that the relative change in profit is:

$$\frac{\Delta \text{Pr}}{\text{Pr}} = \frac{\Delta P}{P} f_p(K), \quad (3)$$

where $f_p(K) = 1/(1 - K)$ is a factor that is greater than one for all values of K .

At cost/price ratio $K > 0.8$, even a small price change leads to a fall or increase in profits of $2\times$ or more. The lower the cost/price ratio (K), the more sustainable the coal mines are. Figure 3 shows the dynamics of the relative change in price and profit for 17

years at different values of K (0.3, 0.5 and 0.8). In 2012 with $K = 0.5$ a 27% price drop resulted in a decrease in profits by 55% and by nearly 136% if it is 0.8.

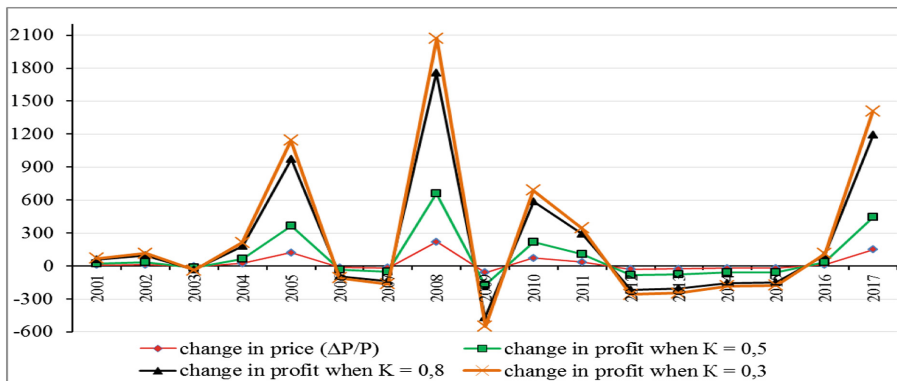


Fig. 3. Impact of changes in coal prices (hard coking coal) on profit changes.

All coal mines with $K > 0.75$ become unprofitable in this situation unless special measures are taking. At $K > 0.8$, we will have the same result when the price falls by as little as 10–20%. From the formula (3) and noted above, it follows that the economic stability of the coal mines to fluctuations in market prices of coal is higher, the smaller K and the better the quality and quantity of developed deposits are.

Let's consider an option with a simultaneous change in the price of coal and the cost. From (2) we have:

$$\frac{\Delta Pr}{Pr} = \frac{\Delta P}{P} \frac{1}{1-K} + \frac{\Delta C}{C} \frac{K}{1-K}. \quad (4)$$

The relative change in profit (for 4) equals to the relative change in price multiplied by $f_p(K)$, and the relative increase in costs multiplied by $f_c(K)$, a factor is always greater than cost/price ratio K (Fig. 4).

The worst of all possible options arises with a simultaneous drop in price and an increase in costs. If cost/price ratio ($K \leq 0.5$) is small, if prices and costs increase by 10%, the profit of the company will drop by 30% (Table 1). In this case, a change of these factors, even by 10–20% at larger cost/price ratio $K (>0.75)$, causes a sharp drop in profits. So the relative change in coal price is always more significant than the same relative change in costs.

In recent years, one of the main problems of the coal mining industry was not only the need to constantly account for price changes of coal but also that the increase of costs is higher than that of prices [15–19]. This contributed to the fact that, for example, Russian companies forced to develop and realize special programs aimed at reducing their operating expenses, to look for ways to produce products with higher added value [20–22].

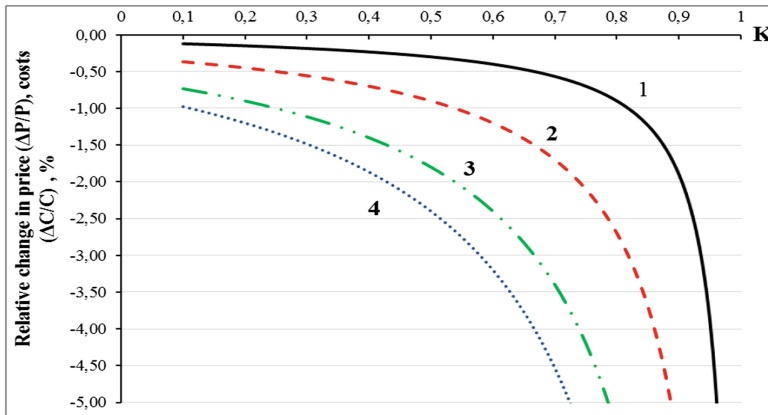


Fig. 4. The degree of impact of simultaneous changes in price and profit costs. Change of price and costs: 1–10%; 2 – 30%; 3 – 60%; 4 – 80%.

For mining companies in a number of developing countries, a temporary way out of this situation has been the depreciation of local currencies against the US dollar and, as a result, the possibility of obtaining more national money from selling their products in a foreign market. For example, from January 2014 till May 2015, the exchange rates of the national currencies of Russia and Kazakhstan almost doubled (Fig. 5), which, to a certain extent leveled the negative effects of low coal prices during this period (see Fig. 1).

Table 1. The relative change of profit (%) in case of price change and increase in cost ($K = 0,6$).

$\Delta P/P, \%$	$\Delta C/C, \%$			
	5	10	15	20
5	20	12,5	35	42,5
10	32,5	40	47,5	55
15	45	52,5	60	67,5
20	57,5	65	72,5	80
-5	-5	2,5	10	17,5
-10	-17,5	-10	-2,5	5
-15	-30	-22,5	-15	-7,5
-20	-42,5	-35	-27,5	-20

The sharp increase of prices in 2016 and their relative stabilization at a sufficiently high level later led to the fact that the operating coal companies were able to significantly improve their financial positions, including through the growth of volumes of coal production and sales.

Analyzing the work of mines and open-pits in South Yakutia that mine mainly coking coal, we can talk about a sufficiently favorable current external and internal

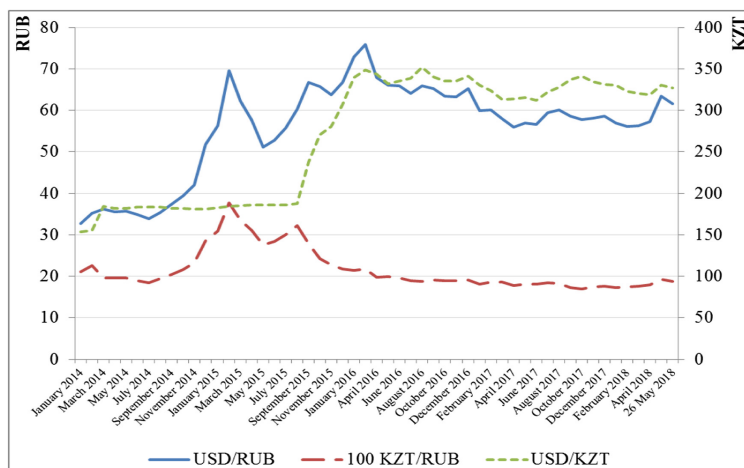


Fig. 5. Dynamics of changes in the USA dollar to the ruble and tenge, tenge to the ruble. According to the Central Bank of Russia and the National Bank of Kazakhstan.

situation. The total cost of one ton of coal on FOB terms at the Far Eastern ports will be on average 4,500–5,500 rubles per ton. Its components are: the production cost of underground coal mining – 2100–2400 rubles per ton, open production – 1300–1600 rubles per ton, the cost of processing is 900–1200 rubles per ton, delivery to Vanino, Vostochny, Nakhodka or Posyet and transshipment of coal in ports on vessels – 900–1300 rubles per ton, commercial and administrative expenses – 1000 rubles per ton. With the current price of coking coal (hard, semi soft) and the current dollar exchange rate at 60–65 rubles, the cost/price ratio (K) is 0.3–0.4. This allows to speak about the high efficiency of mining the majority of coal blocks and seams. However with the supply of thermal coal, the cost/price ratio (K) is already at the level of 0.7–0.8, i.e. at a sufficiently high level for a stable production.

Let's consider, how necessary it is to lower specific costs with a lowering of the price so that the profit of the company has not been changed. From (4) with $\Delta Pr/Pr = 0$ after the transformations and taking into account the accepted notation, we have:

$$\frac{\Delta C}{C} = \frac{\Delta P}{P} \cdot \frac{f_p(K)}{f_c(K)} = \frac{\Delta P}{P} \cdot \frac{1}{K}, \quad (5)$$

which determines the condition for compensating the decline in profits with a decrease in prices due to a reduction in costs. This means that for such compensation it is necessary that the relative cost reduction should be $1/K$ times more than the relative price drop. If the price falls by 25% or more, such compensation is practically impossible, and for companies with small cost/price ratio K ($K \leq 0.5$) it is impossible even with a 10% price drop. It follows that a relative reduction in costs will be required more than the occurred or expected relative price reduction.

Most of the mines in Russia, and the Far East in particular, with more complex and expensive regional conditions for exploitation of the deposits have experienced

numerous crisis situations over the past 15 years. Including the simultaneous price drop for coal and the outstripping growth of energy costs, materials and equipment.

Given that the coal industry is largely focused on shipping its products to highly competitive East Asia markets with highly volatile prices. Individual companies are unable to influence on coal price formation. Therefore, to increase the level of their profit mining companies should have a set of rational and preventive measures directing to decrease as aggregate costs so as increase of quality of coal supplied to consumers. At the same time management processes should not be limited only at the stages of coal mining and dressing. It requires optimal management of such chains with constant account, control and operational correction of dozens of indicators in the monitoring of economic sustainability of supplies in general and its individual chains, primarily coal mines.

It is necessary to use complex systems of coal quality control in the supply chains as a whole [23, 24]. The functioning of such systems should begin with the maximum full assessment and accounting of the geological potential of the deposits. Its increase is possible on the basis of new knowledge, obtaining of which is achieved by a deeper level of research of individual sections and seams of deposits. This can be connected, for example, with the developed approach to differentiation of the ash content of extracted coal in five components of natural and technological dilution, which must be taken into account in planning, mining, preparation of coal for dressing [25]. Equally important to maximally meet the growing demands of customers is the use of the explored possibilities of transport and logistics links in coal supply chains in the interests of preserving or improving its consumer properties [24, 26].

Existing and promising coal supply chains as a rule, are based on increasingly complex and heterogeneous deposits and/or their sections (seams). So the costs for exploration, extraction, dressing and logistics of coal to consumers, and most importantly their price potential can also vary widely. This in turn leads to the necessity and expediency of using the developed and proposed approach to assessing the profit of a coal mines when prices change in various express estimates. This also allows for a more rational approach to the development of both deposits in general and their individual sections (seams).

4 Conclusion

Based on the model of relative change in profit developed and adapted for coal deposits, taking into account the influence of seven basic factors (coal production per an extraction block, recovery factor in run-of-mine (ROM) coal dressing, coal losses and dilution, final product price per unit, aggregate costs per unit, mine performance reliability) it is shown that the impact of relative price change on the relative change in profit is always more significant than a similar relative change in any of the above factors.

For coal mines that produce thermal coal and do not have a sufficient reserve of good quality and are also not sufficient in terms of the quantity of mineral resources, with a cost/price ratio of 0.8, we can see an unstable economic situation. Their condition is very sensitive to price changes and unit costs of output as profit may increase

(or fall) by two or three times with a relative change in price or costs of only by 15–20%. Companies that extract coking coal and utilize concentrate are, as a rule, in a better financial position. With the current market conditions, the cost/price ratio is 0.3–0.4, which makes it possible to talk about the high efficiency of mining most of the deposits and seams.

One of the trends in the development of the coal industry is the objective need to prospect and operate deposits and/or their sections (seams) that are more complex and heterogeneous in their structure. An important reserve in improving the efficiency of coking and thermal coal producing companies should be integrated quality management systems. In these systems, it is advisable to include all segments of coal supply chains, starting from a geological resource with deeper exploration and ending with the utilization from end users, taking into account the qualitative and quantitative changes taking place with fuel after shipment from the extraction and dressing sites.

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Quality of the Human Capital and State Support of Development of Regional Infrastructure

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Abstract. The subject of the study in the article is the quality of human capital and its dependence on the policy of the regions with respect to the development of regional infrastructure. Understanding the nature of the object under study will allow correcting the process of infrastructure modernization, evaluating the effectiveness of existing tools and using the results of the research to design new approaches to solving infrastructure problems at the regional and state level. The aim of the study is to identify key infrastructure directions that can regulate the level of quality of human capital. As results of the study, we need to solve the tasks or argue the existence of factors that hinder the achievement of results.

Keywords: Human capital · Quality of human capital · Education · Health · Infrastructure of the regions

1 Introduction

The formation of human capital as an object of research has been actualized for a rather long time. Interest in this economic asset underwent transformations for a long time. Adam Smith, K. Marx and many other authoritative economists and philosophers wrote about this. Different approaches were suggested. T. Schultz [1] made a significant contribution to the introduction of the theoretical basis for such a concept as human capital at the initial stage. It is thanks to his scientific research that a rethinking and popularization of this economic tool took place. Schultz identified the role of human capital as a fundamental element of the industrial and, later, post-industrial economy. The capacious concept of “human capital” is multilayered. At the micro level, the concept of human capital was discovered by G. Becker. He presented “human capital as a combination of knowledge, skills and abilities” [2]. The costs of education and training Becker regards as an investment in the development of human capital. First of all, he estimated the economic effectiveness of education directly for the person himself. The difference in income between a person with a higher education (v/o) and a poorly educated worker, he defined as a potential difference in income [3].

“The changing role of human capital is realized through the expansion of its structure and functions, the transformation from an expenditure item into the main productive and social development factor. The basis of the new economy is accumulated human capital, mainly affecting the socio-economic potential of modern society” [1].

One cannot fail to note the opinion of A. Smith that the quality of life of “each people is determined by two different conditions: first, the art, skill and ingenuity with which, in general, his work is applied, and secondly, the ratio between the number those who are engaged in useful work, and the number of those who are not engaged in them. Whatever the soil, climate or size of the territory of a particular people, the abundance or scarcity of its annual supply will always depend in this case on these two conditions” [4]. The very understanding of the role of human capital has undergone drastic changes. Expanding the structural and functional potential, an expanded understanding of the range of its influence on the paradigm of the development of the entire structure of society in a civilizational scale has led to a new perception of countries and the world community. And at this stage of the emergence of new economic, sociopolitical, postmodern realities, human capital took the leading place in national wealth and in the total productive capital of the developed countries, which is about 80% [1].

The main objectives of the study of the article the authors see:

- (1) identify the dependence of the quality of human capital on the level of development of certain types of regional infrastructure;
- (2) definition of the relationship between the strengthening of state support for the development of regional infrastructure and the level of quality of human capital;
- (3) search for optimal approaches to the development of regional infrastructure and the rationale for the key role of the state in shaping the level of quality of human capital.

As the main tasks in the article:

- (1) the relevance of infrastructural directions is analyzed and their degree of influence on the quality of human capital is determined;
- (2) the role of the state in the development of regional infrastructure and the impact of the quality of human capital on the economic and social potential of regional development and its dynamics are analyzed.

In the future, human capital is able to influence the socio-economic climate of countries investing in the development of regional infrastructure in a key way. “In the philosophical sense, modernization and dynamic development of the state are systemic changes in the physical, institutional, organizational, intangible (intellectual), financial and other factors of its functioning. It is safe to say that they lead, ultimately, to positive economic, social, political, institutional, environmental, infrastructural and other useful changes [1].

2 Retrospective

V. Patten appealed to the possibility of assessing the monetary value of the productive properties of man in the XVII century. “He believed that the wealth of society depends on the nature of the occupation of people and their ability to work”. In one form or

another, the idea of human capital was considered in the works of A. Smith, D. Ricardo, A. Marshall, K. Marx, F. Engels, J. Mill, L. Walras, JB Clarke and other scientists [3].

However, it was noted that the effectiveness of the use of physical or financial assets is determined by the qualifications, competence and health of people. This conclusion led to the formulation of the concept of human capital in the 1960s (Becker 1964). The theory of human capital has become a vital element of in-depth analysis aimed at assessing the role that the quality of the human factor plays in economic processes. According to the research results, the highest levels of human capital are typical of the most affluent regions in Western Europe, while its lowest levels are found in the poorest countries that became EU members only recently and in countries in southern Europe, including Greece [5].

Thus, A. Smith (2007) wrote that the increase in labor productivity depends, first of all, on the agility and skill of the worker, that the acquired and useful abilities of a person become part of the wealth of society [3, 6]. According to J. Mill (1980), the category of “wealth of the country” can include the skill, energy and perseverance of the workers. More qualified labor, K. Marx considered, is reified at equal intervals of time at relatively higher prices [3].

Thanks to the work of the adherents of the “Chicago school”, such as: B. Weisbrod, T. Schultz, G. Becker, J. Mintzer, in the second half of the 20th century. The concept of Human Capital was formulated and framed in a relatively full-fledged theory. “They used in their work the principles and structural elements of the neoclassical school in relation to social institutions, such as education, health care and other spheres. It was assumed that people are interested in investing in their own migration, in their education, health care and other activities of social infrastructure, if it allows” [3] them to continue to receive a high and stable income (where the keyword is “stable”). The EU is developing its cohesion policy with the main goal of reducing disparities in regional development. The success of politics is largely determined by the identification of factors that contribute to such inconsistencies. Human capital is one of the key factors of economic success [7]. So Norway is gradually overcoming the Dutch disease by means of expanded reproduction of human capital. On the other hand, extraction of hydrocarbons may remain a driver of the Russian economic growth [6].

For G. Becker, this was a set of skills, knowledge and skills of man [3]. According to T. Schulz’s definition, Human Capital is a person’s valuable qualities that can be strengthened by appropriate investments [3]. However, T. Schultz and G. Becker paid more attention to explaining and upholding the idea of an equitable human resource role in the creation of the aggregate social product. In later works, there is a lack of consensus on the definition and content of the concept of “human capital”, which can be explained by the complexity and versatility of this phenomenon. For example, the Penguin Dictionary of Economics defines human capital as a person’s skills, abilities and abilities that allow him to receive income. In the future, this definition was extended to include non-material effects: human capital is knowledge, competence and properties embodied in individuals that contribute to the creation of personal, social and economic well-being [3, 9]. How the perception of the term Human capital changed in a historical retrospective is clearly demonstrated by this block diagram (Fig. 1).

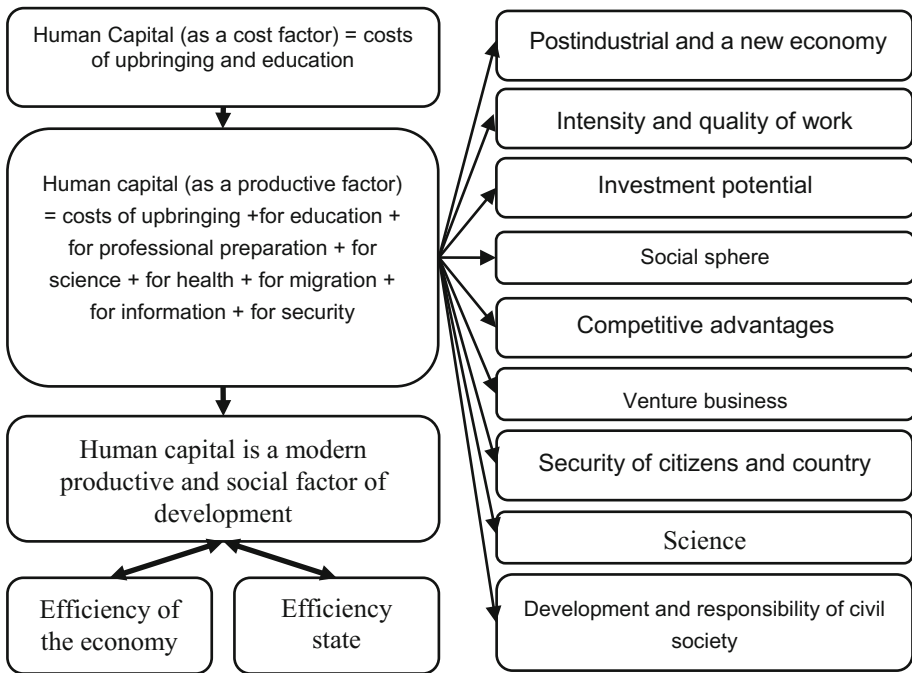


Fig. 1. The concept of Human capital in historical perspective.

3 The Quality of Life

The quality of life is the most capacious concept, which directly determines the formation, development, growth and interregional migration of human capital. Assessing the quality of life in the region allows assessing positive and negative processes, coordinating interdepartmental interaction aimed at improving the conditions that affect it. The rating system allows assessing the interregional differences in the sphere of improving the quality of life. What are their scales? Many of the indicators that characterize the quality of life in different regions of the Russian Federation still differ at times. To determine the quality of life in the regions and assess the existing imbalances in this area, research is carried out every year and ratings on the quality of life are drawn up on the basis of objective indicators. And not the last place in it is the development of the infrastructure of each region.

To assess the quality of life and compile a rating, the source of information is the data obtained from the following sources: Rosstat, the Ministry of Health of Russia, the Ministry of Finance of Russia, the Central Bank of the Russian Federation, and other open sources. Data collection is carried out on 72 indicators, which are grouped into 11 groups, which characterize all the main aspects and living conditions in the region, from the level of economic development and income to the level of provision of the population with various types of services and climatic conditions in the region of residence.

Table 1. The increase (decrease) in human capital in the regions of Russia depending on the quality of life.

№	The subject of the Russian Federation, which includes the city	Distance from the capital (km)	The rating score in the rating is 2017 (Min.-1/Max.-100) ^a	January 2016 (people) ^b	January 2017 (people) ^b	Natural dynamics of growth/abbr. (people) ^b	Migration dynamics of growth/abbr. (people) ^b	General dynamics of growth/abbr. (people)
-	Moscow	-	76.92	12 330 126	12 380 664	21 486	29 052	50 538
1	Moscow region	-	70.55	7 318 647	7 423 470	1 082	103 741	104 823
-	Saint Petersburg	714	75.88	5 225 690	5 281 579	11 180	44 709	55 889
2	Leningrad region	730	56.61	1 778 857	1 791 916	-8 600	21 659	13 059
3	Novosibirsk region	3320	49.11	2 762 237	2 779 555	2 034	15 284	17 318
4	Sverdlovsk region	2150	56.80	4 330 006	4 329 341	-991	326	-665
5	Nizhny Novgorod region	506	55.50	3 260 267	3 247 713	-11 420	-1 134	-12 554
6	Republic of Tatarstan	812	65.59	3 868 730	3 885 253	10 643	5 880	16 523
7	Chelyabinsk region	1776	52.19	3 500 716	3 502 323	-1 068	2 675	1 607
8	Omsk region	2703	42.53	1 978 466	1 972 682	158	-5 942	-5 784
9	Samara region	1054	52.81	3 205 975	3 203 679	-4 277	1 981	-2 296
10	Rostov region	1074	52.91	4 236 000	4 231 355	-9 680	5 035	-4 645
11	Rep. Bashkortostan	1300	50.53	4 071 064	4 066 972	3 298	-7 390	-4 092
12	Krasnoyarsk region	4141	46.15	2 866 490	2 875 301	3 983	4 828	8 811
13	Perm region	1442	45.26	2 634 409	2 632 097	889	-3 201	-2 312
14	Voronezh region	514	61.21	2 333 477	2 335 408	-10 615	12 546	1 931
15	Volgograd region	969	40.22	2 545 937	2 535 202	-6 282	-4 453	-10 735
...								
26	Primorsky region	9 129	44.19	1 929 008	1 923 116	-2 683	-3 209	-5 892

(Source: ^a RIA rating, ^b Rosstat).

Groups in which ratings are combined:

- (1) income level of the population,
- (2) population employment and labor market,
- (3) housing conditions of the population,
- (4) security of residence,
- (5) demographic situation,
- (6) ecological and climatic conditions,
- (7) health of population and level of education,
- (8) provision of social infrastructure facilities,
- (9) level of economic development,
- (10) level of development of small business,
- (11) land development and development of transport infrastructure.

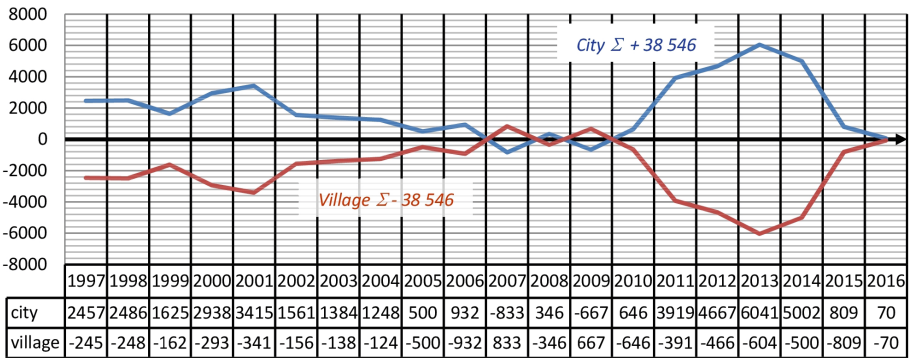
Objectively, this system allows you to monitor the dynamics of processes occurring in the region and affecting the formation and quality of human capital. The following summary table reflects how interrelated and how individual these indicators are (Table 1).

4 Human Capital

To date, there are a number of economic schools that treat the concept of Human Capital in different ways. Our task is to try to formulate the most complete definition of Human Capital, assess its capabilities, prospects for development. So, as Becker said: “Parents then invest more in children when they expect more support from them, manipulating their children’s preferences, but this benefits both children and parents. In the end, we get a positive result from a self-serving parental principle. This shows us that even if the children - altruists are selfish parents; they will still invest the best investment in the human capital of their children, as this will be profitable for them in the future” [10]. This principle works in the relations between the state and the citizen. The uneven development of social infrastructure in the region generates internal migration. People leave villages in search of better conditions and migrate to more comfortable settlements and cities. As an example, consider the diagram of internal migration in the Chelyabinsk region (Fig. 2).

Therefore, we can assess the impact of regional infrastructures on the inflow, development and quality of human capital. This, in turn, will allow us to assess the potential impact of human capital on the economy of the region. Besides, these findings highlight the importance of the demographic transition as a mechanism which underpinned the expansion in human capital witnessed in Western economies during the twentieth century [8].

Human capital - a total system of elements, where each element can be claimed in this or that sphere of the economy. The elements of this system may be either congenital (physiological characteristics, biological, etc.) and acquired through education, experience in practice.



Source: Report of the Minister of Education and Science of the Chelyabinsk Region Kuznetsova A.I. (June 27, 2017)

Fig. 2. Results of intraregional migration of the population over the past 20 years in the Chelyabinsk region.

Factors determining human capital:

- the level of vocational education and qualifications,
- work experience and professional skills,
- the skills of social communication, the ability of independent judgment, leadership, moral qualities, education,
- intellectual and analytical skills,
- physical and physiological abilities and capabilities,
- intuition, including emotional intelligence,
- stability of the psyche and reaction speed, including stress resistance.

In other words, we can say that in economic terms, it is a measure of qualification, educational potential, and other individual characteristics that affect not only its productive capacity, but also on potential income. Characteristics and their combination are very individual, if not unique. However, according to OECD (Organization for Economic Cooperation and Development), Human capital is defined as: skills and knowledge, competences and other personal attributes embodied in individuals or in professional communities acquired over a lifetime and used to produce goods, services or various types of intellectual property under market conditions. You cannot ignore such a thing as economically active age. “Economically active age is quite definite a criterion directly related to the time range of labor, professional, business and creative activity economically active population” [11].

Speaking about the multi-layered concept of human capital, we cannot help but touch upon such a concept as core generation or the core of the generation. “Figuratively speaking, this term can be compared with the heart of a person who radiates energy throughout the body. Namely, between 20 and 24 years of life, each person has the opportunity to choose any of the possible life paths. In the period from 25 to 29 years, there is a search for his path, from 30 to 34 years, a person finds his way, making an informed choice, and from 35 to 39 years intensively moves along the chosen path. For all subjects of the economic and social environment, this is important, because at certain

stages they, when making the most important decisions, determine the direction of the future life. These are years of maximum concentration of energy and motivation, investments in the future, which for most people are embodied mainly in careers, families and children” [11].

For example, the cumulative human capital of an economy, determined by national educational standards, can be regulated by a number of parameters regarding the needs of the labor market. It is possible to forecast such needs right now, and further informatization of the economy will lead to planning on the basis of demand forecasts (or the need for one or another kind of professionals) for this or that level of labor quality. It can be assumed that this will reduce unemployment, adjust the number of places for this or that specialty in higher education institutions and other vocational institutions. It is important to note that human capital occupies the central role among the indicators of strategic effectiveness of enterprise, as it is a source of maximization of enterprise’s profit and provision of its sustainability and minimization of expenses, and compile recommendations for its development by modern enterprises [9].

Very modern can be considered the fact that in the Russian economic environment comes the understanding that a person with his education, qualifications [3], practical skills and experience (in the broadest sense of the word) is an important and at the same time an underestimated economic resource.

5 Levels

That is why great attention is paid to studying and analyzing human capital as a potential resource at all levels of its activity spectrum. This is a macro level, by which we mean individual countries and states.

This meso is a level that interests us and implies municipal and corporate levels.

And, finally, the micro level, which has its object - an individual. Where we consider the link between parents’ influence over the preferences of children, parental investments in children’s human capital, and children’s support of elderly parents. It may pay for parents to spend resources to “manipulate” children’s preferences in order to induce them to support their parents in old age [10].

With this understanding, the meso-economy is an intermediate level between the macro- and micro-economies, on which economic processes are synthesized, within which regions, industries, large economic complexes (clusters, holdings, interregional and interindustry corporations) interact, interbranch and interregional technological chains and networks. Meso-economy is the sphere of the economy in which the institutional, regional, sectoral and infrastructure factors are synthesized, the processes of creating products and providing services as a result of the complex interaction of regions, industries, large economic complexes [12, 14].

Evaluation of this economic category is important task for micro- and macro-levels. As calculating mechanism mostly considers the cost determination of human or labor potential or human capital usually applying the World Bank methodological approaches and make calculations based on customer costs, capitalization of earnings, and cost and earnings ratio of human capital through the evaluation of the educational potential [13].

In this case, it is possible to measure Human Capital, for example, in monetary terms, as a potential future income of the able-bodied population for statistical purposes. However, this method of measurement reflects only a part of the properties of the Human Capital and can serve as a measure of the calculus is limited. It should be noted that measuring the effectiveness of Human Capital in terms of potential income (earnings) is a limited opportunity to assess Human Capital. The income does not always reflect objectively its business and creative potential. OECD considers various ways of measuring human capital using a number of indicators.

6 The Economic Goal

The high level of development and the quality of the available Human Capital are necessary for the active implementation of institutional reforms, modernization of the state, technological upgrading of production and modernization of the economy itself. How to provide it? We characterize the nature of persistence and dynamic complementarities between two components of human capital: health and cognition [14].

Thus, the high level of development and quality of Human Capital in a state with a dynamically developing economy will allow to ensure the access to a stable growth of economic indicators, raising the level and quality of life. Human capital is the main generator of the development of the potential of the regions, and consequently, the stable growth of the economies of developing countries. But what can serve as the basis for the formation of the Human Capital of the required level of quality?

Human capital is the source of the formation of a united cadre corps capable of ensuring the growth of labor productivity and providing integration of all available resources - the formation of a socio-economic system on an innovative basis [16]. The task of preserving and developing human capital is of strategic importance. According to A. Markov's just remark: "... human capital, in virtue of its nature, its economic origin and characteristics of reproduction, is in the sphere of natural interaction of the state, business, individual and society as a whole" [17]. Thus, it is possible to evaluate the concrete world experience of economic growth, such as in China. It is important to say about the investments in human capital in China and its relation to China's participation in the world economy. The Cultural Revolution basically destroyed education in China, especially higher education. Data from the early period of the sixties and seventies show that very few people were trained in school. When China began to play a significant role in the world economy, the government is funding more education [18].

7 Infrastructure

"The social function of the state is realized through the implementation of an appropriate social policy, which is defined as the purposeful activity of public authorities in achieving the basic goals of the development of society at a particular stage" [19].

According to most researchers, the key influence on the quality and growth of Human Capital is the presence or absence of infrastructure, the degree of its development in the regions. Where there is a so-called cradle of Human Capital. According

to the assessment of the majority of economists studying Human Capital, the infrastructure of the regions contributing to the growth and development of the quality of human capital is transport, social, engineering, information, and innovation. Let's consider its contents and the elements displayed on the block diagram (Fig. 3).

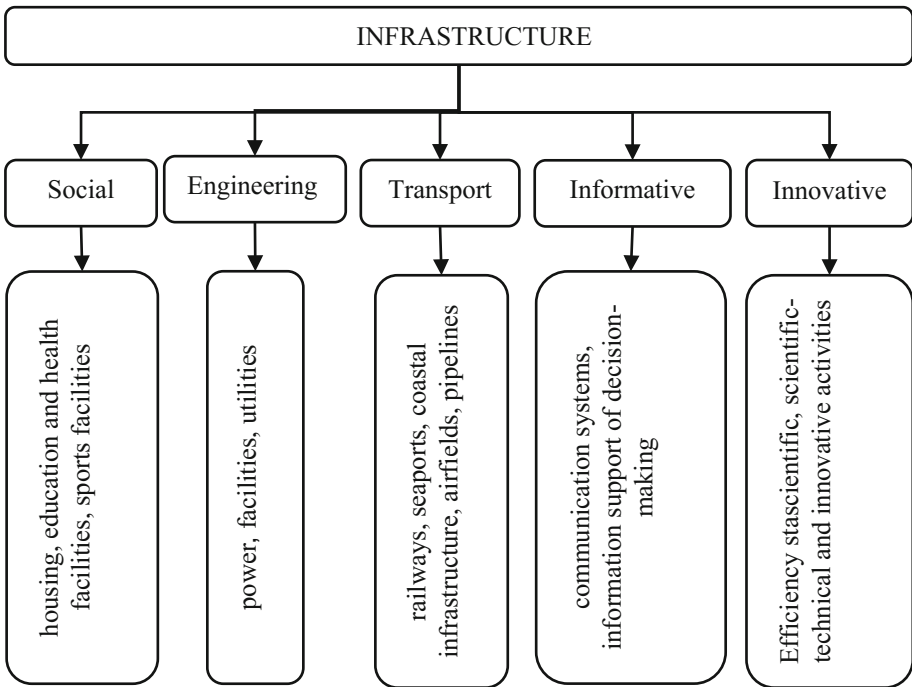


Fig. 3. Infrastructure for quality of life.

Based on the material studied, the experience and opinion of the scientific community can be confidently said that a number of infrastructure systems play a fundamental role in stimulating growth, and, most importantly, the quality of Human Capital. Solving the most important socio-economic tasks of such infrastructure complexes requires systematization. In addition, their elements form an indissoluble socio-economic ecosystem for the production of Human Capital, which has the competences required for the development of the economic meso level. The empirical analysis is based on a newly constructed panel dataset for 15 industrial categories in 92 countries over the period 1970–2010. The results suggest that the extent to which increased tertiary human capital promotes industrial upgrading is contingent on the level of institutional quality, as measured by an index over size of government, legal structure, and access to sound money, freedom to trade and market regulations [17].

To date, the development of regional infrastructure as a kind of unified system is due to the need to withdraw a number of regions from the economic crisis and confront the aggressive economic situation in the international market. It is important to

understand that investing in the development, modernization and innovation of the regional infrastructure will fill the labor market with demanded personnel, reduce unemployment, increase people's incomes and quality of life. The concept of social and economic development of the Russian Federation supported by people over the world - a historical milestone in the country life, answering to objective need of introduction of science achievements and technology in economic component of new democratic society. Overcoming negative manifestations and the consequence of the world economic crisis which has also concerned our state, a course is of restructuring of economy, investment of investments into the human capital, creations of the environment for innovative movement, lifting of education, science and health care, in creation of new democratic national structure inherent in society as a whole are carried out [18].

At this stage of economic and technological development it is absolutely clear that the forms of economic use of Human Capital have changed significantly and have acquired a completely different socioeconomic status. Speaking of this, we mean the innovative Human Capital, which has become an important element in the accumulation of economic and technological innovations. As an example, consider a number of these:

- (1) in modern conditions of functioning of the economic system, the worker's ability to work is not opposed to the material factors of production used. Factors of production now do not appear as opposing sides of functioning capital;
- (2) the integration of labor unites all branches of the public economy, as a result of which a single social and economic complex is formed, based on the integration of material and scientific and educational resources. In such a complex, each individual employee acts as part of a single whole of the economically active population [20]. To date, the existing system of professional labor is formed into a single system of reproduction, which, in turn, is part of the economic system based on scientific, educational and material production [10].

Importance, and most importantly, the timeliness of this socio-economic development concept lies in the formation of a system of personal growth parameters of the individual, which will become a modern concept of the socioeconomic development of the economy. This stage of development of Human Capital is an intermediate goal, while social parameters of the evolution of personal processes - as the ultimate goal of the development of the economy of society [20]. Thus, summing up the above arguments, we can say that the basis for sustainable human development based on the knowledge economy is the principles of the theory of innovation development. In the new social and economic conditions, the human potential of a special kind becomes extremely necessary, since it must not only have a high level of biological and intellectual-educational potential, but also be capable of constantly improving and developing its information-material environment [15].

8 Conclusion

Summing up, it should be noted that the gap between the regional centers, with the exception of the capital regions, is not so great, but there are a number of features that cannot be overlooked.

First, the degree of development of infrastructures, namely, this aspect reflects the ball-rating indicator, is much higher in those subjects that are located closer to the capital region. And it is characteristic that at the same time the outflow of the population in them is approximately equal to the outflow of human capital from distant regions, with the least developed infrastructure. From which one can draw a conclusion: regions with the most developed infrastructure, with a higher quality of life and proximity to the capital, like a magnet draw in themselves a qualitative human capital. They devastate those regions in which the infrastructure is developed, but there are no prospects for further development and highly paid employment. To the same extent, those entities in which the necessary infrastructure is less developed and there is an acute shortage of quality human capital suffers from the losses of the human capital. As they cannot provide themselves with quality human capital. Secondly, climatic features, considerable remoteness, isolation and other specificity of some regions significantly complicate the life and work of a person in these conditions.

It is necessary to eliminate such distortions. In all this, we are interested in the role assigned to the state as a guarantor of stability, law and law, acting on the side of this man himself [21]. For example, we can say “about investing in human capital in China and his attitude to China’s participation in the global economy. The Cultural Revolution basically destroyed education in China, especially higher education. Data from the early period of the sixties and seventies show that very few people were at school in China, especially in high school or university. When China began to participate in the global economy, it all began to change. The Chinese government began to spend a very small part of its income on education at a still lower but much higher share” [22].

In conclusion, it should be noted that the development of high-quality social, transport and engineering infrastructure plays a key role in the formation of high-quality human capital. This includes housing, kindergartens, schools, universities, hospitals, sports and entertainment complexes, cultural facilities, transport, energy facilities, utilities network. All this makes it possible to make a person’s life complete and qualitative. To date, the development of regional infrastructure as a kind of unified system is due to the need to withdraw a number of regions from the economic crisis and confront the aggressive economic situation in the international market. It is important to understand that investing in the development, modernization and innovation of the regional infrastructure will fill the labor market with demanded personnel, reduce unemployment, increase people’s incomes and quality of life.

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Information Opacity and Investment Attractiveness of Enterprises

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Abstract. The purpose of our research is to assess the impact of the quality of financial information on investment attractiveness. The article considers the main factors influencing the objectivity of the financial statements. The risk description is given special attention to the users of the financial statements.

Method: The article considers basic theoretical approaches that emerged in modern science to identify distortion of objectivity of the financial information. We conduct a detailed review of the articles on the research issues, which form the methodological base of the study, both primary and secondary sources of information are considered to ascertain how the distortion of information was detected and what actions should be taken to identify it. The practical significance of the research is that the aspects examined allow us to assess the extent of the problem; to the formulate ways of its elimination and control that can become the basis for the formation of favorable investment climate. The scientific value research is that it can be used by managers, auditors, investors to identify cases of intentional distortion of information in accounting; the study includes a description of typical situations in which a poor reflection of information leads to duplication of data, as well as a description of the main features of window dressing of financial statements and falsification of information used in the Russian practice.

Keywords: Distortion of information · Financial statements · Falsification · Investment climate · Investments · Window dressing of financial statements

1 Introduction

Today financial statements of an enterprise are the main conduit of information of the business, which provides interaction between business entities and society. The asymmetry of financial information recognized by many economists as an important factor influencing the cost of capital of the corporation, the market value of shares, expectations of a dividend, and many other issues; however, they relate to the defining the boundaries of the uncertainty of counterparty's expectations regarding the investment attractiveness of partner.

The transition to a new technological trend requires the development and modernization of the existing corporate sector, which should become the driver of economic growth; this is because of the need to take many investment decisions the basis for which are the results of financial assessments of potential financing. The quality of

the baseline financial information is the most significant problem faced by the investor for the analysis of investment attractiveness, as it is its availability and reliability that determine the boundaries of the informational transparency.

Many specialists investigated the problem of inaccuracy of accounting information; issues of intentional distortion or falsification of accounting information, determining its quality, are considered much less frequently in a specialized context.

2 Data and Methodology

Consider different approaches and analyses the main theoretical postulates; reliability of information is one of the most important requirements for financial statements. In accordance with the Accounting Regulations: accounting statements should provide a reliable and complete representation about an organization's financial position, financial performance and changes in financial situation, in this, reliable and complete accounting statements are considered, which is formed based on the rules established by the normative acts on accounting [1]. In the economic literature, there are many papers, assessing the quality of accounting information; we will analyze the main ones.

One approach is based on assessing the fairness of the financial assessments and expectations which includes several options for the preparation of financial statements. The most global problem is considered by Gračanin and Kalač, who suggest that accounting at fair value has a significant impact on the occurrence, spread and intensification of the financial crisis, as the market reaction in 2008 was due to the reflection of the size of bank financial losses in financial statements [2]. Later this is reflected in the works of the author, considering the variations in the adoption of the rules of information disclosure and oversight rules in various U.S. states and impact on the stability of commercial banks [3]; as well as in papers that analyze the relationship between the content of audit reports and the level of information asymmetry in the stock market [4]; or content of financial statements and exchange rate the value of the shares formed as a result of the investment choice [5]. However, these works state the fact that there are different options for the formation of financial statements, without identifying the reasons and motives of choice, and narrows the subject of research to the banking and stock segments.

Another approach assesses the corporate investment risks associated with the content and interpretation of accounting data, the difference between the concepts of authors is related to the difference of the considered risk subjects. Hegde and Zhou considered investment expectations as the paramount motive of manipulation of enterprises with financial statements [6]. Klein A. explores the issues of comparability of financial statements of different enterprises and impact on associated investment risks in the mergers and acquisitions activity [7]. The study considered the issues of the influence of objectivity of financial statements to reveal the true business results for interested parties [8], creditors [9], and impact of symmetry of financial information on investment attractiveness of enterprises [10]. The separate group of works is aimed at research of problems of formation of fair value [11] and study of comparability of data of intermediate and annual financial statements [12], accounting and economic results of the activity [13].

Therefore, financial statements used as the initial calculation, for these authors; the indicators are compared with the financial figures to identify discrepancies, while the quality of the initial information is not questioned, and the aspect is particularly interesting; since the identification of the causes of information distortion, will not only make the necessary adjustments in the current data, but also to predict the correct result for the future. The work of Al-Htaybat and von Alberti-Alhtaybat can be distinguished separately, which is carried out a study of the phenomenon of big data in corporate reporting and considers double communication flows, allowing to improve future financial statements [14].

The third approach addresses the issues of the imperfection of accounting and reporting while considering both methodological issues of incorrect reflection of financial information and organizational issues concerning its deliberate distortion. The research of the author's collective Fang, Huang, Wang [15] can be considered as the main work in the direction of "technical" imperfection of financial statements; the authors found a correlation between the propensity of firms to the deliberate distortion of the accounting statements and prevalence of unintentional distortion. The development of researches has got the applied character in this direction, it allows to consider all aspects of a problem and to propose actions on a solution; different markets are considered, for example, for the American construction market there is a strong correlation between audited financial statements in periods of growth and subsequent losses on loans in periods of reduction [16], or life cycles individual enterprise [17]. The authors offer various options to overcome the imperfections of accounting reporting by introducing additional methodologies or indicators; for individual investors who rarely use accounting information, because of its complexity or low efficiency in the evaluation of investment risks, offered additional unified document that increases the quality of investment analysis [18]. In part the problem of overcoming the imperfections of financial statements is addressed in the works, considering the possibility of implementation of international accounting standards, which should raise the quality of accounting data. Experience in implementing international standards is considered for individual industries, such as agro-industrial complex [19] or economies [20].

The study Vladu, Amat, Cuzdriorean are a defining work in the direction of deliberate distortion of the financial statements; it is aimed at identifying accounting manipulators [21]. The works considering the possibilities of distortion of financial data by Chinese [22] and Indian companies [23], as well as the possibilities of manipulation in the accounting of activities of private-public partnerships are separately distinguished [24]. In the Russian practice also, it is possible to allocate several works studying the subjects interesting to us; the problems of distortion of accounting information are considered in economic analysis [25], risks are allocated for users by incorrect financial reporting [26], The most frequent ways of fraud with financial reporting are considered [27].

In our opinion a review of the methodology in this direction shows the relevance of the chosen topic of the research; the relationship between forms and motives of distortion of financial information and their influence on formation of symmetrical information environment and as a result of favorable investment climate remains unexplored.

In the framework of the earlier research [28] we analyzed the contradictions arising between the interests of minority and majority owners and proposed recommendations to increase the investment attractiveness of corporations as a result formation of a more comfortable investment environment. We will describe the main revealed ways of information distortion, motives and estimate possible risks for its users using the source data [29]. During the study we will use the information and analytical Information Disclosure System Fira Pro. For the period from 1995 to 2011, more than 3000 companies from different fields of activity were selected, but 900 companies from 9 leading branches of the Russian economy were chosen for the study.

3 Results

Currently, the Russian Federation does not have certain and accurate data on the commission of crimes in the field of accounting reporting, but the world experience confirms that economic crimes, fraud with financial reporting occupies the first place. We introduce the concept of accounting distortion and consider its main types based on research of balance sheet data of enterprises. Accounting distortion is an incorrect reflection and presentation of data in financial statements for violations of the normative base by the personnel of the economic entity. At the same time, different subjects pursue different motives, as well as the possibilities of realization of the intended distortions differ. Some foreign authors pay attention to the issues of fraud by top management, for example, the case of the corporation Live Entertainment Corporation of Canada, in which the low corporate culture and non-existent internal control led to fraud on the part of top management [30] or the proceedings against a company Miller Energy Resources that received the status of public through overstatement of the cost of equipment, it placed shares on the New York Stock Exchange, increasing their value more than nine times [31]. In Russian practice, research on this issue doesn't given due attention, explaining the desire for profits, which is normal for capitalist society. Naturally, the interests of the minority investor are infringed, which is in the asymmetric information atmosphere, it does not contribute to the growth of investment potential, necessary for enterprises, especially in terms of localization financial markets due to sanctions restrictions.

All the distortions we have identified during the analysis can be classified according to certain characteristics. There are significant and insignificant facts on the degree of influence on the reliability of information. Significant facts in the audit are the information on assets, liabilities, income, and indicators of the enterprise, distortions that may affect the adoption of economic decisions based on financial statements. Insignificant facts are factors that do not affect financial results.

Material and monetary distortions can be considered on the object of encroachment. Material distortions are appropriation of material values, such as material deficits, volatility in the purchasing power of money, or a sharp price fluctuation. Monetary distortions exist in monetary relations and occur at a time when there is a social stability or a stable level of prices. Also, the nature of distortions in accounting reporting has a considerable impact. Unintentional distortion is expressed in negligence or incompetence of employee; but deliberate distortions may conflict with and do not

contradict the legislation. For example, tax crimes are the registration of fictitious documents, understatement of the main indicators of the enterprise; tax crimes are manifested in the falsification of balance.

Distortion by way of reflection in accounting is relate to the informational component, since, many of these errors are made to meet the expectations of investors and to attract them. The information in such indicators as revenue, net profit and in the assets of the enterprise is distorted.

Duplication of data is of importance in Russian practice. The most significant reception is capitalization of expenditure as in this situation there is an overestimation of revenues. This situation may arise from the following factors. First, illegal capitalized cost i.e. added to the cost of non-current assets. Secondly, revenue should be recognized for a long period of time, when considering long-term contracts, in this case revenue recognition occurs when the contract ends or use a method of gradual revenue recognition. Determining the percentage of completed work requires the attention of experts since this is the main fact of the method of gradual recognition of revenue, as when the percentage of work done, enterprises increases the revenue of the current period.

In order to reduce of cash balances in the cashier during the reporting period, when the limit is exceeded, there is a separation of articles, the aggregate of which are trying to reduce, producing the fragmentation of articles into parts and attaching them to other articles. In this case, the amount exceeding is attached to another article of the asset, the indicator of which has no effect on the full reflection of the financial state of the enterprise.

The enterprise can connect heterogeneous types of sums in one balance sheet to reduce the amount of arrears in the financial statements, and there is a merger of the balance of the sums of debts of buyers and other persons in one article.

Also schemes in the field of hiding the costs in accounting are widespread. The following actions are performed during this operation: the company represents one part of the costs in their own accounting, and the other part of the expenditure is produced through controlled companies. In this case, the expenses incurred by the enterprise are not reflected in the accounting records. We can conclude when analyzing these cases that the techniques of duplicating are methods by means of which the enterprise, when compiling accounting reports, tries to distort some financial information, to transfer it to other balance articles or hide at the expense of other sources. Thus, there is a duplication of data in which any action aimed at achieving one goal in two copies is carried out. After analyzing the classification of distortions of financial statements and the main methods of duplicating data, we can deduce the main signs of fraud in the preparation of financial statements. The falsification and window dressing of financial statements are distinguished.

Falsification is the most significant problem of accounting, as it is relevant not only for Russian enterprises, but also for firms from developed market economies. Falsification is used to deceive the users of the reporting or to conceal the fact of theft of the property of the enterprise. Window dressing manifests itself in inaccurate information reflected in the accounting methodology, that is not always intentional and occurs because of ignorance of the relevant Accounting Regulations. The most common methods of window dressing of financial statements are as follows:

1. Improper accounting of requirements and obligations, as a result leads to distortion of assets and liabilities;
2. Fragmentation of balance sheet items, the dimensions of which seek to reduce on parts and joining these parts to other line items.
3. Integration heterogeneous amounts in single balance sheet line item.
4. Illegal distribution of the residues under other accounts receivable and accounts payable, and thus, wrong entry of liabilities and assets of the enterprise.
5. Use the credentials of affiliates for window dressing own reporting indicators.
6. Representation of valid obligations as conditional and, on the contrary, depending on the set goals of window dressing of financial statements.
7. Performing calculations through “front companies”, making counter-sales transactions with the counterparty sometimes fictitious.
8. Early recognition of revenue, which is on the border of the reporting periods the company’s revenue and expenditure associated with its receipt, may be taken into account in different reporting periods.
9. The concealment of expenditure in accounting in which revenues are recorded in their own balance sheet but the expenditure or part of them, in the balance sheet of companies controlled by them.
10. The capitalization of expenditure when the costs include the cost of non-current assets, which are associated with the receipt of revenue in the reporting period, this may lead to artificially high profit.
11. Transactions with the condition that revenue from sales of goods are recognised even though the contract contains significant uncertainty in respect of the transfer of ownership and receipt of benefits.
12. The implementation of long-term contracts, for example, on capital construction, in which revenue must be recognised over a long period of time. However, the overestimation of the percentage of work completed allows the company to overstate revenue and profit for the accounting period.

If the distortion of financial statements is beneficial for enterprises to hide its shortcomings, violations, abuse of certain indicators, and there is a personal benefit; risks may arise for users of financial statements. For example, the sharp increase in asset, increase the investment attractiveness of enterprises, but also increases the investment risk of the investor, which for him remain hidden. The risk for lenders is that overstating cash and increasing leverage, the company hides its true solvency, which increases the uncertainty of decision-making and credit risk. All this has a negative impact on the investment climate, causing outflows from the real sector of the Russian economy and complicates the process of production.

It has been said, that in Russia there is no accurate statistical data on fraud in financial reporting and how to detect them, however, ways to identify distortions exist.

First, the external audit is in need of confirmation of the reliability of financial statements as the sole source of information for external users. The purpose of external audit is to establish the accuracy and compliance of financial statements implementation of financial and economic operations according to the Russian legislation.

Secondly, there is the system of internal control; this self-control consists in carrying out the final actions of the accounting service of the organization, which is

engaged in the preparation of reports. The following methods are used to identify errors: inventory or the analysis of the basic financial indicators.

Thirdly, there is the category of certain informants, these individuals are most effective in detecting this kind of fraud.

Fourthly, the following actions should be carried out: strengthening the control functions of accountants at all stages of performance of accounting work; monitoring of accounting personnel through analysis of mistakes that they make; application of the system of disciplinary sanctions. Also, the automation of process should work with the above actions, that is, the program makes calculation on a clear algorithm.

4 Conclusion

Thus, we considered the following highlights in the analysis of problems of distortion of information in the financial statements: the main classification of distortion and signs of fraud, methods of data duplication; we analyzed Russian and foreign statistics, we suggested ways to detect and deal with errors in the financial statements. Therefore, despite the large number of schemes of distortion of information in financial statements, all of them have one goal to overstatement revenue, profit and balance. It is also necessary to pay attention to the changes in the organizational structure, management system, absence of audit committee and internal control service; features of personnel have an important impact. Distortions in the financial statements are identified not only for finding falsifications, but also to improve the legal mechanism. However, for enterprises the benefit fraud in the financial statements is large, and the damage is minimal, because the degree of error detection is small. In connection with the frequent cases in economic shenanigans that today the main task is the improvement of methods for the detection of falsified information in financial statements.

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The Peculiarities of Inter-confessional Relations in Multicultural Space of the Tyumen Region

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Abstract. The modern society is characterized by the world globalization processes. These processes caused the urgent need for the objective study of the issues, concerning the religious relations in order to prevent religious fanaticism and extremism. An effective implementation of the state policy in the field of international, state-inter-confessional and socio - political relations is impossible without taking into account the regional particularities and various age categories. The authors of the article have conducted the research on the territory of the Tyumen region with the purpose of monitoring of the prevailing religious situation in the region and the analysis of state programs in the spheres of national, state-religious and public-political relations and the prevention of extremist manifestations. The complementary activities to the program have become the result of the research; one of the blocks of the activities is focused on the prevention of religious fanaticism and extremism in the youth environment.

Keywords: Globalization processes · Religious relations · Religious fanaticism · Extremism · Multicultural space

1 Introduction

The end of the XXth and the beginning of the XXIth centuries are characterized by a new type of economic, political, social - cultural relations. The global economy and modern social-cultural processes are exposed to the impact of globalization, which is accompanied by the collision of current trends in the economy, political ideologies, cultural ideals and religious beliefs. This fact leads to the situation when the boundaries are not evident, and, as a result, we observe the synthesis of cultures and religions.

The diversity of globalization manifestation creates different levels of relationship that are inherently highly controversial – they can contribute to the unity of economic, social-cultural space and can differentiate it, causing social-economic and cultural contradictions. Sometimes, the integration, that is effected by penetration, and often the confrontation of ideologies is a prerequisite for the serious economic problems emergence, and also serves as a source of political fanaticism, extremism and terrorism.

The process of globalization has an impact on the development of the world community, and on the fate of the individual countries. In the end, all the changes associated with the processes of globalization are projected to the life of each person.

The ambivalent nature of the globalization process involves differently directed trends of integration and differentiation, which can be considered as two directions of civilizational processes: on the one hand, the tendency to unification, and on the other hand, the desire to preserve cultural identity, including religious one. The spiritual sphere, including religious, resists the trend of globalization. The situation among people of different religions, aggravated by the conflicts and manifestations of religious fanaticism, can occur as a result of violations of ethno-cultural and ethno-religious integrity of one nation at the expense of another due to intensive migration processes.

The interaction of different social and cultural values, including religious, can be complicated by the conflict situations because of unacceptance and rejection of other cultural standards of value orientations. Migration flows, both abroad and on the territory of the Russian Federation, create the situation of religious conflicts, provoked by the visitors' reluctance to adapt to the culture, customs and requirements of the country where they have come to. The clash of two ideologies inevitably leads to the manifestation of religious fanaticism and extremism of both sides.

Both politicians and representatives of the scientific community say about the danger of global processes caused by globalization. However, there are different approaches to the interpretation of events nowadays, both in the theory and practice, which, on the one hand, are perceived as a terrorist and extremist actions, and the other hand, are presented as the protection of the interests of the nation from foreign intervention.

The nowadays' situation is extremely ambiguous. On the one hand, in the conditions of religion revival the radicals and extremists "try to find support in religion influence and importance," as the strongest component of culture. On the other hand, state authorities are trying to confront the situation and control the process of "religious Renaissance" [20, p. 345]. The surge of ethnic and religious conflicts in the modern world convinces us that attention to this problem has not only theoretical but also practical significance; it is an important component of prevention of religious fanaticism, extremism and terrorism.

2 Literature Review

The phenomena of religious fanaticism and extremism are the subject of research in the writings of sociologists, political scientists, philosophers and conflictologists, historians, psychologists, jurists, lawyers, psychiatrists that indicates the interdisciplinary nature of the phenomenon. One of the first scientists who declared about religious intolerance and fanaticism were the representatives of the Enlightenment: E. Burke [1], J. B. Bossuet [2], F. Voltaire [21], by D. Diderot [10].

Many sociologists, philosophers, theologians and historians wanted to determine the nature, causes and forms of religious fanaticism as a social-cultural phenomenon. The most fundamental works are: social action theory, theory of social change and typologies of religious groups and religious leadership of M. Weber [22]; Pro-integrationist theory about the identity of religious and social of E. Durkheim [4].

Evolutionism in sociology of religion of G. Simmel [16]; socio-psychological theory of S. Freud [7], E. Fromm [8]; conflictological theories of F. Engels [14] have become a

significant basis. The epigenetic theory of the radical potential growth of P. Conzen [3] and the concept of representative culture by German sociologist F. Tenbruck [19] are undoubtedly of great interest because of the novelty of the ideas of these German scientists. The technologies of psychological manipulation in religious cults have been identified in the works of O. Kernberg [11], G. Le Bon [12], L. Festinger [5], S. Freud [7].

In the discourse of modern science the following scientists have been engaged in the studying of religious fanaticism: Y. Sinelina [17], Zh. T. Toshchenko [20], S. L. Frank [6], G. Hannemann [9], Ya. M. Yakhyaev [23], but taking into consideration the complicated situation in the sphere of religion, connected with the world globalization processes, the modern society continues to have an urgent need for objective study of the issues, related to the population religiosity, to implement effectively the state policy in the sphere of interethnic, state-inter-confessional and social - political relations.

3 Methods and Materials

One of the authors has conducted the case study on the territory of the Tyumen region (without Autonomous districts), concerning the issues, related to the study of the population religiosity condition, attitudes towards such socio-cultural phenomenon as religious fanaticism and the possibility of prophylactic measures on the prevention of manifestations of religious fanaticism [18]. The situation of social interaction in the sphere of religious relations in the Tyumen region is dynamic, as in any other region, but in comparison with the other regions of Russia is quite well, according to the sociologists.

This situation is being formed not only by the members of the public-religious organizations, but also by the entire population of the Tyumen region in general, which because of the experienced historical events is fairly tolerant and prepared both to the ethnic and religious diversity. Therefore, in order to maintain the positive trend and create guidelines to regulate the relationship among religious organizations, it is necessary to study the attitude of the residents of the region to the problems, associated with religion. That's why, the regulation of these issues require the feedback with the population through a variety of sociological types of monitoring.

The aim of the research was the studying of the religious situation in the region, identifying the attitude of the residents of the Tyumen region to the problem of religious fanaticism. The result of the conducted research was the development of the complex of socially-oriented activities to prevent religious fanaticism in the Tyumen region.

Geographically, the given research covered the Tyumen region without Autonomous districts, which is of particular interest, because of the presence of a conglomerate of different nationalities and therefore, religions and faiths. Intensive migration processes have also brought some certain changes in the religious composition of the region under research that allows the researchers to analyze the dynamics of inter-confessional relations at the present stage.

A sociological study was conducted in two stages: a questionnaire survey was conducted among the residents of the Tyumen region (without Autonomous districts); expert interviews (12 people) were conducted among the experts of the Committee for

the Nationalities of the Tyumen region; the researchers; the representatives of religious associations in the Tyumen region. All the experts were the specialists in the sphere of religion and religious relations. The general totality was 1 335 000 people. The amount of the selection totality of the questionnaire survey was 757 respondents and was formed with the representation of the adult population by the place of residence, sex, age, religious affiliation and level of education. A questionnaire method was used for information gathering, where the system of questions was aimed at quantitative and qualitative identification of the research subject and object characteristics.

4 Results and Discussion

The results' analysis of the sociological research has showed that the originality of the modern condition in the religious sphere is the "blurring" of distinctions between the religious people and atheists, and the observance of religious traditions and attendance of religious institutions are often of a formal nature. However, in the crisis moments of life, the help of the coreligionists and the visit to the temple are of great importance for the region's residents, and faith in God, in their opinion, can help in difficult situations. As far as the percentage ratio of the polar opinion indicators are quite smooth, there is no reason to talk about the high religiosity of the Tyumen region population.

The results of the sociological survey have showed that there is a relatively stable religious situation in the Tyumen region at the moment that is proved by a fairly high level of religious tolerance of the respondents. However, some of them said about the potential possibility to break the social norms for the sake of their religious beliefs. The analysis of empirical studies has illustrated that some of the respondents expressed doubts in compliance with the law concerning Freedom of Conscience (Religion). The majority of respondents associates the emergence of non-traditional religious organizations with the activities of foreign religious organizations, as well as confirms the fact of personal contact with religious fanatics.

Identifying religious fanaticism as a phenomenon of a negative nature, some respondents believe that it may have positive qualities in certain circumstances. Not all the respondents put in a single chain the concepts such as religious fanaticism, extremism and terrorism, however, the majority affirms that they are interrelated. A wide range of views was expressed by the respondents in the process of discussion, concerning the introduction of an article of a law about the responsibility for the psychological manipulation of human consciousness to the criminal legislation. The respondents have pointed out that this action requires serious preparation and in the case of incorrect definitions can lead to disastrous consequences.

The results of the survey have revealed a number of negative factors that have the greatest impact on the activization of religious fanatics. Among these factors are the following: "Aggravation of interethnic relations in a certain region"; "Aggravation of social tensions, generated by the crisis in various spheres of human relations (economics, politics, spirituality, ideology, morality)"; "the unresolved problems of employment" [18, p. 131]. The most effective measures were noted, based on the study of the opinions of the Tyumen region inhabitants on the possibility of the religious fanaticism prevention: amendments to the Russian legislation, concerning the

requirements toughening for the registration of religious organizations and explanatory works in schools. The empirical study has revealed that the phenomenon of religiosity and religious fanaticism, which is in close relationship with the inner world of the person, but at the same time it is socially significant - requires sensitivity from the politicians, sociologists, and public organizations.

However, it is important to note that the experts in their responses to the questions of the expert survey consider the introduction of the subject “Religious studies” in the course of school education to be untimely and unprepared. This fact was stressed by the experts unanimously; however, alternatively they offer a gradual system of implementation of the “lessons of tolerance” and the basics of world religions in the course of education.

In order to carry out preventive work against religious fanaticism outbreaks in the country, the experts emphasize the necessity for close cooperation of the law enforcement agencies, social institutions, social organizations and science. According to the experts’ point of view, the most effective measures can be: explanatory discussions and lectures in educational institutions, the work with the population in the media. The experts have found out that currently the main educational work should be addressed to the young generation and middle-aged people by using the Internet, which is the most popular for these age categories. The impact of social networks such as “Vkontakte”, “Odnoklassniki”, “Facebook” cannot be overemphasized at this stage. Timely and accurate monitoring of the various forums is necessary to prevent religious conflicts and foster religious tolerance, we also should not forget about new forms of social activism of the young people.

Therefore, a set of problems, related to the interconfessional relations and possible worsening of the religious situation in the region can be solved only through an integrated approach to the problem. So, according to the order of the Government of the Tyumen region dated 30.09.2013 the long-term target program “The main directions of activities to implement the state policy in the spheres of national, state-confessional and public-political relations and prevention of extremism” for 2014–2016 was in action, which was aimed at regulation of issues in the field of interconfessional relations in the Tyumen region and identified social technologies priority for the prevention of religious extremism and terrorism.

The above-mentioned long-term target program was a set of complex of organizational, managerial, financial, promotional, scientific-methodical, artistic and creative activities. The program was tailored to the specificities of the national, religious and political characteristics of the region.

A positive result of this Program should have become the trend for the improvement of society, strengthening of the tolerance principles in relations among people of different nationalities, religions, political preferences.

The expected outcomes of implementation were formulated in the content of the program, including: ensuring of the ethnic and religious accord, political stability in the region, expressed in the absence of the protests on religious and ethnic basis, publicly expressed in the radical forms of excesses and conflicts: further strengthening of tolerant relations among people of different beliefs.

In addition to that, it is important to notice, based on the results of the empirical research – questionnaire survey of the respondents and the expert survey of the

specialists in the sphere of inter-confessional relations, that the program, identifying the main trends in the implementation of the state policy on stabilization of the public-political relations and prevention of religious extremism is of general nature and does not consider the diversity within the social groups.

Thus, for example, the program did not include the activities, targeted at various youth subcultures. Also, the technical and organizational influence capabilities of this age category were not taken into account. The ability of the students, as a cohort, having a great influential potential on society were not taken into consideration.

The program didn't practically reflect the measures to prevent the destructive activities of international extremist organizations; this problem was only mentioned; there were no measures for the citizens' rehabilitation, affected by such activities.

The commonality of the preventive measures didn't not take into account social and cultural diversity within religions, occurring as a result of the intensive migration processes.

The internal factors that could contribute to the destabilization of the religious situation in the region, such as the insufficient educational level of the clergy, and often formal and incompetent approach to their activities; the use of religious beliefs of people for political purposes; attempts to give a religious character to the conflicts of the other content were not taken into consideration.

An important thing was the use of the scientific community potential, which was not adequately reflected in the complex of activities of this program.

Thus, the analysis of this program, instead of the expected positive results, have identified some of its shortcomings. We have proposed a set of socially-oriented activities, as a supplement to the better program realization, including the following activities:

1. Strict control of the state, law enforcement agencies in the regulation of migration processes.

Spontaneous uncontrolled migration processes lead to the creation of a conflict situation. Ignoring of the legal system, the lack of legal employment opportunities and social vulnerability lead to the growth of crime, issuing from the migrants, and to the discontent of the host party. The quota determination of the quantitative composition of the visitors and strict control over the migration population can contribute to the solution of this problem.

2. Regular media coverage, public involvement in the implementation of the Program through the media, a broad discussion in social nets are important areas in the dissemination of toleration and tolerance questions.

Joint discussions between the representatives of Orthodoxy and Islam, with the participation of the representatives of religious minorities, the forums, organized by the scientific community and social-religious organizations, contribute to the spread of positive frame of mind and updating of practices of mutual inter-confessional dialogue. The opportunity to express their opinion and make proposals on issues of inter-confessional interaction helps to identify problem areas of the religious situation in the region.

3. The establishment of the Association for the protection of the family and person from the uncontrolled missionary activities of new religious organizations.

Accurate organization, formed ideology, active participation of many foreign and Russian new religious organizations of destructive nature, both for society and for the individual, often lead to moral and material damage and can be a threat to the physical and mental health of people.

The European experience shows that one of the most effective methods of dealing with such cults is the creation of various associations, which are actively involved in explanatory work; monitoring of the activities of dangerous sects and new religious organizations that often mask their destructive activities under different names. The development of such associations with the involvement of law enforcement organizations, the scientific community, psychologists and experts in the field of religion can lead to the positive results and help those, suffered from the activities of such cults. The establishment of public rehabilitation centers in the Tyumen region will become a serious mechanism to attract attention to the problem in other regions.

4. The involvement of the scientific community to the development and practical introduction of the state grants' system, supporting the studies and projects, aimed at optimization of the system of religious fanaticism and extremist activities prevention.

Organization and holding of the scientific-practical conferences, devoted to the issues of religious fanaticism and extremism, the publication and wide dissemination of the scientific and scientific-methodical works on the design and operation of the system of religious fanaticism and extremism prevention in the subjects of the Russian Federation can contribute to the formation of a scientific community of the researchers, involved in the study of this problem, which should become an integral component in the implementation of the Program.

5 Conclusion

Content-analysis of the religious extremism and terrorism regional programs prevention has revealed their focus on youth. The success of the Program is possible only under condition of orientation on youth, which is the most dynamic and vulnerable layer of population. It is necessary to take into account and use effective and motivating methods to have a positive influence on inter-confessional interaction in this age group. Therefore, it is advisable, in order to prevent religious fanaticism, to carry out a range of social events for this age group:

1. Course development of "Religious and ethnic tolerance", using modern technical means. Gradual, scientifically based, and at the same time available for understanding explanatory work can lead to the positive trends and become an additional method of the attention attraction to the problem.

There is an urgent necessity in filling the gaps in the field of religion and culture in our educational system. The course of "Religious and ethnic tolerance" may serve as a

relevant alternative. However, it is worth considering that the testing of this course must be carried out in educational institutions of Secondary vocational and Higher education.

2. Contests organizing of social advertising videos on TV and social networks, concerning the topic of positive inter-confessional cooperation and the development of tolerance among young people.

This initiative can promote the creation of a favorable and stable religious situation in the information environment. The opportunity to demonstrate the skills in the use of modern technical means, to create own projects and financial interest can serve as a serious motivational factor for the development of such activities.

3. Strategy development for the organization of the youth's leisure at the level of inter-confessional interaction.

Many Higher education institutions of Tyumen, including Industrial University of Tyumen, have a positive experience of the organization of the young people leisure with different religious, ethnic and racial affiliation. Currently, an insufficient attention is given to the organization of the events that are not only of entertaining ones, but also educational in nature. Acquaintance with religious traditions, historical past of various confessions in the form of creative discourse in conjunction with the usual forms of youth's activities can be one of the new forms of communication among young people. Popularization of such forms of communication can become a positive trend to relieve tension in the field of inter-confessional cooperation.

4. Activities, aimed at the reorientation of youth subcultures of a destructive nature.

These activities can be organized by the specialists of the Department of sport and youth policy of the Tyumen region. Their priority task will be the creation of the field for the implementation of aggressive, extreme manifestations of the young people, keeping them in the framework of the current legislation and social norms. Most successfully, this strategy can be implemented through the development of extreme sports that contain elements of risk – climbing, speedway, snowboarding, parkour, etc. Thus, it is possible to adjust the activity of the youth community in a new positive direction.

5. The role enhancing of the student associations in the University life, the degree of their influence on the processes in the student's environment and the organization of the optional courses in the educational institutions for the study of legislation in the sphere of counteraction to extremism.

The stands of the anti-extremist orientation in the buildings of educational institutions and student's hostels, with the involvement of the law enforcement to this work; monitoring and coverage of the current religious situation, informing and study of the opinions among students can lead to the positive trends.

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Influence Strategic Competitive Advantage International Business Cooperation in the Frame of Financial Crisis

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Abstract. This article reveals the cooperation process between foreign private companies and the local government in organizing the development of the industry connected to MICE and its influence on enterprise financial security under the globalization in the frame of Financial Crisis. Business development, in accordance with the principles of sustainable development, is a challenge in this century. Sustainable development is one of the most common axioms used in the field of tourism. Although international tourism literature determines that the business world widely accepts the concept of sustainable development and corporate social responsibility (CSR), a study that links the social and financial results is limited. Practical recommendations for the tourism business activity development can be applied in the regional, national, and international business travel market. Sustainable development of businesses is one of the common and rapidly growing topics in the field of sustainable tourism. The issue of business sustainability and how this concept is being translated into daily practice has been dealt with for quite a long time.

Keywords: Internationalization · MICE · Meetings industry ·
Business tourism · Incentives · Conventions · Exhibitions ·
Tourism business activity

1 Introduction

Sustainable development of businesses is one of the common and rapidly growing topics in the field of sustainable tourism. The issue of business sustainability and how this concept is being translated into daily practice has been dealt with for quite a long time. Understood as a system's capacity for self-preservation and renewal, business sustainability has been intensely debated for more than three decades, when researchers and practitioners began to be fully aware that the exploitation of natural resources would surpass in scope the possibilities of their being reproduced. As the gap between the consumption of natural resources, so needed to ensure mankind's living, and the pace of their renewal will widen, this will impact on both the environment and the amount of resources and raw materials available to future generations. The Brundtland Report

published by World Commission on Environment and Development stated that public and private organizations should assume greater responsibility for their activity in general and, in particular, for their actions, strategies, and tactics which affect the environment or society. The Commission Report was the first to officially approach sustainable development which was defined as “the development that meets the needs of the present without compromising the ability of future generations to meet their own needs”).

According to researchers, sustainable development of a business means finding those market opportunities that allow the company to generate a competitive advantage by the harmonious and synergic blend and integration of economic, social, and environment dimensions. The sustainability of the economic dimension refers to the whole range of activities pertaining to a business’ sales, profits, cash flow, or number of jobs created. The environment dimension refers to the air or water quality, the (cost-) effective use of energy, and the recycling or reuse of waste produced by production processes. The social aspects pertain mainly to the rights of employees, the impact of supplied products and services on the local community, the safety of production processes, good practices in the workplace, labor protection, etc.). The concept of sustainable development is still subject to a constant revision while researchers are more and more concerned with the need to address it.

The global tourism market is exposed to internationalization processes and as a result is forced to apply modern strategies, offering consumers innovative ways of tourism. Issues connected to the business communication, a requirement in the continuous interaction of business participants, form a new way of thinking in the tourism industry evolution: “Business Tourism Development”. This article reveals the concept of international Business Tourism.

The main factor in the contemporary world tourism market is the growing process of internationalization between the actors in the tourism business sector.

The main goal of this study is to justify the strategic orientations and effective operation of institutional arrangements of the Meetings-, Incentives-, Conventions- and Exhibitions (MICE) industry, due to the global transformational changes to enhance the internationalization of the actors in the tourism business activity.

The methodology used in this research was to do a systematic analysis of national and regional components of the tourist services market, in the course of which systematically contributing factors, as well as negative influences on the economic actors of the tourism business activity have been identified and described.

2 Meetings-, Incentives-, Conventions- and Exhibitions- (MICE) Industry – the Scope of the Notion and Key Elements

Business Tourism creates a relationship link between culture and business. International business programs in the framework of MICE-events influence the development of the historical and cultural tourism, which in turn increases the attractiveness of the tourist areas of a particular region. The concept of MICE or MI (Meetings Industry) was introduced in 2006 in accordance with a decision carried out by the International

Congress & Convention Association (ICCA), the Meeting Professionals International (MPI), the Reeds Travel Exhibitions and the World Tourism Organization (UNWTO) in an attempt to standardize concepts and create a stronger image of the sector (Swarbrooke and Horner 2001; Weber and Chon 2002; Davidson and Cope 2003; UNWTO 2006; Rogers 2008).

By the authors Marques and Santos (2016) the Destination Management Organizations (DMO), and more specifically the Conventions & Visitors Bureaus (CVB), play a key role in the supply structure associated with the territory and in the management, planning and development of tourism destinations, especially those which want to assert themselves as a successful Business Tourism destination.

The MICE industry - a service industry combining trade, transportation, finance, and travel - has been active mainly in Europe and America. It has long been recognized as a sector that draws lucrative direct and indirect revenue for host destinations. As a consequence of all these major characteristics, the number of destinations connecting to this young and dynamic industry is extremely increasing. With the massive development boom that is currently underway throughout Asia, come challenges as well as opportunities. New convention and exhibition facilities, hotels, casinos, integrated resorts and themed entertainment precincts are being developed throughout the region. This development of new products, combined with the world's increasing focus on economic engagement in Asia, means that the entire region will enjoy strong growth in its conventions and meetings market.

The aim of this research is to explore and analyze the MICE industry development in the globalised world and identify its impact on the internationalization process as a main trend of the multinational economy system in the beginning of the XXI century.

Governments of developed and developing countries have awoken to the fact that hosting these kinds of meetings is a vital form of global engagement – both economic and intellectual. They are adding MICE development to their economic policy statements because they see MICE as the key to their economic development strategies.

The main trends of the world economy – internationalization and globalization – are rapidly flowing over all services sectors. That is why in this article we aim to analyze the definition of internationalization, its impacts on the MICE segment in the business travel industry.

In the contemporary conditions of the world economy, it shows that internationalization trend of service market in the business travel industry will continue to grow and deepen.

3 Business Tourism Destination as a Result of Internationalization Processes

Internationalization of enterprises has attracted the attention of the scientific community in the twentieth century.

Issues connected to business communications, continuous interaction between the participants of business and the increasing role of business contacts both at the national as well as on global level, formed a new tendency in the tourism industry. In this case, special importance is given to the study of the formation of and developments in the

business travel market, the evolution of its origin; to define the leaders of the world market, the main actors and the stakeholders' influence. One of the key, but quite poorly studied issues related to this segment, is the impact of business travel on the socio-economic development of individual regions and groups of regions around the world. At the same time, the institutional and theoretical basis for the integration of the Russian regions' development of the Business Tourism market is new and it demands reveal. The need for identifying regional segments of the domestic MICE-industry as a factor of business internationalization activity has led to the relevance of this study.

Vector of the world economy at the present stage was transformed in the direction of expanding and enhancing the impact of internationalization of Business Tourism in the service market. In many countries, there is an increase in production of tourism services and in their share in the GDP, as a result the number of people employed in the services sector is increasing every year, which is supported by the growing number of national and international companies involved in the tourism services sector.

Realizing the urgency of identifying the reasons of increasing income from the service sector in the GDP of developed countries at the present stage of the world economy development, we consider it appropriate to consult authoritative economists who have devoted their studies to the service sector and international trade in the service market in particular.

For example, Christopher Lovelock, a widely recognized expert in the field of services, control theory and service organizations, says: the development of services includes: government policies, social changes, business trends, development of information technology, globalization and the internationalization of service organizations (Lovelock 2010).

The rapid globalization of the world economy has increased the chances for the services market abroad both in developed countries and in emerging economies in recent decades. The effect of this is that services are becoming a driving force as well as the fastest growing sector in the international trade (e.g. Grönroos 1998; Javalgi and White 2002). This fact attracts researchers to follow the changes taking place in the industry.

Despite this growing importance, the internationalization within the services sector remains an elusive and largely invisible business area (Javalgi et al. 2006).

An important contribution to the study of the problems was brought by Western economists such as (Andersson 2000; Nordstrom 1991; Oviatt and McDougall 2005). Their researches focus on the construction of theoretical models and strategies of internationalization of companies. The study questions the transformation of domestic firms in multinational companies/corporations.

The internationalization of the firm is an area of great research interest (Bilkey and Tesar 1977; Cavusgil 1980; Johanson and Vahlne 1977, 1990; Luostarinen 1979). One of the most important models in this field is the so called Uppsala Model, which was developed by Johanson and Vahlne (1977, 1990). The model explains internationalization as a process of increasing experiential knowledge (Eriksson et al. 1997; Penrose 1959). The discussion is focused on development over time, and the main theme is the firms' behavior when it comes to different establishment sequences according to markets and entry modes. Markets are entered with successively greater psychic distance.

Psychic distance is defined as the factors preventing or disturbing the flow of information between companies and markets. Examples of such factors are differences in language, culture, political systems, level of education, level of industrial development, etc. (Johanson and Wiedersheim-Paul 1975). The firm's international behaviour in a single market is a consequence of a successively greater commitment and is described as follows. At the beginning there are no regular export activities, then export takes place via independent representatives, later through sales subsidiaries and finally a manufacturing subsidiary is established (Johanson and Wiedersheim-Paul 1975).

The theoretical part of this study shows the global trend of growth and commitment to leading positions of business and professional services network such as submission service marketing, advertising, management, leasing, research, and information and technologies, consulting, auditing and accounting services.

Its dynamics depends on the content of activities, it is critical from the standpoint of the development of a modern economy based on knowledge, and national competitiveness. Porter (1990) provides illuminating insights into how nations can improve competitive advantage in an age of globalization.

There are four main determinants of national competitive advantage: Factor Conditions; Demand Conditions such as Firm Strategy and Structure and Rivalry; Related and Supported Industries.

However, in order to have positive results, the individual companies, the company leaders and the national governments need to work together.

According to M Porter's Approach to Globalization we formulate an idea of the PPP, that allows to strengthen trust between the government and business representatives on the regional level. PPPs may be seen as a cooperative alliance between the public and private sectors, in different areas of intervention which are traditionally inherent to the public sector, but without embracing a complete privatization process (Linder 1999). The underlying premise of PPPs is to benefit all parties involved, through alignment of their resources and goals. PPPs are becoming more common, because governments realize these agreements may have many tangible and immediate benefits, and the private sector is granted access to new markets and opportunities. According to Kim, Kim and Lee (2005), PPPs are essentially partnerships between public sector organizations and private sector and corporate investors, for the purpose of conception, planning, funding, construction and supply of infrastructural equipment or exploration of services. ECLAC (2007) adds that PPPs are characterized by the sharing of risks, investment, resources, responsibility and rewards.

Some authors, such as Goymen (2000); Marques and Santos (2016) consider that the creation of an organizational structure (CVB) using the common interests of stakeholders can be seen as an example of PPP on the regional level.

Consequently, the existence of a CVB is required to promote cooperation between stakeholders and to pressure local, regional and national authorities in order to develop harmonized policies, appropriate branding, and marketing strategies in the particular territory.

Under the conditions of the principles of management in the tourism industry there is a qualitative restructuring and diversification of business: expanding the scope of tourist services. There is a tendency for the synergy of functional and influence tourism and other businesses. The challenge is to expand and strengthen national tourism

market. In this regard, it is important to develop Business Tourism as a socio-economic factor of innovative development.

4 Research Findings

Cooperation of foreign private companies and the local government connected to Meetings-, Incentives-, Conventions- and Exhibitions is presented in this part as a key factor of the concept of internationalization of this paper. The concept of «Business Tourism», «MICE», and «MICE-technologies» is increasingly common in the travel packages offered by major tour operators and event-companies. Following the recommendation of ICCA, most experts use the term «MI meeting industry» as a general notion, the term «MICE» is also used.

Issues to influence the facts that determine the trends in the global Business Tourism market, are relevant to the modern tourist segment of the world economy, each factor deserves special observation and research. One of these factors of the modern world tourism market is the internationalization of tourism business activity. In Russia, it is particularly important to design and launch specific government programs that would aim at comprehensive and practical development and promotion of the industry. Here, considerable efforts have been made by the government, business, non-governmental organizations and their clear and concrete understanding of the importance of addressing this problem. Promoting the development of Business Tourism, given its place in the economy and the nature of the industry as an important component of the Russian tourism industry, should be the responsibility of the government and the business community.

The MICE industry as a conceptual category of tourist industry is closely linked with tourism and hospitality industry. It is an integral part of the tourism industry, providing a significant positive impact on the investment attractiveness and development of regional areas of the national economy, concerning to the context of international economical relationship.

Marques and Santos (2016) noted, that the areas with lower population density and lower supply of services and facilities have positioned themselves in this segment in order to attract a larger number of visitors and boost tourism, especially at the level of accommodation facilities situated in non-urban areas that have been able to adapt to the demands of this segment and contribute to meetings conducted in quieter places.

Rostov-on-Don city is a one of the leader of the South of Russia in the development of MICE-industry. More than 50% of arrivals are connected with business and MICE-events.

In comparison with other Russian cities, such as Sochi, Kazan, Ekaterinburg, Vladivostok which are the leader in their territories, Rostov-on-Don is one of the fastest developing region, having recognized the potential of this industry to bring economic, social and intellectual benefits. With ever more exhibition grounds (Vertol Expo), accommodation units (Sheraton, Hyatt, Mercure) and entertainment facilities, airport hub being constructed throughout the region, Rostov-on-Don and Rostov Land is strongly positioning itself as a leader in the Russian Federation in the sector of MICE.

This situation is especially developing because of The 2018 FIFA World Cup which held in Russia in 2018. One of the cities is Rostov-on-Don. This event is attracting a big amount of tourists who will bring investments to the region.

One of the world leaders of the MICE industry is no doubt, Asia. With the massive development boom that is currently underway throughout Asia come both challenges and opportunities. New convention and exhibition facilities, hotels, casinos, integrated resorts and themed entertainment precincts are being developed throughout the region. This development of new products, combined with the world's increasing focus on economic engagement in Asia, means that the entire region will enjoy strong growth in its conventions and meetings market.

At the same time, the explosive growth of product means that there is an increased challenge in Asian destinations to ensure that they attract adequate levels of future business to sustain the health of all the hotels and venues that constitute their own facility inventories. To be successful, there can be no doubt that every destination will be seeking increases in tourism while also diversifying their markets so that every possible source of new business is fully developed.

Gunn (1972) was the first person to conceptualize a tourism system. In his simple early model, he noted that attractions drive tourism. A corollary of this conceptualization was that as magnitude of the attraction increased, the number of visitors was likely to increase. This corollary was analogous to the theory of cumulative attraction, which had been formulated in the context of retailing.

According to the survey of Governmental and business authorities of the Russian region, – Rostov Land, which was made by the Regional Chamber of Commerce of Rostov Land and business tourism organizations of Rostov-on-Don, since 2014, the majority of tourists visited the region are business tourists. In the frame of the Governmental program of Tourism Development, the Business Tourism is one of the significant element for Investment Development and Brand creation of the region in Rostov Land.

Thereby, contributing to the growth of the regional economy and prosperity of the region and its individual cities is a consequence of the functioning of the business travel industry.

5 Conclusions

Meanwhile, as a support of the development of corporate communication and cooperation between business structures in the formation of a platform of PPP on regional and national level, the players of the national market of business tourism are joining forces to promote MICE opportunities in Russia.

As we analyzed in this study, the PPP in tourism sphere is a significant instrument of stabilization and economic development in Russian Federation. This research paper described a definition of PPP and described its modern status in Russia and described reasons for the necessity of the development of this sphere of the economy. This article shows general tools and methods of classification of the regions according to the necessity in the governmental investments for the development.

The author of this article described and analyzed the main ways of the development of the PPP in the tourism sphere in Russia. This research paper has given successful example of the creating PPP projecting Russia.

The practical implementation of the research findings and results of this paper is important for the business tourism development on the regional level and CVB implementation as a key tool in the supply structure associated with the territory and in the management, planning, and development of tourism destinations, especially those which want to assert themselves as successful business tourism destination.

The current research clearly reveals that the aspects that support sustainable development may also build tourists' satisfaction with the accommodation units.

Even if only exploratory in nature, our endeavor needs further research and analysis by other authors to reveal even more clearly how sustainable development may contribute not only to draw individuals to a particular destination but also to build their satisfaction and loyalty. The components of sustainable development may actually take the form of marketing stimuli for the informed tourist who wishes to leave the future generation a lasting legacy and become elements generating competitive advantage, which contribute to differentiating products and services and to attracting customers.

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The Concept of Import Substitution in Agricultural Industry: Threats and Opportunities to Improve the Competitiveness of National Certified Agricultural Producers

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Abstract. The article clarifies specific problems of agriculture in Russia, which have a negative impact on the competitiveness of domestic certified agricultural producers. The authors note that introduction of counter-sanctions can stimulate agriculture development and increase its competitiveness and investment attractiveness, since domestic producers obtain certain competitive advantages in the new market conditions. On the other hand, sanctions, as a factor of import substitution, are compulsory by nature. They do not always contribute to the competitiveness of domestic producers in the long run, especially in the global markets. The potential consequences of the forced imports substitution can include declining product quality and increasing prices. Apart from that, the existing problems of import substitution in Russian agriculture may have negative impact on the country's food supply security. According to the authors, import substitution should be considered in relation to existing challenges: improving the quality of goods and living standards of the population, stimulating effective demand, developing marketing and logistics systems. The authors conclude that the existing problems in agriculture are interrelated. An integrated approach is required in order to solve these problems resulting in the increase of the competitiveness of the domestic agricultural producers.

Keywords: Agriculture · Certified agricultural producers ·
Import substitution · Competitiveness · Sanctions · Embargo · Food security

1 Introduction

The concept and practice of import substitution became exceptionally relevant, especially in agriculture, in connection with the sanctions imposed against Russia after 2014. Implementation of rational import substitution plays an important role in the development of the country's economy. The corresponding objectives are interrelated with the general issues of the domestic agricultural enterprises competitiveness and the country's food security.

Import substitution should result in increasing competitiveness of domestic products which can be achieved by stimulating technological modernization of production processes, increasing production efficiency and developing new competitive products with relatively high added value. A reasonable solution to this problem will not only reduce imports, thus preserving a significant amount of funds in foreign currency, but also make the goods cheaper, support domestic producers, and create new jobs.

2 Theoretical Aspects

The contemporary world economy is characterized by the increasing role of globalization, internationalization of production factors, extension of the international division of labor, and the increase in the openness of national economies. The historical development of the international division of labor has resulted in the functional division of countries into exporters and importers in the world market of goods and raw materials. Taking into account the long-term trends of globalization, import substitution becomes one of the tools for protectionism policy implementation, attributed mainly to developing and transition economies [1].

On the other hand, the economies of some countries depend on imports. The countries that had passed the industrialization stage have applied, to a greater or lesser degree, the import substitution policy using various instruments of customs, tariff and non-tariff regulation of foreign economic activity. The policy aims at restricting the access of foreign suppliers to the domestic market and/or forcing foreign companies from the segments they have secured. Import substitution can be carried out with the help of market instruments or through government intervention in the economy. The latter implies that the state imposes administrative barriers to restrict or limit the activities of foreign companies.

Scientific literature does not provide a universally acknowledged definition of the essence of import substitution. The supporters of mercantilism (Men, Montchretien, Pososhkov) as one of the first economic doctrines can be considered the founders of the import substitution theory. They argued that exports are the basis for successful development and wealth of society because it allows the country to accumulate money (gold). Imports at the same time should be reduced, and internal needs should be met through domestic production [2]. Economic science of the twentieth century had both the supporters and opponents of the import substitution strategy [3].

Faltsman identifies three types of import substitution [4]:

- innovative import substitution associated with quality improvement and/or reduction of production costs and product prices;
- forced import substitution often accompanied by decrease of quality, price growth, longer implementation periods for innovative projects;
- proactive import substitution linked to predicted possible downturn in economic relations with other countries in the future.

Innovative import substitution is usually voluntary and can be carried out as a deliberate development strategy of a country or in connection with the growth of the population income level. Forced and proactive import substitution at the same time are

often a least-evil solution associated with a poor condition of the balance of payments or the case of sanctions and counter-sanctions imposed [5].

The concept of import substitution can be considered as an economic process, an economic category and as a state economic policy [6]. Import substitution can firstly be defined as the process of substitution of foreign goods on the national market with similar domestic goods with adequate or higher consumer properties. Secondly, import substitution is a system of economic relations aimed at creating a highly efficient and competitive product similar to a good originating from another country. Finally import substitution is an extraordinary or consistent state policy aimed at optimizing the country's role in the international division of labor and stimulating domestic production through the tools of protectionism policy.

3 Import Substitution in Agriculture

Import substitution is not a novelty for the Russian agriculture. After the collapse of the USSR, the agricultural sector suffered a decline, which allowed foreign producers to occupy the Russian food market. Imports had negative impact on the country's economy as a whole and led to a decrease in the efficiency of Russian certified agricultural producers.

Apart from that, agrarian and land reforms that took place in the 1990s, had destructive impact on agrarian policy. The results of these reforms turned out to be opposite to the initial goals. They led to the collapse of the agro-industrial complex and constant losses of companies operating in the leading industries. The reforms undertaken led to a sharp decrease in total production of agricultural enterprises. It resulted in a paradox: total domestic production of food and raw materials was going down in spite of the stable, guaranteed domestic demand and available opportunities to satisfy it. The volume of food imports, at the same time, was growing and Russia's dependence on food imports increased [7]. After the economic crises of 1988 and 2008, import substitution was associated firstly with the devaluation of the national currency and a general decrease in the income level of the population. By the end of 2008, the annual production volumes for many types of food products almost reached the reference level of 1990, when the best indicators were achieved in the development of the domestic agriculture.

However, the development of agricultural production became unstable after 2008. Production levels for basic food products decreased while imports increased. In this regard, in order to ensure the country's food security, the state authorities adopted the Food Security Doctrine of the Russian Federation in 2010. It sets the objective to keep the level of domestic agricultural raw materials and foodstuffs in the total volume of commodity resources on the domestic market of at least 80 to 95% for basic goods [8].

However, Russia's accession to the WTO in July 2012 and changes in market situation resulted in a sharp increase in imports which forced domestic products out of the national market. Imports of food products and agricultural raw materials to Russia amounted to 43.2 billion dollars in 2013. Imports had a negative impact on the economy of the country as a whole and led to a decrease in the competitiveness of Russian agricultural producers.

The problem of import substitution has become especially urgent in the conditions of the ban on the import of agricultural products to the Russian Federation in accordance with the Presidential Executive Order of August 06, 2014 “On Special Economic Measures to Protect the Russian Federation’s Security”.

The introduction of counter-sanctions in 2014 can become a stimulating factor for the development of agriculture, increasing its investment attractiveness and competitiveness, since in these conditions domestic producers have certain competitive advantages.

There was an increase in the production of some types of import-substitution products in 2016 compared to 2015 (Table 1): chilled pork, poultry, some types of fish and seafood, frozen fruit and vegetable products, fruits and berries. Production of milk and dairy products has also slightly increased. However, production of some positions decreased: beef and frozen pork (preliminary data shows an increase in production of frozen pork in 2017 compared to 2016 by 35%), salted and smoked fish, canned fruits, nuts and potatoes. All in all, the production the main categories of agricultural goods increased in 2015–2016.

The competitiveness of domestic agricultural producers depends on many factors. One of the key factors is the introduction of innovations and new technologies that will reduce production costs and ensure the competitiveness growth [10].

The low level of competitiveness of domestic agricultural producers is largely defined by production equipment wear and tear. Technological modernization is too slow to solve this problem. The fixed assets in agriculture are worn out by more than 50%; the rate of technical equipment availability is only 15%; the speed of machines and tractor equipment retirement is still exceeding the rates of new equipment introduction [11]. Technology used by agriculture in Russia falls behind the world standards. As the result of the lag in technical and technological security of agricultural production, Russia’s agricultural sector demonstrates poor competitiveness both in the domestic and foreign markets.

The low level of technical and technological development of production affects the efficiency of economic activities of agricultural enterprises in a negative way. This, in turn, can become an obstacle to the import substitution implementation.

Apart from that, agricultural production, as well as many other industries in Russia, generally uses basic foreign technologies and equipment. In the face of the sanctions and weakening ruble exchange rate, the industry experiences growing expenditures on the purchase of imported raw materials and production machinery. The threat affects production of incubation eggs for poultry farming, breeding cattle and feed additives for dairy cattle, fry and fertilized salmon roe, potato seeds, sugar beet, and maize [12]. For example, poultry factories Sverdlovskaya, Sredneuralskaya, Reftinskaya and others in the Sverdlovsk region import breeding eggs from Germany, the Netherlands, and the Czech Republic [13].

The growth rates of agricultural raw materials production lag behind the development of the food industry, which constitutes another issue in the market development. The weakness of the raw material base resulted in increasing dependence of the food supply system on the state customs and tariff policy as well as the world market situation [10].

Table 1. Production of main types of import-substituting food products in the Russia (thousand tons) [9].

Product	2012	2013	2014	2015	2016	2016 to 2015, %
Cattle meat, fresh, chilled	178	199	185	203	195	96
Cattle meat, frozen	36	41.6	43.2	51.7	43.2	83
Pork, fresh, cooled, chilled	942	1232	1438	1655	1946	117
Pork, frozen	58.5	67.5	97.1	108	95.7	88
Poultry, meat and offal	3405	3610	3979	4340	4468	102
Sausage products	2533	2502	2475	2445	2436	99
Fish, live, fresh or chilled	1399	1461	1168	1176	1341	114
Fish (except herring), frozen, liver, caviar and frozen fish milt	2337	2434	2347	2502	2606	104
Fish frames, frozen	94.3	108	110	123	141	114
Herring of all kinds	515	496	475	461	469	101
Fish (except herring), salted	42.7	46.1	39.2	33	29.9	90
Fish (except herring), smoked	61.4	63.7	61.2	57.2	52.8	92
Fist, dried, stock	16.2	17.7	16.9	16.1	17.2	106
Balyk products	3.7	4.2	4	3.2	3.3	103
Seafood	97.7	104	120	97.8	122	124
Fruit and vegetables, frozen	40.2	45.3	45.8	55.4	71.7	129
Fruit and vegetable, canned, mln. of cans	7473	7635	7861	7248	6920	95
Dried fruits, berries and nuts	4.1	10.1	12	12.2	11	90
Whole-milk products, million tons of milk	11.3	11.5	11.5	11.7	11.9	101
Liquid processed milk	5267	5386	5349	5449	5540	101
Cream	95.2	103	115	121	125	103
Cottage cheese	396	371	387	416	407	97
Butter	214	225	250	256	251	98
Cheeses and cheese-like products	451	435	499	589	605	102
Condensed milk products, million conditional cans	873	860	833	828	854	103
Fermented milk products, except sour cream and cottage cheese	2430	2521	2520	2445	2487	101
Potatoes	29533	30199	31501	33646	31108	92
Vegetables	14626	14689	15458	16111	16281	101
Fruits and berries	2664	2942	2996	2903	3311	114

Disparity of prices and incomes between different industry sectors is another important issue impeding opportunities for increase of competitiveness in agriculture. The retail price of food is only in a small part defined by agricultural producers. Another problem lies in the supply of products by domestic certified producers of agricultural raw materials. Several factors suppress the development of the industry: immaturity of agricultural markets, the lack of access by local producers of agricultural

products (especially small enterprises) to the shelves of grocery stores, the lack of efficient logistic systems, warehouses, refrigerating chambers for storage of products. As a result, the output of local agricultural producers does not reach the end user (especially in large cities), which leads to a decrease in the efficiency of agricultural producers and deprives the population of the opportunity to purchase local products [14]. Among other negative factors reducing the effectiveness of agricultural production there are the following obstacles: the lack of access to market information, the Internet, roads, etc., lack of systematic and effective management and marketing to find reliable partners, remoteness from centers of business life. It is impossible to increase the competitiveness of agriculture without taking into account the complementary sectors that directly affect the market infrastructure.

The marketing concept of enterprise management should become an important tool aiming to increase the competitiveness of domestic agricultural producers in the current market conditions. However, the main problem is that, on the one hand, there is sufficient theoretical understanding of the general issues of the marketing concept of enterprise management, while, on the other hand, the organizational and methodological grounds for marketing activities of an agricultural enterprise is often inadequate to the level theoretical foundation. Nevertheless, marketing is a tool of competition in all developed countries. It is increasingly often used by agricultural enterprises to protect the business against the unpredictability of the market. Effective marketing and advertising strategy, branding, creating the image of an agricultural producer nowadays become important competitive advantages of the agricultural producer [15]. Producers also increase the competitiveness by keeping the prices at a stable level and providing consumers with a broad selection of products.

Decrease in real incomes of the population can have negative impact on the development of competitiveness of certified agricultural producers. The introduction of reciprocal counter-suctions from Russia resulted in a significant increase in food prices, as well as the saturation of the market with domestic products (Table 2). Reduction of the effective demand has also contributed to the latter. Decrease in real incomes restrains the demand for food, especially for livestock products [16].

The price increase in 2016 compared to 2013 was significant for the main product groups: beef and chicken meat – 29%, fish – 63%, butter – 54%, sunflower oil – 46%, milk – 33%, cheese – 41%, black tea – 80%, rice – 38%, apple – 29%, etc. Thus, almost all major commodities experienced a significant price increase since 2013.

Import substitution should also be considered in terms of the quality of goods produced by domestic companies. For example, after the imposed embargo, imports of cheese-like products to Russia have significantly increased [17]. Cheese-like products cannot be externally distinguished from cheese but manufactured with the use of vegetable fats partly or completely instead of the dairy products [18]. According to experts, palm oil imports increased sharply after the introduction of the food embargo and import substitution policy. Official statistics shows that import of palm oil to Russia grew by 26%. Alongside with that, cheese production increased by 33%. Semin a member of the Russian Academy of Sciences admits that “the volume of milk displaced by the increasing imports of palm oil can now amount to more than 10% of the milk produced in Russia” [19, 20].

Table 2. Average consumer prices for certain types of food products (current price at the end of the year, rubles per kg if not specified otherwise) [9].

Commodity	2012	2013	2014	2015	2016	2016 to 2015, %
Beef (except boneless meat)	248.47	244.55	272.28	314.94	315.02	248.47
Pork (except boneless meat)	220.09	214.18	272.36	271.08	264.32	220.09
Chicken, chilled and frozen	117.26	107.03	136.14	133.73	138.49	117.26
Cooked sausage	288.23	302.94	310.54	344.81	351.27	288.23
Canned beef and pork stew, conditional jar 350 g	75.22	79.33	94.42	117.04	121.37	75.22
Fish, frozen, whole	85.67	90.79	110.65	138.16	147.68	85.67
Fish, salted, marinated, smoked	247.61	252.52	292.21	352.58	382.54	247.61
Canned fish, natural and with oil, conditional jar 350 g	57.76	60.50	70.12	91.94	103.94	57.76
Butter	260.84	308.92	357.54	397.75	477.13	260.84
Sunflower oil	78.51	75.47	78.09	107.62	110.10	78.51
Milk, liquid whole pasteurized, 2.5–3.2% fat, liter	33.88	38.64	43.81	47.61	51.44	33.88
Rennet cheese, hard and soft	272.57	326.89	388.81	418.61	461.71	272.57
Chicken eggs, 10 pcs.	43.34	56.01	58.76	65.02	64.17	43.34
White sugar	31.58	32.32	44.97	52.14	48.78	31.58
Black tea	391.06	422.62	496.40	685.73	759.21	391.06
Wheat flour	25.19	26.83	29.46	32.78	33.27	25.19
Bread and bakery products from wheat flour of the highest grade	50.51	55.11	58.75	64.80	67.61	50.51
Grinded rice	39.80	43.51	53.03	67.87	63.98	39.80
Noodle products from wheat flour of the highest grade	48.87	50.67	55.18	66.01	68.41	48.87
Potatoes	16.07	23.18	26.66	19.91	20.25	16.07
Fresh cabbage	15.65	17.30	25.55	22.68	17.96	15.65
Bulb onions	16.70	21.36	26.47	24.64	21.28	16.70
Apples	62.54	63.26	76.70	87.43	81.92	62.54
Vodka, liter	315.45	406.51	547.02	559.21	583.00	315.45
Ordinary cognac, domestic, liter	920.54	1012.29	1139.95	1261.25	1321.94	920.54
Sparkling wine, domestic, liter	221.88	235.28	253.64	283.72	306.22	221.88
Beer, domestic, liter	69.00	77.18	87.37	98.36	105.68	69.00

Competitiveness of agriculture is positively influenced by the development of various forms of ownership in rural areas. The growing variety of forms of ownership in rural areas solves the problems of unemployment, as well as low labor efficiency. These aspects also prove the dependence of the population on the efficiency of the agricultural sector.

Agricultural production should be provided with labor resources. The issues to be solved in this regard include, on the one hand, low labor efficiency, and on the other hand, the lack of highly qualified personnel.

State support of agricultural producers has always been an important factor in improving the competitiveness of agriculture. State support is more significant for the Russian agriculture in comparison with the competitors from more developed countries, because of its low efficiency. The volume of direct agricultural support per hectare of arable land in Russia is 30–35 euros, while in the European Union the figure is about 500 euros. Agricultural products of domestic producers are noncompetitive in the domestic and foreign markets with the current level of state support [21].

The state should provide constant support and stimulation of agricultural producers. Public procurement should be an important tool for supporting domestic producers. The state monetary policy has also significant influence on the process of import substitution. Weak national currency can create favorable conditions both for import substitution and for attracting foreign investments.

An important condition for improving the competitiveness of agriculture is the availability of sufficient investments. Therefore, the task of increasing the investment attractiveness of agriculture is the top priority. However, the industry remains not very attractive to most investors [22]. The reasons lie in a number of fundamental economic factors, including the following ones:

- long payback periods of investment projects, such as starting production of cattle meat or fish [12];
- long production cycle in agricultural production which results in weak incentives to invest in production.

Import substitution is the main factor in achieving Russia's food independence, and one of the most feasible strategies for ensuring economic growth and the development of the agricultural sector at the current stage [23]. Food security is known as an important part of the national security of any country. It ensures the economic independence of a country [24]. It is considered that a country secures its national food security when consumers are provided with not less than 80% of annual consumption of basic domestic food products that can be produced in the territory of the country, given its natural and climatic conditions, traditional peculiarities, social and demographic structure of the population and in accordance with physiological nutrition standards.

In order to increase the competitiveness of domestic agriculture and ensure the country's food security, special conditions are required to allow national companies produce and market food products of good quality that are competitive in comparison to the imported analogues. In this regard, the state policy of product quality management becomes especially significant. Special veterinary and phytosanitary rules and regulations can be applied as non-tariff barriers and become an important measure to ensure the quality of products and protect domestic producers from foreign competitors.

The policy of import substitution creates “greenhouse” conditions of overprotection for domestic certified agricultural producers. Therefore, import substitution should not result in a decrease of competitiveness. Agriculture development objectives require a

strategic approach, since the possible future cancellation of counter-sanctions can dramatically damage the competitiveness of the industry.

It should be noted that all the existing issues of agriculture development in Russia are interrelated. They can have a negative impact on the competitiveness of the domestic producers. However, the strategic approach can help to achieve synergy and simplify the process of solving the issues and exploiting opportunities of import substitution.

4 Conclusion

Import substitution can be carried out by imposing protectionist measures and/or by increasing competitiveness of domestic companies. We believe that import substitution based on increasing competitiveness is more appropriate. At the same time, the goal of competitiveness improvement should be determined with due regard to the opportunities and competitive advantages of agricultural sectors and enterprises on the basis of analysis and evaluation of external and internal factors. Alongside with that, the state authorities should implement measures to protect the domestic market ensuring the national food supply security. State support can be implemented in the form of public procurement, as well as subsidies for small and middle-scale certified producers, fiscal incentives and special money lending terms. In addition, state support should aim at the development of rural areas, improvement of the social situation in the countryside.

The import substitution policy aiming to create new competitive industries will contribute to structural changes in the country's economy. It is important that import-substituting producers should be ready to export the goods and not focus marketing efforts only on the domestic market [25]. Thus, exploiting opportunities of import substitution should promote the growth of the export potential of agricultural producers and increase the competitiveness of domestic agricultural products and foodstuffs globally.

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From Information City to Smart City: Russian Experience of State Entrepreneurship

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Abstract. The main goal of the Intelligent City and Smart City Programmes is the development of urban management by increasing the efficiency and transparency of urban management; improving the life quality of the Moscow population due to the large-scale use of information and communication technologies in the social sphere, in the sphere of ensuring the integrated security of the city of Moscow and in other spheres of city administration in Moscow, as well as in the citizens' everyday life. The main objective of or paper is to study the current situation of Information City and Smart City Programmes realized by the Moscow government ant the Major and to evaluate the impact of this Programmes on the life of Muscovites today and in the future.

Keywords: Information City · Smart City · Moscow · State enterpreneurhip

1 Introduction

Information technology has become a part of the people's lives throughout the world. Russia, and Moscow in particular, is not an exception. In 2011, by order of the Mayor of Moscow, S.S. Sobyenin, the priority State Programmes for the city of Moscow began to develop, and in August 2011, the Moscow City Government adopted a resolution "On the Approval of the State Programme of the City of Moscow 'Information City for 2012–2018'". In 2012 the share of the information and communication technologies (ICT) in the GRP of the city of Moscow was 3.8%, in 2016 – 5.6%, in 2019, the growth rate of the indicator up to 5.9% is planned. In June 2017, 5 years after the launch of the Programme, Moscow, according to the data of the study "The Future is Coming: Cities Readiness Rating" conducted by the international network of PwC companies took the leading positions in the quality of virtual services for citizens, the level of infrastructure development, open adaptive education and digital economy in the overall rating letting ahead only Singapore, London, Shanghai and New York [21].

2 Methodology

We are analysing data received by the official Internet sites of the Moscow Major, Moscow Government and the Department of Information Technology of Moscow (hereinafter - DIT), who is responsible for the project implementation.

3 State Programme “Intelligent City”: Objectives and Main Directions of Realisation

State Programme objectives:

1. Determination of long-term trends in the development of the information technology and communications industry.
2. Ensuring equitable access to modern information and communication environment.
3. Increasing the efficiency and quality of the provision of public services in the city of Moscow in electronic form.
4. Creating and implementing effective mechanisms and technologies for urban management.
5. Creating favourable conditions for the development of the information technology and communications industry.

The Programme budget in 2012–2019 is:

- 344.1 billion rubles – Moscow budget;
- 2.4 billion rubles – federal budget resources;
- 199.4 billion rubles – extrabudgetary investments (Table 1).

Table 1. Expenses of State programme “Intelligent City”.

Name	Expenses, mln rubles				
	2012	2013	2014	2015	2016
PROGRAMME TOTAL	55,456.9	59,346.7	63,173.9	65,422.5	70,582.7
- from Moscow budget of which by the Departments:	34,460.3	34,223.9	37,992.1	39,322.5	44,482.7
Department of Information Technology	19,706.9	19,843.5	23,567.2	23,227.1	29,809.3
Department of Media and Advertising	10,404.8	10,822.6	11,442.7	12,708.9	13,216.2
Department of Health	1,116.4	893.5	1,135.2	1,169.1	14.0
Other executive authorities (chief budget funds administrators)	3,232.2	2,664.3	1,847.0	2,217.4	1,443.2
- from federal budget	2,246.6	122.8	21.8	0.0	0.0
- from extrabudgetary funding sources	18,750.0	25,000.0	25,160.0	26,100.0	26,100.0
	2017	2018	2019	TOTAL	

(continued)

Table 1. (continued)

Name	Expenses, mln rubles				
	2012	2013	2014	2015	2016
PROGRAMME TOTAL	80,632.4	80,169.1	71,147.3	545,931.5	
- from Moscow budget of which by the Departments:	54,532.4	54,069.1	45,047.3	344,130.3	
Department of Information Technology	41,062.0	42,783.4	33,761.6	23,3761.0	
Department of Media and Advertising	12,037.3	11,279.4	11,279.4	93,191.3	
Department of Health	50.0	0.0	0.0	4,378.2	
Other executive authorities (chief budget funds administrators)	1,383.1	6.3	6.3	12,799.8	
- from federal budget	0.0	0.0	0.0	2,391.2	
- from extrabudgetary funding sources	26,100.0	26,100.0	26,100.0	19,910.0	

Main directions of the Programme implementation:

1. Creation and development of information services;
2. Security;
3. Healthcare;
4. Education;
5. Housing and Utility Infrastructure and Construction;
6. Urban Technologies and Leisure.

Let us consider the indicated directions in more details.

3.1 Information Services

Such services as Active Citizen, open data portal, Our City portal, MOS.RU website and My Documents service function in Moscow today.

The Active Citizen project is Moscow Mayor's project created on the initiative of the Moscow Government. Moscow became the first city in the world to create a state platform built on the basis of blockchain technology [22]. This is a platform for holding public polls, surveys, opinions and/or assessments of the citizens in electronic form within which every week Muscovites are offered to discuss the issues important for the city. Answering them the capital's residents directly affect the decisions taken by the authorities.

To solve the problem of ensuring the project transparency a number of tools that allow the users to monitor the progress of voting and the reliability of the results obtained have been implemented. Each user who participated in the voting can:

- check the correctness of recording and accounting of the voice given to them;
- monitor the overall dynamics of voting results in online mode.

By the number of active users and issues brought to the decision of citizens [23] the project is unique in the world and is honoured by several prestigious awards including Smart Cities Awards-2015.

The open data portal of the Moscow Government (data.mos.ru) was launched on January 29, 2013. As of March 02, 2017, 830 data sets were published on the Portal, which is 16% more than on the London portal (data.london.gov.uk) and 33% more than on the Berlin portal (daten.berlin.de). As of the beginning of 2018, 850 thematic data sets and reference books were published on the portal. The data sets provide information on more than 1,900,000 urban infrastructure facilities, data on education, sports, health, key cultural and leisure facilities.

In 2011, the Moscow City Government on the initiative of the city Mayor introduced a fundamentally new way of communicating with the capital's residents – Our City portal.

Our City project implements the TOGETHER! city solution system – three interactive projects (three stages) on the authorities and residents interaction:

- Stage 1 – priorities selection – residents offer their ideas;
- Stage 2 – decision-making – residents select specific activities;
- Stage 3 – implementation – residents control execution.

At the Davos Economic Forum Our City project was presented in the top twenty as the most successful international project.

My Documents service is implemented through the site of the State Budget Institution of Moscow Multifunctional Centres for Public Services Provision. The site provides an opportunity to use the online services of such departments and organizations as:

- Main Department of the Ministry of Internal Affairs of the Russian Federation for Moscow;
- Federal Service for State Registration, Cadastre, and Cartography (Rosreestr);
- Pension Fund of the Russian Federation;
- Department of Information Technologies of Moscow etc.

In 2016, the integration of the Moscow Mayor official portal, state services portal, Electronic Atlas, the Auto-Code service and over 40 websites of the executive authorities in the single portal of Moscow mos.ru was completed. It has become an effective and convenient tool that allows Muscovites to receive numerous services. The number of personal offices of individual applicants who apply for government services and services in electronic form has increased from 620 thousand in 2012 to 5.8 million in 2016 (according to the plan, in 2019 this number will be 6.6 million). In 2017 the number of unique users increased by 28% compared to 2016 and exceeded 40 million people.

Today there are a number of applications for iOS and Android systems, such as Our City, State Services and Active Citizen.

3.2 Security

The transition to the provision of state and municipal services in electronic form requires the state to provide people and public authorities with a tool for secure online identification.

The Ministry of Telecom and Mass Communications of the Russian Federation within the framework of e-government infrastructure development has created and is developing the Unified System for Identification and Authentication (hereinafter – USIA).

The system provides:

- streamlining and centralization of users registration, identification, authentication and authorization processes;
- reliable identification of users with verification of significant criteria and information protection, confidence levels support;
- use of a single account for access to various information systems of public authorities;
- management of their personal data in the USIA;
- keeping registers of individuals and legal entities, organizations, state authorities officials;
- maintenance and provision of information on the users powers regarding the information systems registered in the USIA.

In 2011–2012, in Moscow, the Mobile Inspector system was created which allowed traffic police officers to register incidents and to write up fines electronically with the help of tablets. In 2016, it was modernized, its functionality and ergonomics were improved, and as a result, in the course of the year, 50% of fines and road accidents were registered electronically. In 2017, due to the Mobile Inspector system 70% of all accidents and fines were registered.

Since 2014, the AUTO-CODE portal functions with the help of which it is possible to view the history of the vehicle, find fines (either paid or unpaid) accrued to either the driver or the car, appeal the decisions of Moscow Administrative Road Inspection and Moscow Parking Space Administrator, make an appointment in the State Traffic Safety Inspectorate.

For automatic and computer-aided control of traffic on the city road network in Moscow under the order of the Government of Moscow and the Ministry of Transport of the Russian Federation, a teleautomatic traffic control START system is being created. The system is already being implemented and used and provides:

- informing the traffic participants by means of the indicator boards and guided road signs;
- automatic traffic lights coordination;
- traffic environment monitoring;
- traffic jams decreasing;
- speed and traffic safety increasing;
- traffic dispatch control of in extreme situations;
- environmental improvement.

The elements of the Moscow intelligent transport system are the Safe Bus and Smart Stop information systems.

This systems provide:

- video surveillance, video and audio recording of events in the passenger compartment and the driver's cabin of the bus and the traffic situation;
- dispatcher or emergency response services call using the alarm button;
- monitoring of the environment in the passenger compartment and passenger traffic;
- informing passengers about the route;
- informing passengers about numbers, route, time of arrival, changes in the timetable and tariffs of passenger transport;
- video surveillance and dispatcher or emergency response services call using the alarm button.

By the middle of 2019 all the stops of the city will become 'smart' (now there are 500 of them).

The city video surveillance system is deployed in Moscow. It includes seven types of services:

1. Access and yard video surveillance.
2. Video surveillance of places of mass congestion of citizens, in educational organizations, of weekend fairs and trade and services facilities, in medical institutions, of the construction sites.

The system is being improved today. On the data.mos.ru portal there is a register of cameras in the open access – today over 100 thousand entrances, about 20 thousand yard territories and more than 2.5 thousand public places are equipped with them. The percentage of coverage of the residential sector by means of video surveillance (entrances) was 59% in 2012, 86.3 – in 2016, according to the results of 2019, it is planned to cover 90% of the residential sector.

A pilot project City Video Surveillance Portal has been launched. The users of the Public Services Portal pgu.mos.ru are provided with access to broadcast images from the cameras of city video surveillance in test mode.

Today special attention is paid to cybersecurity. In 2016, the hacker attacks on government resources were conducted every 30 s, in 2017 – every 20 s (average – 1 million attacks per week). The transition to Smart City implies among other things the protection of electronic services from hacking and other cybercrime. For this purpose, as early as in 2017, a new form of user authorization with additional measures to protect personal data was implemented. 46,000 employees of government agencies and institutions were trained in the basics of information security. Preliminary work was done to ensure a transition from a reactive to a proactive and preventive approach in the field of security.

3.3 Healthcare

For several years the Medical Information and Analytical System (EMIAS) [24] is used in Moscow, the electronic medical cards are actively introduced and used, the possibility of affixing to the clinic online and online arrangement to see a doctor is realized

(also the terminals of the arrangement to see a doctor are used). In 2016, 100% of Moscow residents were insured under compulsory medical insurance with the possibility to register for a doctor's appointment using ICT.

The EMIAS system implies:

- possibility of online arrangement to see a first contact doctor and a second contact doctor (highly specialized doctor) by the referral;
- search for medical institutions by location and type;
- obtaining health insurance and compulsory health insurance policies online;
- filling in the questionnaire for the prophylactic examination or preventive examination;
- possibility of arrangement at all the doctors for obtaining medical certificates for weapons and traffic police.

On May 09, 2017, the EMIAS system was awarded the Global mobileGov Awards. This international competition taking place in Great Britain assesses achievements in the field of mobile public services. Moscow today is the only metropolis in which all polyclinics are united in a single system, unlike New York, London, Barcelona, Sydney. During the meeting on July 12–13, 2017, the experts of the World Health Organization also noted the work of EMIAS. Moscow was the first in Europe in terms of longevity growth rate.

The pilot project conducted in 2017 in which physicians from polyclinics going out to see the patients received tablets with EMIAS mobile application. It was highly appreciated by users and will soon be scaled to the whole city.

Digital Vision pilot project that helps doctors in the early diagnosis of cancer and the risk of stroke is being implemented in Moscow. The project uses large data and artificial intelligence to help doctors – the first results show that the use of this technology improves the accuracy of the diagnosis by 15%.

In 2018-2019, EMIAS will appear in hospitals which will make it possible to unite the outpatient and inpatient unit in the capital's healthcare. The quality of the capital's medicine will shift to a new, higher level – physicians of all medical institutions will be able to access the full medical history of the patient in an electronic medical record.

In 2018, EMIAS will be introduced in Moscow schools.

3.4 Education

In the world's largest megacities, the latest developments are introduced in education system. Education in Moscow took on a new form too. Our capital is not inferior to world leaders in the field of computerization of the educational process, the integrated development of educational infrastructure and management system even surpasses the performance of London, New York and Hong Kong. Modern technological solutions which have already been introduced in the capital's schools have significantly increased the involvement of children in the educational process. The Moscow Electronic School programme (hereinafter - MES) is being implemented in Moscow.

Today, 559 Moscow schools are connected to the MES project (6,158 high-tech classes). By the end of 2018 every school in Moscow will be provided with the necessary equipment and infrastructure for the MES project.

Implementation of this project implies:

- the use of interactive panels with touch screens;
- the use of electronic textbooks and tests;
- the availability of a database of ready interactive lessons scenarios and a library of educational materials. Already, more than 133,000 lessons scenarios have been uploaded to the MES Library, of which over 14,000 are shared;
- the use of an electronic diary and a log which enables students to study from home and not to skip the topics of the classes, the parents – to learn about the progress of the child online, to communicate with the teacher and other parents, to track the child's schooling and catering process, the teachers – to comment on the work of each student, to shorten the time for finding and verifying information and making grades, to inform students and parents about the activities at the school. In 2012 the part of students of Moscow state general education organizations for whom electronic diaries and logs are maintained was 95% and in 2016 – 100%.

The Moskvenok project – the information Passage and Nutrition system – is implemented by the Government of Moscow in Moscow kindergartens, schools, lyceums, colleges since 2012. The project provides a number of convenient and useful services for schoolchildren and parents:

- safe passage to school (today the system is installed in 3,568 buildings of educational institutions in Moscow - more than 90% of school buildings and 70% of the city's kindergartens);
- receipt and payment for food by non-cash payment, keeping the top-list for products harmful to the child, hot meals managing;
- remote adding funds to the current account;
- formation of a scope of trusted persons receiving information about the events in the child's school life.

In the next 5 years, the IT infrastructure of all Moscow schools will be fully updated.

3.5 Housing Maintenance and Utilities and Construction

One of the main results of the DIT work in the sphere of housing maintenance and utilities was the launch of the Unified Dispatch Centre (hereinafter – UDC) through which all applications of residents on housing issues pass today. The appearance of the UDC allowed the city to coordinate the work of all public utilities efficiently. About 700 operators who receive over 900 thousand applications per month work in the UDC today.

The Resources Consumption Accounting Automated System (RCAAS) project which allows to control the consumption of resources in the building and warn about the deviation in indicators is implemented in Moscow.

It is possible to pay bills for housing maintenance and utilities and submit the readings of water and electricity meters online at the MOS.RU site or application.

In Moscow, the Smart House programme is already being implemented today. It is a system that watches what is happening in the apartment and manages the home

devices as a single mechanism. Smart House facilitates the analysis of energy costs and reduces power consumption. There are a number of companies offering rental of the Smart House system equipment in Moscow today; the approximate cost of rent per month is 1,500 rubles. (about 20 euros).

Another promising direction of housing maintenance and utilities sphere informational support is the introduction of smart meters that will automatically send the readings of the resource consumption metering devices to the system. Smart meters will be able to pay attention to too high consumption and report about a potential leak.

The Town-Planning Policy and Construction Complex of Moscow has the Information and Analytical System for Managing Urban Development Activities which includes 84 databases and provides information on budget and investment construction in the city. It provides the maintenance of a single register of construction sites, information support and information interaction of the authorities, information recording, reporting and monitoring of the implementation of Urban Planning Policy and Housing state programmes.

Within the framework of the Information and Analytical System for Managing Urban Development Activities there are such online services as:

- Procedures Calculator.
- All Moscow Construction Sites.
- Five-Story Buildings Demolition.

3.6 Urban Technologies and Leisure

Today, over 80% of Muscovites use smartphones, computers, laptops or tablets. Due to the high competition and active development of networks the mobile Internet costs the Muscovites five times cheaper than New York residents.

Moscow is one of the 10 largest cities in the world with the highest speed of fixed Internet.

The expansion of the city Wi-Fi network was already been carried out in 2017. At the moment, the City Wi-Fi programme operates in Moscow – the access points to free wireless Internet located on the streets of the city within the Garden Ring, metropolitan parks and dormitories of higher education institution, leisure centres. There are now 10,618 network access points, and by 2019, Wi-Fi access points will be installed in all classes of Moscow schools. Today, with the help of the City Wi-Fi network, the Department of Transport is provided with the possibility to rent vehicles, transfer images from 2,000 police registrars to the Single Data Centre and transfer data in the Mobile Inspector project.

There is Wi-Fi in Moscow subway and Moscow urban land transport too.

The Smart Museum platform was created in Russia – an electronic guide that allows the exhibition visitors to receive timely and comprehensive information about the exposition. It was founded in 2012 and has already been implemented in the State Literary Museum, the Furniture Museum and the State Tretyakov Gallery. The Pushkin State Museum of Fine Arts use the Smart City concept - the augmented reality technology such as Artifact AR-application. The State Hermitage Museum uses digital technologies for energy saving, fighting queues, cultural population digitizing. Historic

and Architectural Complex of the Kazan Kremlin uses it for the operation of projection installations, touch screen information kiosks, audio outlets. As the IT infrastructure develops, new opportunities will also open up for inter-museum interaction, from virtual cross-museum expositions to the virtual memory network that unites the museum funds.

4 Results

Compared to 2016, Moscow has improved its position in many international ratings and studies on smart cities. In the global cities forecast (A.T. Kearney) the capital moved from the 35th to the 10th position, in Cities in Motion Index (IESE Business School) – from the 108th to the 89th position, in the Cities Innovation Index (2thinknow) – from the 45th to the 43rd position. City projects are honoured with the international and Russian awards. The free city Wi-Fi network has become the best infrastructure project according to the professional IT-directors community in Russia, Global CIO. The application won the Best m-Government Service Award, and EMIAS, as indicated above, took the third place in the Global mobileGov Awards competition. Moscow Electronic School became a laureate of the Runet Prize in the category Science and Education.

Moscow entered the top 7 Intelligent Communities of 2017 and won the prize of the World e-Governments Organization of Cities and Local Governments, WeGO, but serious changes are yet to come.

In 2018, the Information City programme will be completed and replaced by a new Smart City programme. It will be based on key modern technologies. Among them are artificial intelligence for decision-making automation based on data analysis, blockchain technology for paperless contracts, big data technology for targeted services. In particular, it is expected that the development of the artificial intelligence technologies will ensure the transfer of part of routine operations to machines and the robotization of many processes. For example, technologies such as recognition and synthesis of speech, images and video, machine translation and many others will get widespread use.

Among the basic Smart City principles are:

- involvement of residents in the city management;
- availability of all services around the clock from any device;
- primacy of the electronic document over the paper;
- reliance on domestic solutions;
- development of the city together with business.

The discussion of the Smart City programme runs from April to June, 2018 in public mode – the city invites industry experts, business community representatives, citizens to participate in the development of a new strategy according to which the capital will live until 2030.

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21. The residents of Moscow, London, Barcelona, New York, Sydney, Singapore, Shanghai, Tokyo, Toronto and Hong Kong were the participants in the enquiry. At least 100 respondents were interviewed in each city. Totalling 1,500 people told about their attitude to the use of innovative technologies
22. Blockchain – a continuous series of blocks (linked list) containing information constructed according to certain rules. Most often, copies of the block chains are stored on a variety of different computers independently of each other
23. Currently, over 1,980,000 users are registered in the project, over 2,710 votes are conducted and over 86 millions of opinions are obtained
24. EMIAS.INFO portal is an independent non-governmental Internet resource that provides online services in the field of digital healthcare



On the Identification of Financial Instruments in the Aspect of Indicators of Financialization of the Economic Life of Economic Entities

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Abstract. The study is to show the problem of financialization of the economic entities as a result of development of the financial sector of economy, basing on using of financial instruments (FI) that have a “virtual” form. This includes financial instruments hold for trade and financial derivatives (PFI) that complicate financial relations based on financial speculation and divorced from the real sector of the economy into a parallel plane filled with abstract categories. Under these conditions entities use FI to generate additional income, which adversely affects the development of the real economy, both in general and at the level of the business unit (the entity). Therefore there are suggestions to classify FI and PFI according to their type, value measurement and their cash flow to assess their impact on financialization in the article. This allows to correct the financial items of the Statement of Financial Position by eliminating “non-financial” items related to cash flow and financial income reflected in the statement of Income Statement by excluding items that are not secured by cash flows (similar to the EBITDA analytical indicator). It also gives the opportunity to distinguish items directly influencing the processes of financialization, which include, first of all, FI that are revalued at fair value through profit and loss. Moreover, there are recommendations in the article about modification of the information base for financial analysis of entities and supplementing it with ratios that take into account the evaluation factor of financialization.

Keywords: Financialization · Financial instruments · Derivative financial instruments · Financial income · Fair value

1 Introduction

The role of financial sector of economy is increasing in the conditions of market economy. The introduction of the market economy was characterized of serve of financial sector for others economic sectors, but nowadays the financial sector has become an independent sector of economy. Moreover, the financial share of economy is often exceeds other sectors of the economy of practically in all developed countries of the world. The activation of the development of the financial sector of the economy and the growth of financial services is evidenced by the contribution of financial intermediaries to the formation of the world economy, which has increased by 1.2–2 times over the past decade. This is also confirmed by a significant share of national

income, redistributed through all parts of the financial system, varies from 35 to 50 percent in different countries [1]. This trend is caused by the fact that investments in manufacture, opening of new branch offices, investment in labor efficiency is becoming less profitable for entrepreneurship than participation in the developed financial market with its variety of financial instruments that allows to receive income not only from core business, but also from operations with financial instruments (FI) and derivative financial instruments [2, 3]. However, the growth of the financial sector conduce country economic growth up to a point, and then the positive impact of it is declining [4]. The real sector is narrowing and risk-generating assets of companies grow on their balance sheets, that have a negative impact on economic stability of a company.

Some authors call the process of financial sector predominance over other sectors a financialization [5, 6], and others a capitalization process [7]. Regardless of the name of this process, the essence is the same - the predominance of the financial sector leads to an outflow of funds from the real capital to the so-called unreal or fictitious capital. The essence of the independent life of financial capital, as fictitious capital, was analyzed by K. Marx, who, based on the nature of the loan and formation of the joint stock capital, predicted the divarication of the financial and real sector. He said that fictitious capital lives just as a symbol of possible profit, and acquires value only as a result of some parameters that are almost not related to the process of creating value [8]. This emphasizes the main distinctive feature of fictitious capital, which, in itself, does not generate income, but only contributes to its redistribution [9]. This create the possibilities for fictitious capital to being stand-alone business unit.

The financialisation processes at the macrolevel are widely discussed, but the financialization process of non-financial firms are rarely raised [10, 11]. That is confirmed by the study of scientific sources, where issues related to the processes of financialization at the macrolevel are rather widely represented [12, 13], whereas the problem of financialization of enterprises of the real sector of the economy (microlevel financialization) and methods of assessing of its financialization are not explores. However, in point of fact, the processes of financialization intrinsic to enterprises and can be interpreted as growing processes of transactions with financial instruments that are held for trade and derivatives for the purpose of getting income not from their core business.

2 Problem

The problem of the financialization of the economy is significant, first of all, for countries with developed market economies. The growth of the financial sector in such countries is due not only to soft monetary policy, but also to a higher level of financial capability of the public. Working people, for instance, increasingly have their (pension) savings invested in mutual funds and stock markets, while their mortgages and other debts are turned into securities and sold to global financial investors [14, 15].

The question then become whether the financialization problem is relevant for Russian firms? According to the statistical information of the The Moscow Interbank Currency Exchange (MICEX), futures business are increased by 23% each year on the average, and options transactions by 25% [16]. Thus, there is a positive trend in

derivatives business on domestic level. This suggest that the processes of financialization of the economy are relevant for our country, though the Russian financial market is young compared to NASDAQ or LME.

The present article investigates the problem of absence of methods to analyze the financialization processes of nonfinancial corporation (NFC) based on financial statement. That is to say according to the information provided in financial statement of NFC, it is difficult to determine the extent to which the primary activity that is stated in their company charter is implemented. Furthermore, according to the russian reporting it is not accurate and clear enough to see the source of income: either - as operating income received from the core activity and aimed for the development of its production, or as financial income received from financial transactions, including speculative operations in the stock market of securities, and aimed not at developing its core business, but at increasing fictitious capital.

In order to rectify the problem of monitoring the processes of financialization at the micro level (at entity), there is a need to modify forms of accounting with regard to disclose of FI and derivatives. The reason of that is reports are an information base for assessing the entitie's financialization and for making ratios of financialization based on it.

3 Discussing

On the ground of researching theoretical and practical sources financial instruments and derivatives were identified as the key factors of finansialization at the micro level. What is more financial instruments and derivatives are subject of financialization and they both are financial reporting's items. The impact of financial instruments and derivatives on business life of entities is ambiguous. Entities receive supplementary income that are not related to the core activity due to the implementation of transaction with financial instruments and derivatives. It is important to note that primarily derivatives business were served to reduce the risks of transaction in financial instruments, but as of today's date almost all of derivatives are bought for speculative purposes [17]. The analyze of the national accounting statements, in particular, the Income statement, showed that there is no information about financial instruments and derivatives that are affecting on the processes of financialization, especially about the speculative ones, in the reporting and it is impossible to determine the share of financial income and expenses received from the use of these instruments. The reason for this is the lack of the classification of all elements of financial instruments in the accounting reports. There is a lack of detailed information about financial instruments and derivatives in the framework of assets and liabilities in the balance sheet and lack of detailed information about non-operating income and expenses coming from transaction with financial instruments and derivatives in Income statement.

According to IFRS 32 Financial instruments: presentation a financial instrument is a contract that gives rise to a financial asset of one entity and a financial liability or equity instrument of another entity [18]. This definition identifies the basic elements of financial instruments: financial assets, financial liabilities and equity instrument. However, the researching is shown that the factors affecting financialization are

elements of financial assets and financial liabilities, but the elements of the equity instrument haven't impact on processes of financialisation in the aspect of speculative operations related to the formation of non-operative income.

To modify the form of accounting reporting and determine the items for the assessment of the processes of financialization at the micro level, we classified the financial instruments and derivatives using some criterions of classification: by type, by derivativeness, by measurement category and by the impact on financialization.

The classification financial instruments by types has been shown that the main main factors influencing the financialization are financial assets, because they are involved in the financial income generation in a greater degree. The analysis of the structure of financial assets (FA) showed that they include: financial investments in stocks (in shares), financial investments in debt securities (bonds, financial bill, loans granted, certificates of deposit) and trade receivables, including debt on received commercial bills. Almost all financial investments in both equity and debt securities have an impact on the processes of financialization, because all of them reflect transactions related to the funds diversion with the purpose to buy financial instruments. Moreover the impact of financial instruments on processes of financialisation are ambiguous and depends on other classification criterions, which will mention below. As far as trade receivables, it does not have a direct impact on the processes of financialization of the entity, because it is related to the core business of the company. However, receivable may include derivative transactions that are factors of financialization. That's why they should be calculated separate of other receivables in the balance sheet, although receivables are presented as a comprehensive item that includes a significant proportion of nonfinancial assets.

The analysis of the structure of financial liabilities (FL) showed that they include financial liabilities (on loans received, on issued bonded loans, on issued financial bills) and trade payables. The processes of financialization are influenced by debentures and issued bonded loans if these loans were gotten not for the core activity of the company, but for the acquisition of financial instruments (speculative securities and derivatives). But in most cases financial liabilities on issued financial bills are more related to the core activity. However, their purpose should be controlled in the aspect of assessment of financialization. As far as trade accounts payable, it does not influent on process of financialization of entity, because it influents at operating income coming from the core business of the company.

The next type of financial instruments is the derivative financial instruments, which are regarding to IAS 32 and fully meet their definition and are regulated by the same standard as financial instruments [18]. However, under the derivativeness criterion of classification they refer to secondary derivatives in relation to primary financial instruments, which include: shares, bonds, receivables and payables and other tangible and intangible instruments. The derivatives include: options, futures, forward contracts, swaps, etc. We believed, all derivatives have to be divided by two groups for the purposes of identifying the factors finansialization. The first one is derivatives acquired for hedging purposes and the second one is derivatives that are purchased for speculative purposes. In our opinion, the derivatives purchased for hedging should be excluded from the factors influencing the finansialization, because they are used as tools to reduce the risks associated with the implementation of the core activity of the

company. On the other hand derivatives purchased for speculative purpose are direct factors of financialization, as they are used to obtain additional financial income, not related to the core activity of the company. The derivatives purchased for hedging influence on financialization if they are not related to the core activity of the entity.

An important classification criterion of financial instruments in terms of their impact on the processes of financialization is their measurement category. Following to IFRS 39: recognition and measurement all financial instruments must be determined by their subsequent measurement: either at fair value, which is divided into fair value through profit and loss (FVTPL) and fair value through other comprehensive income (FVTOCI); or at amortized cost [19]. Financial instruments that are designed as instruments at fair value through profit and loss have a direct impact on the processes of financialization. This category include speculative financial instruments that take away funds from operating income to nonoperating income. These are short-term financial investments in shares and bonds held for trading which are listed on financial market. Financial liabilities for short-term bond are valued at the same cost. Financial liabilities in this case are recognized as liabilities with the purpose of repurchasing in the near future, or those transactions that were made with a view to obtaining short-term profit [19]. These indicators can be considered as first-order factors that affect the financialization, and separately showed in the balance sheet.

Almost all derivative financial instruments are valued at fair value through profit or loss. The reason of that is due to one of the strategic characteristics of their use, such as speculation purpose that means all derivatives transaction are conducted with only for the purpose of arbitrage or yield curve trading. And in this case, the participant in the futures transactions with the derivatives is in a better position than the investor as a participant of the primary market. This is because in order to take a position on the terminal market, he only needs to deposit over spot or a margin, what allows him to make a deal for a much larger amount than the investor has [20]. However, the intention to obtain potentially high profits leads to high risks, because in case of adverse market conditions, the participant in a future transaction may be wiped out. Remarkably the risky nature of derivatives business is significantly increased. The prime target of derivatives was need to manage risks which associated with turn of market for basic assets [21], but today their derivativeness depends not so much on the prices of the underlying assets, but how many of the functioning mechanisms of the derivatives market.

This emphasizes the virtuality of the derivative financial instruments based on the expectation of income receivable in this securities market, to ensure its high predictive capability, as well as its increased vulnerability to negative signals [22]. And this may lead to the need to post derivatives in reporting as complex mathematical models of risk assessment in the near future [23]. This can negatively affects the quality and the transparency of items of financial statements based on accounting data; bring about the development of conditions for uncontrolled financial income generation that affects the processes of financializing the economic life of entities. Financial instruments of this group, that are valued at fair value through profit and loss, can be attributed to first-order factors of the impact on financialization and separately showed in the balance sheet.

Financial instruments that are measured at fair value through other comprehensive income include investments in equity securities for investment purpose and investments in bonds held for sale. These investments do not have a direct impact on the processes of financialization, because they are not for trading, however, the investment of funds in their acquisition also distracts funds from the amount of business for a long time.

The other category of measurement of financial instruments is amortized cost. Financial investments in bonds held to maturity, financial instruments for loans received and provided, financial investments in finance bills, trade receivables and payables are valued at amortized cost. All instruments, with the exception of trade receivables and payables, have an indirect impact on the processes of financialization on micro level because of non-operating using of funds by entities of the real sector and can be classified as second-order factors of the impact on financialization and showed in notes to the balance sheet.

The classifications are proposed above could be the foundation for disclosure of information about financial instruments and derivatives in the notes to the balance sheet. Using this disclosure based on classifications above it is getting possible to calculate a number of ratios of financialization: the financialization ratio of assets holdings, the speculative ratio of financial assets, the financialization ratio of capital, the speculative ratio of financial assets and financial liabilities and the updated absolute liquidity ratio and the updated current liquidity ratio in terms of financialization (Table 1).

Table 1. The ratios of financialization of business life of entities based on Balance sheet.

Ratio	Formula	Meaning
Financialization ratio of assets holdings	Financial assets 1st and 2nd level \div Balance sheet total	Shows the share of financial assets in the balance sheet total
Speculative ratio of financial assets	Financial assets 1st level $\div \sum$ Financial assets	Shows the share of assets for speculative purpose in total financial assets
Financialization ratio of capital	Financial liabilities 1st and 2nd level \div Balance sheet total	Shows the share of financial liabilities in the balance sheet total
Speculative ratio of financial assets and financial liabilities	Financial assets 1st level $\div \sum$ Financial liabilities	Shows the share of liabilities for speculative purpose in total financial liabilities
Updated absolute liquidity ratio	Financial assets 1st level $\div \sum$ Short-term liabilities	Indicates the ability to pay off short-term liabilities due to financial assets held for trade
Updated current liquidity ratio	Financial assets 1st and 2nd level $\div \sum$ Short-term liabilities	Indicates the ability to pay off short-term liabilities due to financial assets for speculative purpose

To identify the factors that influence the processes of financialization at the level of economic entities, we need to determine the place of financial income and expenses in the Income statement or Profit and Loss Statement (P&L statement). Non operating revenues and expenses are set in the P&L statement after the item Operating income. In the other words, among the items that form the income obtained from the non-core activity. This part of the P&L statement can be divided into two parts: dividends and interest receivable and payable and other income and expenses. The first part completely meet to financial incomes and expenses, and the second is represented by a complex item that contains financial results not only from transactions in financial instruments, but also results from transaction in other operations. Moreover, the item reflects incomes and expenses not confirmed by actual cash flows.

To identify non operating income and expenses that affect the processes of financialization, we group them depending on the type of financial instrument and their connection to the cash flow. Depending on the type of financial instrument, non operating income includes: income from shareholdings; interest receivable (received on financial investments in debt instruments: in bonds, in financial and commercial bills, in certificates of deposit, in loans granted to other companies). These non operating incomes are formed due to the investment of funds for purchasing these financial instruments. That is caused of increasing financial sector but not the real sector of the economy, and if the share of non operating incomes is greater than operating incomes it influence on the processes of financialization. The exception is income on commercial bills that coming from trade receivables (as an element of financial instruments), providing for payment by installments. It is directly related to the implementation of the core activity of the company, because they are served to maintain the primary activity of the company and coincides with the classification of cash flows [24].

To monitor and manage non operating income and their influence on the processes of financialization, it is necessary to create the items by types in correlation with the relevant financial instruments and by purpose of using (for the purposes of core or non-core activities of the company) in notes to financial statements. That is why IFRS allow financial income to be presented separately as a separate item in the profit or loss statement, if the enterprise considers it appropriate to understand its financial result [25].

Depending on the same criterion (type of financial instrument), non operating expenses include: interest payable (on loans received, on issued bonded loans, on issued financial and commercial promissory bills). The IFRS is required to show non operating expenses as a separate item in the income statement. This must be done in order, first of all, to organize control and management of them, as well as to assess their influence on the processes of financialization. However, they have less influence on financialization in the aspect of debentures than financial investments. The reason of it is the cash outflow affects the financial sector only in terms of cash flow as part of interest payments as a type of financial expenses. An exception may be short-term bonded loans issued for the purpose of repurchasing in the near future or for the purpose of obtaining short-term profits [19], since in this case the speculative purpose is pursued.

Regarding interest paid on the remaining financial liabilities listed above, they are almost all related to the implementation of the core activity and reflected as expenses of

the reporting periods to which they relate. The expenses consist the interest on all types of debt liabilities, except those that are included in the value of the investment asset [26].

For the control purposes it is also appropriate to post financial expenses taken in conjunction with the relevant financial instruments, depending on purpose of their use (core or non core business) in separate section of P&L statement or in notes to financial statements. All the mentioned above non operating incomes and expenses need to be designed to the second level of their influence due to lack of direct influence on the processes of financialization.

Non operating incomes and expenses of the first-order factor of financialization are reflected in the complex item Unusual Income/Expense of the P&L statement. These include income and expenses received from the sale of financial assets (debt and equity instruments) and transactions with derivative financial instruments that held for trade. Following the IFRS such income and expenses are results of transactions in financial instruments that are measured at fair value [25]. The purpose of such an assessment is to implement the fair value gains. In other words, there is the speculative purpose is pursued, but not investment purpose in this case. This item of income should be placed under the control in terms of purpose of using and may be identified as the main factor affecting financialization.

In P&L statement this item also includes the income and expenses as a result of creating the fair value reserve because of changing fair value and revaluation of the financial instruments (for example, provision for securities or provision for doubtful debts, etc.). In contrast to the above described incomes and expenses that conjunct to real cash flows, other income and expenses associated with revaluation and creation of reserves do not entail a real cash flow. For this reason they should be excluded from the factors influencing financialization, and also not to consider (or exclude) for the purposes of forming the total amount of unusual income and expenses and profit before tax. This can be explained by the fact that such incomes and expenses, although they are aimed at a real valuation of the balance sheet items, however, in P&L statement they are consider as items without financial essence or non-monetary items. So it is useful to show them in notes to financial statements as correcting items for the purpose of calculate real profit (loss) before taxation. In this case, it is possible to equate this with indicators of amortization and revaluation that are part of the cost production and which are excluded from the calculation of cash flow from the core business of the enterprise when calculating the indicator EBITDA [27].

EBITDA is calculated on the basis of the income statement, to calculate Gross Profit the item of Cost of goods sold is adjusted downwards by the amount of amortization and estimated reserves (formed using the production costs) and compare with Revenue. This is explained by the fact that reflection of amortization and estimated reserves as part of expenses does not correspond to the cash flow from the company to external structures [28] or it does not entail the subsequent emergence of external cash outflow from the organization. EBITDA is used to make a decision on whether to retain the main business, or enter it, or market representation [29]. This indicator can also be used for the purpose of adjusting unusual incomes and expenses and how it is mentioned above it is useful to show them as correcting items for calculating the indicators of financialization.

Based on the proposed corrections and notes to the Income statement it is possible to calculate the degree of financialization of profit and the financial return on sales for the purposes of assessing the company's financialization. These ratios allow analyzing the effective strength of the use of financial assets and the quality of profit. In other words, whether the company receives a larger share of the income from the core activity or from the financial one (Table 2).

Table 2. The ratios of financialization of business life of entities based on Income statement.

Ratio	Formula	Meaning
Degree of financialization of profit	$\text{Financial profit} \div \text{Income before tax}$	Shows the quality of profit
Financial return on sales	$\text{Financial profit} \div \text{Revenue}$	Shows the effective strength of the use of financial assets

4 Results

The using of the proposed financial ratios above is demonstrated by analyzing reporting statements of several Russian companies which have various financial instruments. These companies publish consolidated statements according to IFRS what allows us to calculate the above-mentioned ratios of financialization. Since, as was mentioned above, the Russian financial statements do not disclose those items that are necessary for calculation the above-proposed ratios.

There are three companies of the real sector of the economy were selected for the analyzing of the financialization. This is the agro-industrial multicorporate enterprise "Rusagro", JSC "Siberian Coal Energy Company" (SUEK) and energy company JSC "Gazprom".

According to the data in Table 3, the degree of financialization of assets holdings and capital of Rusagro is about 5%. These indicators indicate that the company is engaged in its core business and receives revenue from the core business. However, 5% of profit comes from income from transactions in financial instruments that is proved by indicator of the degree of financialization of profit, which was about 5% in 2017.

Table 4 presents the results of calculating the financialization ratios of energy company Gazprom, based on the company's reporting statement. JSC Gazprom specializes in the extraction, processing, transportation and sale of gas and oil, as well as heat and electricity.

The data of Table 4 show that the speculative ratios of both financial assets and financial liabilities have decreased. The overall financialization ratio of assets holdings remained unchanged and is slightly more than 6% in 2017. However, the financialization ratio of capital increased and amounted to 18%. This suggests that almost one-fifth of all liabilities of the company are liabilities associated with financialization financial instruments. In comparison with Rusagro Gazprom is using financial instruments more actively, but in spite of this, the degree of financialization of profit of Gazprom is lower than that ratio of Rusagro. The possible reason for the decline in the

Table 3. The ratios of finansialization of multicorporate enterprise “Rusagro” for 2016–2017yy.

Ratio	2016	2017	Movement
Financialization ratio of assets holdings	0,049	0,047	–0,002
Speculative ratio of financial assets	0,85	0,96	+0,11
Financialization ratio of capital	0,04	0,05	+0,01
Speculative ratio of financial assets and financial liabilities	1	0,9	–0,1
Updated absolute liquidity ratio	0,11	0,13	+0,02
Updated current liquidity ratio	0,13	0,13	–
Degree of financialization of profit	0,046	0,048	+0,002
Financial return on sales	0,003	0,024	+0,021

Table 4. The ratios of finansialization of JSC “Gazprom” for 2016–2017yy.

Ratio	2016	2017	Movement
Financialization ratio of assets holdings	0,066	0,066	–
Speculative ratio of financial assets	0,088	0,059	–0,029
Financialization ratio of capital	0,175	0,184	+0,009
Speculative ratio of financial assets and financial liabilities	0,038	0,020	–0,018
Updated absolute liquidity ratio	0,053	0,029	–0,024
Updated current liquidity ratio	0,586	0,468	–0,118
Degree of financialization of profit	0,049	0,019	–0,030
Financial return on sales	0,007	0,003	–0,004

degree of financialization of profit ratio against the backdrop of the growth of financialization ratio of capital may be the growth of financial profit is insignificant compare to the profit from the core business.

Table 5 shows the ratios of financialization, calculated on the basis of financial reporting of the JSC “SUEK”. The core business of the company is coal mining. This company is one of the leaders of the global coal industry.

Table 5. The ratios of finansialization of JSC “SUEK” for 2016–2017yy.

Ratio	2016	2017	Movement
Financialization ratio of assets holdings	0,04	0,04	–
Speculative ratio of financial assets	0,07	0,04	–0,03
Financialization ratio of capital	0,45	0,48	+0,03
Speculative ratio of financial assets and financial liabilities	0,32	0,31	–0,01
Updated absolute liquidity ratio	0,03	0,02	–0,01
Updated current liquidity ratio	0,34	0,45	+0,11
Degree of financialization of profit	0,52	0,13	–0,39
Financial return on sales	0,05	0,02	–0,03

The data of Table 5 show the financialization ratio of assets holdings of SUEK remained unchanged and amounted to 4% in 2017. The financialization ratio of capital increased and amounted 48% in 2017. This ratio is significantly higher than that ratio of previous companies. The ratio shows that almost $\frac{1}{2}$ of all liabilities of the enterprise affect the financialization. This fact confirms the degree of financialization of profit, which was 52% in 2016 and decreased to 13% due to revaluation of loans and derivatives in 2017.

Thus, the results of the analysis of the ratios of financialization of three companies operating in the real sector of the economy, but specialized in different activity showed that regardless of the type of activity, the economic life of enterprises in the real sector of the economy is more or less influenced by financialization. Thus, the degree of the financialization of assets holdings for all analyzed enterprises is within 5%. According to Russian Accounting Standard (RAS) 9/99 and RAS 10/99, the indicator is considered significant if it is 5% or more of the total amount of income (expenses) for the reporting period [30, 31]. The indicators of the financialization ratio of capital also exceeds or equal to 5% for the analyzed companies. So, if the financialization ratio of Rusagro only reached 5%, then in such companies as Gazprom and SUEK, these ratio were 18 and 48% respectively. Possible causes of such a significant difference in the ratio is the area of specialization of companies and their experience on the market. Companies that extract and transport raw materials have active securities and that why these companies are more likely familiar with the possibility of generating income not from the core activity, but from the transactions with financial instruments. However, as the analysis has shown, even enterprises engaged in agro-industry are beginning to resort to the use of financial instruments and derivatives for the purpose of generating income. So the multicorporate enterprise Rusagro did not have bonds held for trading in 2015, but such bonds appeared on their balance sheet for the amount of 2 549 thousand rubles in 2017. This shows that the processes of financialization are characteristic not only for financial companies, but also for non-financial companies.

5 Conclusion

The phenomenon of financialization is characteristic not only of the macroeconomy, but also of microeconomy or in other words financialization of business units. However, the phenomenon of financialization is paid inadequate attention in the business environment, despite the fact that this process at macro-level leads to a narrowing of the real sector of the economy and, accordingly, influence on nonfinancial corporations. The growth in the financialization of enterprises in the non-financial sector is confirmed by an increase in the share of financial assets and financial liabilities in the total share of all assets and liabilities of the organization [32]. The research confirms the existence of the processes of financialization in economy life of enterprises.

Thus, the unreal in the economy becomes real and dominant [33], and the growth of fictitious capital exceeds the growth of real capital. In order to avoid the growth of financialization processes it is necessary to regulate transactions with financial instruments and derivatives by accounting standards, and also to control the transparency of accounting and reporting in financial statements of transactions with these

instruments carefully. At the moment, there are practically no ratios that are used for assessing the impact of financialization on the business life of a particular enterprise. At the same time, the analysis of the items of their financial statements does not allow to see the processes of predominance of financial items over non-financial ones, and thereby to identify the processes of financialization. The proposed ratios of financialization can be used in an advanced financial analysis of an enterprise in order to assess the degree of its financialization. This information can be useful for internal users as well as for external ones. For example, for management of the company in terms of making decisions or for investors who think to invest money and interested in a reliable analysis of the company's core business. Moreover, the growth of transactions with financial instruments, in particular speculative financial instruments, increases the risk of financial insolvency of the company due to the risky nature of such assets and liabilities, which also affects the investment attractiveness of the company.

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Financial Provision of Innovative Activity in the Russian Economy

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Abstract. Subject of article – development of theoretical provisions and methodical approaches to financial security of innovative activity. The work purpose – is to determine the criteria for priority directions of the state financial support of innovative activity as main measure for improvement of efficiency of use of limited financial resources, based on justification of need of the state assistance to financial security of innovative processes and development of a technique of influence of financing of innovative activity at a size of gross domestic product. The hypothesis of a research is based on objective need of improvement of the directions of the state financial support of innovative processes that assumes modernization of the existing theoretic-methodical approaches to financing of innovations on the basis of differentiation of sources and methods of financing depending on stages of innovative activity for the purpose of modelling of dynamics of gross domestic product on sources of her financing. Methodological bases of the system approach and economic-mathematical modelling are applied: grouping methods, abstractions, comparisons, which enable to determine the links between the volumes of financing and the introduction of innovations into the economy of the country; methods of correlation-regression analysis, which makes it possible to establish a connection between the volumes of financing scientific and technological developments, innovation activities and GDP volumes. The offered approach can be used by government institutions in the context of definition of the priority directions of innovative activity.

Keywords: Innovation · Innovation activity · Financial provision · Modeling of GDP

1 Introduction

The level of development of scientific and technical sphere defines the boundaries between developed and developing countries, creates conditions for sustainable economic growth, and is an important factor in solving social problems [5]. It is the innovative processes that are the driving force that influences the strategic economic development of society. It should be noted that it is very important to recognize science as one of the factors determining the rate of economic growth of a country that does not

manifest itself immediately, since its influence is rather mediated and requires an extended period of time. The country that dominates among others in terms of the weight of the innovative product gets the maximum opportunities to increase the qualitative rates of economic growth [6].

The concept of “innovation” has become very popular, it is used in all areas of activity however the problem of practical implementation of innovative designs remains a problem. Scientists and representatives of public authorities believe that the direction of strategic development of the state is an innovation-type economy characterized by a high level of development of education and science, especially applied science, development of research and development projects that have a favourable economic environment for implementation [22].

Russia has no other realistic path of economic development than innovation.

1.1 Scientific Significance of the Issue and Problem Statement

Conceptual issues of innovative development are devoted to the work of outstanding scientists of the late nineteenth and early twentieth centuries: Tugan-Baranovsky, Kondratiev, Schumpeter [12, 23, 26], who made a serious contribution to the innovation theory. In their works the aspects connected with innovative processes in the world economy, with economic cycles and decisive influence of STP on reproduction processes are covered.

The understanding of innovation as a primary factor of economic development has found its reflection in many studies of foreign authors [17, 19].

Given the world experience, which shows that in developed countries for almost 40 years the stage has continued when the contribution of such a factor as STP to economic growth was the most significant, Russia must solve the problem of rapid innovation renewal of production. It is possible to do this by studying and using the experience of developed countries, taking into account the peculiarities of the national economy and enhancing the state policy of stimulating STP and innovation and investment processes.

World innovation leaders is the number of States that have overwhelming specific gravity of the latest technologies and controlling about 80% of the market of science-intensive products. The leading position is occupied by the USA, Germany, Japan [7], now also China.

The development of the innovative direction was continued by such economists as: Alexandrova, Bazhal, Bezchasny, Grineva, Ivanova, Popovich, Soloviev, Utkin, Fathutdinov, Yakovlev and others [1–4, 8, 9, 15, 18, 21, 22, 24].

These authors reviewed a wide range of problems, however, questions remain regarding the prioritization of public financial support for innovation activities, application of indirect methods of stimulation of attraction of investments into the innovative sphere.

The main reason for the insufficient development of innovative processes is the volume of financial resources allocated to innovation sphere. One of the main tasks is the effective distribution of limited financial resources, the essence of which is the maximum concentration of available funds in important areas of scientific and technological progress. In modern conditions, the state is not able to embrace support for all

areas of the innovation process, therefore, the incentive system for innovation activity should be based on and guided by well-founded priorities of innovative development.

In this regard, the purpose of this work is to determine the criteria for priority areas of state financial support for innovation as the main measure to improve the efficiency of the use of limited financial resources, the rationale for the need for state assistance in financing the innovation processes and the development of a methodology for influencing the financing of innovation activities on gross domestic product.

Approaches to Determining the Priorities of Financing Innovation. In our opinion, the national innovation system formed in Russia should cover a set of the following components: subjects of innovation; management of innovation processes; system of regulatory tools for innovation (legal, organizational, financial, etc.).

Priority directions of innovation should be scientifically, economically and socially justified in order to achieve maximum effect regarding the provision of society's needs for high-tech and competitive products, high-quality services and increasing the state's export potential. The priority areas should be formed on the basis of fundamental predictive and analytical studies and trends in world scientific and technological development, the results of implementing the main directions of the development of science and technology in Russia, comparing them with the real needs of the country's economy, opportunities and the state of its innovative potential.

In this regard, we proposed a system for determining priority areas for financing innovation: on the stages of the innovation process and areas of research and development; on subjects of innovative activity; on the sectoral components of innovative development (priorities by types of economic activity); on regional directions of innovative development.

This approach to organization of financing of individual stages of innovation process is based on its features.

In general, it makes sense to apply a differentiated approach to financing the various stages of the innovation process, depending on the sources and forms of financing. Such an approach will reduce the burden on the state budget, strengthen incentives for production facilities, attract extrabudgetary funds [1].

World experience shows that the ratio between fundamental, applied and scientific and technical developments is 15:25:60 [9]. In 2016 in Russia it was 18:15:68 [14]. Obviously, significant changes are needed in the direction of further development of applied and scientific and technical developments on the basis of the current trend regarding a decrease in the share of applied in the total volume.

It is advisable to provide funding for scientific, technical and innovative activities first in priority sectors that have the highest innovation rating, in order to eventually create conditions for improving the innovation activities of other industries. According to Russian Federal State Statistics Service, scientific research on priority areas for the development of science and technology accounted for only 11% of the total amount of scientific and technical developments, and state funding was provided primarily to primary processing industries, with up to 70% of budget funds invested [13].

Analyzing the level of innovative activity of industries in 2016, it should be noted that the production of new types of products is being actively mastered, automation and mechanization of production are being carried out, new technological processes are

being introduced in the oil refining, chemical and petrochemical, machine building, and metallurgy. In the production and distribution of electricity, gas and water, which are recognized as priority, innovation activity is only 3%. This indicator is not high in the pulp and paper industry, publishing and extracting industries [14].

Forecasting the development of science and technology, which is based on the definition of priorities, requires the development of a methodological basis for the implementation of appropriate forecast calculations. In the world practice there are about 120 different methods to take into account the specifics of scientific and innovative activities. They consist in the fact that not all expected consequences can be quantified and mathematically formalized [25].

According to researchers, the organization of development of forecasts of scientific and technological and innovative development should be carried out taking into account the following principles (approaches) [16]:

- ensuring the systematic and continuous implementation of predictive and analytical work. In Russia, such a document is the “Strategy of Innovative Development of RF 2020” [26];
- study of domestic scientific and technical potential;
- large-scale attraction of highly qualified specialists to the formation of forecasts;
- ensuring the participation of central executive authorities in the process of carrying out research;
- ensuring the coordination of the work of ministries and departments in the development of the program and the practical implementation of the results.

Effective implementation of topical priority areas of scientific and technological development requires increasing the level of their funding by several times. According to specially conducted calculations, which envisage the need to increase the salaries of their performers by 3–4 times and the provision of material and technical resources by 4–5 times, the cost of such developments per each scientific worker will grow from 2.2 thousand dollars a year to 20–25 thousand dollars [1].

Thus, clarifying the priority areas for the development of science, technology and innovation in Russia is a priority task of the scientific and technological level, which allows us to concentrate financial resources in strategic directions of economic development.

Modeling of Gross Domestic Product Dynamics by Sources of Innovation Financing. The study of the relationship between the individual indicators characterizing the development of the market economy is an important task of government, business leaders, managers, economists. This task becomes particularly relevant in the conditions of the innovative model of development of the Russian economy.

In order to study innovation and its financial support, a regression analysis of the relationship between the volume of financing of scientific and technological developments, innovation and GDP in the country was carried out from 2007–2016.

To conduct the study, we assume that volume of GDP is a function of state, own and borrowed funds aimed at the scientific, technical and innovative development of Russia. In General, this function has the form:

$$GDP = f(Statefunds; Ownfunds; Borrowedfunds) \quad (1)$$

The resulting factor (y) is the volume of GDP (billion rubles). Factors are the volume of financing of scientific, technical and innovation activities in the Russian economy. Sources of financing: x_1 – the volume of financing of resources from public sources (billion rubles); x_2 – the volume of own funds (billion rubles); x_3 – the volume of funds raised (billion rubles) Because the studied economic system is dependent on a variety of independent factors for its description selected multivariate analysis (multivariate regression).

As a result, two types of models are formed: linear multivariate regression and nonlinear multifactor regression of Cobb-Douglas type:

$$\begin{aligned} y &= a_0 + a_1x_1 + a_2x_2 + \dots + a_nx_n; \\ y &= a_0x_1^{a_1}x_2^{a_2} \cdot \dots \cdot x_k^{a_k}. \end{aligned} \quad (2)$$

It should be noted that the obtained models are adequate to experimental data. The statistical characteristics of these models are significant according to the Fisher f-criterion, have high values of the coefficients R^2 and R, which makes it possible to formulate economic conclusions.

The study was conducted in three stages:

- on the first - volumes of financing of scientific and technical activity from various sources;
- on the second - volumes of financing of innovative activity from various sources;
- on the third - the general volumes of financing of scientific and technical and innovative activity from various sources.

For the first stage of the study, empirical data (2007–2016) were used: GDP; the amount of funding from public sources; volume of financing from own funds of enterprises; volume of financing at the expense of raised funds. Economic-mathematical models that characterize the dependence of country's GDP on the amount of funding for research and development from various sources of financing are presented in Table 1.

The correlation coefficient $R = 0.99$ indicates a high coupling density between the data calculated from the regression equations and empirically.

Table 1. Economic-mathematical model of the dependence of GDP on the volume and structure of financial resources aimed at financing scientific and technical activities in Russia (2007–2016).

Economic-mathematical model	Determination coefficient R^2 , correlation coefficient R
$y = 1213 \cdot 10^4 + 56.95x_1 + 156.2x_2 + 78.81x_3$	$R^2 = 0.98425, R = 0.9921$
$y = 917.819x_1^{0.2343}x_2^{0.1165}x_3^{0.5437}$	$R^2 = 0.98237, R = 0.99115$

The above models indicate that the volume of GDP is positively affected by financing from all the designated sources.

Economic-mathematical models that characterize the dependence of country's GDP on the amount of financing innovative activity for various sources of financing are presented in Table 2.

Table 2. Economic-mathematical model of the dependence of GDP on the volume and structure of financial resources aimed at financing innovation in Russia (2007–2016).

Economic-mathematical model	Determination coefficient R^2 , correlation coefficient R
$y = 3843 \cdot 10^3 + 11.4x_1 + 83.59x_2 + 15.98x_3$	$R^2 = 0.95708, R = 0.9783$
$y = 382.987x_1^{0.1256}x_2^{0.8702}x_3^{-0.05665}$	$R^2 = 0.95079, R = 0.97508$

The correlation coefficient $R = 0.97$ indicates a high coupling density between the data calculated from the regression equations and empirically.

The above models indicate that the volume of GDP is positively affected by financing innovative activity at the expense of all designated sources of financing.

Economic-mathematical models that characterize the dependence of country's GDP on the total amount of funding for scientific, technical and innovation activities on various sources of financing are presented in Table 3.

Table 3. Economic-mathematical model of the dependence of GDP on the volume and structure of financial resources aimed at financing scientific, technical and innovation activities in Russia (2007–2016).

Economic-mathematical model	Determination coefficient R^2 , correlation coefficient R
$y = 2128 \cdot 10^4 + 102.9x_1 + 28.7x_2 + 17.53x_3$	$R^2 = 0.99159, R = 0.99579$
$y = 355.669x_1^{0.5607}x_2^{0.2503}x_3^{0.1351}$	$R^2 = 0.98912, R = 0.99454$

The correlation coefficient $R = 0.99$ indicates a high coupling density between the data calculated from the regression equations and empirically.

These models show that the volume of GDP is positively affected by funding of scientific, technical and innovation activities at the expense of all sources of financing considered.

Based on the constructed linear multi-factor production functions, we note that an increase in the amount of financial resources invested in scientific, technical and innovative activities has an impact on the growth of the country's GDP. This is confirmed by the fact that in all the models generated, the coefficients of variables representing factors are additional numbers. The increase by one (in our case - 1 billion rubles), one factor x_i with the constancy of others, leads to an increase in the resultant factor by a_i billion rubles (Table 4).

Table 4. Growth in the value of Russia's GDP, depending on changes in the volume of financing of scientific, technical and innovation activities.

View activities	Activities change in funding by source			Change in GDP, billion rubles
Financing of scientific and technical activities	Δx_1	Δx_2	Δx_3	Δy
	1	0	0	56,95
	0	1	0	156,2
	0	0	1	78,81
Financing of innovation activity	x_1	x_2	x_3	Δy
	1	0	0	111,4
	0	1	0	83,59
	0	0	1	15,98
Financing of scientific, technical and innovation activities	x_1	x_2	x_3	Δy
	1	0	0	102,9
	0	1	0	28,7
	0	0	1	17,53

The data presented in the table indicate that the largest increase in GDP is by 156.2 billion rubles. is possible with the increase of own funds of business entities by 1 billion rubles, directed to finance scientific and technical activities. With the financing of innovation, the largest changes in GDP (111.4 billion rubles) are observed with an increase in the amount of public funds allocated for financing innovative activity by 1 billion rubles. In general, as can be seen from the developed economic and mathematical models, the largest impact on the increase in GDP will have the amount of financial resources allocated by the state for the development of the scientific, technical and innovation spheres. This testifies to the exceptional role and significance of the state in the development of these spheres.

The nonlinear multifactor models of the Cobb-Douglas type that are constructed allow us to determine the intensity of the effect of changes in factors on the resulting index. To this end, we define the elasticity index, which characterizes the relative increase in GDP per unit of relative increase in the volume of financing:

$$E = \frac{\partial y}{\partial x_i} \cdot \frac{\bar{x}_i}{\bar{y}} \quad (3)$$

For functions of the Cobb-Douglas type, the exponents are the power coefficients (a_i) for factor variables. The intensity of influence of factors on the resulting indicator is defined as the sum of the elasticity indicators (Table 5).

$$I = \sum_{i=1}^n a_i \quad (4)$$

Table 5. Indicators of the effectiveness of the economic system.

Scope of financing	Elasticity indicator			Intensity indicator
	a_1	a_2	a_3	$I = a_1 + a_2 + a_3$
Scientific and technical activity	0,2343	0,1165	0,5437	0,8945
Innovative activity	0,1256	0,8702	−0,05665	0,93915
Scientific, technical and innovative activities	0,5607	0,2503	0,1351	0,9461

With a one percent increase in the volume of public funds directed at scientific, technical and innovation activities and the consolidation of the average level of funding from other sources, an increase in the volume of GDP by 0.561% is ensured. A similar analysis can be made for all indicators.

Value of the intensity indicator for all models is less than one ($I < 1$).

Thus, the current volumes of financing innovative development in Russia do not affect the intensity of GDP growth in the country. The increase in the amount of financing in k times leads to an increase in the volume of GDP in $k^{0.9461}$ times.

The study confirmed that the available funding for the scientific, technical and innovation spheres did not reach the level at which the impact of science and innovation on GDP growth will be intense.

Analysis of the time series of statistical data makes it possible to see the mathematical model of the economic process represented by the time series, and to predict its future development through the construction of a trend. The trend analysis was carried out by a simple regression procedure. The time series can be represented as follows: $y_t = x_t + \varepsilon_t$, where: x_t is the deterministic nonrandom component (trend) of the corresponding process; ε_t is the stochastic random component of this process. The deterministic component characterizes the existing dynamics of the process as a whole, i.e. a temporary trend in the change in the indicator under study. The stochastic component reflects random oscillations of the corresponding processes. To perform the prediction, it is necessary to create an extrapolation function in the form of regression on the basis of the input empirical data.

The analysis showed that there has been a positive trend of growth in the volume of financial resources for all sources, which is also confirmed by the forecasted data calculated on the basis of the constructed econometric model for 2017–2020 (see Table 6).

The main tendency of the dynamics of the volume of financing is described by the dependence of the type $y = e^{a_0 + a_1 t}$, where t is the time period, in our case the year. The constructed mathematical models have high values of the determination coefficients (the minimum value $R^2 = 0.9453$, and the maximum value 0.9893). This makes it possible to carry out a reliable point forecast of the studied indicators for the future (Table 6).

Based on the foregoing, we can conclude that at present, growth rates of financing innovative development are insufficient to significantly affect the country's economic development indicators.

Table 6. Forecast calculations of the volume of financing of scientific, technical and innovative activities in Russia (2017–2020).

Indicator	Forecast values, billion rubles			
	Year	Point value	Lower limit	Upper limit
Volumes of state funds allocated for scientific, technical and innovation activities, billion rubles	2017	190,0	152,6	199,5
	2018	211,5	185,9	237,0
	2019	254,00	226,1	281,0
	2020	305,1	274,6	335,0
Volumes of own funds directed to scientific, technical and innovation activities, billion rubles	2017	446,7	363,4	529,9
	2018	566,6	475,9	657,0
	2019	718,8	619,7	817,0
	2020	911,8	803,7	1019,9
Volumes of funds attracted for scientific and technical and innovation activities, billion rubles	2017	4400,9	3856,6	4961,4
	2018	5450,1	4849,0	6052,9
	2019	6730,8	6080,6	7395,0
	2020	8320,9	7611,0	9046,0
General financing of scientific, technical and innovative activity, billion rubles	2017	5038,0	4373,0	5691,0
	2018	6228,0	5511,0	6947,
	2019	7704,0	6926,0	8493,0
	2020	9233,0	8689,0	10400,0

2 Conclusion

The article is devoted to theoretical research and further solution of an important scientific and practical problem - justification of the theoretical and methodological foundations of financial support for innovation in Russia. This allowed us to formulate a number of theoretical and scientific-practical conclusions that ensure the solution of the main tasks of the work.

1. To ensure long-term socio-economic growth, use of the latest scientific achievements and structural technological changes, the financial policy of stimulating innovative processes, in particular, the effective functioning of the financial support system for innovation, is of great importance.
2. In order to maximize the effectiveness of the system of financial support for innovation, it is advisable to differentiate the sources and methods of financing, depending on the stages of innovation. The need for such an approach is due to the fact that each stage of the innovation process has its inherent values: the possibility of successful implementation of innovative design; duration of the period, taking into account the period from the beginning of investment of funds to profit; volumes of attraction of necessary financial resources and expediency of introduction of innovations on a commercial basis. All this affects degree the choice of methods of financing.

3. Depending on the purpose of investments and methods of control over the effectiveness of their use, the methods of state financial support for innovation activities are divided into: public funding on a gratuitous basis and public lending (direct methods of financial support of the innovation process); measures to stimulate investments in innovative activities (indirect methods of financial support of the innovation process).
4. Measures to improve the efficiency of the use of limited financial resources are the maximum concentration of available funds in important areas of economic development, which will help to level the dispersion of funds, focus on key positions of innovation progress and achieve concrete, significant results within a relatively short period of time. In this regard, a system has been proposed for determining priority areas for financing innovation.
5. For the reasoned definition and clarification of the priorities of state financial support for innovation activities, it should be borne in mind that, in the first place, the forecast and analytical studies needed to find out the most relevant areas of development of the scientific, technical and innovation spheres, as well as fundamental and applied research, need financing. For this, it is necessary to formulate priority criteria with a focus on the prospects of research and the universality of their results. In addition, it should be monitored to determine the ratings of industries and regions regarding the need and feasibility of innovative incentives and the introduction of a special innovation regime for certain structures and regions. In conclusion of each innovation stage, it is necessary to monitor the influence of the innovation process on GDP.
6. The constructed economic and mathematical models of the dependence of GDP on the volume of financing innovative activity on different sources of financing showed that the volume of GDP in Russia, first of all, positively depends on financing scientific, technical and innovative activities at the expense of state financial resources. The study also confirmed that the available amounts of funding for the scientific, technical and innovation spheres have not reached the point at which the impact of science and innovation on GDP growth will be intense.

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Optimization of Logistics Business Processes Based on the Implementation of Cognitive Information Technology

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Abstract. Modern development of the economy is characterized by an evolutionary transition from the industrial stage of economic reproduction to the stage of information-network interaction. Such a transition is accompanied by a radical change in the principles and methodology of economic activity, a change in the structure of the economy and the globalization of the markets for goods and services. With the help of a new interactive communication system using the achievements of information and communication technologies, the value chain is being transformed and traditional vertically integrated companies are being replaced by integrated networked logistics business communities using new forms of inter-functional and inter-organizational logistics coordination. Emerging in the course of these changes, problematic situations between participants in the business-logistic community require the use of new tools and methodological approaches to their solution that meet modern conditions and ensure the effectiveness of the processes of logistics interaction. This new approach is the application of the paradigm of integrated logistics and the creation on its basis of new cognitive forms of information management tools based on the use of the potential of virtual interaction. At the same time, the use of digital technologies, which acquires a general character in the conditions of the modern information and network economy, allows to transfer the integration and logistic coordination functions into the virtual environment, which leads to a significant transformation of the supply chains and the emergence of virtual logistics providers. This article briefly discusses the theoretical and methodological foundations of the formation of virtual logistics providers in the system of interorganizational logistic coordination in conditions of full-format digital transformation of economic relations and provides examples of modeling new cognitive forms of virtual logistics providers that provide automated execution and security of virtual transactions in the modern system of logistics business processes. And also the authors consider the optimization of logistics business processes based on the introduction of technologies for constructing optimal routes for the movement of vehicles by solving the traveling salesman problem. An overview of modern information methods for solving the problem is provided. Models for optimizing routes using MS Excel and OpenOffice Calc packages and cloud computing capabilities are proposed.

Keywords: Cognitive information technology · Traveling salesman problem

1 Introduction

The current stage of the development of the economy can be regarded as a stage of transition from the industrial stage of development of economic systems to information, which is characterized by the priority development of the information and IT sphere, the emergence of new forms of economic activity, the changing forms and mechanisms of competition, the globalization of the economy and the growth of integration processes in it. Many authors note that every economic system must necessarily have a stable institutional design [13, 14], and to date the widespread development of information technologies and their active use in economic activity, dating back to the last decade of the twentieth century, has led to the emergence of new, previously not common forms of organization - networks (Network Form of Organization) [18–20]. Successful use of information technology unites and turns commodity and logistics chains of organizations into a network structure, which gives them new qualities that were not in the traditional formats of their existence. These new qualities consist in increasing flexibility and adaptability to changes in the external and internal environment, increasing the speed and quality of management decisions, the automation of work that can localize the negative consequences of management errors related to skills deficiencies at lower levels of government, as well as limitations of a person's physical abilities for the perception, processing, analysis and application of information.

In the development of the described scientific ideas, the authors of this article suggest that further development of integrated logistics and logistics outsourcing in modern conditions will be conditioned by the development of computer technologies and intelligent database software. Also, it can be added that the development of expert systems and neurocybernetics, as well as the increasingly widespread use of “cloud” and distributed computing, remote and distributed databases, will allow us to move to a completely new level of information processing and decision making, consisting of in their automation and implementation without permanent human intervention.

Distributed computing technologies allow processing practically unlimited volumes of information and, therefore, to service logistic chains and logistic networks of any scale, both national, international, and planetary. This will allow us to cover and integrate logistics networks and supply chains in each country, economic or geographical alliance, as well as on different continents, in the future creating and servicing a single global economic-distributive network of commodity economy. In turn, artificial intelligence technologies will automate decision-making in logistics networks of this scale, replacing in this issue the intellectual abilities of a person who in this case will not be physically able to cope with the scale of activity.

Modern reality can be absolute impartiality and maximum optimality from the point of view of the effectiveness of the functioning of logistics networks, the life activities of states and economic unions. The society will be able to approach the optimal food and commodity supply of the national economy and consumption, ecological and energy security and economy. The use of artificial intelligence technologies will allow not only to conduct the most effective operational accounting, control and planning of logistics networks, but also to carry out tactical and strategic management of logistics networks based on self-learning expert systems. At the present stage, the authors of the article

hypothesize that the modern logistics virtual 5PL-provider has the opportunity to move from the ordinary level of the logistics supply chain, performing for it a certain list of clearly defined logistic functions, to a full-fledged entity managing logistics chains and supply chains, and economic management, in the subject of decision-making.

2 Relevance of Scientific Research

At the present stage of the development of economic science and practical activities in the field of economics and logistics, changes are becoming evident in the process and functional composition of logistics service providers who act as intermediaries in the implementation of logistics operations both on-line and off-line. Today we can observe the expansion and drastic change in the range of services and goals of logistics providers. In recent years, virtual logistics providers have densely begun to determine the policy of development of the world logistics service, and, consequently, the policy of developing the economy of various countries of the world. Using the technologies mentioned above, the 5PL-provider has the opportunity to set the coordinate system of activities for the participants of logistics chains and supply chains, act as an integrating factor, automatically finding a very mobile and constantly changing balance between the multidirectional interests of states, consumers and commercial participants of supply chains for food and industrial products.

In this context, it is possible to conclude that it is the conceptual changes in the goals, tasks, functions and scope of activity, as well as the place, role and purpose of the logistics provider in supply chains, that allow us to speak of a really new step and a new level in the modern scientific classification of logistics operators.

And the listed possibilities of independent determination of the strategy for the development of logistics chains and supply chains based on a given and chosen political concept, the principles of the automated forcing of supply chain participants into the execution of decisions taken by the 5PL-provider, are the basis for distinguishing the virtual logistics 5PL-provider as an independent, conceptually new and different cardinally the principles of work from all previous logistics operators, the provider of the highest level in the classification logistic operators outsourcing [15, 17, 19, 21]. To date, many scientific studies are aimed at giving an accurate interpretation of the concept of a virtual logistics 5PL provider, to make a detailed classification of their species, to identify the laws of development and to consider the stages of the life cycle [11–13]. However, despite the fact that the idea of creating and developing virtual logistics providers has existed for a long time, we can find quite a few authors and studies that are trying to create an integrated model or a set of interrelated models for which a virtual logistics provider could work [12], models that would reflect its basic business process could visually present a scheme of its work and its management processes, according to which in the future it would be possible to design and create such an integrating a virtual logistics provider as the managing subject of the activities of logistics chains and supply chains.

The research presented for consideration is very actual, as it produces modeling and the formation of work algorithms, as well as the creation of basic prototypes of specialized virtual logistics providers that provide the construction of optimal logistics

routes and select the most relevant carriers for the customer's requirements. to be integrated into a single integrated structure of a higher order with a wider spectrum being solved tasks, allowing to generate full logistics chain or supply chain.

3 Statement of the Problem

The essence of the traveling salesman's problem (TSP) is to find the optimal route of the vehicle along the ring route. Criteria for selection are: the shortest path, the minimum time on the road, saving costs. The variety of methods for solving the traveling salesman problem is divided into two types: exact algorithms and approximate algorithms [7]. Exactly called the brute-force method and the branch and bound method closest to it [8]. Among the approximate algorithms distinguish: nearest neighbor method, greedy approach, graph theory, [8–10], and the most attention in recent years has been obtained by the search for methods of improving the genetic (genetic algorithm) [2, 6] and ant [4, 5, 7] algorithms (ant colony optimization).

In the field of optimization of transport and logistics processes, the choice of the TSP solution methodology and the integration of the resulting solution into everyday business processes with minimal financial, time and intellectual costs becomes the paramount task for the company in modern conditions. Within the framework of our research, the advantages and disadvantages of each of the above algorithms were analyzed and an optimal variant of the choice of the calculation method for the ring route of the enterprise with a limited number of destinations was proposed.

Carrying out the structural and object modeling of the main business processes for the future virtual logistics provider required the authors to develop algorithms for implementing an impressive list of operations that should provide the solution of the main tasks of the virtual provider of logistics services. In this list we included:

- selection of all possible contractors for cargo transportation and/or use of special vehicles;
- compilation of a ranked list of possible counterparties based on selected indicators;
- selection of the only best option for the counterparty, taking into account all current requirements for the logistics operation;
- Optimization of the supply chain for the reliability of order execution and the interaction of the focus company with all other participants in the chain;
- drawing up of the most profitable schedules of cargo transportation and use of special transport;
- Drawing up of schedules on required sections of a way or on actual periods of time;
- presentation of text schedules in the form of a sequence of addresses of destinations, as well as in the form of routes on the map;
- drawing up forms of transport, payment and reporting documents;
- conduct and monitor online payments;
- Tracking of cargo and transport.

The implementation of automation tools in these business processes is possible within the framework of integrated logistics structures, as well as within the framework of independent specialized virtual logistics providers, which are a kind of the first stage

or the first stage in the process of building an integrated business system. It is on the development of this kind of specialized virtual logistics providers (VLP) that the research is focused on optimizing logistics business processes by implementing automation tools.

4 Theoretical Part

The whole set of business processes VLP has a linear relationship, that is, one process implies another, or, in other words, the output of the previous process is the input for the next. Mandatory when modeling an object using the process approach is the identification of each of the selected processes and their detailed representation. At the stage of identification of business processes, factors or objects of identification that affect the success of each of the business processes are identified:

- Inputs and outputs, including information on inputs and outputs:
 - input process: information, raw materials, material, input documents, etc.;
 - output of the process (result of the process): semi-finished product or finished product (service), document, record, account, etc.;
 - suppliers of inputs and users of outputs;
- decomposition of processes:
 - separation of processes of lower levels (subprocesses), or operations, of which the process consists;
 - definition of the interconnection of subprocesses;
- the formation of an algorithm for each subprocess: a description of the sequence of technological operations, by which the input of the process is converted into an output;
- control actions on the process:
 - normative documents (laws, standards, instructions) that limit the conditions for the implementation of the process (operation);
 - technological documents (instructions, drawings, technological maps), establishing procedures and methods for performing processes (operations);
 - requirements to the quality of the process and the quality of its result;
 - indicators of process quality, their composition and values, procedures and methods of control;
- Required process resources:
 - the cost of implementing the subprocess (operation) and the process as a whole;
 - composition, functions, responsibility and authority of personnel performing the process, including the process manager;
 - the composition of the consumable resources necessary to support the process in its working condition;
 - the composition and state of the infrastructure through which the process is implemented.

At the completion of the identification stage, each process can be presented verbally, graphically and cryptographically as a separate functional block in which all the main identification objects are identified. Examples of compiled structural models are

schemes of such basic business processes of a virtual logistics provider as: choosing the best counterparty option for the execution of the transport service and drawing up the most cost-effective schedule for the execution of transport services (see Figs. 1 and 2). It is in the detailed presentation of the main streaming processes that the main advantage of using the process approach is that it allows the concretization of the main activities and modeling and design of the control object of interest as accurately as possible, concisely, convenient for perception and analysis.

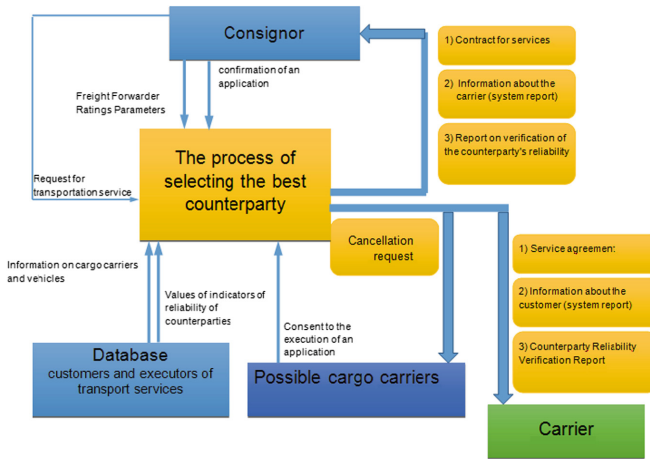


Fig. 1. Business process model for selecting the best counterparty option for the execution of the transport service.

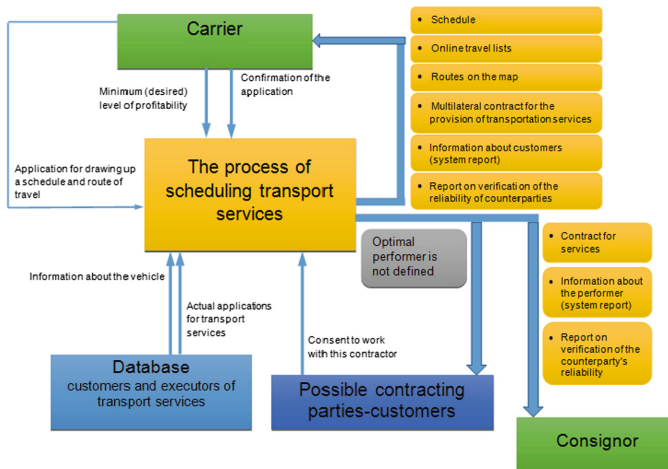


Fig. 2. Model of the business process of drawing up the most cost-effective schedule for the execution of transport services.

In addition, modern information systems offer a rich tool for improving the business processes of the organization. So, for example, for TSP solutions for enterprises with a limited number of destinations, we propose using the capabilities of the already existing software in the enterprise, i.e. add-ins tools MS Excel and/or OpenOffice Calc. The algorithm for solving the problem using which is presented in the form of a scheme below (see Fig. 3).

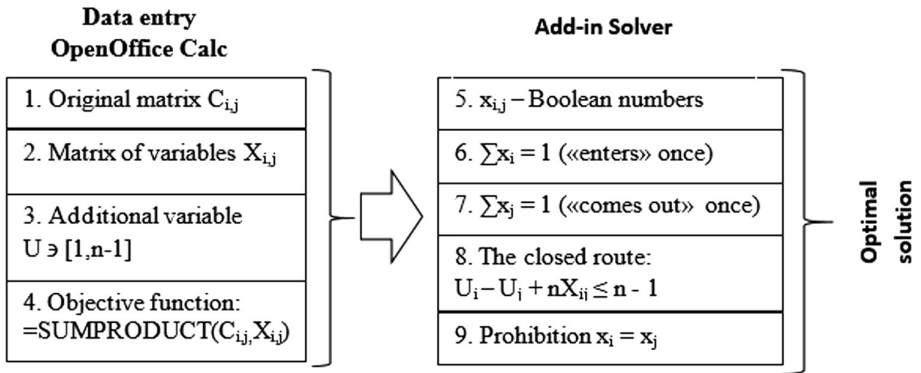


Fig. 3. Algorithm for solving the traveling salesman problem using the OpenOffice Calc add-in.

Notes on Fig. 3: $i, j [1, n]$ - points of destination; n is the number of points; U are natural real values. Presented on Pic. 3 the scheme is applicable to the widely distributed MS Excel software product.

5 Practical Part

The first of these tasks within the framework of this sub-stage of research work on the modeling of a virtual logistics provider was solved by conducting a “field” study on the basis of the regional transport company OOO Brig Logistic, which provides services of regional and federal road freight transport. In the course of the study, the company’s internal business processes as well as external business communications of OOO Brig Logistic were studied. The analysis of company’s methods of valuation and selection of counterparties in the virtual market of transport services was conducted. Also, the methodology of evaluation, ranking and selection of potential counteragents proposed by the author is approved (see Fig. 1).

The study confirmed the growth in the popularity of virtual services in logistics, including in the transport market, and during the research the problems of the participants in the Russian transportation services market were confirmed, consisting of the following needs:

- automated ranking of all available offers on the sites of virtual bulletin boards;
- automating the selection of the best option for the transaction and counterparty;

- drawing up of the most profitable schedules of cargo transportation and routes of movement of cargo vehicles;
- ensuring the reliability and security of the virtual transport services market.

In addition, in the course of this study, new, previously not anticipated, needs of logistics companies were identified:

- scheduling of cargo transportation not with the highest possible profitability based on existing orders, but with the required profitability, based on the preferences of the owner of the freight vehicle, the profitability criteria adopted at the trucking enterprise, the experience of manually compiling such schedules and travel lists;
- automatic compilation and filling of forms of transport and payment-settlement documents accompanying cargo transactions;
- drawing up a report for the Inspectorate of the Federal Tax Service of the Russian Federation on the verification of the selected counterparty for the transport transaction for its security and reliability, primarily related to stricter requirements and rules of tax control;
- automatic verification of possible counterparties for solvency, associated with the currently progressing crisis phenomena in the Russian economy.

Also, there was a lack of need for legal persons in the online payment module, which is connected with the banking and cash discipline in the Russian Federation.

Based on the conducted “field” research, the corrected conceptual model of the virtual logistics provider was compiled, and corrections were made to the design of the service for routing optimization of commercial traffic. Due to the exponential complexity of the exact algorithms [1], the proposed scheme (Fig. 3) is too time consuming and inefficient to use in enterprises with a large number of constantly changing routes. As a solution to this problem, we are proposing the creation of a service that uses cloud computing to solve the TSP and find the optimal route.

As the key features of the service are considered: (1) the ability to “combine” the various algorithms in the TSP solution depending on the number of route points; (2) the lack of the need to install additional software and training to work with it, as well as to increase the computing power of the available in the organization electronic computing resources, t. (3) Integration with the geographic information system will contribute to significant time savings due to the automatic generation of the initial distance matrix between the route destination points; (4) additional possibilities are proposed for introducing additional restrictions, in particular “prohibitions” of the direction of travel between the undesirable points (in connection with repair work, traffic jams, unsatisfactory quality of the road surface, etc.). (5) taking into account the more flexible approach to the solution of the problem and the possibility of making amendments, complications and improvements, the possibility of complicating the standard approach to the traveling salesman’s problem is considered. The possibility of considering not only the ring route, but also the route without returning to the starting point [3].

6 Conclusion

Based on the proposed system of models for the activity of a virtual logistics provider, the virtual Internet service LogistPro specializes in selecting the most relevant freight forwarders (www.transport.logist-pro.ru). To date, as of February, 2018, thanks to the automation of the process of selecting counterparts, as well as well-established work algorithms, the example service allows to save an average of about 6–8 thousand rubles from one route of the carrier company. The data was provided by one of the company's clients - the company of GC TOCHINVEST (Russia, Ryazan, Perm, Krasnodar, St. Petersburg).

The technique for optimizing the circular routes of commercial traffic, shown in Fig. 3 was also used to verify the optimality of route compilation and was tested at a food industry enterprise, which daily deals with the delivery of food products to the regional retail network. As a base of research, the local enterprise of LLC “Moloko Zauralye” (Russia, Kurgan) was chosen. The new delivery routes for dairy products obtained as a result of the decisions were in fact more effective by 13–21% according to the main criterion - the length of the route. Increased efficiency in the compilation of the route will lead to an increase in the speed of delivery of food products and a reduction in the cost of fuels and lubricants. At a cost of 1 L of gasoline grade 92 equal to 33 rubles, the savings from one route at the enterprise LLC “Milk of Zauralye” was 653.4 rubles a month, and in the year 7950 rubles. After the increase in fuel prices with the establishment of a new price of 1 L of gasoline of grade 92 equal to 39.9 rubles, the savings from one route at the enterprise LLC “Milk Zauralye” will be 790 rubles per month, and in the year 9612.27 rubles.

In accordance with the features described in clause 5, a technical development of the service okroute.ru was carried out, in which the full-bust method (12 points) and the genetic algorithm (13–50 destinations) are used to solve the problem of route optimization. Further, the decision is inappropriate because of too long calculations or the need to reduce the number of iterations, which will lead to a decrease in the accuracy of the calculation. To form the initial service matrix, the Google Map geoinformation system was chosen.

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Psychological Factors of Motivated Readiness to Labor in the Forest Manufacturing Industry of the Far East

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Abstract. On the basis of different approaches to the phenomenon of labor the main conflict which needs to be resolved in the process of students' professional training at a college of forest manufacturing industry, is determined: it is the conflict between the value of labor as the basis of the world's material reproduction and the self-fulfillment of a person for one side and, on the other hand, its forcing, energy-intensive and freedom-curtailling nature. Developing a motivated readiness to work in the forest manufacturing field during the process of professional training is considered to be the basis for resolving this conflict. In the course of empirical study (experiment *expostfacto*) carried out using multifunctional (hybrid) computerized diagnostic system Psychometric Expert Practice 8.6 and factor analysis, psychological factors of a motivated willingness for work among students of the college of forest manufacturing industry, their dynamics in the process of specifically organized assistance during professional training were defined. To be suggested is the idea of understanding and adopting the value of labor in the context of its forward-looking subjective interpretation and building one's individual career; this idea provides students with turning labor into creative activity of reproducing the world and self-fulfilling.

Keywords: The phenomenon of labor · Motivated readiness to labor · Psychological factors · Professional training

1 Introduction

The forest manufacturing industry provides employment and supports at least 100 localities with over 300,000 inhabitants accounting for 20% of the population of Khabarovsk Krai (a federal subject of Russia) [1: 119–121]. One of the most important forest manufacturing issues expressed while back at the beginning of this new century, which is the composition and structure of the workforce, still remains relevant. The average age of the working staff is rising, the best qualified labourers and engineers prefer other industries with a better socio-economic and financial situation. The sphere of vocational training of employees at all levels, and especially in the cases of labour occupations which are not considered to be prestigious, still remains a problem [2].

The similar tendency is revealed all over the world. For instance, according to the Indonesian research data showing readiness to work in industrial sectors from 2010 to 2014 only 36, 63% of school graduates are qualified workers [3], that is why the problem of labor resources remains topical [4] (Table 1).

Labor involved in the forest manufacturing industry is mostly physical and often carried out on a rotational basis in rough conditions of impenetrable forests. The particular nature of this work is connected with the need to combine several working specialities and interoperability of team members which sets higher standards for vocational training of the employees of this industry. One more special feature of this labour is connected with the nature: the forest manufacturing industry workers literally “leave traces on the lands”, so the state of the planet in the nearest future depends on these workers’ attitude towards forest exploitation.

The conflicting nature of this phenomenon of labour has been the focus of attention of philosophers, sociologists and psychologists ever since the time of Aristotle. While there are differences between the approaches, the authors note the basic contradiction of labor: for one side, by most of research scientists it is defined as a value, the basis of the world’s material reproduction and the self-fulfillment of a person; on the other hand, the forcing, freedom-curtailing nature of routine physical labor is impossible to be neglected. This contradiction finds its proof in the differentiation between two types of labour: mental and physical [5]. Meanwhile, according to G. Simmel, even mental work can be considered labour, if it includes exhaustion, difficulties, hard work and throes of creation, and if there are no such attributes – it is not true labour [6: 481]. Modern philosophy deepen the problem of the loss of the subjective value of physical labour, stressing its biological nature as monstrous compulsion contrary to “creation” and “act” (Hannah Arendt) [7:165–166], its death drive (Jean Baudrillard). All the attempts to rehabilitate labour in philosophic terms crash, for one side, into setting it against creative work [8], also including business activity, and, on the other hand, into labour’s dissolving in all kinds of people’s practical work (including leisure and contemplation) [9].

A conceptual consensus can be reached by defining the practicability and the meaning of labour as the process of reproduction and a person’s self-fulfillment. And if, in terms of consumption of products, the meaning of labor is obvious, the meaning of labor itself is (according to the definition given by G.W.F. Hegel) “in at-one-time harmonization of human needs and things which help to serve them” in the context of division of labor [5: 51]. Thus, the meaning of labor for a worker consists of both the external, “if the work process is perfectly organized both technically and socially” [6], and the internal values because in the process of labour and as its result a worker discovers his/her capabilities, abilities and the role in relationships with others.

Psychological meaning of any activity for a person can be determined only by measuring his/her motives (which people are not always conscious of) against the purposes (which people are conscious of) [10].

Motives of labour are considered to be a relevant subject of research in the psychology of management and occupational psychology in the aspect of employees’ motivation and also in developmental psychology in the genetic aspect. The concept of the integrative theory of motivation introduced by Leonard, Beauvais and Scholl [12] refers to 5 groups of the sources of motivation: internal motivation; instrumented

motivation; the external self-concept; the internal self-concept; internalization of goals. Improvement of the labor motivation according to the given conception is connected with the dynamics of attitude to labor as enforcement restricting enjoyment and then as to a way of getting reward and its gradual transformation into subjectival value, a mode of existence and a source of moral satisfaction of private and public objectives. In the context of forest manufacturing industry the former means responsible forest exploitation.

Besides, the present dynamics gives way to reveal discrepancy in labor, study-professional and professional activities. These discrepancies according to the conception of Aleksej Leontjev [10], are determined by a fine differentiation in activities the essence of which is the difference in motifs: mediated by labor activities directivity to work for their own good, immediate directivity towards the methods of acting, mastering the profession and self-development – in study-professional activity and, finally, transformation (internalization) of human needs to their own good and wish to make their activity effective to the maximum for the society - motif of professional activity.

Practical overcoming of conflicting nature of labor is phenomenally reached in motivational readiness of a person to productive labor, integrate meaning of labor into the system of personal values.

The concept ‘motivational readiness for labor’ is applied in practice-oriented psycho-educational studies and defined in the works of Russian psychologist [13–17].

Foreign researchers distinguish the phenomenon of motivational readiness for labor and professional training at college [18–24]. According to Subkhan Rojuli, et al. (2017), “readiness for labor is a visible behavioral objective” [3: 556]. In Worker and Campbell’s judgments (2013) readiness provides competent preferences and satisfaction with work [23].

Let’s view some distinctions in the interpretation of the phenomenon. V.G. Aseev not specifying the nature of motivational readiness when defining it emphasizes attention at “energy mobilization” of a person implementing the activity transforming it from in posse into real even in case of self-restraint [13]. In foreign interpretation of motivational readiness the opposite want of a person is emphasized – to act, regardless if it has been realized or not, which in case of its absence withdraws the motivational readiness [22].

The structure of motivational readiness in Russian studies is presented by the components: motif, setting, interest, values, competence, determining the success of acquisition of basic labor activities [15, 16].

The structure of motivational readiness in the foreign researchers’ opinion includes the state of want and expected possibility to satisfy it [22], the need in accomplishment, self-determination, self-assessment, competence and personal autonomy [24].

In our view the phenomenon of motivational readiness can’t be regarded out of the age-related context and without solving the problems of the youth and young adulthood.

Apparently regardless of motive types, indirectly or directly pointed at the object of labor or professional activity, strive of the person for labor operation implementation transforms potential possibility into real activity.

That is why the fact of job placement according to the specialty can be regarded as the presence of motivational readiness for productive labor.

Conflicting nature of the estranged labor of a hired worker in the forest – manufacturing complex determines the necessity in psycho-educational impact on the formation of motivational readiness to labor. However before elaborating the system of psycho-educational support of the formation in question it is important to draw the boundaries of the phenomenon “motivational readiness for labor” [24].

2 Methods

The purpose of our exploratory study was to define the psychological structure and dynamics of motivational readiness to labour in the process of studying at a college of forest manufacturing industry.

The study was organised as an ex post facto experiment during the period from September 2014 to May 2016. The sample design was carried out by using the strategy of natural groups. It consisted of 28 students who, after graduating from college, started working in the industries of the forest manufacturing complex of the Far East and had worked for at least one year. The age of the students: 1st year students-15–17 years old, 2nd year students-16–18 years old, 3rd year students-17–19 years old. The collection of empirical data was carried out by using multifunctional (hybrid) computerized diagnostic system Psychometric Expert Practice 8.6 [25]; the data was collected annually in January and February during the process of the college studying of the research participants (for 3 years). A package, which included 41 psycho-diagnostic methodologies and provided the diagnosis of the sphere of motives and needs, sets of values, self-evaluation, the level of aspirations, psychodynamic and personal characteristics of the respondents, was used. The values of the scale of academic achievements were also included in the procedure of a statistical treatment. The statistical treatment was carried out by using factor analysis, provided in the package of the software Statistic 10.0.

3 Results

The table below presents factor structures, obtained from the procedure of the statistical treatment of the results of the diagnostic study conducted on the respondents, who were the first-, the second- and the third-year students at the forest manufacturing industry college of Komsomolsk-on-Amur.

Factor analysis was carried out by selecting the maximum number of factors in order to achieve the exploratory effect; the total number of factors was determined by using the method of the principal components in terms of their explanatory potential (weight) (no less than 10% of dispersion).

In the first phase of studying at college there were 5 factors, which were distinguished in the process of psycho-diagnostic research and had the total weight of 83,99%.

The first factor, which explanatory potential is 20,06%, is unipolar and includes the following scales (the consequence is given in descending order of the factor pressure): hedonism, social courage, internal conflict environment, passivity, social frustration, external self-concept.

Table 1. Psychological factors, which define the personality structure and motivated readiness to labour of students of the college of forest manufacturing industry.

The stage of professional training (year)	Distinguished factor (type of charge) (% of general dispersion)	Cumulative % of dispersion
1st year	1. Social Immaturity (unipolar) (20,06) 2. Puberty Neurosis (bipolar) (17,99) 3. Orientation in Values of Life (bipolar) (16,35) 4. Exploration and Commitment (bipolar) (15,35) 5. Pragmatic Hedonism (bipolar) (14,21)	83,99
2nd year	1. External Self-identification (unipolar) (20,26) 2. Self-identification and Procedural Motivation of Professional Activity (bipolar) (18,49) 3. External Self-concept of Building a Career (bipolar) (17,32) 4. Irresponsible Oppositionist (bipolar) (17,51) 5. "An Appendage of a Machine" Position (bipolar) (15,38)	88,95
3rd year	1. Self-identification and Building a Career (unipolar) (23,13) 2. Self-presentation and Optimism (unipolar) (17,12) 3. Self-criticism (bipolar) (16,84) 4. Hysteria (unipolar) (12,5) 5. The Sphere of Technical Interests (unipolar) (11,8)	81,37

This factor was named "*Social Immaturity*" and it reflects the dissatisfaction with both the social status, which does not ensure the acts of enjoying the pleasures, and the attitudes of the people around, whose opinions the respondents are guided by.

The second factor has explanatory potential of 18% of dispersion; this factor, which was distinguished while conducting the study on the first-grade students, is bipolar. It includes the following scales: depression, sexual conflict, free will. This factor was named "*Puberty Neurosis*" and it reflects the internal conflict of the first-year students between the physiological maturity and social and moral restrictions in sexual relations.

The third factor is bipolar and formed by the scales which make a group at the positive pole, they are communication, kindness, permanence of the place of residence; the scales which make a group at the opposite pole are consideration of the future profession, love, the act of serving, lie. The weight of this factor is 16,35%. We named it "*Orientation in Values of Life*". This factor reflects ostentation and self-deception when evaluating the future profession and service for one side, and, on the other hand, it shows the need for stability and comfort in communication.

The fourth factor is bipolar, its weight is 15,35%. It includes the following scales which make a group at the positive pole: extroversion, universalism, openness to experience and power. At the opposite pole there are the following scales: integration of lifestyles, social status, stability of the workplace, social activity. The given factor received the denomination "*Exploration and Commitment*" and reflects the

inconsistency of social landmark search as well as strives for stability and passivity of the respondents, absence of labor and status commitment.

The fifth factor, which weight is 14,21%, is bipolar. The scales forming this factor also make two groups. One of the groups is formed at the positive pole and includes the following scale values: rest, material well-being and professional competence; the other group is formed at the negative-value pole and includes the following scale values: maturity, help and compassion for others. This factor was named "*Pragmatic Hedonism*"; it obviously reflects the meaning of labor for the respondents.

As shown in the table, the psychological profile of the second-year students is also represented by using the five-factor system. The factor named as "*External Self-identification*" is unipolar; the values of the scales which it includes are negative and they are the following: the initiative taken in social interactions, working environment, extroversion, openness to experience, work attitude, the sense of dispossession, self-incrimination.

The second factor which was named "*Self-identification and Procedural Motivation of Professional Activity*" is formed by both the scales with positive values (rest, process orientation, material well-being, self-sufficiency, reflexivity, getting new knowledge) and the scale with negative value (self-confidence).

The third factor named "*External Self-concept of Building a Career*" is bipolar and formed by both the scales with positive values (neuroticism, social courage, external self-concept, forward-looking orientation) and the scales with negative values (social activity, propensity for entrepreneurial activity, result-based orientation).

The fourth factor is also bipolar and named "*Irresponsible Oppositionist*" (*the formation of internal principles*) because it includes scales with both positive (social frustration, general creativity, self-confidence, a desire for confrontation) and negative values (searching for and enjoying the beautiful, the motive for power).

The fifth factor (bipolar) was named "*An Appendage of a Machine*" Position". The positive-value scale which formed this factor is "instrumented motivation". The negative-value scales are "the approach to problem solving", "self-guidance" and "the freedom of choice".

The factor structure of personalities of the third-year students is also formed by five factors.

The first factor, which is unipolar and has the biggest weight (23,13% of dispersion), was named "*Self-identification and Building a Career*". It is formed by scales with the positive value, which are stability, universalism, prescriptiveness, compliance, openness to experience, autonomy and the freedom of choice.

The second factor named "*Self-presentation and Optimism*" is also unipolar and formed by the positive-value scales: ostentation, activity, optimism, communication.

The third factor, which is bipolar and named "*Self-criticism*", is formed by the positive-value scales (self-incrimination, the sense of dispossession, discrepancy between the real-self and the ideal-self) and the negative-value scale "process-based orientation".

The fourth and the fifth factors each include one distinguished scales and have names "*Hysteria*" and "*The Sphere of Technical Interests*" respectively. They, probably, reflect the severity of the respondents' emotional reactions towards their expectations and fully-developed priorities in the process of professional training.

It is significant that the values of the students' scale of academic achievements are not found in the content of the factors at any stage of professional training. These results correlate with the conclusions of other studies: the critical factors for college graduates' success in finding a job are non-cognitive – these factors are motivation and self-regulation [3, 4, 26].

4 Discussion of the Results

The analysis and comparison of the factor structures of the respondents in the process of professional training shows that at all stages of the training the relationship between *self-identification* and implemented *needs (motives)*, which stipulate *orientation* in the system of values and external conditions, and also between the content and the valance of *self-evaluation* can be determined. At the first stage the pursuit of enjoyments and vital need satisfaction contradicts the processes of serving and helping other people. Professional competence is being considered in the context of the respondents' own well-being. Self-evaluation depends on the opinion of others and causes internal conflict. In the process of self-identification (ego-identification) the dominating act is the act of searching in the absence of commitment to a certain profession: according to the concept of J. Marcia [27], it is consistent with the state of moratorium.

Psychological structure of the respondents at the second stage of the study is determined by conflicting needs: on the one hand, we can see the continued desire for well-being and rest, on the other hand, there is an internal conflict and increasing extrapunitive aggression against the requirement to obey and limit themselves. Attraction to performing types of activities, a refusal to engage in business, solve problems and accept the freedom of choice, and a preference to do physical work are indicative of the ongoing processes of shaping the attitude of an executor and aiming to obtain the skills for the professional life. Changing of the subject of the needs shows the process of setting up the vocational activity. Self-evaluation is determined by the reduced self-confidence and increased individual self-reflection in terms of learning.

Factor structure of the personalities of the forest manufacturing industry college graduates who found jobs after graduation, can be determined as motivated readiness to labor. The basic needs (motives) of the respondents are related to achieving results and presenting them in the professional community. The characteristic features of the respondents' self-identification are commitment to work and openness to experience, while mental work in the technical sphere is not excluded: the graduates probably associate this kind of work with the process of building a career in the forest manufacturing industry. Self-evaluation depends on the work performance and has a rather negative valance, which can be explained by comparing one's own results with the professional ideal.

The dynamics of metamotivational states is connected with the predominance of the paratelic motivational mode at the primary stages of studying and the predominance of the telic motivational mode at the final stages of studying. This dynamics determines the process of shaping the oughtness and responsibility in the structure of the labor motive and points at the changes in the sources of motivation: at the primary stage of the college studying there is an internal hedonic motivation which is aimed at the

process, at the final stage of the college studying there is a motivation based on the internal self-concept. In our view, this can be proved by the fact that it is the resultative motivation which is a part of the structure of the factor named as “self-criticism”. The graduates’ self-evaluation is determined by the results of their work, which they are not completely satisfied by, but which determine the necessity and direction of their self-improvement.

Furthermore, the study of the factor structure and dynamics of motivated readiness of the forest manufacturing industry college students showed prognostic potential of Leonard, Beauvais and Scholl’s theory of work motivation, which is based on the sources of motivation [12].

Psycho-pedagogical assistance in forming motivated readiness in terms of forest manufacturing industry college of Komsomolsk-on-Amur can generally be regarded as positive, because the amount of students who refused to look for a job after graduation does not exceed 7,5% (2 people). The system of pedagogical assistance in college is designed to support competitive motives, which rouse the need for self-affirmation and professional self-development in the students by making them take part in the competition World Skills [28]. Psycho-pedagogical assistance includes operational diagnostics and guidance on individual demand of those involved in the educational process, application of new forms of learning (including discussions, role-playing and activity-organizing games) which provide students with a vision of the career perspective in the forest manufacturing industry and help with defining their own roles in the process of preserving the ecological balance of the planet. The structure of motivated readiness at the final stage of college studying determines the necessity of emotional support for graduates and young specialists at the stage of professional initiation, for instance, by staying in regular contact with them through specialized clubs or groups in social networks, and also by introducing a mentoring system at the workplace

5 Conclusion

Psychological structure of the personalities of the study participants who were forest manufacturing industry college graduates employed and worked in the industry for at least one year, can be described as motivated readiness to labor. Motivated readiness to labor in the forest manufacturing industry (based on the results of the study) is a process and the result of self-identification in the sphere which is significant to the subjects of the study; this sphere is attributable to the relations between the needs for achieving results in work, their presentation in the professional community. Self-identification is characterized by commitment to work and openness to experience and is oriented towards mental work in the technical sphere: this kind of work is associated with the process of building a career in the forest manufacturing industry. Self-evaluation depends on the work performance and can be considered an additional motive for professional self-development.

The dynamics of motivated readiness to labor during the process of college studying is related to turning the hedonic, process-based structure of needs and the external self-concept and conflicting self-evaluation connected to this structure (self-

evaluation, in its turn, reflects the processes of accepting the position of an executor and at the same time refusing to obey and be forced in the working process) into motivated readiness to labor.

The recognition of the value of labor and emergence of motivated readiness can be reached during the process of psycho-pedagogical assistance provided for students and oriented towards their need for self-affirmation, competition and professional achievements (World Skills), and also towards perspective interpretation of labor in the context of building a career which starts the process of turning labor into creative activity of reproducing the world and self-fulfillment.

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Psychological Readiness to Entrepreneurship of Economics Students

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Abstract. Political and economic changes in Russian society, the development of market relations resulted in the expansion of scientific research in the field of human behavior in the search for optimal ways to change public consciousness. The development of small and medium-sized businesses has led to the emergence of a new community of people - entrepreneurs who can greatly develop the economic progress of Russian society. Entrepreneurship as a form of economic activity is currently an important form of self-employment of a part of the population, a powerful factor in the creation of new jobs.

Entrepreneurship is an economically efficient business entity that specifies its attractiveness for young people under modern conditions of Russian society development and gives rise to mass enthusiasm to this type of business entity. However, according to modern entrepreneurship research of this country, the fact that to establish one's own business and effective entrepreneurship it is required to show certain psychological traits of character, is frequently not taken into account. So the research into psychological readiness to entrepreneurship has proved to be extremely acute and socially important.

The article is dedicated to empirical study of psychological readiness to entrepreneurship of Economics students. In this work there has been used a questionnaire including a number of questions of standardized program of social and psychological research into economic consciousness of personality (A. P. Zhuravlev, N.A. Zhuravleva, V.P. Pozdnyakov, Psychology Institute of the Russian Academy of Sciences (RAS PI)), the Holland code career test; methods to diagnose social and psychological attitude of the personality by O.F. Potyomkina. The research resulted in defining types of students showing different combinations of psychological traits of character and orientation to establish their own business. There have been offered recommendations to form psychological readiness to establish their own business in students under higher school conditions.

It is possible to practically realize the obtained results with state programs on support of youth entrepreneurship, small and medium-sized business, effective implementation of psychological counseling of these programs, the work of students' centers on employment promotion and business incubation of higher schools.

Keywords: Entrepreneurship · Psychological readiness to entrepreneurship · Economics students

1 Introduction

Political and economic changes in Russian society, the formation of market relations have stipulated the necessity of scientific research expansion in the field of people's behavior in the search for optimal ways of changing public consciousness. The development of small and medium-sized businesses has led to the emergence of a new community of people - entrepreneurs, who have become the driving force of the economic progress of Russian society.

Entrepreneurship as a form of economic activity is an important form of ensuring self-employment of a part of the population, a powerful factor in creating new jobs.

The study of entrepreneurship has a long history, characterized by an interdisciplinary nature of research in this field, the existence of numerous interpretations and methodological approaches to the definition of "entrepreneurship".

As the world economy develops and becomes more complicated in the history of science, the definition of the phenomenon of entrepreneurship also changes [8].

In Europe, the word "entrepreneur" has been known since the Middle Ages, when such people were called as organizers of parades and various musical performances, as well as leaders of large production or construction projects.

One of the first concepts of entrepreneurship was developed by a famous English economist of the early eighteenth century, Richard Cantillon in 1725. It is he who some researchers consider to be the father of the term "entrepreneur", under which R. Cantillon understood a man who operates in a risky situation, because traders, farmers, artisans and other small owners buy at a certain price, and sell - for unknown, that is, they take a risk.

In the history of economic thought in the nineteenth and twentieth centuries a transformation of the category "entrepreneurship" took place depending on the existing picture of the economic reality and on the change of the real entrepreneur as an economic agent.

D. McClelland turned out to be among the first ones to study the psychological image of the entrepreneur. At the same time, the major emphasis was made on the need to study motivation and personal traits of entrepreneur's character.

The next direction in the psychological study of entrepreneurs was related to the consideration of risk. In the works of Brockhaus [3] and a number of other researchers, a conclusion was made about the more successful activity of entrepreneurs with a moderate propensity to take risks than entrepreneurs with a low or high level of risk preference.

In the 1970s one of the leading foreign trends in the study of the psychological image of entrepreneurs was associated with the identification of their value orientations.

Despite the efficiency of foreign experience in the study of entrepreneurship psychology, direct transfer of the obtained data is not possible, since the domestic entrepreneur is developed in the context of another economy, a different social environment, a different way of making an entrepreneurial career, and possibly acquiring other skills and abilities [16].

With the introduction of economic reforms in Russia, Russian entrepreneurship has become the subject of intensive interdisciplinary research. Issues of entrepreneurship received new coverage in the works of such domestic scientists as L.I. Abalkin, A.I. Ageev, V.S. Avtonomov, P.G. Bunich, A.V. Busygin, T.I. Zaslavskaya, V.V. Radaev, G.P. Chernikov, A.Yu. Chepurenko, V.M. Yakovlev and several others. Later, a number of studies were carried out in the field of the psychology of Russian entrepreneurship, its various aspects, psychological prerequisites for success of Russian entrepreneurs (A.L. Zhuravlev, N.A. Zhuravleva, T.V. Kornilova, V.V. Marchenko, V.P. Poznyakov, V.A. Khashchenko, E.V. Shorokhova, A.E. Chirikova, and others) [5–7].

In the 1990s, political and economic reforms in this country became the foundation for the revival of domestic entrepreneurship. The first attempt (after October 1917) was undertaken within the framework of implementing the New Economic Policy (NEP), as a way out of Russia's economic and social crisis. However, in the course of historical process, this reform was not developed, entrepreneurial spirit was suppressed in the society, and enterprise was prosecuted by law.

The initial stage of reforms in modern Russia was characterized by a deep economic crisis, a disastrous decline in the standard of living of the major part of population, the rapid destruction of all sources of economic development. So, the "entrepreneurial boom" in the 70's - early 80's of the twentieth century, which resulted in the process of mass establishment of new enterprises in virtually all leading Western countries, according to scientists, was largely caused by the structural economic crisis of the mid-70's and increasing tension in the labor market. This was confirmed by a number of empirical studies (J. Bannock, M. Binks, A. Dzheningis).

In its development, Russian entrepreneurship passed through a number of temporal stages. These regularities of the entrepreneurship development are in many ways characteristic to the Chuvash Republic. Specific features of the Chuvash Republic are: satisfactory natural and climatic conditions for the development of agriculture; high population density; a geographical position that favors the development of industry, construction and trade; due to the absence of significant fossils persistence, labor and qualification of the population are relied on when conducting reforms and economic development.

The revival of entrepreneurship in Russia, the strengthening of state support to small and medium-sized businesses is a necessary condition for further dynamic development of the country, improving the spiritual and moral life of Russians.

Russian entrepreneurship researchers have shown both coincidence and peculiarities of psychological factors influencing success of economic behavior of Russian entrepreneurs.

One of the most urgent and profound works in this field there have appeared a series of studies on social psychology of Russian entrepreneurs, conducted at the Institute of the Russian Academy of Sciences, under the leadership of A.L. Zhuravlev and V.P. Poznyakov.

As a result of a series of studies, it was possible to find out a number of significant socio-psychological characteristic features of modern Russian entrepreneurs (motives,

value orientations, psychological relationships) that determine the direction and level of their business activity and the efficiency of entrepreneurial activity.

In addition, the research data showed a certain regional peculiarities of socio-psychological factors of economic behavior among entrepreneurs [17].

As an important factor that stipulates the socio-economic changes of modern Russian society, it has turned out to be necessary to study the value orientations [30]. As domestic scientists have proven, changes in value orientations have an undeniable interrelation with modern large-scale economic changes in Russian society, with variability of ownership patterns, socio-economic status of an individual, subjective economic status.

The next peak of activity and study of Russian entrepreneurship occurred in 2012–2013. It is associated with the work of E. V. Belova, L. N. Zherelina, T. A. Bergis, P. A. Morozov and a number of other authors.

In sociocultural conditions of the Chuvash Republic, various psychological characteristics of entrepreneurs have become the subject of study in the works by V.P. Fominyh, A.N. Zakharova, G.S. Dulina. Studies have made it possible to carry out a comparative analysis of some socio-psychological factors of economic behavior of entrepreneurs of the Chuvash Republic, Moscow and a number of central Russian regions [13–15, 19, 24]. In recent years, the research made by domestic scientists in the field of business psychology has focused on the study of the dynamics of value orientations of entrepreneurs in Russian changing environment [21, 26, 28, 30, 31], attitude to the business partnership [4, 17, 18]. Important directions of applied psychological research at the present time are believed to be the diagnosis and formation of psychological readiness for entrepreneurial activity in schoolchildren and students, as well as psychological counseling of working entrepreneurs [20, 22]. One of the most popular subjects of the study of domestic entrepreneurship in recent years has been the study of students' personal readiness for entrepreneurial activity and conditions of its formation within the system of education [1, 2, 9–11, 23, 25].

According to T.G. Khashchenko, the basis for highlighting the problem as an acute scientific problem of the psychological readiness of a person for entrepreneurial activity is the contradiction between the need observed in different sectors of the economy for specialists with entrepreneurial potential and the lack of such a potential among a significant number of graduates of higher educational institutions, the need to introduce psychological education into the system technologies, providing the formation of psychological readiness of the person to business activity and insufficient study of this phenomenon.

D.A. Kitova and B.N. Dyshekov [11, 12] believe that it is not possible to teach successful economic activity, including entrepreneurial activity, and one should only talk about the formation of a psychological readiness for it.

Within the structure of the readiness to the entrepreneurial activity T.G. Khashchenko [10] defines such subsystems as orientational, operational and basic subsystems, the latter of which determines the development and functioning of the entire system as a whole.

Z. G. Khanova [9] suggests considering psychological readiness for the entrepreneurial activity as a complex integral formation characterized by social and economic orientation, value-oriented goals, subject-activity semantic structures, the degree of awareness of the attitude towards entrepreneurial activity, the high level of the formation of ideas about it.

D. S. Amiryanyan [2] on the basis of studying the socio-psychological readiness for entrepreneurial activity among future entrepreneurs, their potentials and overcoming personal limitations, argues due to timely detection of socio-psychological readiness for entrepreneurial activity and the implementation of targeted formative conditions it is possible to significantly improve the effectiveness of higher school training for future entrepreneurs.

Entrepreneurship is an economically efficient business entity that specifies its attractiveness for young people under modern conditions of Russian society development and gives rise to mass enthusiasm to this type of business entity. However, according to modern entrepreneurship research to establish one's own business and effective entrepreneurship it is required to show certain psychological traits of character and personality traits. So, the research into psychological readiness to the entrepreneurial activity of students is of utmost importance and has proved to be scientifically significant.

2 Research

The aim of the research is to study psychological readiness of Economics department students to entrepreneurial activity.

2.1 Research Questions

What personality traits does an entrepreneur possess?

Are Economics department students willing to be engaged in entrepreneurial activity?

Are Economics department students psychologically ready to entrepreneurial activity?

What are the dominant socio-psychological attitudes of the individual in students who are going to start their own business?

What are the expressed professional personality types for students aimed at entrepreneurial activity?

Is there a correspondence of orientation to entrepreneurial activity with the student's personal characteristics?

3 Methods

There have been applied the following research method: analysis of scientific sources, questioning, testing, mathematical and statistical data processing.

The following psychodiagnostic techniques were used:

1. The methodology of diagnosing the socio-psychological attitudes of the individual in the motivationally-demanding sphere (O.F. Potemkin), aimed at revealing the degree of intensity of socio-psychological attitudes toward “altruism-selfishness”, “process-result”, “freedom-power” “labor - money.”
2. The questionnaire of J. Holland “Questionnaire of professional preferences” in its theoretical feasibility is based on the theory of professional preferences (vocational choice), developed by J. Holland (J. Holland, 1963). According to this methodology, the respondents determine the intensity of the six professional types, their predominance and correlation: realistic, research, artistic, social, entrepreneurial, conventional professional types [27].

For the questioning in the study, a number of questions were used to assess the characteristics of economic consciousness and behavior, the respondents’ economic views from a standardized program of socio-psychological research of the individual’s economic consciousness [29].

Questionnaire offered to Economics department students included the following questions:

“Would you like to start your own business?” The students were to choose from the following variants: “I will take up my own business in any, even an unfavorable case”, “I would like to have my own business, but I am highly unlikely to do that”, “I would like to start my business under favorable circumstances”, “I would not like to have my own business”.

To the question “Will business activity bring you personal satisfaction?” there were offered the following answers: “Yes, it will bring me high personal satisfaction”, “It will bring me insignificant satisfaction”, “It will bring me no satisfaction”.

To the question “What form of labor organization would you prefer other things being equal?” there were offered the following answers: “Work with a large enterprise”, “Work in a small team of well-known people”, “work individually” and “work only together with the family members”.

To the question “If you had a choice, what would you prefer?” there were offered the following answers: “to have my own business that will require a great deal of energy, but if successful, it will bring a significant income” and “to have not a very large but stable income”.

To the question “Do you think you will be able to get adopted to the existing economic circumstances and provide a decent level of material well-being?” there were offered the following answers: “Yes, I will be able to get adapted without much effort”, “Yes, I will be able, but it will require much effort” and “No, I will not be able to get adapted if the conditions do not change”.

These economic ideas are aimed at forming the nature of social motivation to perform actions that promote or impede economic and innovative transformations; orientation of social attitudes and, accordingly, in many respects express essential features, the aggregate and development measure of which will determine the type of economic consciousness and economic behavior of a person in the current economic situation, whether he will be active or passive, modern or conservative, efficient or inefficient, etc.

As an orientation to the active type of economic consciousness and behavior, we considered economic concepts of choice: to have a big business, even if it is connected with economic risk; to prefer to have one's own business that requires a great deal of energy, but if it is a success, it brings a significant income, a focus on building one's own business, economic ideas related to the orientation toward establishing one's own business and professional self-realization; confidence that they will be able to adapt to existing economic conditions and secure a decent level of material well-being in the future, i.e. psychological readiness for entrepreneurial activity in conditions of competition and economic risk.

As an orientation toward a passive type of economic consciousness and behavior that does not require independence, initiative, the unwillingness to start one's own business, the respondents' judgments about the preference "to have a not very large but stable earnings"; the assertion that doing business will not bring them personal satisfaction, the conviction that they will not be able to get adapted to the existing economic conditions and will be able to secure a decent level of material welfare in the future, i.e., psychological unpreparedness for entrepreneurial activity in conditions of competition and economic risk.

4 Results and Discussion

The research was conducted in socio-cultural conditions of the Chuvash Republic (Russian Federation) at a higher educational institution of Cheboksary.

According to the survey of the students majoring in economics 65 Economics students aged 18–22 (19.25 ± 1.13 y.o.) were picked up to participate in this research.

The criteria to select these students were their entrepreneurial intention and establishing their own business. i.e. the analysis of the replies to the questions: "Would you like to take up entrepreneurial activity?" and "Would you like to launch your own business?".

Revealing economic behavior linked to active economic activity it was found out that 12.3% (8 people) would like to own a business in any case even under unfavorable conditions; 66.2% (43 people) would like to launch their own business under favorable conditions; 21.5% (14 people) would like to start their own business but they are unlikely to do that. To conduct further analysis and taking into account the replies to the above question respondents were divided into three subgroups – on the extent to the orientation to entrepreneurial activity, decisiveness to launch their own business. Group 1 included students showing the highest decisiveness to launch their own business ($N = 8$), Group 2 included students showing average level of decisiveness to launch their own business ($N = 43$), Group 3 included students showing low level of decisiveness ($N = 14$).

To study the following "activeness-passiveness" indicator of economic consciousness and behavior of respondents, i.e. self-assessment of being adapted to the modern constantly changing economic activity environment, the respondents were asked a question if they could get adapted to the existing economic environment and ensure decent level of material welfare.

The research showed that only one man is 100% sure that he would be able to get adapted to the modern constantly changing economic environment making no particular effort. Overwhelming majority of the respondents having a realistic view of things believe that they will be able to reach high standard of material welfare due to high strain, making every effort to do it (93.8%, 61 people). At the same time 4.6% of the respondents (3 people) suppose that if existing economic conditions do not change, they will not be able to adapt to them.

Analysis of the replies to the question “Do you think your business activity will bring you satisfaction?” allowed estimating the degree of positive perception of business and entrepreneurship. 69.2% of respondents of the research (45 people) are sure that business activity will be highly rewarding, 26.2% of respondents (17 people) assume that their own business will bring them insignificant personal satisfaction, 4.6% of respondents (3 people) replied their own business will not be rewarding.

The questionnaire data testify that business activity for the respondents is not only a means to survive and economic necessity, the preferred type of economic activity is supported by positive attitude and satisfaction from entrepreneurial activity.

Inclination and ability to active economic behavior allowed us to specify the question as well: “If you had to choose, what would you prefer?” 64.6% of students (42 people) would like to have their own business that will require a lot of effort, but if it is a success, it will bring considerable income; 3.6% (3 people) would like to have a big business connected with economic risk. 30.8% student (20 people) replied that they would prefer to have a stable even if it is not very large.

Proceeding from the fact that one of the main manifestations of the Russian mentality is the orientation toward collectivism, which sometimes contradicts the requirements of the new economic time, respondents were asked to indicate the preferred form of economic behavior.

Opinions on the choice of work, other conditions being equal, served as indicators of the entrepreneurial activity orientation, - to work individually, to work in a small team; to work together with the family members but not with a big enterprise.

Replying to the question “What form of labor organization would you prefer other things being equal?” 40.0% students (26 people) preferred work with a large enterprise, 41.5% students (27 people) preferred work in a small team of well-known people, 16.9% students (11 people) would prefer to work individually and only one respondent would prefer work only together with the family members.

According to the results of the questionnaire of J. Holland “Questionnaire of professional preferences” on the whole the prevalence of a social professional type was revealed (8.8 ± 2.68) (Table 1). According to Holland, people of this type have vivid social skills (the ability to communicate, the need for leadership), verbal abilities, they are oriented to social contacts and constant personal communication. Although this type is active, but it is dependent on others and public opinion, it is more likely to be characterized by getting adapted. They solve problems referring to their emotions and feelings, but not to rationality. They are characterized by humanity, sensitivity, focus on social norms, the ability to feel empathy and the ability to understand the emotional state of another person.

Further on, on intensity there comes an entrepreneurial professional type (7.91 ± 2.37). According to J. Holland’s theoretical concept it is this type that is

mostly characteristic to entrepreneurs. Representatives of this type are resourceful, practical, fast-oriented in a complex situation, they are inclined to take independent decisions, to social activity, and have developed communicative skills. Among the significant features of this professional type are enterprise, striving to leadership, demand for being recognized, certain aggressiveness, verbal abilities. People of this type choose goals and tasks that allow them to show energy, enthusiasm, achievement of leadership and personal status.

Then comes a conventional type (7.43 ± 1.71). Such a professional type gives preference to strictly structured activities, instruction work, certain algorithms. They show skills to process non-verbal, concrete, routine, digital information. The ability to achieve economic and planned activities is combined with such features as conservatism, subordination, dependence, stereotyped approach to problems. They, as a rule, are weak organizers and leaders. People of this type work well as accountants, financiers, economists, clerks, clerical employees.

The next type is artistic (7.38 ± 2.13). Representatives of this type prefer creative activities (playing music, drawing). In character traits, independence in decision-making is combined, with flexibility and originality of thinking, the predominance of imagination and intuition, an emotionally complex view of life.

Realistic professional type and intellectual one are less characteristic to the sampling under research.

People related to realistic professional type (5.86 ± 1.75) are focused mainly on practical work, the solution to specific problems; the presence of mobility, perseverance, dealing with technology are characteristic to them. Communication is not the principal ability within the structure of their activity; and their ability to communicate with people, formulating and expressing their ideas are less developed.

Intellectual professional type (4.52 ± 2.04) is characterized by introvert thinking, lack of focus on communication, analytical mind, independence and originality of judgments, the prevalence of theoretical and aesthetic values and orientation toward the solution to intellectual creative tasks.

Table 1. Professional type of personality, ($M \pm \sigma$).

Professional type	General	Group 1	Group 2	Group 3
Social type	8.8 ± 2.68	9.28 ± 2.45	5.63 ± 1.92	9.14 ± 2.60
Artistic type	7.38 ± 2.13	7.51 ± 1.72	7.75 ± 3.37	6.79 ± 2.46
Entrepreneurial type	7.91 ± 2.37	7.74 ± 2.14	10.13 ± 1.64	7.14 ± 2.77
Conventional type	7.43 ± 1.71	7.30 ± 1.68	7.63 ± 1.69	7.71 ± 1.90
Realistic type	5.86 ± 1.75	5.58 ± 1.65	6.13 ± 2.03	6.57 ± 1.79
Intellectual type	4.52 ± 2.04	4.51 ± 1.87	4.52 ± 1.58	4.43 ± 2.79

One-factor analysis allowed us to reveal that statistically significant differences between the isolated groups appeared only in the social professional type ($F = 7,8007$; $p = 0,0009$) and entrepreneurial professional type ($F = 4,8549$; $p = 0,0109$).

At the next stage of the research, the methods “Determination of the socio-psychological attitudes of the individual” allowing to diagnose the intensity degree of socio-psychological attitude of a personality by O.F. Potemkina were used. The results are presented in Table 2.

Table 2. Socio-psychological attitude of a personality, average values and standard deviations ($M \pm \sigma$).

Socio-psychological attitude	General	Group 1	Group 2	Group 3
Orientation to freedom	6.28 ± 1.68	6.50 ± 2.39	6.14 ± 1.58	6.57 ± 1.60
Orientation to process	6.20 ± 1.75	5.38 ± 1.69	6.47 ± 1.76	5.86 ± 1.66
Orientation to result	5.66 ± 1.56	6.75 ± 1.28	5.58 ± 1.58	5.29 ± 1.49
Orientation to altruism	4.88 ± 2.14	3.13 ± 1.89	5.53 ± 2.06	4.50 ± 2.07
Orientation to labor	4.05 ± 1.73	4.38 ± 1.51	4.21 ± 1.87	3.36 ± 1.22
Orientation to selfishness	3.86 ± 1.97	5.25 ± 3.01	3.53 ± 1.88	4.07 ± 1.07
Orientation to power	3.78 ± 2.03	5.0 ± 2.62	4.02 ± 1.83	2.36 ± 1.55
Orientation to money	2.98 ± 1.96	4.38 ± 2.97	2.93 ± 1.78	2.36 ± 1.55

Analysis of the results showed that the most vivid socio-psychological attitude of the personality among students who took part in the study is “orientation to freedom” (6.28 ± 1.68), i.e. freedom is the major value for them.

On the whole on the sampling “orientation to process” intensity (6.20 ± 1.75) is a little higher than “orientation to result” (5.66 ± 1.56). People more focused on the process, think about the achievement of the result less, their orientation hinders their effectiveness; they are more driven by interest to the business, and to achieve the result requires a lot of routine work, a negative attitude to which they cannot overcome. People focused on the result can achieve results in their activities in spite of fuss, hindrances and failures.

According to the research results the orientation to result but not to process should be characteristic to businessmen. Among the compared groups, this indicator is higher in the group most focused on entrepreneurial activity (6.75 ± 1.28) Group “I will take up my own business in any, even an unfavorable case”.

A rather unexpected result appeared the predominance of “orientation to altruism” (4.88 ± 2.14) over “orientation to selfishness” (3.86 ± 1.97) and “orientation to money” (2.98 ± 1.96). Altruism is a valuable social motivation, the presence of which distinguishes a mature person, but at the initial stage of establishing your own business, the share of “reasonable selfishness” is important and too profound altruistic orientation can have a certain inhibitory effect.

“Orientation to work” (4.05 ± 1.73) in the sampling on the whole is in the middle of the rating, is also more intense than “orientation to money” (2.98 ± 1.96). This orientation indicates that work brings them more joy and pleasure than any other occupation.

Among the compared groups, in the group most focused on entrepreneurial activity indicators of “orientation to the result” and “orientation to freedom” are the highest and the ones of “orientation to altruism” are the lowest (3.13 ± 1.89).

In the group with an average level the highest indicators are those of “orientation to process” and “orientation to freedom” and the lowest ones are those of “orientation to selfishness” and “orientation to money.”

In the group with a low level, the highest indicator is that of “orientation to freedom” and the lowest ones are those of “orientation to power” and “money orientation” (2.36 ± 1.55).

The correlation analysis revealed the existence of a relationship between the focus on entrepreneurial activity and the professional type of “enterprising” ($r = 0.32$, $p \leq 0.05$), the socio-psychological orientation of the person “orientation to money” ($r = 0.27$; $p \leq 0.05$), “orientation to power” ($r = 0.039$; $p \leq 0.01$). Thus, the more students are focused on the future entrepreneurship, the more profound the orientation data are.

5 Conclusions

The transformation of economic relations in Russia at the present stage requires that the population to be independent and enterprising, to have active economic behavior. According to foreign and domestic studies, entrepreneurs are characterized by independence, a propensity for individual work and non-conformism.

Entrepreneurship is an economically productive form of management, which determines its attractiveness to young people in the modern conditions of Russian society and generates a mass enthusiasm for this method of management. However, future entrepreneurs do not take into account that certain psychological qualities and personality characteristics are required for the organization of their own business and effective entrepreneurship.

The study, which was attended by 65 students of the university of economic specialty, oriented in the future to entrepreneurial activity, showed that at the present stage of social and economic transformation of society the orientation of freedom, independence, result, reliance on own strength are important for future entrepreneurs.

We considered economic notions about the preference for own business, which requires a great deal of effort, but in the case of the success of a significant income (68.3% of students), the focus on building one's own business, economic ideas associated with orientation to create one's own business and professional self-realization; confidence that they will be able to adapt to the existing economic conditions and secure a decent level of material welfare in the future (93.8%), i.e. psychological readiness for entrepreneurial activity in conditions of competition and economic risk as an orientation to the active type of economic consciousness and behavior.

As an orientation toward a passive type of economic consciousness and behavior that does not require independence, initiative, the following judgments were considered: “to have a not very large but stable earnings” (30.8% of students); assertions that doing business will not bring them personal satisfaction (4.6%); the conviction that they will not be able to adapt to the existing economic conditions and will not be able

to secure a decent level of material welfare in the future (4.6%), i.e. psychological unpreparedness for entrepreneurial activity in conditions of competition and economic risk.

The analysis of the representation of professional types and the dominant socio-psychological attitudes in the sample of the study makes it possible to predict psychological difficulties in entrepreneurial activity among some of the respondents. It was expressed in the absence of a developed enterprise, activity, orientation toward the achievement of the result of the case; difficulties in business communication and communication with people and business partners; uncertainty in their abilities, which determines the psychological spheres of work to enhance entrepreneurial potential.

The program of formation of psychological readiness for entrepreneurial activity in the conditions of the university, including motivational and value, cognitive, behavioral and activity components, should be aimed at studying entrepreneurial activity in modern conditions; analysis and coverage of experience, methods, technologies of successful entrepreneurship; to develop a positive attitude to business; conducting periodic monitoring of psychological diagnosis to identify potential entrepreneurs among students; conducting training programs to develop psychological readiness for business activities of students, their business and personal qualities, overcoming socio-psychological barriers that interfere with effective economic behavior; psychological training and consulting for beginning entrepreneurs; the use of modern active and teaching technologies (Kutuev R. A. and co-authors, 2017; Kryukova N. I. and co-authors, 2017, Talanova T.V. and co-authors, 2016).

Experience of the university shows that such work is effective in the conditions of the Business Incubator of the University, which currently consists of several divisions - the Innovation and Education Center, the Consulting Center, the Electronic Business Center.

Practical application of the obtained scientific results is possible for use in government programs to support youth entrepreneurship, small and medium-sized businesses, the effective implementation of psychological support for these programs, the work of student employment promotion centers and the business incubator of the university.

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Identification of Key Global Trends in Research in the Field of Government Service Economy

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Abstract. In the article the author tries to systematize the main scientific trends that have developed in foreign science for more than 20 years based on statistical and scientometric analysis of publications in the field of government service economy. During the research, a special software (CiteSpace) identified nine major research clusters (staff motivation, management efficiency, strategic management problems, quality assessment, reform process problems, privatization of government services, the development of local initiatives, motivation of service sector employees, modern public administration) using a cluster analysis of publications. The special processing tool which was carried out an analysis and gave those clusters a meaningful description. On the basis of the obtained data, the author concludes on the formation of an active research front within the framework of the stated problems, identifies bursts in the development of the research field and determines the most promising areas of research.

Keywords: Scientometric analysis · Public (government) services ·
A study of global trends

1 Introduction

As a part of the post-industrialization of society, the amount of information is growing exponentially. Even a highly qualified scientist may find it difficult to determine the limits of his own research. There is a risk to waste time by repeating someone's research. There is an increased interest in scientific and bibliometric research because it affects the complexity of research and search for the necessary literature [2]. Due to the heterogeneity of existing and emerging information, researchers use qualitatively new forms of analytical processing. In addition, international scientometric databases are becoming increasingly available (Web of Knowledge, Scopus, Google Scholar). However, their analytical tools are not perfect and do not provide a wide range of tools to find the necessary literature on the selected topics [3]. For a more systematic analysis, special free software is used. One of these programs is CiteSpace.

2 Current Problems of Scientometric Research

Currently, there is a problem of finding global trends in a studied area. It is difficult for the researchers to select literature devoted to their studies. This trend was reflected in the works of both Russian (Matraeva L.V., Mazov N.A.) and foreign (Chen C., Zhao, D. and Strotmann A.) scientists. As noted by Zhao D., web technologies continue to drive developments author bibliographic coupling analysis, especially at the research front, although perhaps more indirectly than before [14]. However, earlier such an analysis was reduced mainly to research in the areas of the h-index. But nowadays connectivity analysis and full-text analysis are interconnected.

3 Research Hypotheses

In this study, the author faces the task of studying ways to find the necessary information in the field of government services using analytical instruments Web of Science, as well as using the program CiteSpace, which has free access and is a solid tool for bibliographic research.

The article is based on the verification of two hypotheses: the first one relates to the possibility of allocation of research clusters to a specific topic in order to narrow the field of scientific research and to form some theoretical base for further research. The second hypothesis is based on the search and analysis of bursts of activity around certain scientific works to find the basic “drivers” of the research direction, around which the scientific field is currently actively formed.

4 Methods

This paper uses a set of general scientific methods, such as content analysis, which was used in the semantic analysis of texts about public services. Inductive and deductive methods of analysis were also used, which allowed to combine the views of many researchers on this problem and make the author’s own conclusions. In addition, the algorithm of search of active research fronts in the global information flow, proposed by Matreeva L. V., is used on request of “government services” using a special CiteSpace-a freely distributed software application developed for visualization of the progressive field of knowledge and search for bursts in the development of the scientific field or sphere [1]. Besides, special methods were used – absolute and relative statistical indicators, dynamic indicators and clustering method. The information basis of the research was the database of scientific works of Web of Science on the explored topics.

5 The Need for Research of the Government Service Economy Topic

Issues related to the improvement of the efficiency of management and quality of public services in the Russian economy received a new status of state priority only in 2003–2005 within the framework of the current administrative reform. Although within the framework of foreign public administration, they have always occupied a special position, which was constantly under the close attention of representatives of the authorities at various levels. This “special status” of public services and close monitoring of their effectiveness is explained by the fact that this sector of public administration is directly related to the “end-user” composed of businesses and citizens. And the level of satisfaction with public services directly forms the opinion of the population about the effectiveness of the “wheels of state” and the ability of the current government to manage it.

The public services as one of the main forms of relations between a citizen and a legal entity created new challenges for the Government of the Russian Federation and required a creation of new methods and technologies that were gradually introduced in the framework of administrative reform.

The regulatory and organizational base was formed in the first stage [5]. Many authors note that the term of “public service”, in fact, was created within the framework of the current administrative reform [6–8]. «...public service... is the activity implementing the functions of the Federal Executive body, the state extra-budgetary Fund, the Executive body of the state power of the constituent entity of the Russian Federation, as well as the local self-government body, exercising certain state powers transferred by Federal laws and laws of the constituent entities of the Russian Federation, which is performed on requests of applicants within established regulatory legal acts of the Russian Federation and normative legal acts of constituent entities of the Russian Federation of powers of the bodies providing the public services» [10].

In the next stage a pilot introduction of the public services system as a whole was made. All-Russian programs “related” to this topic were involved in this period to achieve these goals.

Today this stage is almost completed and the government faces a new task. It has to improve the efficiency of public services management, improve the parameters of their quality, take a course on the development of innovations. At this stage the study of foreign research in this field is very relevant, since many foreign countries are already at the later stages of reforming the system of government services. Foreign governments have obtained experience by trial and error, which must be considered to try to prevent their mistakes in the process of transformation and formation of the public services sector in Russian Federation.

However, the difficulty of studying the works of foreign authors is due to the fact that the term “public service” has no unambiguous linguistic interpretation in foreign languages. The closest translation into English is the term “government services”. At the same time, depending on the context, the word “public” can be translated into

Russian as “state and municipal”, “social” or “common” [6], which unnecessarily expands the research area within the framework of the claimed topic. The analysis of publications in its semantic content close to the problems of this study, showed that the keywords “government services” are used by authors to describe the content researched in this article. This keyword was adopted as a “search anchor” on the subject.

6 General Quantitative Analysis of Publication Activity

According to the original request “government services” for all categories of WoS from 1975 to 2017, the search results obtained 43267 articles [15]. This quantity of observations does not allow to generate a report on citations. The period of articles was reduced to 1994–2017. Figure 1 shows the distribution of observations by web of Science category. About 50% of all publications fall into the fields of public administration, economics or management, so it is advisable to conduct further analysis using these results.

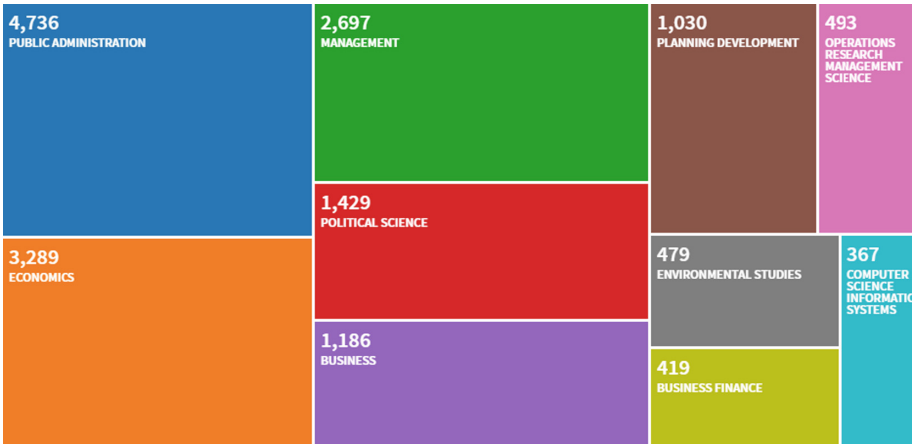


Fig. 1. Distribution of observations by categories Web of Science on request “government services”.

A growing number of publications and citations was found by the author during the initial exploratory stage of analysis of publication activity in the chosen direction using the database of Web of Science. This indicates the scientific interest and relevance of the investigation.

For a more in-depth study of the problem field formed within the concept of public services, a scientometric analysis technology is used. It is implemented in WoS. The search was previously narrowed to 3 categories “public administration, economics, management”. The increase in publications on this request over the past 24 years is shown in Fig. 2.

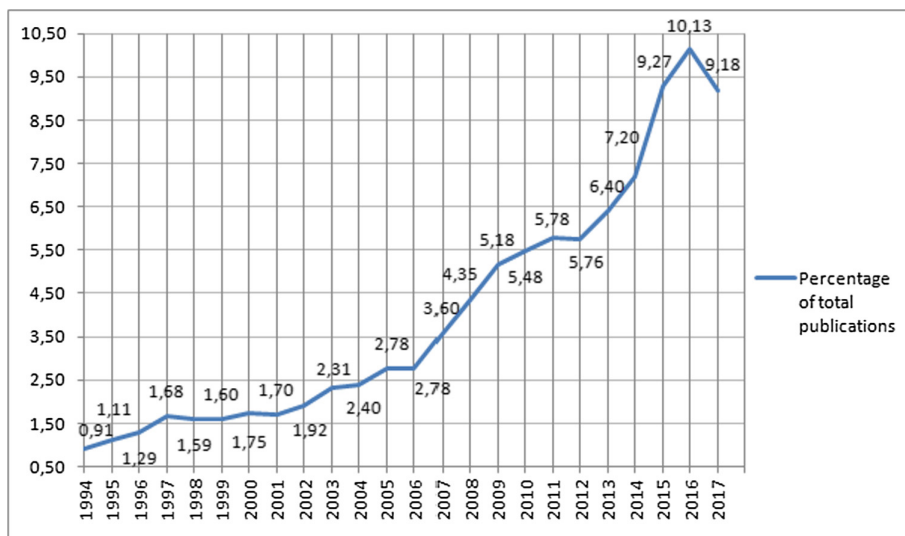


Fig. 2. Publication activity at the request of “government services” in the Web of Science database by year (in % of the total number of publications on this subject in WoS).

It can be noted that during this period the number of publications on this subject has grown exponentially, with a peak in 2016, significant decline in the scientific interest of the authors was not observed.

If we consider the number of publications by country, about a quarter of all articles on this subject are affiliated with the United States, 15% - China and 10% - England. The share, which was covered by Russian scientists, does not fall into the top 10. Russia takes 22nd place in this rating, the share of russian researchers is 1.025% of the total number of query results.

It is further advisable to use a truncated sample to form the report on citations, which is represented by 9947 entries with a total number of citations (excluding self-citations) equal to 83797 and a general Hirsch index of 110. Such analysis of publication activity allows to draw conclusions on the formation of an active research front within the framework of this problem [1].

By analyzing the data presented in Fig. 3, it is clear that the debate on this issue is growing. Thus, in 1994, the average number of citations per publication was 0.11, and in 2017 this figure rose to 17.5.

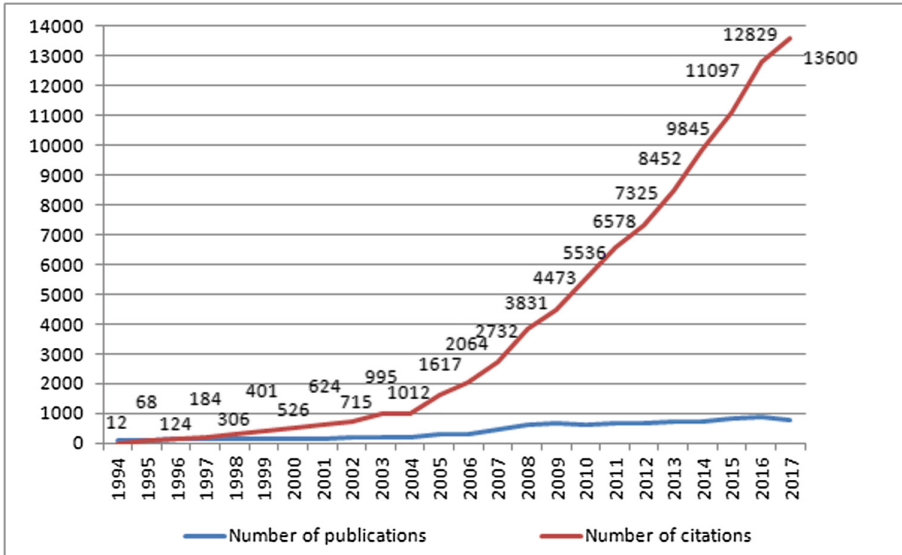


Fig. 3. Number of publications and citations on request of “government services” from 1994 to 2017 in WoS database.

7 Identification and Characterization of the Research Clusters in the Field of Government Service Economy

For further software processing of the data, the proposed period is divided into 23 time sections. These network-like sections are built using program modules and can be seen in Fig. 4.

It reflects the development of this topic, as well as the main subjects causing bursts of citations by researchers of each other during this period. Younger clusters are painted in orange and as they grow older, they flow into a blue palette. Thus, we see that the newest groups of problems are concentrated within clusters 11, 20 and 31.

In CiteSpace, the quality of the cluster network is estimated using two indicators: Modularity Q (in this case, 0.8081) and Mean silhouette (0.2881). The first one is rather high and means that the network is objectively divided into weakly connected clusters, and the second indicator shows that the homogeneity of the obtained clusters is not very high on average [13]. The initial processing results in 149 clusters, which are subsequently transformed into 9 clusters generated over the past decade, with a sufficiently high level of homogeneity (Table 1).

All silhouette scores are close to 1, which is a high value. However, in the case of 31, 23, 20 and 14 clusters, the number of observations is small (less than 10), which partly explains their high rate of homogeneity. These clusters are characterized by relative novelty, however, along with it, and narrow focus of research. For example, the 14th (2004) and 20th (2012) clusters with a total of 16 observations, which reflect regional studies, in particular the Swiss management system. The publications related

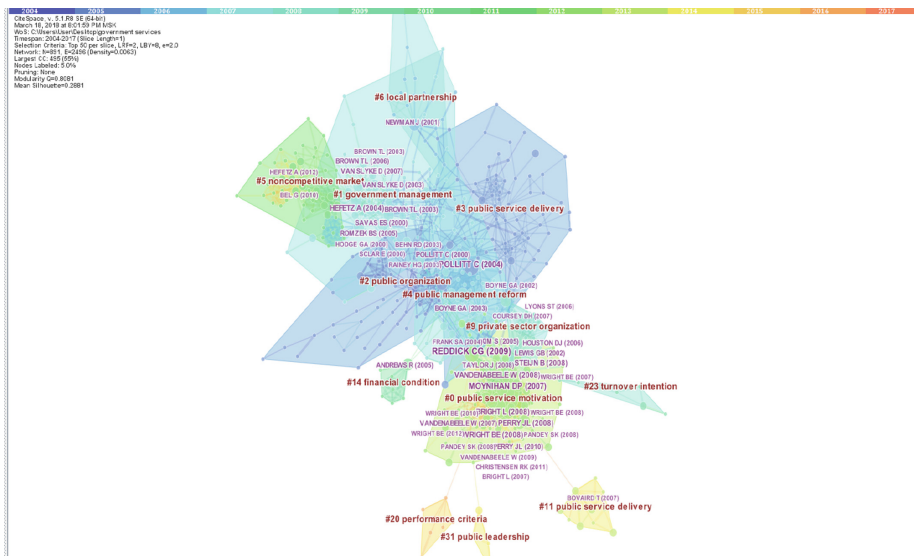


Fig. 4. Map of the field of science on request “government services”.

Table 1. Clusters formed by the algorithm “LRR”.

ClusterID/conditional name	Size	Silhouette	Mean (year)	Label (key-word)
Employee motivation (0)	107	0.851	2007	public service motivation, material incentive, performance-related pay, socio-relational motivating factor, strategy content, local government, cross-sectional research
Management efficiency (institutional cluster) (1)	71	0.836	2001	principal agent problem, contracting back-in, contracting process, local government contracting, citizen concern, statistical analysis, new public management, good administrative judgment, accountability paradox, administrative technologies, meta-regression analysis, administrative modernization, efficiency mark
Problems of strategic management (2)	71	0.863	1999	strategy content, strategy content matrix, organization strategy, strategic action, strategic action, strategic stance, geographical variance, historical difference

(continued)

Table 1. (continued)

ClusterID/conditional name	Size	Silhouette	Mean (year)	Label (key-word)
Quality assessment (3)	66	0.846	2000	public service delivery, local authorities, high trust, economizing effect, new labour government, user satisfaction indicator, british local government, user satisfaction survey, comprehensive performance assessment, asian reform, asian administrative reform
Problems of reforms, efficiency assessment (4)	53	0.835	2002	public management reform, red tape, organizational flexibility, reform program, internal indicator, uk labour government, empirical analysis, english local authorities
Privatization of public services, market approach (5)	53	0.95	2007	noncompetitive market, local government, outsourcing public service, alternative provider, for-profit contracting, public service market, transaction cost, asset specificity
Development of local initiatives (6)	21	0.983	2001	local partnership, organizational innovation, public participation, democratic renewal, new labour agenda, local initiative, participative local partnership, citizen involvement, enhanced public participation, british local government
Motivation of service sector employees (9)	15	0.963	2003	value system, managerial behavior, classical value system, comparative empirical survey, suggesting public-private value, public sector organization, public service, administrative ethics, organizational values, business ethics, material incentive, motivational base
Synergetic approach/ Modern public administration (11)	12	0.999	2010	public service delivery, solid theoretical basis, efficient service, established theories, user co-production, systematic selection, usable knowledge, increasing diversification, previous inventories, public administration, administrative theory, organizational theory, new public governance, innovative contribution, public-service dominant theory

to the 23rd cluster are characterized by the theme of employment dynamics and population mobility in General. Therefore, it is advisable to consider larger clusters because of their greater representativeness-they are clusters № 0, 1, 2, 3, 4, 5, 6, 9, 11.

The zero cluster is the largest of the presented, including 107 observations, and at the same time has a strong enough relationship between the elements, despite its size. It combines publications on the tactics of staff motivation and here it is a question of motivating civil servants. It is very similar to the 9th (motivation of service sector employees), but is newer and much larger.

The 1st cluster has a strong institutional orientation, as often found for the keyword phrase “transaction costs”, “contract”, etc. The Second cluster is the most mature. Issues raised in the papers included in this cluster are associated with strategic management.

Analyzing 4, 5 and 6 clusters, it can be noted that they combine the proceedings, which provides the experience of unique national models of management reforms in the quality of public services. Conventionally, the debate in this case affects two areas of discussion of the national model: specificity and universality. To universal conditionally include those models that were originally formed within specific States, but then were quite successfully transferred to the practice of public administration in other countries - that is, they have a successful experience of replication. A vivid example of a universal model for the implementation of reforms in this case are reforms of the social sphere, carried out by the labor government in the UK in the 2000's. They included a set of measures for the empowerment of local communities and their active participation in social transformation. Mixed funding for public services, partnership programs and increased public control over the quality of services has been intensified. The development and implementation of public service standards was an attempt make equal access to services for different segments of the population.

In turn, the specific models have proven to be effective only at the national level and do not pass approbation in other countries. The solutions that were created within the framework of these models have the right to exist only in the economic system of a particular country. The Swiss system stands out as a country where local government is the main source of sovereignty and has a higher constitutional value than the Federal government. However, the Swiss system of collective management is unique, which does not allow its system of work to improve the quality of public services in other countries. That is, the transfer of the whole system is impossible and impractical, while the scientific interest is called “boxed solutions” - that is a set of measures aimed at a certain area by analogy with software products. This access is provided on fixed terms with standard functions for all users.

An example of such a universal model can be the experience of the introduction of e-government in the UK, extended to many European countries, which pays great attention to standards and protocols, which should guarantee the compatibility of state systems and technologies. Key standards for ensuring the compatibility and unity of state systems are defined in the document “Environment of interdepartmental interaction in government” (Government Interoperability Framework, e-GIF) and set the basic requirements for the provision of integrated online public services [9].

The main scientific thought is formed within the last of the considered cluster. It is a younger 3rd receiver that is related to the quality of public services. The central idea of

this group of works is the focus of public administration on the analysis of satisfaction with public services. Consideration of political processes in a strict hierarchy is not so important at this stage of development of States, so Bovaird T. proposes to consider them as a system of interacting elements, between which “negotiations” are constantly conducted [4]. Accordingly, public services are not just a set of qualified employees and managers, but a product of interaction between a citizen and a government body. The author of the Central work of the cluster describes new concepts of interaction of elements of such a system and the use of such mechanisms in practice.

8 Identifying the Underlying “Drivers” of the Considered Direction on the Basis of Outbreaks of Citations

As for the current outbreaks of citation of authors on this subject, we can distinguish the works of Van Slyke D, Perry J.L., Vandenabeele W., Christensen R.K., Pollitt C. (Table 2). For the formation of this table, the analysis of citations from 2004 to 2017 of all works selected earlier was used. Of the 150 bursts of citations, the newest, strongest and longest were chosen. The most resonant was the article, which is a retrospective analysis of the work of James L. Perry и Lois R. Wise, published almost 20 years ago, which also contains a study of the changes occurring in public administration and social Sciences. At the same time, a great emphasis is placed on new methods of motivation of the public service [12].



Christopher Pollitt is the author of several fundamental works that caused the strongest spikes in citations in 2000, 2004 and 2011. At the moment, the subject of his research covers innovation in public institutions [11]. Public institutions have traditionally been considered less innovative than private firms. However, innovation can be present in the public sector, only in other forms. Other researchers in recent years have focused on the economic consequences of new public administration.

Table 2. Identification of research bursts in the government service economy.

Burst of citation	Year	Strength	Begin	End	Dynamics
Van Slyke D., 2007, Journal of Public Administration Research and Theory, V17, P157	2007	9.0609	2009	2012	
Perry J.L., 2008, Motivation Public Management	2008	8.268	2010	2014	
Vandenabeele W., 2008, Public Administration, V86, P1089	2008	9.8455	2011	2014	
Perry J.L., 2010, Public Administration Review, V70, P681	2010	11.7144	2012	2015	
Christensen R.K., 2011, Journal of Public Administration Research and Theory, V21, P723	2011	8.2298	2012	2014	

(continued)

Table 2. (continued)

Burst of citation	Year	Strength	Begin	End	Dynamics
Vandenabeele W., 2009, International Review of Administrative Sciences, V75, P11	2009	7.27	2012	2017	
Pollitt C., 2011, Public Management Review	2011	7.7951	2013	2017	

9 Conclusions

Thus, using the scientometric analysis of the works of foreign authors over the past 24 years, the main global trends in research in the field of government service economy. There is a smooth transition of emphasis in the works from the perception of public services separately from each other to a synergetic approach in their study.

Currently, research in this area is shifting towards improving the quality of public services, including through the impact of scientific and technological progress and the transition to post-industrial development. At the same time, quality management and service management approaches are actively used. The assessment of the quality of public services is very difficult due to the complexity of its structure. The result of their provision may be information, establishment or confirmation of the right, material security of the right, etc. In some situations, this result is not the final stage of meeting the needs of the citizen, because it provides only an opportunity to meet the needs in the future. Accordingly, the assessment of the quality of public services should take into account a large number of factors affecting it and be adaptable to the life cycle of a particular service.

The leading impetus for the development of government service economy is the needs of people who, in the process of post-industrialization of society, have completely new requirements for quality. And the more timely the public authorities react to such changes, the more stable the internal political situation will be, which will allow the state as a system to respond more effectively to modern challenges.

As a result of this study, the cluster network, consisting of 9 clusters, which are assigned conventional names, reflecting their problems, was discovered (Employee motivation, Management efficiency (institutional cluster), Problems of strategic management, Quality assessment, Problems of reforms (efficiency assessment), Privatization of public services (market approach), Development of local initiatives, Motivation of service sector employees, **Modern public administration** (Synergetic approach).

The search for bursts in the development of the scientific field of government service economy has led to the identification of seven of the longest, most powerful and relatively new bursts of activity, in which 5 authors of the Central works on the studied problems appear.

In General, such methods of bibliographic analysis simplify the research of scientists, as they relieve some of the burden associated with the search for the necessary literature. Programs provide more and more visualization every year, which increases the interpretability of the results.

The results obtained from this work can be used by researchers not only of public services, but also of related areas. The algorithm of work is universal that allows to apply it for almost any issues.

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Integration Approach to Solving Problems of Interdisciplinary Nature in the Conditions of Post-industrial Education

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Abstract. The article is dedicated to the problem of interdisciplinarity in modern school education. Interdisciplinarity is highly relevant to school system in educating a personality with creative and critical thinking capable of taking major responsible decisions in the conditions of post-industrial society and increasing professional competitiveness in the local and global labour markets. This article presents the results of the study of the theoretical (terminological) and practical aspects of Interdisciplinarity in the Russian and foreign scientific literature. The authors in this article do not concern the categorical differences between the terms «Interdisciplinarity» and «Intersubjectivity» and regard these terms as synonymous in the sense the terms «educational discipline» and «educational subject» are synonymous. Interdisciplinarity is considered to be a phenomenon of integrative processes in the modern school system. A number of practical decisions have been put forward. The authors have described the results of the pedagogical research project «The Renewal of the Contents of the General Education and the Teaching Methods in the Conditions of the Modern Information Environment» and have presented actual decisions to the problem stated: the elaboration of specialized didactic and methodological instruments in the form of students' exercises of meta-subjective character, a specialized expert map, teachers' instructions, Google-forms, functional supports. The scientific novelty of this article is concluded in the techniques and instruments which have been elaborated in the context of the commonality of methodology of educational activity. The article has provided the examples of the construction of the content of educational disciplines.

Keywords: Integration · Interdisciplinarity · Educational tasks · Functional support materials · School · Methodological instruments

1 Introduction (Problem Statement)

The scientists have definitively proved that the newest post-industrial epoch has come since the second half of the 20th century which has also been termed as «Information Society», «Knowledge Society» [16]. The 21st century is the era of information and globalization. The school practice has indicated the significant changes in social

development of school students: the level of acquisition of information by school students has increased dramatically. The major impact of mass media including the Internet resources on a personality development has actually become an important factor of formation of views, beliefs and, consequently, the creation of the mental picture of the world.

The high social demand for the current implementation and further exploration of the integration approach to solving problems of interdisciplinarity in Russian school education has been reasoned by its well-proven great efficiency in the conditions of the post-industrial society.

The term «integration» is understood as the entire system consisting of its elements (lat. «integer» as the whole encompassing all its parts). Modern methodology of integration has been employed in the course of the educational process, on the one hand, in order to create strong, complex, profound interdisciplinary relationships, mutual enrichment of the areas of knowledge of various curriculum subjects, the achievement of acquiring holistic knowledge and skills, the unification of the contents of the educational programmes, different disciplines or their elements within a certain discipline, and, on the other hand, in order to reach a goal of continuity between the primary, lower secondary and upper secondary schools [13, 26]. The authors have used the former interpretation of the term «integration» in the present article. The term «approach» is understood as the certain starting point in educational practice [14]. To sum up, the implementation of the integration approach allows for achieving the holistic unity of the contents of different educational programmes and for overcoming some disagreement of various educational disciplines and their elements. The research objective has been underpinned by the fact that the post-industrial society has put forward strong innovative dynamically developing requirements and newest standards for the quality of perfectly competitive professionals in national and global labour markets.

The scientists have concluded that the whole school educational process should be reformed including its goals, forms, methodology, professional tools, etc. [15]. Moreover, the Federal State Educational Standard of General Education of the Russian Federation has imposed legislative requirements to provide the interdisciplinary relationships for the achievement of the targeted educational results in the aspect of their meta-subjectivity. One of the elements of the educational results is the level of comprehension of interdisciplinary terms and definitions to be acquired by school students [22]. However, as the practice has shown, the educational process at present is characterized by a number of problems. For example, they embrace the issues of the deficiency of contemporary didactic and programme-methodological facilities to provide the educational process. Thus, the actual professional task of further development of theoretical and practical mechanisms of realization of the integration approach has been put forward and its significance has been highlighted.

2 The Scholarly Importance and History of the Research Question

The pedagogical research work «The Renewal of the Contents of the General Education and the Teaching Methods in the Conditions of Modern Information Environment» performed within the FGBNU state task at «The Institute for the Development Strategy of Education of the Russian Academy of Education» has been aimed at elaborating the methodological foundation of introduction of interdisciplinarity into school education in the aspect of the contents of educational programmes, enrichment of the knowledge and methods of learning activity of school students, didactic tools and techniques and the provision of scientific research and methodology of the education. As such, the methodology of learning activity [14] and the integration approach have been put forward.

The academic study has confirmed that the theme of integration in the system of education along with the interdisciplinary relationships has been considered in the pedagogical scientific literature in Russia and abroad. As regards the terminology of interdisciplinarity, no differences have been revealed.

Various interpretations of the term «integration» have been explored. According to S.M. Vishniakova, «integration» is a process of converging of sciences with the opposite simultaneous process of differentiation of sciences [24]. This definition has conveyed the same philosophical essence: interrelationship, mutual enrichment of knowledge areas, methods and techniques of different school disciplines, the continuity between the stages of school education, which provide the holistic unity of the system of education. The pedagogical scientific literature has considered integration as one of the basic methodological principles behind both content selection and creating educational models [9].

It is significant to study the essence and research methods of interdisciplinarity/ intersubjectivity in the foreign scientific publications. According to J.T. Klein, over the course of the 20th century, knowledge in the Western intellectual tradition was classified into specialized domains within a larger system of disciplinarity. In the latter half of the century that system was supplemented and challenged by an increasing number of ID studies [12]. The phenomenon of interdisciplinarity in the foreign scientific literature has been thoroughly researched by the Russian scientists, for instance [6] and others. The following terms have been used in foreign scientific publications: «polydisciplinarity» («multidisciplinarity»), «intersubjectivity» («interdisciplinarity»), «transdisciplinarity» (C. Broersma, L. Duerr, Eth. Kleinberg, J. Holbrook, D. Youngblood and others. [8]. For example, J. Holbrook has regarded the term «interdisciplinarity» as the context of generalization for the research work where separate disciplines are thought to be its parts. C. Broersma utilizes the term «transdisciplinarity» in the aspect of interdisciplinarity in the sense of globality and locality of modern scientific knowledge when the knowledge of different disciplines is studied simultaneously at school [5]. In conformity with the legislative documents on Bulgarian system of education, which has been analyzed by L. Tsvetanova-Churukova the term «interdisciplinarity» has been implemented to reflect integration ideas: integrative forms of education, integrative lessons, complex educational modules, interdisciplinary courses, etc. [23].

The problems of the elaboration of mechanism of introduction of interdisciplinary/ intersubjective relationships into education were explored by Russian scientists as early as last century. As such, complex educational programmes at the Soviet school at the beginning of the 1920s were used, which implied the departure from separate subject curriculum school education. Those programmes were combined into three main blocks: «Nature», «Labour», «Society» with focus on local knowledge [20]. The programmes did not indicate long-term vitality [2]. During the period of 1960s–1980s in the USSR the issue of interdisciplinary relationships was solved through the reflection of the relationships of all basic elements of the holistic system of education and knowledge of the nature, society, mankind and a personality [27]. The emphasis was, firstly, on the principle of universality, comprehensiveness, interrelationship between curriculum subjects (as regards their contents, skills system), secondly, the continuity of the stages of school education (primary, lower secondary and upper secondary stages of schooling), and, thirdly, on the correlation between the professional instruments for the interdisciplinary methodology realization [18]. To achieve integration and improve knowledge the section «Interdisciplinary Relationships» has been introduced into the lower secondary school curriculum. It comprised the terms, definitions, concepts initially formulated at other subjects of the curriculum (for instance, Geography, the Fundamentals of the Soviet State and Law), the titles of scientific works were listed, and so were the skills (the skill to work with the map on Economic Geography, analyze statistic reviews, characterize the regional economies, etc. [25]). The culturological approach was implemented in the period of 1970s–1990s as a mechanism of elaboration of theoretical foundation of the contents of education (I.Ya. Lerner, V.V. Kraevsky, etc. [21]). The definition of the term «education» as a cultural (societal) experience of the mankind is increasingly important today. The 21st century has also been marked by the new level of interest to an integration approach in education. The acting Federal State Educational Standard of General Education considers the system-activity approach and meta-subjectivity (interdisciplinarity) as fundamental. The system-activity approach and meta-subjectivity are directly related to school subjects integration.

As the foreign scientific literature has illustrated, the interdisciplinary approach is realized by studying the same educational theme in parallel at different subjects of the curriculum within the framework of the given time period. A.W. Jackson and G.A. Davis have presented the above scientific idea [10]. The issue of creating a unified integrative curriculum has been proposed by J.A. Beane [3]; interdisciplinary courses, programmes stimulating student motivation to learning are recommended by Eth. Kleinberg [11], K. Bellisario, L. Donovan [4]; the concept of cooperative learning has been elaborated by A. Adams [1], R. Slavin [17].

So, the research question of interdisciplinarity in the parts of the contents of the educational process and the methodological mechanisms of its realization has been scientifically studied in Russia and abroad. However, the aspect of school education in the context of contemporary reality of the post-industrial education has not been fundamentally and comprehensively analyzed yet.

3 The Research Tasks

The integration approach to solving interdisciplinarity problems in the conditions of post-industrial education is considered for the purpose of performing the following scientific tasks:

- to establish the character and essence of integration of the contents of the curriculum subjects as required precondition of providing agreement between the curriculum subjects and the educational programmes determined by the system of sciences;
- to elaborate didactic and methodological instruments in the context of the generality of methodology of learning activity for development of the activity of the subjects of educational process, for the creation of the forms of organization to enable the school students to acquire integrative knowledge of different curriculum subjects and also to form specific methods of work with such integrative knowledge.

4 The Theoretical Foundation of Implementation of the Integration Approach to Solving Problems of Interdisciplinarity

It is important to designate an aspect of organization of school students' learning activity for the successful realization of an integration approach to the educational process and for attaining the goals and fulfilling the tasks mentioned above. The learning activity of school students should be properly organized. In accordance with the definition of the term «methodology» as the doctrine of organization of an activity [11], the term «to organize» means «to systemize an activity and to modify it into the system with the targeted characteristics». The setting of an exact goal to be reached by a certain range of actions is one of the distinctive characteristics of the definition of the term «activity». The structural units of an activity are the operations correlated with objectively substantive conditions of attaining the goal. The operations are relatively complete, automated elements of a person's activity [11]. Therefore, if the actions are to be correlated with the goals, and operations are to be correlated with the conditions, the following continuity has to be emphasized: activity (goal) – action – operations (functions). In accordance with the scientific works by A.N. Leontiev, such a distinction of elements of the term «activity» is quite tentative since the above elements do not exist in the conditions of separation from each other: One and the same goal can be achieved in different conditions, but a certain action is carried out by different operations. The operations themselves can be included in different actions. Consequently, it is much important for a teacher to reflect and conclude not only the structural elements of a learning activity but also integration relationships between them. The special didactic and methodological system of tools has been elaborated with the purpose of providing a broad professional support for a teacher in modern school.

5 Findings

In accordance with the former research task of the present work, the article has analyzed and reflected the character of the integration processes concerning modeling and constructing the school disciplines. Here are some examples. The educational domain «Environment and the World Around a Personality» (primary school) combines the material of Natural Sciences, Social Sciences and Humanities. In order to create the holistic picture of the world for students of primary school Natural Sciences integrate the knowledge of Physics, Chemistry, Biology, Geography, Ecology, Astronomy while the Social Sciences integrate the knowledge of the Russian History, Law, Ethics, Economy, etc. The educational system organizes gradual acquaintance of primary school students with the phenomena, processes, objects of nature and social life, historical events which form subsequent layers of knowledge producing strong associative links. Integrative, interdisciplinary relationships allow school students to perceive the world around them as the holistic knowledge with all the components logically linked together, to learn different methods of the cognition of the world and to implement the method of meta-subjective relationships for improving the knowledge of the objects and phenomena of the world. Besides, the subject «Environment and the World Around a Personality» interacts closely with other subjects of the primary school curriculum, i.e. «the Reading of Literature», «Visual Arts», «The Fundamentals of Religious Culture and Secular Ethics». At the lower secondary stage of school education the curriculum subject «The Fundamentals of Social Sciences» has been formed on the basis of meta-subjective integration. This subject domain explores the problems of a personality and the society by means of a complex of Social Sciences including Economics and Economy, Sociology, the Fundamentals of Jurisprudence, Ethics, History. In addition, the above subject is based both on the views, beliefs, concepts about the world acquired by school students at the primary school stage and on the knowledge about a personality and the society studied at the lower secondary stage (History, Literature, Geography, Biology). Modern integration in curriculum subject «The Fundamentals of Social Sciences» is a higher level of interaction and interrelation of different disciplines established on the grounds of the object-oriented approach in comparison with the definition of the term «Intersubjective/Interdisciplinary Relationships». For instance, the term «family» is considered both as a social group and as an object of economic, psychological, ethical, demographic processes. To sum up, in the curriculum subject «The Fundamentals of Social Sciences» a personality is presented in the educational process both as a part of Nature, and as a representative of a humankind, as well as a subject of social life creating the human culture and simultaneously as an object of social reality. The profound understanding of the philosophy, concepts and practice of interdisciplinary integration by a teacher should assist to properly put focus on different aspects of perception and studying subject themes and problems for the discussions and to direct the educational process in order to teach, bring up, form a self-consistent, critically thinking personality of a future professional, an active subject in a contemporary labour market capable of taking efficient responsible decisions in the conditions of post-industrial society.

Within the framework of the latter research task stipulated in this article there have been elaborated meta-subjective educational tasks (class assignments, practical activities) joined together in the thematic blocks [19]. The task blocks prescribe the implementation of methods of organization of a learning process on the basis of indicative framework for action. The functional support material is considered to be the grounds for indicative framework for action. The functional support material used for development of learning activity, a student's life experience and ability to communicate, defend his or her own point of view in a discussion, etc. The learning activity is constructed by means of definite operations (functions) placed on a special educational cards (a kind of navigation system) in a suggestive sequence for each of the discussion participants depending on the choice of the method of reaching a concrete educational target. For example, while pursuing the strategic aim for a student to underpin his or her own position during the discussion, it can be needed to divide activity into separate functions: to explain, to compare, to verify, etc. There can be an educational situation where it needs preparing for the discussion beforehand. It can also be necessary to have the foresight of various strategies of managing an emotional and intellectual atmosphere during the discussion and to take into consideration different possible scenarios of a discussion development and patterns of behavior of the participants.

For instance, as a kind of an educational task while disputing the actual problems of the students of upper secondary school the participants of the discussion – the students – can be suggested that they should formulate a thesis reflecting changes in the spiritual life of the youth which have been taking place for the past ten years or that they should give arguments reflecting the consequences of latest developments of the psychological and social attitudes of the youth.

Teachers are supplied with the methodological instructions on employing educational tasks within the framework of a definite discipline of the form, theme, lesson, as well as professional advice on methods of organization of school students' activity, and a methodical map which allows for fixing both the teacher's and students' activities, analyzing the efficiency of each student's classroom activity, observing the course of the educational process of solving meta-subjective problems. For the purpose of the research work there has been created a network of target premises on the basis of educational institutions (schools) in the Russian regions where the system of approbation and assessment of a complex of educational tasks has been effected aiming at forming school students' skills of universal learning activities and students' proper understanding of the essence of interdisciplinary terms and definitions. The above system allows for measuring and assessing the level of a teacher's readiness to conduct his or her professional activity in the newest social and intellectual format of post-industrial education. The assessment of teachers' cognitive level in the aspect of methodology of interdisciplinarity has been conducted in the Google virtual room where special Google-form has been placed [7]. It presents a questionnaire with a multiple-choice answer sheet. The assessment results obtained has been processed by Google automatically. The test has reflected the problems of teachers' professional activity. In general, it concerns, firstly, the problem of teachers' understanding the definition of the term «Interdisciplinarity» (only 8.3% of the respondents have indicated they can formulate exactly its essence and give a respective definition) and, secondly, the issue of organization of the students' learning activity oriented towards

the realization of integration approach. None of the respondents have indicated to the learning, teaching and upbringing activity in the out-of-classroom mode as a method of an integration approach. This and some other data of the research work certifying the current level of teachers' readiness to professional integration approach implementation has evidenced that without making sufficient changes in the existing traditions of educational practices it is impossible to increase the competitiveness level of Russian professionals of the future in both national and global labour markets.

6 Conclusion

The results of the research work «The Renewal of the Contents of General Education and Teaching Methods in the Conditions of Modern Information Environment» has allowed to make the following conclusions.

The concise analysis of various interpretations of an integration approach in the Russian modern education has evidenced that the system of education consistently evolves according to the laws of spiral dialectic development. Some variants of integration in the contents of education employed in the previous time periods tend to return within the framework of the modern system, but they are studied and practiced within the relevant tasks of tackling the most recent challenges of the epoch in the conditions of post-industrial social development. The phenomenon of interdisciplinarity and integration has been evolving from multidisciplinary relationships at the classroom lessons where, first of all, the interaction of the contents of different disciplines has occurred (History-Literature, Geography-History) to meta-subjective and distinctive interdisciplinary relationships. The latter is characterized not only by greater extent of interrelation and interdependence of elements of education forming the holistic unity but also by implementing the system of universal learning activities and further creating newest educational domains on the interdisciplinary basis. The given examples of constructing contents of the curriculum subjects allow teachers themselves to work out interdisciplinary educational tasks.

The strategic trajectories of realization of the integration approach in the systems of education of both Russia and other countries of the world tend to intercross and can supplement each other.

The proposed theoretical foundation of implementation of the integration approach to solving problems of interdisciplinarity, in particular, the methodology of learning activity, provides the efficient practical realization of the integration approach in the system of education.

It is important to state the special didactic and methodological instruments, techniques and tools have been worked out and can be utilized for the purpose of creating educational situations of interdisciplinarity realization both during the classroom work and at the periods of out-of-classroom activities. These instruments are as follows: educational tasks (class assignments, practical activities) of meta-subjective quality for the school students, specialized expert maps, teachers' instructions, Google-forms, functional support materials. The conclusions made on the results of the present research work and subsequent professional recommendations have motivated and stimulated modern teachers to effect projection activity of the educational process in the

context of a life experience of school students, which therefore makes great contribution to the development of school students' self-consistency, creativity, leadership, responsibility, i.e. certain personal qualities of a highly competitive professional of the future.

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Estimating the Effects of Free Trade Agreements on Trade Flows in East Asia

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Abstract. Standard trade theory suggests that Free Trade Agreements (FTAs) could disrupt trade between members and non-members. Using novel empirical approaches researchers can estimate trade creation and trade diversion effects. However, the trade diversion effects of FTAs have not been thoroughly examined empirically.

In this paper we estimate the effects of free trade agreements on trade flows in East Asia (EA). Based on international trade statistics for nine countries (China, Indonesia, Japan, Republic of Korea, Malaysia, Philippines, Singapore, Thailand, Taiwan) for the period 1994–2012 on 13 sectors and data on existing free trade agreements (FTAs) using the Bayer and Bergstrand model and the quasi-maximal likelihood method of Poisson, the effects of FTA on trade flows of EA countries are estimated. The results of the model evaluation showed that the FTAs have a positive and statistically significant effect on the volume of bilateral trade between East Asian countries. In general, the countries that concluded FTAs increased bilateral export by 6.7%. FTAs had an impact on bilateral trade and at the sectoral level, but it was not possible to set a clear time trend. For such enlarged industries as textile, electrical machinery, the production of household electrical appliances, following a significant initial effect, a decline was observed. For such industries as food production, oil and coal industry, production of stone, clay, glass and concrete products, ferrous and non-ferrous metallurgy, the initial effect of FTA was quite small or nonexistent, but increased with time. Values of the estimated coefficients for a dummy variable with a 6-year time lag indicate that for most industries, the effect of FTA remains significant over time. Exceptions were the sectors of the production of household electrical appliances and precision engineering, for which the value of the coefficient is positive, but not great, and also the industry of the production of electric machines, for which the value of the coefficient is negative. This is due to the fact that the effect of FTA on trade volumes for some or most of the goods in these industries was short-lived.

Keywords: Free trade agreement (FTA) · Creation and diversion effects · Gravity · Trade flows · East Asia

1 Introduction

According to the regional trade agreement (RTA) database of the World Trade Organization (WTO), the number of RTAs notified to WTO has increased rapidly since the early 1990s, with 612 RTAs notified as of April 2015 (406 RTAs were in force). One reason for the surge of RTAs is that global trade liberalisation under the WTO system has not proceeded smoothly with the increasing number of member countries. Many countries have pursued trade liberalisation by forming bilateral or plurilateral trade agreements to gain various economic benefits which come from trade creation and market expansion effect by elimination trade barriers and various dynamic effects such as capital accumulation and productivity improvement brought about by liberalisation of foreign direct investment (FDI) and technology transfer among member countries. Viner (1950) is the first study to discuss the static effects of regional trade integration in terms of trade creation and diversion [1]. The dynamic theory of regional economic integration by Balassa (1961) is the first attempt to introduce the dynamic effects of economic integration such as scale economy, technology change, and impact on competition [2]. Up to the present, a number of theoretical studies have indicated that the dynamic effects of economic integration benefit member countries more than static effects. As regards free trade agreements (FTAs) in East Asia, bilateral and regional FTAs have increased rapidly after the 2000s behind the world trend of RTAs. Figure 1 shows the number of RTAs in East Asia. Until the 1990s, few countries joined regional or inter-regional agreements of trade preferences such as the Global System of Trade Preferences among Developing Countries and the Asia Pacific Trade Agreement. Although East Asia was the first to establish the first regional FTA - with the creation of the ASEAN Free Trade Area (AFTA) in 1992 - it had been behind other regions in the world as regards the formation of regional FTAs.

Therefore, East Asia was called an 'FTA vacuum' until the beginning of the 2000s. However, since the latter half of the 2000s, bilateral FTAs in this region have rapidly increased, and five ASEAN+1 FTAs - namely, ASEAN-China FTA, ASEAN-Japan FTA, ASEAN-Australia-New Zealand FTA, ASEAN-Korea FTA, and ASEAN-India FTA - have been established one after the other. About 70 FTAs have been formed by East Asian countries by 2015. Also, wider regional FTAs, such as the Regional Comprehensive Economic Partnership (RCEP), are being negotiated.

With the increase of FTAs in East Asia, intra-regional trade and FDI have been increasing since the 2000s. For example, the share and value of regional trade of ASEAN countries, Australia, China, India, Japan, Korea, and New Zealand in 2011 were around 45% and 4.5 trln USD respectively. Although intra-regional trade share has not varied drastically since the 1990s, the value has been increasing from the late 1980s and surged from the beginning of the 2000s. This rapid increasing trend of regional trade reflects an upsurge of exports to outside the region as well as an increase of intra-regional trade in East Asia. Regarding inward FDI to ASEAN countries, the share of inward FDI from East Asian countries has increased since the 2000s. Given these facts of regional trade and FDI, the upsurge of regional FTAs in East Asia seems to be an important factor in positively impacting regional trade and FDI in this region.

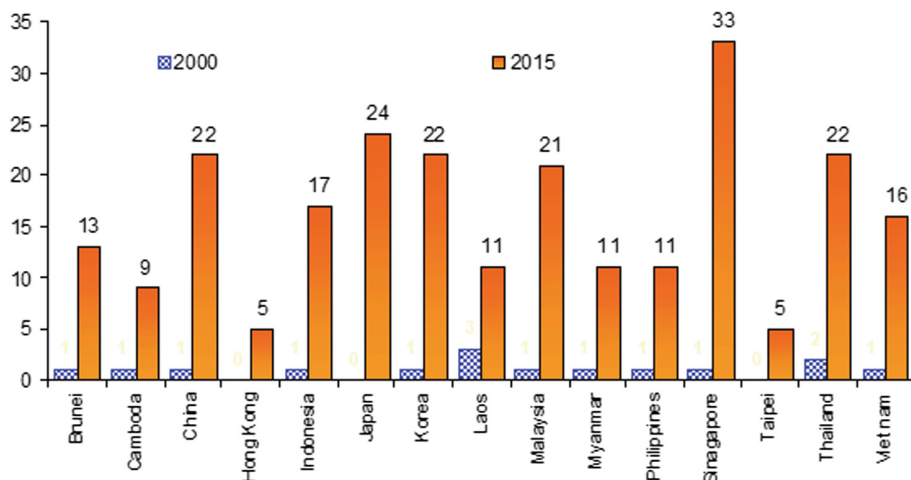


Fig. 1. Number of RTAs involving East Asian Countries.

Detailed studies on the impact of FTAs on trade and FDI are indispensable for all countries in this region where new FTAs have been established or are being negotiated. The first half of this paper aims to review studies on the impact of FTAs on trade in goods in East Asia to find out what has been explained so far regarding the impact of FTAs. Two types of analyses are used to investigate the impact of FTAs on trade in goods, namely, ex-ante and ex-post analyses. We use recent and very useful paper by Okabe (2015) for literature review [3].

A typical ex-ante analysis is a simulation analysis by computable general equilibrium (CGE) model, which enables us to investigate the impact of an FTA on various aspects of the economy such as trade value, production, and economic welfare by sector or country. In a CGE model, implementation of an FTA is measured by tariff reduction/elimination.

Various measures of trade liberalisation implemented with tariff reduction/elimination under an FTA, such as trade and investment facilitation and service trade liberalisation, can be set in the model. Thus, we can estimate both direct and indirect impact of different FTA types on various aspects of the economy. Ex-ante analysis is useful for estimating the impact of an FTA before it is enforced.

Major ex-post analysis is an empirical study applying a gravity model for trade data at an aggregated or disaggregated level. The gravity model, originally developed by Tinbergen (1962) and Poyhonen (1963), has been used extensively to explain trade patterns for over 50 years [4, 5]. Studies on the impact of FTAs on trade in goods by applying the gravity model have been conducted since the 1960s. The pioneer of empirical study on the impact of FTAs is Tinbergen, who examined the effect of the Benelux FTA on trade in goods. After the 1970s, several studies investigated the impact of major regional FTAs such as the European Economic Community, European Free Trade Association (EFTA), and the Latin America Free Trade Agreement by Aitken (1973) and Brada and Mendez (1983) [6, 7]. These studies used dummy

variables of FTAs to capture the effects of FTAs on trade flows. If the estimated coefficient of an FTA dummy is significant and positive, an FTA has a positive impact on trade between members; in other words, the FTA has a trade creation effect. As FTAs rapidly expanded in the world since the 1990s, an increasing number of studies have attempted to examine the impact of FTAs by applying various types of gravity model.

By applying said model on the increasing number of studies on trade, two issues of estimation methodology present a challenge to be solved. One is concerned with the endogeneity problem of the gravity model. Some explanatory variables in the gravity model, such as gross domestic product (GDP), can be regarded endogenous. Also, FTA dummies can be an endogenous variable since the decision to form an FTA between two countries may depend on their trade relationship. Baier and Bergstrand (2007) treated FTA dummies as endogenous variables and found that the impact of FTAs on trade is much higher than in previous studies [8]. Considering endogeneity among explanatory variables, Carrère (2006) used an instrumental variable method, the Hausman-Taylor method, to estimate a gravity model [9]. She found that FTAs have generated a significant increase in trade between members.

The other issue of gravity model estimation is zero-trade flows. Many country-pairs have no bilateral trade. This often happens in the case of disaggregated trade data. Dependent variables in a standard gravity model are transformed into logarithms of bilateral trade values, while the log of zero bilateral trade flows is undefined. Santos Silva and Tenreyro (2006) pointed out that zero bilateral trade flows are almost half of all country-pairs in their study [10]. To avoid biases caused by dropping zero values, several studies have addressed the development of econometric methodology to solve this problem. Santos Silva and Tenreyro (2006) utilized the Poisson Pseudo-Maximum-Likelihood (PPML) estimator to estimate a gravity equation that includes zero trade flows. Furthermore, Helpman et al. (2008) developed a two-stage estimation procedure to deal with zero trade flow problems [11]. A selection equation that formulates a firm's decision to trade or not with a partner country is estimated at the first stage, and a trade flow equation similar to the standard gravity model, at the second stage. Analyses on trade flows at the sector or product level data by gravity model have been often conducted recently; hence, the above standard approaches to deal with zero trade flow problems are often used.

The theoretical background of the gravity model has been developed since the late 1970s. Anderson (1979) was the first to develop a simple theoretical gravity equation based on a two-country model of classical trade theory [12]. After the 1990s, the new trade theory with an assumption of monopolistic competition was applied to explain intra-industry trade.

Anderson and Van Wincoop (2003) derived a gravity equation from the general equilibrium model under monopolistic competition which can be used to estimate intra-industry trade [13]. Their contribution is to introduce "multilateral trade resistance" (MTR) terms which consist of price indexes, trade cost, and expenditure of trade partner. However, MTR terms are not observable. There are several ways to adopt MTR terms in an estimation equation. With the development of panel data, many studies have used country-year effects of importer and exporter as MTR terms. Based on such development of theoretical foundation and econometric methodology for

gravity model, the most recent studies on the impact of FTA on trade often apply PPML estimators for panel data country-year fixed effects which are proxies for MTR terms. The most recent application of the gravity model is based on the Melitz (2003) model, also called the “New-New” trade theory [14]. The Melitz model focuses on firm-level differences -such as firm heterogeneity - and assumes that only productive firms are engaged in export. Based on said model, several empirical studies applying firm-level data to the gravity model have attempted to examine bilateral trade flows which are composed of extensive margin, namely differentiated number of exporting firm, and intensive margin, namely export value per firm. Helpman et al. (2008) applied two-stage estimation to firm-level data, and found that the bias of estimated coefficient by the gravity model is caused by omission of extensive margin. In other words, the number of firms engaging in international trade is important information for estimating the gravity model.

Based on the development of research on the impact of FTAs, we reviewed mainly ex-post studies in Sect. 2 on the impact of regional FTAs in East Asia. Section 2.1 reviews empirical analyses in general impact or tariff reduction of FTAs on trade in goods. Sub-sections focuses on studies related to AFTA, regional and bilateral FTAs in East Asia respectively. Section 2.2 discusses on studies on other trade liberalisation measures related to FTAs and channels of impact of FTAs. Section 3 explains estimation methodology and data for our empirical investigation of FTA impact on trade flows of East Asian countries. Based on recent developments in theoretical background and empirical methodology, we estimated gravity equations with FTA dummy variables to determine whether trade creation effects are caused in each sector of EA countries.

2 Literature Review on FTA’s Impact on Goods Trade in East Asia

2.1 Impact of FTAs on Goods Trade in East Asia: Ex-Post Evaluation ASEAN Free Trade Area (AFTA)

AFTA was signed in 1992. Its original members were six ASEAN countries - namely, Brunei Darussalam, Indonesia, Malaysia, the Philippines, Singapore, and Thailand - and four newer members - namely, Viet Nam, Lao PDR, Myanmar, and Cambodia which joined in 1995, 1997, 1997 and 1999, respectively. The key objective of AFTA is trade liberalization under the Common Effective Preferential Tariff (CEPT) scheme to eliminate tariffs on intra-ASEAN trade which have been in effect since January 1993. AFTA was planned to reduce tariff rates on products in the Inclusion List to a level between zeros to five percent by 2008 in the beginning, then the target date was moved to 2002. Moreover, the ASEAN-CEPT agreement was revised significantly by the ASEAN Trade in Goods Agreement in 2008. The tariff rates of the products in the Inclusion List were planned to eliminate to zero percent by the year 2010 for the six ASEAN countries and by 2015 for the remaining four countries. By 2010, the share of tariff lines with the zero percent tariff rate was about 99% for the six countries, and the share of tariff lines with zero to five percent tariff rate was more than 95% for the

remaining four countries. Tariff elimination under the AFTA has almost been completed in the last 20 years.

At the start of AFTA, according to Frankel (1997), many studies presumed that trade creation by AFTA would be small [15]. For example, DeRosa (1995) used a CGE model to find that Most Favoured Nation (MFN) tariff liberalisation of ASEAN members would increase trade more than trade liberalisation by AFTA [16]. Frankel and Wei (1995) examined the impact of ASEAN's regional trading bloc by using a gravity model with ASEAN dummies [17]. Although the coefficient of ASEAN dummy was significant and had positive values, they found that this ASEAN bloc effect disappeared completely when the East Asian bloc effect dummy was added to the estimated equation simultaneously with the ASEAN dummy. Therefore, they concluded that the intra-ASEAN trade bloc is still effective while the ASEAN trade relations with outside industrialised countries are more important than intra-ASEAN trade relations.

Endoh (1999) introduced two types of RTA dummies which capture trade creation and diversion effect to a gravity model [18]. Based on the estimated results, he found that ASEAN had no effect in boosting trade among its member countries during sample periods 1960–1994. He presumed that this result reflects the fact that the share of intra-ASEAN trade of each ASEAN country is still low.

As described in the previous section, the methodology to estimate gravity model has been modified since the 2000s. Furthermore, data coverage has been expanded. Soloaga and Winters (2001) used a Tobit model for estimation with consideration of zero trade flows [19]. They quantified the impact of major preferential trade agreements on trade. The coefficient of the intra-bloc trade of ASEAN was negative but insignificant. Likewise in previous studies, ASEAN countries' trade with outside regions was significantly facilitated. Given that country-pair effects are unobservable, Carrère (2006) applied the instrumental variable method proposed by Hausman and Taylor (1981) [20]. Comparing the estimation results by panel and cross-sectional data, she found that most RTAs resulted in an increase in intra-regional trade while reducing imports from the rest of the world. As for ASEAN, the trade creation effect was seen over the periods.

With increased interest in the growing intra-regional trade of ASEAN countries since the 1990s, the number of studies focusing on the impact of AFTA has been increasing gradually. Elliot and Ikemoto (2004) applied a modified gravity model to examine trade creation and diversion effects by AFTA [21]. Comparing the estimated coefficient of AFTA dummies before and after the AFTA process started, they found that both trade creation and trade diversion effects are significantly positive. Their findings indicate that AFTA increased not only intra-regional trade among its members but also trade with non-members. In other words, it is important to consider not only intra-ASEAN trade but also the effect of AFTA on trade between ASEAN members and non-members. Kien (2009) employed the Hausman-Taylor estimation for panel data of 39 countries from 1988 to 2002 to estimate several RTAs [22]. By using the dynamic way of AFTA dummy which takes the value of one for only effective years, he investigated the effect of AFTA as an institutional framework rather than a regional trading bloc. Similar to Elliot and Ikemoto (2004), the result indicates that AFTA gives rise to a trade creation effect; at the same time, the effect of AFTA on trade between

members and non-members was positive. Controlling unobserved heterogeneity by using country-pair specific time trend, Bun et al. (2009) applied two types of AFTA dummies, that is, an AFTA dummy which takes the value of one between members after the year 1992 and an AFTA dummy multiplied to the time trend which captures the effect of gradual tariff reduction under AFTA [23]. They found that AFTA positively affected trade during the sample periods, and suggested that careful control for unobserved explanatory variables of the trend in trade is necessary for testing the impact of AFTA. As most recent studies show, they pointed out that panel data should be used to estimate a gravity model for handling endogeneity problems.

Although many studies had concluded that ASEAN regional trade blocs had little impact at the beginning of AFTA, several recent studies have found that as AFTA progressed, it made a significant and positive impact on trade. This transition of research findings is also caused by improved data availability and estimation methodology. These studies lead us to the temporary finding that the institutional framework of AFTA has facilitated intra-regional trade to a varying degree. Studies using an AFTA dummy, however, do not provide further insights into the mechanism of trade liberalisation measures under AFTA to facilitate intra-regional trade. Trade liberalisation under RTAs is usually implemented through several measures along with tariff elimination. To understand the impact of FTAs more fully, it is necessary to investigate the effect of these measures directly. On the impact of the tariff elimination process under the CEPT scheme of AFTA, a few studies attempted to estimate the impact by using tariff data. Manchin and Pelkmans-Balaoing (2007) applied a gravity model with time-varying country fixed effects as MTR terms for aggregated and disaggregated trade data to estimate the effects of preferential AFTA tariffs on trade flows of AFTA members [24]. Although their data set is limited to four ASEAN members in 2001–2003, they investigated carefully the impact of different preferential margins on trade. The result shows that the tariff reduction effect of AFTA have no or little impact on intra-ASEAN trade basically. However, they found that positive tariff reduction effects of AFTA are significant in a limited range of products where the preferential margin is higher than 25%. Interestingly, their result implies that the cost of using AFTA is higher than the benefit from obtaining the preferential treatment when the difference between the MFN tariff rate and the preferential AFTA tariff rate is small. Similar to above mentioned research Okabe and Urata (2013) utilized preferential margin, defined as the difference between the MFN rates and preferential tariff rate under the CEPT scheme as an explanatory variable of gravity model [25]. They investigated the effects of tariff reduction under the CEPT scheme for 52 products of nine ASEAN members in 1980–2010. As the result, they found positive and significant trade creation effects from tariff reduction for a wide range of products, while the elasticity of tariff reduction on imports tends to be much larger than that on exports. Also, trade creation effects for Singapore and newer ASEAN members such as Cambodia and Viet Nam were very low. It may be because the preferential tariff margin of Singapore had already been zero in almost all products. As for newer ASEAN members, the little impact of tariff reduction could be due to both small shares of regional trade of these countries and the subsequent tariff elimination schedule. Although very few studies on the impact of tariff reduction under AFTA exist, it could be argued that tariff reduction under AFTA has a positive impact on regional trade in products where

the difference between the MFN tariff rate and AFTA tariff rate is big, and on regional trade between countries trading in relative large volumes. However, the impact on trade flow is not so strong basically. Also, the effect of tariff reduction under AFTA on newer members is limited. Based on these results, tariff reduction under AFTA is not necessarily the most important measure to promote region-wide trade. To promote region-wide trade in ASEAN and to make AFTA contribute to raising the economic welfare of all member countries, other measures such as trade facilitation, reduction of non-tariff measures (NTMs), and coordination of rules of origin (RoO) as well as improvement of AFTA utilisation should be examined carefully (Table 1).

Table 1. Results of studies on the impact effect of ASEAN or AFTA.

Authors (year)		Methodology	Data	Trade creation, estimated coefficient (elasticity)
Endoh (1999)	ASEAN dummy	Cross-section analysis, by pooled data	80 countries, 1960–1994	0.589–0.778 (80%–117%)
Carrère (2006)	ASEAN dummy	GL and Hausman-Taylor estimation, panel data	130 countries, 1962–1996	0.64–2.02 (90%–653%)
Elliot and Ikemoto (2004)	AFTA dummy	Cross-section analysis by pooled data	34 countries, 1983–1999	0.35–2.03 (42%–661%)
Kien (2009)	AFTA dummy	Hausman-Taylor estimation with two-way components	39 countries, 1988–2002	0.626 (87%)
Bun, Klaasen, and Tan (2009)	AFTA dummy *time trend	Panel data approach with country-pair specific time trends	217 countries, 1948–1997	0%–9% annually in average
Manchin and Pelkmans-Balaoing (2007)	AFTA Tariff rate	Panel data with time-varying country fixed effects	217 countries, 2001–2003	0.19–0.96% change when preferential margins are from 25% to 60%
Okabe and Urata (2013)	AFTA tariff rate	Hausman Taylor estimation	52 sectors, 193 countries 1980–2010	0.36% for export, 0.38% for import

ASEAN+1 FTAs. The impact of five ASEAN+1 FTAs, which already have been in force, and other broader region-wide FTAs, such as RCEP which is in the process of negotiation, is one of the most interesting issues in EA. A number of ex-ante studies of simulation analysis apply a CGE model on the impact of these region-wide FTAs. Estrada et al. (2011) compared the impact of ASEAN+China, Japan, and Korea FTA (hereafter ASEAN+3 FTA) and existing ASEAN+1 FTAs on the economic welfare of member countries by using the Global Trade Analysis Project (GTAP) model [26].

They found that ASEAN+3 FTA has the advantage of feasibility and desirability for ASEAN members and China, Japan, and Korea. Ando (2009), using the GTAP model, investigated the impact of (a) ASEAN+3 FTA; (b) ASEAN+Australia, China, India, Japan, Korea, and New Zealand FTA (hereafter ASEAN+6 FTA); and (c) FTA between APEC members [27]. Her simulation model with various trade and investment facilitation and technical assistance indicates that the larger the number of member countries, the more positive is the impact on the economic welfare of each member country. Itakura (2013) applied a dynamic GTAP model to capture cross-border investment for the long-term effect of FTAs, and demonstrated that welfare gain from ASEAN+6 is larger than that from ASEAN+3 [28]. He also clarified that the welfare gains for each member country are larger when service trade barrier is reduced and trade cost of time are reduced than when only tariff is eliminated. It follows from these ex-ante studies on region-wide FTAs in East Asia that trade liberalisation not only by tariff elimination but also by other measures as trade and investment facilitation, trade cost reduction, and service trade liberalisation is accelerated and increases the positive effect of FTAs to raise the economic welfare of member countries.

In addition to simulation by CGE model, several studies attempted to predict the impact of ASEAN+1 FTAs by using some trade indices or by estimation using trade data. Sheng et al. (2012) estimated a gravity model using intra-industry trade flow data in parts and components during 1980–2008, and the predicted trade creation effect on intra-industry trade under ASEAN–China FTA (hereafter ACFTA) based on actual 2008 data [29]. They found that ACFTA will have a substantially larger impact on trade flows between members particularly based on close international production linkages while the positive impact will be spread unevenly among ASEAN countries. By using trade indices, such as trade intensities and trade potential index, several studies attempted to estimate adequacy and predicted impact by sector. Bano et al. (2013) calculated the trade intensities between New Zealand and ASEAN countries and the trade potential of members of the ASEAN–New Zealand FTA (hereafter AANZFTA) using trade data after the year 1980 [30]. They showed that trade intensities between members of AANZFTA have increased continuously, so the fact AANZFTA is explainable. Additionally, they drew the results of significant potential for future growth in specific export sectors by estimating potential trade between New Zealand and ASEAN across industries. Chandran (2012) discussed the impact of the India–ASEAN FTA (hereafter AIFTA) focusing on India's fishery sector by using trade indices and a comparative advantage index [31]. Based on sector analysis, he concludes that India could improve trade by tariff elimination under AIFTA with some ASEAN countries, particularly less-developed members. With regard to ex-post evaluation on ASEAN+1 FTAs, studies are few due to insufficient sample periods because these FTAs started recently. Considering the results of previous ex-ante studies, the conduct of ex-post analysis will hopefully be made to investigate the impact of various measures along with tariff elimination under ASEAN+1 FTAs. In addition, as Sheng et al. (2012) and Chandran (2012) demonstrated, examining the impact of ASEAN+1 FTAs on the growth gap among member countries and on trade flows by the industrial sector in the long term is an interesting research topic.

Bilateral FTAs in East Asia. Likewise in the cases of ASEAN+1 FTAs, ex-post studies on bilateral FTAs in East Asia are few because of limited data. Ando (2007) examined the impact of the Japan–Singapore Economic Partnership Agreement (EPA) and the Japan–Mexico EPA by applying a gravity model for trade data at the commodity level [32]. Comparing actual values to fitted values before and after the EPA's implementation, she found that the Japan–Singapore EPA has had little impact on trade, while the Japan–Mexico EPA has had a positive impact on trade, particularly on export. She reasoned that the actual reduction of tariffs by the Japan–Singapore EPA is quite limited. Also, considering additional analysis on various situations beyond trade liberalisation, she indicates that conditions beyond tariff elimination, such as business environment and EPA utilisation, are important factors to design an effective EPA for trade liberalisation.

Athukorala and Kohpaiboon (2011) examined the impact of the Thailand–Australia FTA (hereafter TAFTA), paying attention to the implications of RoOs and the utilisation of tariff preferences [33]. By linking a data set of utilisation of tariff preferences by traders to bilateral trade volumes between Australia and Thailand, they found that trade has expanded faster after TAFTA came into effect, but the impact has heavily concentrated on a few product lines in Australian imports from Thailand. They pointed out that the reason for limited impact is attributed to the rate of FTA utilisation. Hence, their result suggests that enhancing FTA utilisation is also necessary to strengthen the positive impact of FTAs. To sum up so far, similar to the result of studies on AFTA and other FTAs in East Asia, ex-post studies on bilateral FTAs also show that bilateral FTAs positively impact trade. To some extent, however, the positive impact is brought about by tariff elimination under FTAs and by other necessary conditions for trade liberalisation such as improvement of utilisation rate of preferential tariff.

2.2 Measures Other Than Tariff Elimination and Channels of FTA Effects

With the elimination of tariff under FTAs progressing, the importance of reducing NTMs, harmonizing RoOs under several cumulative FTAs in East Asia, and implementing other measures, such as trade facilitation and improvement of transport infrastructure, has been recognized increasingly. For example, ASEAN prescribes that NTMs be eliminated gradually within five years after the concessions applicable to the products. Also, ASEAN+1 FTAs - for example, ASEAN–Australia–New Zealand FTA and ASEAN–Korea FTA - include detailed guidelines on the elimination of NTMs.

A major cost of FTA utilization at the firm level comes from certificates of origin. Medalla and Balboa (2009) pointed out that the cost of RoOs immediately impacts FTA utilization [34]. Therefore, efficient administration of RoOs is an important factor in facilitating trade creation under FTAs by increasing the utilisation rate of FTAs. Cadot, de Melo, and Portugal-Perez (2006) found that a 10% point reduction of the local value content requirement increases the utilisation rate by between 2.5 and 8.2% points by using trade data between the European Union and the Generalized System of Preferences and the Africa, Caribbean and Pacific partners [35]. Also, Carrère and de Melo (2004) identified the difference of compliance cost of RoOs by using Mexican

export to the United States under North American Free Trade Agreement (NAFTA), and found that the largest compliance cost is caused by a technical requirement, and then a regional value content, and a change of tariff classification [36]. Medalla and Balboa (2009) examined the various design and implementation practices in RoO regimes, focusing on RTAs where ASEAN is involved [34]. Likewise, Medalla (2011) compiled a database on the RoOs of AFTA, ASEAN+1 FTAs, and bilateral FTAs forged by Japan with ASEAN members [37]. Hayakawa and Laksanapanyakul (2013) constructed a list of RoOs in Thailand of ACFTA, AKFTA, and ASEAN–Japan FTA (AJCEP) to calculate a new measure on FTA liberalization [38]. Based on their list, most preference products follow a regional value contents (RVC) in the case of ACFTA and AKFTA while AJCEP sets many product-specific rules and relatively a large number of products follows “change heading or RVC” (CH/RVC) or change of chapter. Judging from these recent studies, there is a significant divergence in types of RoOs of cumulative regional FTAs in the region. Also, the restrictiveness of RoOs varies significantly depending on products and each ASEAN+1 FTA.

To enhance trade creation effects under FTAs by reducing the FTA utilisation costs, it is reasonable to suppose that RoOs should be simple and less restrictive. In addition, convergence of all RoOs under FTAs in East Asia where six multilateral regional FTAs and many bilateral FTAs coexist is necessary to raise the utilisation rate of both existing FTAs and the region-wide FTA being formed. Hayakawa and Laksanapanyakul (2013) examined the impact of RoOs on FTA utilisation rate by using Thai export data under ACFTA and AKFTA [39]. They found that the harmonisation to ‘change in tariff classification (CTC) or RVC’ among FTAs has a significantly positive effect on utilisation of multiple FTAs. Furthermore, using Thai export data to Japan under JTEPA and AJCEP, Hayakawa (2012) compared the impact of RoOs under a bilateral FTA with a multilateral FTA [40]. He found that a multilateral FTA, namely, diagonal cumulation, brings about four percent trade creation effects. The relationship between RoOs and trade flows is more complicated than that between elimination of tariff measures and trade flows. The above latest studies have unveiled gradually the impact of RoOs on trade. Their investigation clearly shows that harmonizing and conforming to unrestrictive RoOs among FTAs are necessary to facilitate trade of goods in this region.

While the importance of NTMs is recognized and most FTAs in East Asia include provisions of NTMs, there is no standard measure of NTMs among these FTAs. Several methodologies to measure NTMs are available, and each methodology has both merits and demerits. Also, NTMs have a wide range in scope from direct trade measures to indirect measures. As Deardorff and Stern (1997) remarked, “NTMs are defined by what they are not, that is NTBs consists of all barriers to trade that are not tariff” [41]. Hence, construction of quantitative data on NTMs under FTAs for empirical analysis is not an easy task.

Although ASEAN provides the NTM database of each member country at HS4 9-digit level, the data is qualitative - not quantitative - and the classification of commodities is not completely standardized among member countries. Therefore, it is not easy to utilize the database to conduct an empirical analysis. Ando and Obashi (2010) constructed a comparative and quantitative NTM database based on the ASEAN NTM database [42]. Due to the limitation of NTM data, there remain few studies on the

impact of NTMs on trade under FTAs in East Asia. Carrère and Melo (2011) reviews studies on the impact of NTMs on trade flows mainly between European Union (EU) members or Organisation for Economic Co-operation and Development (OECD) countries [43]. They found that (1) NTMs have a negative effect on the volume of bilateral trade, (2) core NTMs are more restrictive than existing tariffs, and (3) these core NTMs limit market access more for low-income countries. Taking into account the previous studies on NTMs in the world, NTMs certainly also significantly impact trade in East Asia. It is necessary to construct a comparable and quantitative database of NTMs of each member country of FTAs in this region for a detailed analysis on the impact of NTMs. Turning now to channels of FTAs' impact on trade in goods, the question of which liberalisation factors associated with FTAs have the most effective impact on trade in goods is also an important research issue. There are no empirical studies on channels of FTA impact which conduct a comparative analysis using data of all liberalisation measures - such as tariff elimination rate, NTM's reduction level, RoO index - since comparable data sets of these liberalisation measures are not available from any FTAs. Although it is not easy to build these data sets of comparable liberalisation measures under FTAs, research on channels of FTA impact on trade in goods are significant both for academic research and formation of effective FTA policy.

In addition, tariff elimination under an FTA directly affects import/export of one product and indirectly affects import/export of another product. If substantial tariff is eliminated on one product, import or export of another product which has a complementary or substitution relationship with the product could be changed. Such indirect effects of tariff elimination can be examined by ex-ante analysis using the CGE model. However, ex-post analyses on the effects of tariff elimination under an FTA have been focused solely on direct effects on import/export of each product. Although it is not easy to discern direct effects from indirect effects, a comparative analysis of the impact of tariff elimination by product using ex-ante and ex-post studies enables us to examine such direct and indirect impacts by product to an extent. Research on the direct and indirect effects of tariff elimination under an FTA is also an interesting further research issue.

3 Empirical Investigation on the FTA Impact on Trade Flows in East Asia

3.1 Econometrics Specification

Our baseline econometric specification is the one from Baier and Bergstrand (2007) but at sectoral level. Specifically, for sector k , we estimate:

$$X_{ij,t}^k = \exp[\beta_0^k + \beta_1^k FTA_{ij,t} + \beta_2^k FTA_{ij,t-1} + \beta_3^k FTA_{ij,t-2} + \eta_{it}^k + \theta_{jt}^k + \gamma_{ij}^k] + \varepsilon_{ij,t}^k, \quad \forall k$$

Here, $X_{ij,t}^k$ is bilateral trade between partners i and j of goods in class k at time t . $FTA_{ij,t}$ is a dummy variable capturing the presence of a free trade agreement between partners i and j at time t ; $FTA_{ij,t-1}$ and $FTA_{ij,t-2}$ are dummy variables capturing the presence of a free trade agreement between partners i and j with lag time 1 and 2; η_{it}^k is

a set of time-varying exporter (source) fixed effects. They control for the unobservable outward multilateral resistances and total shipments from the structural model of Anderson and van Wincoop [13]. Similarly, θ_{jt}^k is a set of time-varying importer (destination) fixed effects, which account for the inward multilateral resistances and total expenditure from the structural gravity model. Finally, γ_{ij}^k is a set of country-pair fixed effects that, following Baier and Bertrand (2007), are used to address FTA endogeneity. Following the recommendation of Santos-Silva and Tenreyro (2006), we estimate our model using the Poisson pseudo-maximum-likelihood (PPML) estimator to account for the patterns of heteroskedasticity inherent to trade data and for the prominent presence of zeroes in sectoral trade flows data. Since the model used data from the three-year period, the values of dummy variables $FTA_{ij,t-1}$ and $FTA_{ij,t-2}$ are the value to 3 and 6 years lag, respectively [44].

3.2 Data

For our investigation the database was formed based on RIETI TID 2012 and ARIC Databases for the period 1994–2012 (a three-year period) for the nine East Asian countries. For the study we used statistical data on 13 sectors, of which the classification proposed by the Japanese Research Institute of Economy, Trade and Industry (RIETI).

The List of Free Trade Agreements in East Asia was used for our assessment is following:

1. Asia-Pacific Trade Agreement (1976) - **People's Republic of China - Republic of Korea**, Bangladesh, India, Lao PDR, Sri Lanka
2. ASEAN Free Trade Area (1993) - **Indonesia - Malaysia, Philippines, Singapore, Thailand**, Brunei Darussalam, Cambodia, Lao PDR, Myanmar, Viet Nam
3. Japan-Singapore Economic Agreement for a New-Age Partnership (2002) - **Japan - Singapore**
4. People's Republic of China-Thailand Free Trade Agreement (2003) - **People's Republic of China - Thailand**
5. Japan-Malaysia Economic Partnership Agreement (2006) - **Japan-Malaysia**
6. Republic of Korea-Singapore Free Trade Agreement (2006) - **Republic of Korea-Singapore**
7. Japan-Thailand Economic Partnership Agreement (2007) - **Japan-Thailand**
8. Japan-Indonesia Economic Partnership Agreement (2008) - **Japan-Indonesia**
9. Japan-Philippines Economic Partnership Agreement (2008) - **Japan-Philippines**
10. People's Republic of China-Singapore Free Trade Agreement (2009) - **People's Republic of China-Singapore**
11. People's Republic of China-Taipei, China Economic Cooperation Framework Agreement (2010) - **People's Republic of China-Taiwan**

3.3 Results

The result of quantitative assessment leads to the conclusion that free trade agreements generally have a positive and statistically significant effect on the volume of bilateral

trade between the partner countries of the region. The evaluation (using the PPML estimation method) allows you to set the direction and degree of influence of free trade agreements on the volume of trade between the countries of East Asia (by sector) during the period 1994–2012. Table 2 shows the values of the coefficients of the dummy variables for selected FTA econometric specifications that were obtained for each of the 13 sectors. It indicates how free trade agreements affect trade between the partner countries.

Table 2. Summary of estimated coefficients of FTA's dummy variables.

Dummy variables	Sectors						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
FTA	0.014	0.545	−0.064	0.063	−0.064	−0.071	0.002
FTA-1	0.084	−0.105	−0.040	−0.069	0.151	0.029	0.050
FTA-2	0.206	0.289	0.144	0.182	0.558	0.220	0.305
const	5.434	4.929	5.545	6.115	3.119	4.348	5.290
	(8)	(9)	(10)	(11)	(12)	(13)	All
FTA	0.010	0.164	0.143	−0.158	0.123	0.090	0.065
FTA-1	0.023	0.014	−0.106	0.201	−0.013	−0.042	−0.019
FTA-2	0.107	−0.010	0.055	0.168	0.046	0.156	0.150
const	7.167	7.491	5.237	3.585	3.515	3.720	8.444

In general, countries that have concluded agreements increased volumes of bilateral exports by 6.7% ($e^{0.065} - 1 = 0.067$). Table 3 shows the parameters change (in percent) of trade flows by sector.

Table 3. Trade flows change by sector, percent.

Dummy variables	Sectors						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
FTA	1.4	72.5	−6.2	6.5	−6.2	−6.9	0.2
FTA-1	8.8	−10.0	−3.9	−6.7	16.3	2.9	5.1
FTA-2	22.9	33.5	15.5	20.0	74.7	24.6	35.7
	(8)	(9)	(10)	(11)	(12)	(13)	All
FTA	1.0	17.8	15.4	−14.6	13.1	9.4	6.7
FTA-1	2.3	1.4	−10.1	22.3	−1.3	−4.1	−1.9
FTA-2	11.3	−1.0	5.7	18.3	4.7	16.9	16.2

Free trade agreements have an impact on bilateral trade, and at the sectoral level, but failed to identify a clear time trend. For industries such as the (2) Textiles, (9) Electrical machinery, (10) Household electric appliances after a significant initial effect recession can observed. For other industries, such as (1) Foods, (5) Oil and Coal,

(6) Stone, clay, glass and concrete products, (7) Iron and steel, Nonferrous metals, the initial effect from FTA it was quite small or non-existent, but increased with time.

The coefficient on the dummy variable with a 6-year time lag (FTA-2) indicates that for most products the impact of the FTA remains significant over time. The exceptions are following sectors: (10) Household electric appliances and (12) Precision machinery, for which the value of the coefficient is positive, but not great and the industry (9) Electrical machinery, for which the coefficient is negative. We can assume that the effect of the free trade agreement on trade volumes for part or most products in these sectors exists.

The results of the model evaluation showed that the FTAs have a positive and statistically significant effect on the volume of bilateral trade between East Asian countries. In general, the countries that concluded FTAs increased bilateral export by 6.7%. FTAs had an impact on bilateral trade and at the sectoral level, but it was not possible to set a clear time trend. For such enlarged industries as textile, electrical machinery, the production of household electrical appliances, following a significant initial effect, a decline was observed. For such industries as food production, oil and coal industry, production of stone, clay, glass and concrete products, ferrous and non-ferrous metallurgy, the initial effect of FTA was quite small or nonexistent, but increased with time. Values of the estimated coefficients for a dummy variable with a 6-year time lag indicate that for most industries, the effect of FTA remains significant over time. Exceptions were the sectors of the production of household electrical appliances and precision engineering, for which the value of the coefficient is positive, but not great, and also the industry of the production of electric machines, for which the value of the coefficient is negative. This is due to the fact that the effect of FTA on trade volumes for some or most of the goods in these industries was short-lived.

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Modeling the Ruin Probability of a Non-state Pension Fund Taking into Account Risky Investments

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Abstract. The issues of financial sustainability of non-state pension Funds, which is understood as sufficiency of assets for fulfilling obligations to clients, are of great importance in the modern economy both for participants of pension programs and management of financial organization. Actuarial risks and investment policy of an organization have a significant impact on the solvency of the pension fund. The paper presents a simulation model for assessing the financial resources dynamics of a non-state pension Fund investing in risky and risk-free assets. Approbation of the model is performed on the example of two pension schemes operating in Russia: mandatory pension insurance, non-state pension insurance. The model allows estimating the financial resources of a non-state pension Fund in dynamics, collecting descriptive statistics of financial resources distributions, assessing the financial and actuarial risks of an organization. The author suggests an approach to assessing the ruin probability of a non-state pension Fund considering risky investments over a finite time. An impact analysis of the risk process characteristics of pension fund on the ruin probability is carried out.

Keywords: Non-state pension Funds · Ruin probability · Risky investments · Financial sustainability · Financial resources in dynamics

1 Introduction

Non-state pension Funds are socially-significant institutions of the modern economy. The issues of financial sustainability of non-state pension Funds (NPF), which is understood as sufficiency of assets for fulfilling obligations to clients, are of great importance in the modern economy both for participants of pension programs and management of financial organization. Monetary capital of pension Funds is formed by contributions of entrepreneurs, workers and employees, accumulated for long periods. With long-term funds, pension Funds act as investors, investing them in securities.

Thereby, actuarial risks and investment policy of an organization have a significant impact on the paying capacity of the pension fund. From the point of view of NPF, a risk represents an alleged event or a series of events, as a result of which, considering the likelihood of its occurrence and the degree of influence on the result of management of pension savings and pension reserves, the NPF will not be able to fulfill its obligations to depositors, participants, insured persons and their successors in full and on time.

A lot of scientific publications are devoted to the investment analysis of pension Funds, to identification and assessment of risks inherent in the activity of pension Funds.

From a point of view of methodology, NPF manager can use classical tools, such as portfolio investment theory or optimal management models to form an investment portfolio (Cairns [1], Deelstra et al. [2], Menoncin [3], Merton [4]). But he or she must also consider the actuarial obligations of pension Funds, the schemes for the formation of their financial capital (Blake [5], Keel and Muller [6], Wilkie [7], Wise [8]), as well as the influence of a stochastic medium (Boulier et al. [9], Haberman and Sung [10]).

As is known, funded pension schemes are different in that pension contributions are paid in advance and “work” for a certain time, generating investment income. These include defined contribution schemes (DC) and defined benefit schemes (DB). In non-funding or distribution schemes, incoming funds are immediately used to pay pensions (pay-as-you-go, PAYG). PAYG models are implemented, as a rule, within the framework of state pension insurance. The modeling of financial resources by this way was researched by Alonso-García and Devolder [11], Breyer [12], Fenge [13], Van Praag and Cardoso [14].

Defined contribution models (DC) were explored in the papers of Asch et al. [15], Haberman, Vigna [16], Piekola, Deschryvere [17], MacDonald and Cairns [18].

Management of defined benefit plans (DB) are described by Cairns [19], Josa-Fombellida and Rincon-Zapatero [20]. In these papers, a study of the financial capital of a pension fund is carried out in dynamics on the basis of optimal control models. The main goal of a company is to preserve the fund assets as close as possible to actuarial obligations including investing. Dufresne [21] had researched DB model of pension plan with a stationary population of participants and random, independent and equally distributed, relative to different years, return on investment. Limit expressions for mathematical expectations and variances of reserve and contribution for a sufficiently long, stable functioning of the pension plan were obtained on the basis of various actuarial methods in his works. Later, this model was developed for the case of dependent investment returns modeled by ARMA processes (Bédard and Dufresne [22], Haberman and Wong [23]).

The papers by Devolder [24] are devoted to the issues of investment activity optimizing of pension funds in a stochastic market. So in his work the pension plan with the determined payments is considered, where the benefits are paid by the annuity. The author sets and solves the problem of finding the best investment policy for assets that provides pension obligations throughout the lifetime of the plan participant, before and after retirement. Later research [25] takes into account the stochastic nature of the population’s mortality in the formation of a strategy for investing in risky and risk-free assets. The author presents optimization models of investment activity on the basis of which it is proposed to manage assets and liabilities within the framework of the asset-liability management approach (ALM).

In the above works, Markov models of the diffusion type and optimal control models are used to model the financial resources of pension funds and to form an investment portfolio, as a rule. In this case, fairly strict limitations on the model parameters are imposed. For example, the prices of risky assets have to satisfy the stochastic Black-Scholes model, stochastic components are described by the Wiener process, and constraints on the distribution laws of the models parameters are imposed.

The method of simulation, which is proposed by the authors of the article, is less demanding of the parameters included. General principles of the imitation models for insurance and pensions are described in the work of (Daykin et al. [26]). Sholomitsky [27] proposed an imitation actuarial model for estimating cash flows for a contingent pension program, as well as conducted a cost-effectiveness study of various funding schemes. However, the proposed model does not allow the combination of different types of pension schemes implemented by non-state pension Funds. In addition, the model has limitations that make it impossible to apply it in practice: the only reason for leaving the population is mortality; the only type of pension is old-age pensions paid from the retirement age, the same for men and women, the same annual salary of participants in the scheme, investment only in risk-free assets.

The papers' analysis in the field of assessing and modeling the risks of pension Funds allows us to conclude that the authors of scientific papers do not pay sufficient attention to practical aspects of assessing and modeling the solvency of non-state pension Funds, due to existence of several simultaneously functioning pension schemes (in particular, DB and DC) the stochastic nature of income and outflow of funds, fluctuations in the number of pension schemes participants, the return of risky assets.

The paper proposes an imitation model for assessing the financial resources dynamics of a non-state pension fund, considering investment in risky and risk-free assets, which allows estimating the financial resources of a non-state pension fund in dynamics, collecting descriptive statistics of financial resources distributions, assessing the sufficiency of the company's funds to fulfill its obligations to clients on the basis of statistical data on contributions and payments on different types of contracts, the dynamics of the number of clients, as well as assets return. An approach is proposed to assess the ruin probability of a non-state pension fund over a finite time, taking into account risky investments, where the concept of "ruin" means excess of payments over revenues and reserves. The impact analysis of the risk profile of the pension fund on the ruin probability is carried out.

2 Model Description

NPFs perform the role of insurers in compulsory pension insurance, managing the means of mandatory pension savings. Financial resources of NPFs are formed at the expense of insurance contributions of participants in pension schemes and investment of pension savings. The outflow of financial resources is due to the fulfillment of fund's obligations. Payments on insurance liabilities occur after the client reaches retirement age or a state of health that does not allow him to continue working. We adapt the simulation model given in [28] to the activity of NPF.

Financial resources of NPF at the current time t ($t = 0, 1..T$), where T – period of modeling, depends on accumulated financial resources in the previous period, inflation, return on investment in risky and risk-free assets. The funds outflow is due to payment of obligations. The inflow of funds is formed by insurance premiums and investment income. The financial resources of NPF will be formed as an algebraic sum of the current value of cash flow to the current time and current cash transactions.

Suppose investment portfolio of NPF $pf = (a_0, a_1, \dots, a_n)$ is formed by one risk-free asset, the share of which in portfolio is a_0 and n types of risk financial assets, which shares equals $a_j, j = 1, 2..n$ accordingly. Then, assuming stationarity of receipt of funds, payments and yields of stock prices, the model for estimating the financial resources of NPF at the time t takes the following form

$$Y_t = \frac{Y_{t-1} \left(1 + a_0 r + \sum_{i=1}^n a_i w_i \right)}{(1+d)} + \sum_{i=1}^m \sum_{j=0}^{M_t^i} D_t^{i,j} - \sum_{i=1}^p \sum_{j=0}^{N_t^i} R_t^{i,j}, Y_0 = u, t = 1, 2..T, \quad (1)$$

$$\sum_{j=0}^n a_j = 1, a_j \geq 0, j = 0, 1..n, \quad (2)$$

where Y_t - financial resources of NPF at the time t ;

u - financial resources of NPF the initial time point of the study period;

r - rate of increase for risk-free assets;

d - discount rate (inflation);

a_0 - share of investment in risk-free assets;

a_i - share of investment in risky assets $i = 1, 2..n$;

w_i - rate of increase in risky assets;

m - number of insurance contribution types;

M_t^i - number of contribution for i type ($i = 1, 2..m$) received at the time t ;

$D_t^{i,j}$ - income volume from insurance contributions i type ($i = 1, 2..m$), received at t time ($j = 0, 1.. M_t^i$);

p - number of payments types on pension liabilities;

N_t^i - number of pension payments i type ($i = 1, 2..p$) received at t time;

$R_t^{i,j}$ - amounts of payments on pension liabilities i -type ($i = 1, 2..p$), received at t time ($j = 0, 1.. N_t^i$).

Probability of impurity in a finite period of time $(0, T]$ with initial capital u will be defined as follows:

$$\varphi(u, T) = P(Y_t > 0, \forall t = 1, 2..T / Y_0 = u) \quad (3)$$

Ruin probability in a finite period of time $(0, T]$ this is the probability of the opposite event:

$$\psi(u, T) = 1 - \varphi(u, T) \quad (4)$$

Let us analyze the structure of NPFs money resources, typical for Russia. The NPF operates on the basis of two funding schemes - DB and DC in the framework of mandatory pension insurance (MPI) and non-state pension provision (NSPV). The outflow of funds is due to:

- one-off payments on retirement for old age or disability, paid at the request of the participant in the scheme of the MPI;
- payments of funded pensions under MPI agreements (pension benefit) and NSPV, payments can be urgent or lifelong, depending on the terms of the specific contract;
- transfers of savings funds from MPI to other pension Funds, which is permitted under Russian legislation to be carried out at the request of the participant of the pension scheme once a year (made in March);
- payments to successors under the MPI and heirs of NSPV of accumulated funds in case of death of schemes participants of retirement age or in the framework of unfinished fixed-term contracts of pensioners;
- payments of accumulated funds under agreements of NSPV in the event of their termination.

The main inflow of financial resources to the fund is due to:

- receipt of contributions by MPI (under the Russian legislation this type of income is not temporarily implemented, but in the model this possibility is taken into account, as it is stipulated in the existing pension schemes);
- transfers of accumulated MPI funds from other sources, made in March;
- income from NSPV;
- investment income.

Considering the presented flows, the model (1) takes the form:

$$\begin{aligned}
 Y_t = & \frac{Y_{t-1} \left(1 + a_0 r + \sum_{i=1}^n \alpha_i W_i \right)}{(1+d)} + \sum_{i=1}^{M_t^{C MPI}} C MPI_t^i + \sum_{i=1}^{M_t^{h MPI}} in MPI_t^i + \sum_{i=1}^{M_t^{C NSPV}} C NSPV_t^i - \sum_{i=1}^{N_t^{O PMPI}} O PMPI_t^i \\
 & - \sum_{i=1}^{N_t^{P BMPI}} P BMPI_t^i - \sum_{i=1}^{N_t^{P BNSPV}} P BNSPV_t^i - \sum_{i=1}^{N_t^{out MPI}} out MPI_t^i - \sum_{i=1}^{N_t^{emp Ps MPI}} emp Ps MPI_t^i - \sum_{i=1}^{N_t^{pen Ps MPI}} pen Ps MPI_t^i \\
 & - \sum_{i=1}^{N_t^{bef Ph NSPV}} bef Ph NSPV_t^i - \sum_{i=1}^{N_t^{pen Ph NSPV}} pen Ph NSPV_t^i - \sum_{i=1}^{N_t^{T NSPV}} T NSPV_t^i, t = 1, 2..T,
 \end{aligned} \quad (5)$$

$$\sum_{j=0}^n a_j = 1, a_j \geq 0, j = 0, 1..n, \quad (6)$$

$$N_t^{emp Ps MPI} = F1(M_t^{C MPI}), N_t^{pen Ps MPI} = F2(N_t^{P BMPI}), t = 1, 2..T, \quad (7)$$

$$N_t^{bef Ph NSPV} = F3(M_t^{C NSPV}), N_t^{pen Ph NSPV} = F4(N_t^{P BNSPV}), t = 1, 2..T, \quad (8)$$

$$N_t^{new P BMPI} = G1(M_t^{C MPI}, L, K) + H1(M_t^{C MPI}), t = 1, 2..T, \quad (9)$$

$$N_t^{newPBNSPV} = G2(M_t^{CNSPV}, L, K) + H2(M_t^{CNSPV}), t = 1, 2..T, \quad (10)$$

$$M_{t+1}^{C MPI} = M_t^{C MPI} + M_t^{newMPI} + M_t^{inMPI} - N_t^{outMPI} - N_t^{empPsMPI} - N_t^{newPB MPI}, \quad (11)$$

$$t = 0, 1..T - 1,$$

$$N_{t+1}^{PB MPI} = N_t^{PB MPI} + N_t^{newPB MPI} - N_t^{OP MPI} - N_t^{penPsMPI} - N_t^{endMPI}, t = 0, 1..T - 1, \quad (12)$$

$$M_{t+1}^{CNSPN} = M_t^{CNSPV} + M_t^{newNSPV} - N_t^{TNSPV} - N_t^{befPhNSPV} - N_t^{newPBNSPV}, t = 0, 1..T - 1, \quad (13)$$

$$N_{t+1}^{PNSPVI} = N_t^{PBNSPV} + N_t^{newPBNSPV} - N_t^{penPhNSPV} - N_t^{endNSPV}, t = 0, 1..T - 1, \quad (14)$$

$$Y_0 = u, M_0^{C MPI} = M^{C MPI}, M_0^{PB MPI} = M^{PB MPI}, M_0^{CNSPV} = M^{CNSPV}, M_0^{PBNSPV} = M^{PBNSPV}, \quad (15)$$

where

$C MPI_t^i$ – amount of incoming contribution to MPI at time t ($i = 1, ..M_t^{C MPI}$), $M_t^{C MPI}$ – number of contributions received by MPI at time t ;
 $inMPI_t^i$ – remittances amount of accumulated MPI funds from other funds at time t ($i = 1, ..M_t^{inMPI}$), M_t^{inMPI} – number of transfers of MPI funds from other funds at time t ;
 $CNSPV_t^i$ – amount of incoming contribution for NSPV at time t ($i = 1, ..M_t^{CNSPV}$), M_t^{CNSPV} – number of incoming contributions for NSPV at time t ;
 $OP MPI_t^i$ – amount of non-recurring payments from MPI at time t ($i = 1, ..N_t^{LSP MPI}$), $N_t^{LSP MPI}$ – number of non-recurring payments from MPI at time t ;
 $PB MPI_t^i$ – amount of payment of funded pension within MPI at time t ($i = 1, ..N_t^{PB MPI}$), $N_t^{PB MPI}$ – number of pensioners receiving a pension in the framework of MPI at time t ;
 $PBNSPV_t^i$ – amount of funded pension payment for NSPV at time t ($i = 1, ..N_t^{PBNSPV}$), N_t^{PBNSPV} – number of pensioners receiving a pension under NSPV contracts at time t ;
 $outMPI_t^i$ – amount of accumulated funds transfers MPI to other funds at time t ($i = 1, ..N_t^{outMPI}$), N_t^{outMPI} – number of accrued transfers of MPI funds to other funds at time t , $N_t^{outMPI} = 0$ if t is not march;
 $empPsMPI_t^i$ – amount of payments to legal persons of able-bodied age participants in MPI scheme at time t ($i = 1, ..N_t^{empPsMPI}$), $N_t^{empPsMPI}$ – number of dead participants in MPI scheme of working age at time t ;
 $penPsMPI_t^i$ – amount of payments to eligible retirees, participants in MPI scheme at time t ($i = 1, ..N_t^{empPsMPI}$), $N_t^{empPsMPI}$ – number of dead participants in the pension scheme of pensioners at time t ;
 $befPhNSPV_t^i$ – amount of payments to heirs of persons of pre-retirement age, participants in NSPV scheme at time t ($i = 1, ..N_t^{befPhNSPV}$), $N_t^{befPhNSPV}$ – number of dead participants in NSPV scheme of pre-retirement age at time t ;

$penPhNSPV_t^i$ – amount of payments to heirs of pensioners, participants NSPV scheme at time t ($i = 1, \dots, N_t^{penPhNSPV}$), $N_t^{penPhNSPV}$ – number of dead pensioners, participants in NSPV scheme at time t ;

$TNSPV_t^i$ – amount of payments to dissidents of NSPV contracts at time t ($i = 1, \dots, N_t^{TNSPV}$), N_t^{TNSPV} – the number of terminated NSPV contracts at time t ;

M_t^{newMPI} – number of workers of able-bodied age contracting MPI at time t ;

$M_t^{newNSPV}$ – number of workers of able-bodied age contracting NSPV at time t ;

M_t^{endMPI} , $M_t^{endNSPV}$ – number of contracts concluded at time t , in connection with the fulfillment of obligations by the fund in full under the term contracts of MPI and NSPV respectively;

$F1(X)$, $F2(X)$, $F3(X)$, $F4(X)$ – functions reflecting mortality of the corresponding category of participants in the schemes among X persons;

$G1(X, L, K)$, $G2(X, L, K)$ – functions reflecting the number of retired in relevant category of scheme participants among X persons, L and K – age of retirement of men and women;

$H1(X)$, $H2(X)$ – functions characterizing the number of participants who have moved to the category of pensioners for reasons not related to the achievement of the retirement age, such as disability, are assessed on the basis of statistical information of the organization or a region, are modeled by the inverse function method.

The functions $F1(X)$, $F2(X)$, $F3(X)$, $F4(X)$, $G1(X, L, K)$, $G2(X, L, K)$ are constructed on the basis of actuarial principles [29], based on distribution tables of X persons by age according to the organization's statistical data (if sufficient data are available) or the region (based on statistical compilations).

The model parameters characterizing return on assets, the size and amount of contributions and payments are assumed to be stationary random variables and modeled by the inverse function method on the basis of empirical distribution function constructed from the statistical data of the analyzed company. Correlation between assets can be made by the method described in the paper [30].

The authors developed a software tool that allows you to assess the financial resources of a non-state pension fund in dynamics using the Monte Carlo method, as well as to estimate the ruin probability in a finite period of time $(0, T]$ using expression (4).

3 Model Approval (Modeling Exercise)

Let us analyze the financial resources dynamics of NPFs on the basis of statistical data on the amounts of payments, payments volume, amount of incoming funds, statistical data on the returns of risky assets. The statistical data are collected for the period from 01.2016 to 12.2017. The assets of financial management company ($a1$) as well as shares of Apple ($a2$) and Adobe Systems Incorporated ($a3$) are chosen as risky assets for by way of example. The yield of risk-free investment is 7% per annum, the inflation rate is 4% per year. The simulation is carried out for the period 01.2018 ($t = 1$) to 06.2019 ($t = 18$) monthly. Calculations were made with the following values of the initial parameters: $Y_0 = 15000$ ths. rub., $M_0^{CMPI} = 126819$ people, $M_0^{PBMPI} = 20926$ people, $M_0^{CNSPV} = 385$ people, $M_0^{PBNSPV} = 600$ people.

Analysis of the distributions laws for NPF financial resources, calculated for a different number of simulations, presented that 50,000 simulations are sufficient to achieve 0.01 - a specified degree of accuracy. Conducting of the retrospective prediction has showed that the model adequately describes the dynamics of NPFs financial resources. The relative deviation of the financial resources from the expectation values of the modeled process is not more than 0.01.

Based on the results of the modeling exercise, a distribution analysis was made for the random variables “Financial resources of NPFs at time t ” when investing funds in the assets portfolio in the ratio $pf = (0.6; 0.246; 0.026; 0.128)$. The graphs of frequency distribution of NPFs financial resources, for example, for $t = 4$ month and $t = 16$ month, are shown in Fig. 1.

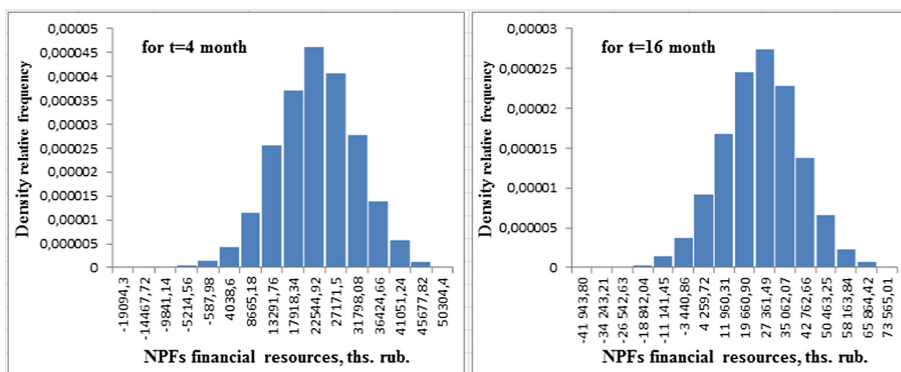


Fig. 1. The schedule of empirical distribution density of NPFs financial resources.

Estimates of the distribution parameters for the amount of NPFs financial resources at different times and ruin probability, obtained as a result of modeling for the cases: without investment; when investing in a portfolio of assets in a ratio $pf = (0.6; 0.246; 0.026; 0.128)$ are presented in the Table 1.

Table 1. The results of modeling of NPF funds and ruin probabilities at different times, while $d = 0.0033$, $r = 0.0058$, $u = 15000$ ths. rub.

Time point t , month	Estimates of mathematical expectation Y_t , ths. rub.		Estimates of mean-square deviation Y_t , ths. rub		Ruin probability $\psi(u, t)$	
	No investing	With investing	No investing	With investing	No investing	With investing
1	18155,99	18199,11	2482,941	2488,990	0,0008	0,0007
2	20980,65	21154,00	3559,455	3464,910	0,0017	0,0010
3	17856,47	18151,84	8414,432	8417,954	0,0199	0,0167
4	20250,07	20567,32	8661,824	8745,055	0,0222	0,0197
5	22309,06	22704,09	8895,434	9053,486	0,0231	0,0213
6	24100,54	24580,74	9188,752	9295,223	0,0248	0,0224
7	25610,79	26179,78	9473,529	9601,919	0,0259	0,0235
8	26809,70	27513,14	9736,542	9825,581	0,0268	0,024

(continued)

Table 1. (continued)

Time point t , month	Estimates of mathematical expectation Y_t , ths. rub.		Estimates of mean-square deviation Y_t , ths. rub		Ruin probability $\psi(u, t)$	
	No investing	With investing	No investing	With investing	No investing	With investing
9	27721,09	28565,35	9980,488	10144,23	0,0275	0,0247
10	28366,33	29295,76	10276,54	10457,64	0,0281	0,0251
11	28721,63	29793,7	10590,56	10815,31	0,0295	0,0262
12	28750,37	29955,76	10951,12	11139,50	0,0312	0,0277
13	28492,04	29845,85	11258,9	11539,47	0,0326	0,0297
14	27996,13	29474,55	11649,93	11913,88	0,0354	0,0314
15	21489,49	23067,59	14079,94	14188,32	0,0827	0,0679
16	20593,77	22254,09	14389,88	14585,11	0,0974	0,0829
17	19405,84	21123,03	14792,88	14964,34	0,1169	0,1000
18	17903,42	19738,06	15175,50	15427,98	0,1409	0,1174

By results it is visible, that the value of ruin probabilities at investment of financial assets is higher, than in case of no investment and the difference grows with time. The sharp decline in NPF funds corresponding to March ($t = 3$, $t = 15$) is due to a sharp outflow of money regarding the transfer of savings funds under mandatory pension insurance to other funds significantly exceeding the amount of revenues. Besides, due to temporary restrictions on the replenishment of MPI funds, the number of pensioners on mandatory pension insurance has been increasing over time, while the number of able-bodied participants in MPI scheme has been reduced, which leads to a decrease in financial resources, starting from the moment $t = 14$.

Let's analyze how the initial parameters of the model affect the probability of the company's ruin. In particular, we will estimate the influence of the pensioners' number in MPI and NSPV schemes on the ruin probability for the period under study. The graphs of relationship between ruin probability and the initial number of pensioners in MPI and NSPV are presented in Fig. 2.

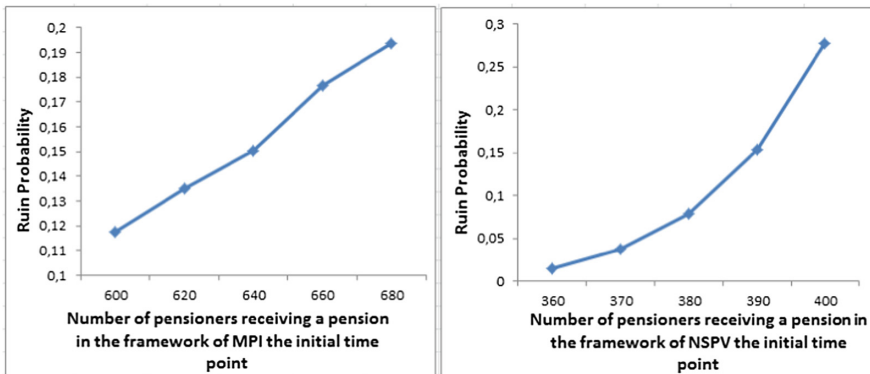


Fig. 2. Dependence of ruin probability on number of pensioners receiving a pension in the framework of MPI and NSPV schemes the initial time point, with fixed values of the other parameters of the model.

The analysis showed a high sensitivity of ruin probability to the parameter of the number of pensioners in NSPV. This is due to a small number of participants in the NSPV scheme of pre-retirement age. The number of pensioners in MPI scheme also has a strong effect on the probability of ruin.

4 Conclusion

The paper suggests a simulation model for assessing the financial resources dynamics of a non-state pension fund, which allows considering several simultaneously functioning pension schemes, as well as the stochastic nature of the receipt and outflow of funds, fluctuations in the number of participants in pension schemes, and the returns of risk assets. The model allows assessing the financial resources of a non-state pension fund in dynamics, collecting descriptive statistics on the distribution of financial resources based on statistical data on contributions and payments for different types of contracts, the dynamics of the clients' number, and the returns on assets. An approach is proposed to assess the ruin probability of a non-state pension fund over a finite time, considering risky investments, which allows assessing sufficiency of the company's funds for fulfilling obligations to customers. Approbation of the model is performed on the example of two pension schemes operating in Russia: mandatory pension insurance, non-state pension insurance. The influence analysis of the number of pensioners in various pension plans on the probability of NPF ruin is carried out.

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The Concept of Health Protection in International Law

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Abstract. The authors analyze the content of the concept of “health protection” in international law, taking into account the fundamental importance of the right to health in the system of basic human rights. There is a lack of a uniform interpretation of this term, as well as a difference in the approaches to its understanding in the most important regulatory legal acts, which creates certain difficulties for law enforcement practice. In addition, the interpretation of the concept of “health protection”, according to the authors, is of decisive importance in the process of legal consolidation of the fundamental human right in the field of health, and also determines the meaning of the entire health care of states and their cooperation in this area.

In the context of the topic of their research, the authors analyze the content of the most important international instruments that perpetuate the right to health. The content of the concept of “health protection” is investigated by the authors both from the standpoint of legal dogmatic (normative content) and from the point of view of its actual filling as a set of measures provided by the state. It is concluded that despite the differences in the definitions of the concept of “health protection” existing in international instruments, as well as its absence in the main act of international level, which secures socio-economic human rights - the International Covenant on Economic, Social and Cultural Rights, health protection in its legal nature is a specific mechanism allowing to achieve the realization of the right to the “highest attainable level” of health, which is proclaimed in this act as the basis of future.

Keywords: The right to health · Health protection · Medical care · Health protection as a right · Health protection as a set of measures · The fundamental human right in the field of health · Health

1 Introduction

The growing role and importance of international law in the regulation of health care issues has actualized the need to improve the legal mechanism for international cooperation in this field. In the course of decades, this mechanism has accumulated a number of conceptual problems that over time have significantly influenced the effectiveness of joint activities of states in the field of health protection. Thus, the active use of the norms of international legislation in the practice of health care has exacerbated the problem of the legal content of the basic terms by which international obligations establish the state’s obligations in the field of health. Even the very notion

of “health protection” in international law is treated differently. Moreover, there is a marked difference in approaches to understanding it in the most important acts of international law, which complicates law-making and law enforcement activities in the field of health care, not only at the international level, but also at the level of individual states, taking into account the growing importance of international standards for national health systems.

It seems to the authors of this article that the international community needs to develop a common understanding of health protection as a set of measures aimed at ensuring health as a social good. The achievement of certainty in this issue is also dictated by the needs of ensuring basic human rights, since the interpretation of the concept of “health protection”, in our opinion, is of decisive importance in the process of legal consolidation of the fundamental human right in the field of health, and also determines the meaning of all public health activities of states and their cooperation in this domain.

Our article will consider the development of international legal cooperation in the field of health protection, the historical and ideological aspects of this activity, since there is no doubt that the formation of a modern understanding of health protection in international law was influenced by the peculiarities of the formation of an interstate system of cooperation in the field of public health. This process influenced the ideology of international health activities, including the approaches of the international community to the definition of the legal content of the concept of “health protection”. In addition, the provisions of the main international instruments that formulate the notion of health protection will be analyzed, which will allow us to clarify its content as a term of international law.

The work of the authors was based on the use of methods of comparative analysis, theoretical generalizations, formal-legal and others.

1.1 Health Protection as a Subject of International Legal Cooperation: Historical and Ideological Aspect

The industrial revolution of the 19th century, as a milestone in the development of world civilization, gave rise to a number of problems that go beyond national jurisdiction. One of these problems was the acute need for international cooperation of states on public health issues, as these issues became increasingly important as economic exchange and international trade developed.

One of the tools for solving the above-mentioned problem was the legal instrument, since it was the one of the most suitable instrument for organizing coordinated activities of states in the field of health protection. Thus, the role of international law in health protection has significantly increased as an instrument allowing to unite the efforts of various states on the basis of the development of common goals, rules and principles of activity.

The first attempts to organize international cooperation in the field of health protection were undertaken in 1833 by the ruler of Egypt, Mehmet Ali, who established the Consular Commission on Health. In 1839, the meeting of this commission took place in Constantinople [1]. The next step in this area was the organization a series of international conferences on sanitation, the first of which took place in 1851 in Paris.

The result of these conferences was the drafting of several international sanitary conventions, as well as the organization of the Permanent International Commission on the Epidemic [2]. It should be noted that not all researchers are inclined to perceive the first international conferences on sanitation as measures aimed at actually protecting health. In their opinion, these conferences were dictated by needs of a purely utilitarian (economic) nature and did not set as their main goal the protection of health as such. As the well-known specialist in international healthcare, Roskam Ebint, said, these conferences were aimed at protecting Europe from “exotic epidemics,” which among other things also “hamper the development of international trade” [3]. Fidler pointed to the economic background of these conferences [4]. One way or another, one cannot deny the fact that the conventions adopted at the first international sanitary conferences objectively served the interests of protecting the public health from infectious diseases, and they cannot be underestimated. With regard to the economic conditionality of the first international sanitation conferences, then, in passing, let us say that this trend is also taking place in modern international health practice. At the same time, no one calls into question the necessity and expediency of preserving and improving human health, regardless of the motives of this activity.

At the international conference on sanitation in 1903, it was decided to establish a permanent international health organization, which began its work in 1907 after the signing of the corresponding agreement by twelve countries including Russia. This organization was called Office International d'Hygiene Publique and its task were to improve the methods of combating infectious diseases and to disseminate information about them.

It should be noted that in the next few decades cooperation in the fight against infectious diseases has become a notable area of international diplomacy. The legal expression of this activity was the conclusion of a large number of multilateral agreements in the field of interaction with infectious diseases, which by the early 1950s there were already more than two dozen.

Turning to the question of the ideology of international cooperation in the field of health care, we should perhaps admit that initially - throughout the entire 19th century, cooperation in this area was indeed carried out within the framework of other, broader areas of activity, from the point of view of goal-setting. The main goal of international cooperation at the moment was harmonization of national restrictive (quarantine) measures, which was a necessary condition for the normal functioning of the international trading system. With the beginning of the XX century, the situation is changing, and the subject of international legal cooperation of states is already the protection of health. From a purely legal position, the starting point in this process can be considered the Intergovernmental European Conference on Rural Life, held in Madrid in 1931. The resolution of this conference spoke directly about improving the health of the population as the main goal of any healthcare system: “An effective public health system that organizes medical services in such a way that the entire population can enjoy all the achievements of modern medicine in order to improve its health, detection and treatment of diseases in their initial stage” [5].

The international legal cooperation of states in the field of health protection received a great impetus after the Second World War, with the development of the concept of human rights and its subsequent transformation into a general paradigm of

world development. Recognition of health as one of the universal human rights stimulated the activities of international organizations in the field of health and undoubtedly affected the practice of public health in individual states. It was the implementation of the above-mentioned law that became the ideological basis of international cooperation in the field of health protection.

For the first time, human rights as the basis of international cooperation in the field of health were named in the resolution of the World Health Assembly “Global Strategy for the Prevention and Control of AIDS” [6]. It spoke about the need to respect the human rights of HIV-infected people. From that moment, the international public health strategy began to affirm the idea that health and human rights are interrelated concepts that impose corresponding obligations on states [7]. This ideology was implemented in a number of WHO programs implemented in the late 90s and early 2000s, such as the Health and Human Rights initiative, health for all by the year 2000, and others. In addition, the philosophy of international cooperation in the field of health protection, based on the fullest possible realization of the right to the “highest attainable standard of physical and mental health” (Article 12 of the International Covenant on Economic, Social and Cultural Rights (ICESCR)) [8] has led to an increased role in this the interaction of organizations such as the Committee on Economic, Social and Cultural Rights, the International Labor Organization, the Council of Europe, the European Union, the World Trade Organization, the International Monetary Fund and others that brought health problems on a much higher level. At present, it can be quite definitely said that health issues to some extent affect all areas of international legal cooperation and constitute an important aspect of the activities of most of the world’s and regional organizations.

At the same time, it should be noted that in the modern world, state cooperation in the field of health protection is implemented not only within the framework of the human rights paradigm, but also within the framework of an economically conditioned concept, when a higher level of health is seen as a condition for higher labor productivity. The establishment of the WHO Commission on Macroeconomics and Health confirms this. Thus, the ideology of healthcare activities at the international level during the 19th and 20th centuries made a unique twist - beginning its development under the influence of trade and economic needs, it was then transformed into an ideology (and, accordingly, into activity) that was purely humanistic, aimed at reaching the highest possible standards health as a human right, and then again starting to take into account the interests of economic development.

It seems to the authors of this article that the above-mentioned “twist” of the ideology of health was objectively conditioned by the successes of medical and other sciences that significantly influenced the general philosophy of international legal cooperation in this field. The priorities of international health care began to change, the correlation of public and personal interest in health protection changed. Judge for yourself: control over the “traditional” infectious diseases of the previous centuries, made possible by the success of microbiology in the 20th century, made it possible to shift the attention of the world medicine from the protection of public health exclusively to the questions of the individual state of a person. It was the increased opportunities of medicine that made it possible to recognize health as one of the fundamental subjective human rights, which in turn stimulated research in the field of

individual health (i.e., the huge number of noncommunicable diseases that are a scourge of modern mankind). On the other hand, revolutionary advances in the field of genetics at the turn of the 20th century again exacerbated the public interest in health, which led WHO and other international organizations to return to protecting public health as a priority area for their activities.

1.2 Health Protection as a Legal Category: Doctrinal and Legislative Approaches

Recognition by states of their responsibility for the health of citizens, as well as their duty to carry out certain actions that enable citizens (by the authors) to be healthy, led to the establishment at the international level of a legally enforceable right, which in its most general form can be characterized as the fundamental rights in the field of health. The wording “the fundamental human right in the field of health” is conditional, since this law, both in international and national legislation, is established through terms with very different legal content. The latter circumstance, in fact, creates the problem of its legal assurance (and taking into account the economic capabilities of states and their real security) in each of the countries, since the term used in legislation, as a rule, predetermines the list of specific measures that ensure this right. Even if we disregard all other formulations that establish the basic human right in the field of health and focus on the term “health protection”, then this interest will be fully justified, since the legal content of this term in international legal practice is far from always the same (identical). But his interpretation, as we have already pointed out, is of decisive importance in the process of legal consolidation of the fundamental human right in the field of health, and also determines the meaning of the entire health care of states and their cooperation in this sphere.

Earlier in our publications, we have already drawn attention to the absence on the international legal doctrine and practice of any standard definition of the concept of health protection [9, 10]. Most Western European and American scientists put in its content such mandatory elements as medical (medical) care, home care, prevention of diseases and some other elements [11]. Thus, health protection in their understanding is a fairly broad concept, which includes a whole system of activities aimed at ensuring health. Moreover, the scope of this concept covers even the assistance provided by people who do not have medical education and are not directly connected with medical assistance. This conclusion can be drawn, for example, from the definition of Professor H. Linen, who defined health protection as “the whole system of health care at home, in medical institutions and beyond, including professional medical care, administration and funding of relevant institutions” [12]. Such a broad approach to health protection was also received at the official international level, in particular WHO. This organization among the measures that make up the first level of health care, among other things, calls assistance to mothers and children, prevention and control of local endemic diseases and other activities that many scientists attribute to the so-called “basic health prerequisites” or “healthy living conditions” social support to those in need, improved sanitation and nutrition, a healthy environment, normal working conditions, availability of sewerage systems, etc. [13, 14].

The broad scope of the legal content of the notion of “health protection” can also be stated when referring to acts of international law. For example, the European Social Charter calls for the elimination of possible causes of disease among health-related measures, the establishment of consultative and educational institutions that promote health and development (promotion) of individual responsibility for health, prevention of epidemics and other diseases, as well as accidents (art. 11) [15]. As you can see, measures that are part of the health protection measures are traditionally referred to in the scientific doctrine as “ensuring the basic prerequisites for health”.

A similar legislative interpretation of the notion of “health protection” is demonstrated in the CIS Convention on Human Rights and Fundamental Freedoms of May 26, 1995, which, in Article 15, contains measures aimed at eliminating as far as possible the causes of deterioration of health; provision of advisory services and training facilities to promote health and promote personal responsibility in health matters; provision of sanitary and hygienic conditions preventing as much as possible the emergence of epidemic, endemic and other diseases [16].

There is no need to prove that health care *a priori* involves the provision of medical care. Otherwise, it would simply mean the absence of the very possibility of maintaining health in the event of illness. In this regard, it should be noted that Article 11 of the European Social Charter and Article 15 of the CIS Convention on Human Rights and Fundamental Freedoms on Health do not mention health care as such. Its provision is provided for in other articles of the Acts, along with the provision of social assistance. It seems that this feature of the legal protection of health in these international legal documents was due solely to the desire of their creators to consolidate the possibility of obtaining medical care for the least well-off strata of the population, and nothing else. Either way, however, the approach to protecting health outside the context of medical care seems at least strange.

It should be noted that the practice of international lawmaking in the field of health protection knows the other extreme when determining the legal content of this concept, which consists in excluding the necessary conditions and prerequisites of health from its composition. An example is the Charter of Fundamental Rights of the European Union, which formulates the notion of health protection as “the right of access to a system of preventive measures in the field of health care and the right to use medical care” [17].

When analyzing this definition, it is easy to find the desire of the creators of the Charter to avoid the need for legal (and, correspondingly, factual) provision of a wide range of “basic prerequisites for health” that cannot always be guaranteed with confidence. To such premises, in our opinion, it is necessary to include the world, the necessary earnings, a stable ecosystem, sustainable resources, social justice, equality and other conditions of our life that can be legally guaranteed very relatively. At the same time, some international documents fix these conditions as necessary (mandatory) prerequisites for health (such as the Ottawa Charter for Health Promotion of 1986), which, in our view, does not make them more realistic.

A distinctive feature of the Charter of the European Union is also the definition of health protection as a right, and not as a set of measures (as in most other definitions). In addition, the advantage of this definition, in our view, is the interpretation of health protection and, accordingly, the right to health protection as a “right of access” to a

system that provides health. In our opinion, this interpretation of subjective law is of decisive importance for the practice of real provision of the fundamental human right in the field of health.

In the international legal practice of securing the above-mentioned right, in addition to the term “health protection”, the term “appropriate health care system” is often used. Analysis of the content of this term allows us to conclude that it is identical with the term “health protection”. The concept of an “appropriate health care system” presupposes a public system that allows the provision of the necessary medical care to the entire population and ensures the prevention and diagnosis of diseases; special measures to protect the health of mothers, children and the elderly; general measures aimed at combating alcoholism and drug addiction, control over the quality of food and the state of the environment [18]. As you can see, the structural components of this concept almost coincide with the traditional elements of health protection in its broadest interpretation.

Summing up our research, we draw the attention of the reader to the fact that the main act of the international level that establishes social and economic human rights - the International Covenant on Economic, Social and Cultural Rights, does not mention the notion of “health protection”, as well as the “right to protection health”. The ICESCR recognizes the right of everyone to the right of everyone to the “highest attainable standard” of physical and mental health. However, the measures specified in the Covenant that States must take to implement this right are a traditional set of measures for health protection in its generally accepted meaning. Thus, if the right to the highest attainable standard of health (not analyzing the content of the term in this case) is the main, fundamental human right in the field of health, the main goal of state cooperation in this field, then health protection is a set of measures (t a concrete mechanism), which makes it possible to achieve this goal.

2 Conclusion

The study of problematic issues of the concept and legal content of the international legal term “health protection” carried out within the framework of this article allowed the authors to draw the following conclusions:

1. The need for international cooperation in the field of public health was actualized in connection with the rapid development of trade and economic relations that resulted from the industrial revolution of the XIX century. It was then that in the solution of health problems at the international level, a legal mechanism was used to unify the efforts of various states on the basis of voluntarily assumed obligations. Thus, from the beginning of the 19th century, health protection became the subject of international legal cooperation, which objectively led to an increase in the role of international law in resolving critical public health issues;

2. Analysis of the most important international acts convinces us that as a set of necessary measures to ensure public and individual health, health protection is enshrined in international law through terms that have varying legal content, and accordingly provide for different volumes of specific obligations of states in the field of health. Such a situation reduces the guarantees of ensuring the basic human right in the field of health and reduces the effectiveness of international cooperation in this field;
3. Despite the differences in the definitions of the notion of “health protection” existing in international instruments, as well as its absence in the main act of an international level that secures socio-economic human rights, the International Covenant on Economic, Social and Cultural Rights, legal nature is a specific mechanism allowing to achieve the realization of the right to the “highest attainable level” of health, which is proclaimed in this act as a fundamental one.

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Features of Legal Securing Fundamental Human Rights in the Field of Health in the Russian Federation

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Abstract. With the purpose of revealing the peculiarities of legal consolidation of the fundamental human right in the field of health in the Russian Federation, the article considers various options for its legislative consolidation, which take place in the practice of international and national lawmaking. Particular attention is paid to the analysis of terms by which the basic human right in the field of health receives its normative expression.

The analysis of the most important acts of international and national law, including the constitutional legislation of the Russian Federation, allowed the authors to conclude that the term by which the basic human right in the field of health is fixed in Russia - the right to health protection, does not correspond to the leading international legal health-related provisions, and does not reflect the actual, up-to-date content of this right. At the same time, from the point of view of legal techniques, the Russian version of the legislative consolidation of the basic human right in the field of health, according to the authors, has a number of advantages in comparison with the option of securing this right common in international law and the law of the European Union countries.

Unlike the right to “medical care”, “the right to health care that is necessary to maintain health,” the term “right to health” has a broader content that includes, in addition to medical care, a range of other medical and non-medical measures that create additional legal guarantees for the realization of this right. The strengthening of the basic human right in the field of health by means of the term “the right to health” in Russia has advantages over the term “the right to health”, widely used in international practice, since the term of Russian legislation is more specific and provides for a specific list of political, economic and medical measures, which are the responsibility of the state. Failure to comply with this obligation by the state allows Russian citizens to seek legal protection for their rights. At the same time, the “right to health” cannot be a right secured by judicial protection, since it is obvious that perfect health cannot be guaranteed to everyone.

Keywords: The basic human right in the field of health ·
The right to medical care · The right to health · The right to health protection ·
Health protection measures · Health · Legal securing

1 Introduction

The desire to prevent harm to health, to preserve and protect health, to receive medical care if necessary, to strengthen it, reaching the highest possible (“highest achievable”) level of health - is a natural desire of a person, conditioned by its need for a normal and full life in society. This aspiration, due to the objective significance of health, has been legally expressed in the national legislation of most states, for which the provisions of the main international legal acts in the field of human rights have become a guideline.

The unified form of legal consolidation of people’s desire to be healthy was its recognition by the international community as a legally secured right. In this respect, the similarities of the above-mentioned consolidation largely come to an end, since this right, in its legal status, content, subject matter, terminology, by means of which it is established, is very different in different legal systems. The same is true with the perception of this right at the doctrinal level. In Russia alone, in scientific literature, there are expressions “the right to protect and promote health”, “the right to meet the need for health” and others.

Given the existing differences in the definition of the law itself, i.e. taking into account the difference in its normative formulations, as well as doctrinal definitions, the authors chose the expression “the basic human right in the field of health” as the general expression used by them for the purposes of their research. This expression, in our opinion, makes it possible to delineate the subject of research most accurately and, accordingly, to characterize it most fully taking into account different points of view. In addition, this expression is widely used in Russian-language scientific research on the legal problems of public health.

Thus, the purpose of this study is to characterize the legal consolidation of the basic human right in the field of health in the Russian Federation, taking into account its characteristics and differences from the widespread forms of legal consolidation of this right in other countries and international legislation.

The goal set forth necessitated the solution of the following research tasks: 1. to clarify the content of the doctrinal and legislative interpretations of health available in Russia and at the international level; 2. Conduct a comparative analysis of the specifics of the legal consolidation of the basic human right in the field of health in Russia and other countries. The solution of these problems has found a step-by-step reflection in the sections of the presented study.

The work of the authors was based on the use of methods of comparative analysis, theoretical generalizations, formal-legal (normative-dogmatic) and others.

2 Results and Discussion

2.1 Doctrinal and Legislative Understanding of Health

The problem of health is objectively one of the most important socio-philosophical, philosophical and purely utilitarian problems of modern society. The multidimensionality of this problem is obvious, because as a certain quality of a person health

affects all aspects of his life. That is why the phenomenon of health is the subject of research of various sciences, each of which studies this phenomenon in its specific aspect.

In the medical and legal aspect, the problem of defining the very notion of health is extremely important, since this determines the approaches to regulatory regulation in this area and thus largely predetermines a set of specific measures aimed at ensuring this good.

It should be noted that as our ideas about health developed, so did the approaches to the definition of this concept, and its content was influenced not only by objective data of medical science, but also by cultural, religious and other characteristics of one or another people (it is no secret that the representatives of different cultures may have different criteria in assessing the state of health, as well as in its importance in the system of social benefits). Even at the present time, the thought voiced at one time by Feldman: «Health is that no one can accurately determine, but everyone knows when it has it, or, more often, when it does not» [1]. One way or another, but we must admit that «the notion of health is somewhat arbitrary» [2]. At the same time, it seems obvious that it is necessary to define this concept for practical purposes.

The existing multiple definitions of health as their conceptual sources have two interrelated, but different areas of activity - medicine and public health. The first area of activity focuses on the health of an individual, and the second - on the health of the human population. As medicine and public health themselves intersect each other, the definitions of health created by these activities began to integrate into certain common definitions that contain elements of one and the other in their content. Thus there was an evolution of views in the understanding of the category of "health" from a purely medical approach to the medico-social. The latter approach currently dominates the scientific research and practice of health care. To a large extent this was promoted by the wording of health enshrined in the Constitution of the World Health Organization (WHO): "health is a state of complete physical, mental and social well-being, and not only the absence of disease and infirmity" (preamble to the WHO Constitution). This formulation, taking into account the status and authority of the organization that adopted it, for a long time was a guideline for the legal consolidation of the concept of health in national and international legislation. Nevertheless, the initial (medical-biological) approach is still quite widely represented, especially at the doctrinal level.

As for Russia, in our country the approach to the definition of health from the perspective of purely medical has a long tradition. Despite the increase in the legislative array of the social component of health (which was influenced by the general international trend), the traditional treatment of health as a category with medical and biological content are very common in a professional environment. So, Vorobiev believed that health is a property of a person that is characterized by the complete harmony of all physiological functions in the body, realized in his subjective sensations, as an awareness of the optimal correspondence of the person and the environment in the process of life activity [3]. The definition of health presented in the Great Medical Encyclopedia, according to which health as a whole is regarded as a natural state of the organism, characterized by its complete equilibrium with the biosphere and the absence of any pronounced painful changes, is not subject to criticism from Russian scientists [4].

As you can see, the main signs of health in the above definitions are the balance of the organism with the surrounding natural environment and harmony (the absence of painful changes) of physiological functions.

Gradually, in the definitions of health, the criterion for the equilibrium of the organism with the surrounding natural environment, or otherwise - the optimal adaptation to it, began to be supplemented by the criterion of adaptation to the social environment. This can be explained by an increasing awareness of the importance of the social environment (social environment) of a person for his health. An example of such definitions can be the definition of Venediktova and his co-authors: health is a state of dynamic balance of the organism with the surrounding natural and social environment, in which all laid down in the biological and social the essence of a person's abilities are manifested most fully and all vital subsystems of the human body function with the greatest possible intensity [5].

Since the mid-1980s in the doctrinal definitions of health, the social component is beginning to come to the fore. Russian scientists are beginning to associate health more and more with the results of human life, with the possibility of a person performing his social functions. "Health is a state of the optimal life activity of a person, ensuring the completeness of the realization of its essential forces" [6]. This is the state of the human body, which ensures the full and effective performance of social functions [7].

The emphasis of scientific attention in the definitions of health on the previously noted criteria of adaptation to the environment over time led to the fact that a number of Russian and foreign scientists began to consider health as a whole as a process of adaptation. This trend started, perhaps, even with Professor Sigerist [8]. Picked up in the West, [9] it later found its continuation in Russia. Back in the 60s of the XX century, the Soviet scientist Davydovsky noted that the most common and most typical sign of health is life as a synonym for adaptation. In the following years, this approach to the definition of the concept of "health" only gained strength [10]. For example, Shademetov insisted that health cannot be considered only as the absence of disease. In his opinion, health also implies the ability of the body to adapt quickly and in a timely manner, adapt to the changed socio-psychological and environmental conditions [11]. Some representatives of Russian science have developed this idea even deeper. A number of definitions, for example, stated that health is the ability to adapt to the environment and its own capabilities; preserve itself, natural and artificial habitat; improve the capabilities of your body, the quality of life and habitat; to produce and preserve cultural, spiritual and material values, as well as other abilities [12].

As you can see, in the above definition of health, in addition to the adaptive capabilities of the human body, an essential role is played by the social component of human life. This only proves the general trend of Russian science on the actualization of the social aspect of health, the actualization of the significance of social activity for the characterization of health.

The importance of the socially useful activity of a person as characteristics of his health was pointed out by Shademetov already mentioned by us: health is characterized by active social and labor activity of a person, in which his physical and spiritual needs are manifested [11].

Thus, for modern science and public health practice, there is a wide range of opinions regarding the content of the category “health”. Such uncertainty even prompted some researchers to state that “it is not necessary to give a special definition of health ...” [13].

We think that we cannot agree with this opinion, since the effect of legal regulation in the healthcare sphere, like in any other, depends very much on the content of the terms used (more simply, on the clarity of their wording). Therefore, despite the correctness of Academician Petrovsky, who formulated the classical definition of health yet made an important reservation that health is a condition that cannot be determined with sufficient accuracy, [14] it is impossible to abandon attempts to create the most optimal definition of health, since this is due to needs of legal practice.

As for the interpretation of health in Russian legislation, the situation here is even more complicated than in the scientific doctrine, since in each branch of law the category “health” is used in its own way. In public law, for example, in criminal law, health is viewed as a public interest protected by the state, the public good. Dispositions of a number of the Criminal Code of the Russian Federation (CC RF) link the public danger of the act with causing harm to human health (Ch. 16, 25, 26 of the Criminal Code of the Russian Federation). At the same time, the deciphering of the concept of “health” is not a criminal law contains. However, the generally accepted position of representatives of criminal law and practice amounts to the fact that health should be defined as “the actual state of the human body at the time of the crime” [15]. Thus, in criminal law, the object of protection is not some abstract health, but a specific physical and mental state of a person at the time of the crime. What kind of health a citizen has, this is how health is protected.

In the branches of Russian private law, in particular - civil law, health is called an immaterial benefit and is attributed to objects of civil rights (Article 150 of the Civil Code of the Russian Federation).

As for the Russian constitutional law, the Constitution of the Russian Federation and Federal constitutional laws do not contain health statements. However, the highest judicial body of Russia, entitled to interpret the provisions of the Constitution of the Russian Federation - the Constitutional Court of the Russian Federation, in one of its Definitions stated the thesis that “human health is an inalienable good without which many other goods and values lose their meaning” [16], expressing thus its relation to the category under consideration.

The above examples from the Russian legislation and judicial practice, in our opinion, give all grounds for the conclusion that, in general, the Russian legislator and law enforcer regard health as a public good. It should be noted that this approach corresponds to the trend that takes place in international law and the national legislation of some countries. For example, the Additional Protocol to the American Convention on Human Rights in the Field of Economic, Social and Cultural Rights of 1988, the Constitution of the Italian Republic of 1947, and others.

The detailed definition of health is contained only in one Russian law - the Federal Law “On the fundamentals of protecting the health of citizens in the Russian Federation”. In it, health is treated as a state of a person’s physical, mental and social well-being, in which there are no diseases, as well as disorders of the functions of the organs and systems of the organism (Article 2). It should be noted that in this case the Russian

legislator practically reproduced the formulation of health proposed in the WHO Constitution. However, the very formulation of WHO in the Russian professional (medical and legal) circles is constantly criticized for its excessive “vagueness (uncertainty)”.

Thus, the content of the concept of health in Russian science is revealed far from the same. Likewise, the content of this term in Russian legislation is not the same, that our view complicates the practice of consolidating and implementing the basic human right in the field of health. At the same time, it seems to us, it is important to understand that, whatever the definition of health; it will always be an element of relativity and depend on a personal, professional and public understanding of what is normal or abnormal.

2.2 Legal Consolidation of the Basic Human Right in the Field of Health in Russia and Other Countries: A Comparative Analysis

As you know, attempts to make the state at least partly responsible for the health of its citizens were undertaken throughout the life of human civilization. Already from the earliest times, the practice of sanitary-hygienic, quarantine and other measures, to some extent aimed at ensuring public health, is known. However, it was only after the Second World War that this was done by providing each person with subjective rights in the field of health in connection with the rapid development of the idea of socioeconomic and cultural rights. Moreover, unlike other socio-economic rights, the basic human right in the field of health received its legal recognition is much more difficult. The main reason for this was the specificity of health as an object of rights. In fact, as Cass noted, «health is a vital state, it cannot be given...». There is no sense in proclaiming the right to health, just as there is no point in proclaiming a person's right to wisdom or courage. To shift responsibility for one's own health to someone else would not just be dishonest, it would imply imposing on him a duty that cannot be fulfilled” [17].

Nevertheless, the basic human right in the field of health has received its legal consolidation in the main international legal acts affecting the issues of medicine and public health. At the same time, the literal text of the formulations establishing this right varies considerably, which in other words does not prevent us from determining its true content in each specific case.

The Charter of WHO, which established that the enjoyment of the highest attainable standard of health is one of the fundamental rights of every human being without distinction of race, religion, political opinion, economic or social status, has begun the legal fixation of the basic human right in the field of health. Being, by its legal nature, an international treaty of universal character, the WHO Constitution, thereby created the necessary legal preconditions for the reproduction and concretization of this right in national legislation.

It is believed that the basic human right in the field of health received its normative fixing in the Universal Declaration of Human Rights of 1948. However, this document does not contain literal language such as “the right to health protection”, “the right to health”, “the right to health protection”. It is more logical to talk about the mention of the basic human right in the field of health within the broader right “to an adequate standard of living” (Article 25).

The International Covenant on Economic, Social and Cultural Rights of 1966 in Art. 12 directly proclaim the right of every person to the highest attainable standard of physical and mental health (the right to health). As can be seen, the formulation of the basic human right in the field of health, as presented in the Covenant, is broadly similar to the formulation of this right in the WHO Constitution. However, one cannot but pay attention to the fact that under health Covenant understands only physical and mental health, excluding social well-being, which is mentioned in the WHO Constitution as a necessary element of health. Thus, in terms of its legal content, the basic human right in the field of health, as presented in the International Covenant on Economic, Social and Cultural Rights, looks more limited than its content in the WHO Constitution.

For our part, we believe that the absence in the text of article 12 of the International Covenant on Economic, Social and Cultural Rights the mention of social well-being as an integral part of the basic human right in the field of health seems to be fully justified, since its presence would lead to the existence of subjective authority over its implementation. At the same time, the presence of a large number of objective and subjective reasons that affect a person's achievement of social welfare excludes the possibility of a legal guarantee of his security for everyone. Moreover, this is problematic in the framework of ensuring the right to health. In addition, in our opinion, it is health that is the main condition for achieving social well-being, and not vice versa. After the adoption of Art. 12 of the International Covenant on Economic, Social and Cultural Rights, WHO, judging by its own documents, has taken the line to fulfill the elementary rules of health care. In turn, this led to the use at the international level and the corresponding term - the right to care for health. This term has often been used in interstate discussions on access to health services.

"The right to care for health" as a term expressing the basic human right in the field of health was favorably received by a part of the scientific community. A well-known expert in the field - Roskem Ebbing reasoned about this: "it would be more realistic to formulate this right as a right to care for health" [13].

The term "right to health care" also gained acceptance. As the term defining the basic human right in the field of health, it is used in art. 11 of the European Social Charter.

Thus, the term by which the basic human right to health at the international level is legally enforced is very different in content. In turn, this entailed and terminological diversity in securing the above-mentioned rights in national legislation.

If we take countries in which the basic human right in the field of health is fixed at the constitutional level, then the term "the right to health" is fixed, for example in Suriname and Ecuador. As a "right to protect health" it appears in the Constitutions of Bolivia, Venezuela, Mexico, Chile and a number of other countries. There are states in which the basic human right in the field of health is the aggregate possibility of its protection and protection - Brazil, Uruguay.

As for the United States, Canada, the states of "old" Europe, in most of them the basic human right in the field of health in the Constitutions is not mentioned (although it is in the sectoral legislation). This is due to the nature of the legal systems of these states (for example, in modern Europe the provisions of the pan-European Conventions have a direct effect on the territory of the countries acceding to them, and accordingly there is no need to duplicate them in national legislation), and also with the widespread

opinion in the West that the formulation of the main human rights in the field of health is not very important: “the importance of the right to health can gradually develop by itself, through the repeated application of this right in international and national judicial and quasi-judicial mechanisms” [18]. At the same time, it is an illustrative example of some Eastern European states, in particular the Republic of Hungary, which in its constitution directly enshrined the right to the highest possible level of physical and mental health (art. 70/D of the Hungarian Constitution), thus repeating the wording of Art. 12 of the International Covenant on Economic, Social and Cultural Rights.

Note that in some European countries, which have a significant level of economic and social development, despite this, the basic human right in the field of health fixed in a fairly truncated form. For example, in Finland, it involves only providing access to medical services and emergency medical care (Section 15a of the Constitution of Finland).

In the Russian Federation, the basic human right in the field of health has been legally consolidated at the constitutional level by means of the term “the right to protect health and medical care” (Article 41 of the Constitution of the Russian Federation). Immediately a number of Russian scientists stated that the term does not correspond to the leading international legal provisions on health, nor does it reflect the real modern content of the basic human right in the field of health. It was pointed out that it did not correspond to the formulation of the International Covenant on Economic, Social and Cultural Rights as the main document in this field. In addition, it was noted that the concept of “the right to health protection” does not allow delineating this right from related constitutional rights and freedoms, the object of which is also human health [19]. It was suggested to use the phrase already common in scientific circulation, such as “the right to protect and promote health” [20], “the right to meet the needs for health” [21] and others.

While agreeing that the term in the Russian Constitution from a formal point of view does not really coincide with the majority of the international formulations of the basic human right in the field of health, we nevertheless believe that, in comparison with the prevalence in the international law and law of the countries of the European Union rights, the Russian version is more perfect.

Our statement is based on the following:

- Firstly, by establishing the basic human right in the field of health by means of the term “right to health protection”, Russian legislation at the same time provides a normative formulation of the basic concept underlying the term - the concept of “health protection”. According to Article 2 of the Federal Law “On the fundamentals of protecting the health of citizens in the Russian Federation,” the protection of the health of citizens is a system of measures of political, economic, legal, social, scientific, medical, including sanitary and anti-epidemic (preventive) nature, carried out for the purpose of prevention diseases, preserving and strengthening the physical and mental health of every person, maintaining his long active life, providing him with medical care. The normative consolidation of the concept of “health protection” excludes possible discrepancies in the use of this term in law enforcement practice.

For comparison, the international and foreign legislation of the terms “health protection”, “health protection”, “care that is necessary for maintaining health”, etc., as a rule, do not, as a rule, contain or treat them too narrowly, reducing their content to disease prevention or medical care. In this sense, the term of Russian legislation has a broader content, which includes in addition to medical care a range of other medical and non-medical measures, which creates additional legal guarantees for the realization of this right.

As can be seen from the above formulation of the Russian law, medical care is an integral part of the notion of health protection. At the same time, in the Constitution of the Russian Federation the right to medical assistance appears as an independent right (along with the right to health protection). It seems that this creates an additional guarantee for its implementation.

- Secondly, the term “right to health” has advantages over the term “the right to health”, widely used in international practice, since the term of Russian legislation is more specific and provides for a specific list of political, economic and health measures that are the state’s responsibility. Failure to comply with this obligation by the state allows Russian citizens to seek legal protection for their rights. At the same time, the “right to health” cannot be a right secured by judicial protection, since it is obvious that perfect health cannot be guaranteed to everyone.

3 Conclusion

The study carried out by the authors made it possible to draw the following conclusions:

1. The significance of the health phenomenon for a person objectively determines the need for its legal provision, which is reflected in the granting of this status of subjective right to a given good. At the same time, in the practice of international and domestic lawmaking, a single definition of the concept of “health” has not been developed. There is no unity on this issue and in scientific research;
2. In the Russian law, the definition of health is fixed at the level of federal law. In this case, the Russian legislator almost completely reproduced the health formulation proposed in the WHO Constitution. At the same time, each branch of Russian law has its own approaches to understanding and using this term. However, in general, the Russian legislator and law enforcers view health as a public good;
3. In the Russian Federation, the basic human right in the field of health is fixed in the Constitution by means of the term “right to health protection”. At the same time, Russian sectoral legislation contains a concretization of this right, both through the enumeration of its specific powers, and through the legislative (legislative) consolidation of the notion of health protection, containing its detailed formulation;
4. The authors of this study believe that the method of legal consolidation of the basic human right in the field of health, elected in Russia, is the most perfect of all available in the world practice. Firstly, this is due to the fact that the term “right to health protection” in Russia compared with its foreign counterparts has a broader content, which includes, in addition to medical care, a whole range of other medical

and non-medical measures, which creates additional legal guarantees for the implementation this right. Secondly, the term “right to health”, used in international law, cannot be a right provided with judicial protection, since it is obvious that perfect health cannot be guaranteed to everyone. At the same time, the term of Russian legislation is more specific and provides for a specific list of political, economic and health measures proper, which are the state’s responsibility. Failure to comply with this obligation by the state allows Russian citizens to seek legal protection for their rights.

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Methodical Approaches to Classification of Mega Projects of Social and Economic Development

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Abstract. The aim of research is to investigate directions of applying the “green” economy principles in the implementation of mega projects. Author specifies characteristics of mega projects currently being implemented in various regions and shows their features and directions of implementation in the fields of the development of natural resources, creation of infrastructure and energy facilities. One of the results of research is a classification of mega projects based on such criteria as the scale and amount of financing, significance and directions of development and sources of fundraising. It is established that individual interests are usually associated with a large environmental risk of changes for individual users of natural resources, and public interests make it possible to take this risk into account.

Keywords: Mega projects · Environmental support · Fundraising · Public-private partnership · Green economy

1 Introduction

In practical terms, the greening of some mega-projects is a rational combination of interests of individuals and legal entities with public interests, needs and preferences. The peculiarity of such combination is the absolutization of the economic aspect of individual interests in the limited time intervals and the long-term growth of the role of environmental and social aspects of the public preference. It was found out that individual interests were usually related to the high environmental risk of changes for certain users of natural resources and the public interests give the opportunity to take this risk into account. The directions of use of the “green” economy principles are shown when implementing these mega-projects.

The objective of this research is to study the directions of use of the “green” economy principles when implementing these mega-projects. The tasks of the research are the following:

- to specify the notion and the characteristics of a mega-project in Russia on the base of the international experience;
- to consider the peculiarities of mega-projects in Russia, to classify them;
- to consider the environmental risks and offer the measures of their reduction when implementing mega-projects.

2 Literature Review

A mega-project is a large investment project including a set of interrelated projects combined by the common target, allocated resources and time given for their implementation. Mega-projects are characterized by high cost (approximately 1 bln USA dollars or more), labour intensity (15–20 mln people), and duration of implementation (5–7 years or more). A mega-project in contrast to purely financial investments is aimed at the development of the economy, formation of the infrastructure (transport, social infrastructure), implementation of large social and economic tasks giving a qualitatively new development of the territory, country and region. The implementation of a mega-project can have a particular material result – a large construction (for example, the Channel Tunnel) or a large scientific and technical achievement (for example, launching of a person into space). The implementation of a mega-project has a significant, long-term impact on the development of the society.

Many scientists study mega-projects and there are a lot of studies dedicated to this subject.

The theoretical and practical review of mega-projects is represented in the “International Handbook on Mega-Projects” (Priemus and Van Wee 2013). The history and epistemological logics of the development of mega-projects is considered in the work of Gellert and Lynch (2003) “Mega-Projects as Displacements”.

The mega-projects are rather complicated essentially and therefore, they are often considered from different directions, for example, how to manage the mega-project. When implementing mega-projects, there is a big uncertainty, involvement of a huge number of people, complexity of management. The traditional project management using the newest methods and data does not suit for work with mega-projects. Sun and Zhang (2011) offered their own approach of mega-project management in the work “Owner Organization Design for Mega Industrial Construction Projects”.

A mega-project has some positive moments for the country, region, city where it is implemented. Mega-projects encourage the creation of innovations and also their distribution; that means they become the drivers of the growth of the new technologies and solutions (Siemiatycki 2013; Husin et al. 2015). When implementing mega-projects, the initiators have to apply the resource-saving and “green” technologies. It is related to the fact that many interested parties collide during the implementation of a mega-project: state, public men, architects, business, population and other groups and each of them have their own priorities during the implementation of the project. On the one side, it is reasonable to use the traditional technologies and low cost materials when building the mega-project, but on the other side, the supporters of the “sustainable development” will not agree. Therefore, often the environmental materials and technologies are used in the mega-projects detriment of the efficiency (Brooks and Rich 2016).

There are also some risks when implementing mega-projects. The availability of the ambitious tasks in the form of mega-projects, on the one side, contributes to the activation of the state as well as the society to solve the common problems together but on the other side, it can lead to negative situations in cases of non-implementation of mega-projects due to different reasons. Therefore, it is important to estimate the portfolio of mega-projects from the point of view of expenses and benefits and to have

a clear idea of their future (Pouya et al. 2016). The state and business cooperating for the implementation of mega-projects can create social benefits but this is risky for the state as well as for the private investors (Fainstein 2008).

A separate direction of the research is the study of mega-projects of the cities and metropolitan agglomerations. It is these projects that become often the most advanced in the field of technologies because the construction of large objects in the cities faces many difficulties: allocation of land lots, transfer of utilities, approval of mega-projects with many parties (officials, population, business, public organizations, etc.), preservation of the historical heritage, making no harm to the environment and many others. Often, solving the mentioned problems, we have to seek for non-standard solutions and apply the modern technologies (Fainstein 2008; Wiedmann et al. 2013; Brooks and Rich 2016; Pouya et al. 2016; Hwang 2014).

Often, mega-projects become the basis of the social and economic development of the cities when in the conditions of the traditional urban development the city cannot handle the fast growing population. In the situation, the experience of such fast-growing cities as Delhi and Ahmadabad is interesting (Mittal and Kashyap 2015).

It should be mentioned that not all mega-projects have a logical end. Some international mega-projects are frozen because of the political differences, for example, such projects as the Nabucco and the South Stream (Baev and Overland 2010).

The international experience in the implementation of the mega-projects is interesting:

- mega-projects in New York, London and Amsterdam (Fainstein 2008);
- the Blackfriars Station and the Shard in London (Brooks and Rich 2016);
- the Msheireb project in Doha's historic centre (Wiedmann et al. 2013);
- the Dongdaemun Design Plaza & Park Project in Seoul (Hwang 2014);
- construction of the third bridge, Istanbul canal, and third airport (Pouya et al. 2016);
- highway Egnatia Motorway in Greece (Abeyasinghe et al. 1999);
- the Channel Tunnel (Stannard 1990);
- the Sunda Street Bridge in Indonesia (Husin et al. 2015);
- the Kundli-Manesar-Palwal Global Corridor in Delhi and the Sardar Patel Ring Road in Ahmadabad (Mittal and Kashyap 2015).

Also the research of the mega-projects should be mentioned from the point of view of symbolism. When the mega-project is not rational and economically efficient, for the statesmen it becomes the evidence of success of their governing (Van der Westhuizen 2007).

In Russia, mega-projects also have been implemented in recent years and are implemented now. As the examples of such mega-projects, we can name:

- construction of the sports Olympic facilities Sochi-2014 and objects of infrastructure (2007-2014) that provided the functioning of the sport facilities (investments outlays were 214 bln roubles);
- construction of Kambarata-1 Hydro Power Plant in the Kyrgyz Republic – the largest joint Russian-Kyrgyz energy projects, cost of approx. 100 bln roubles;

- construction of the cascade hydro power plant in the Indian state Arunachal-Pradesh, India, capacity 9.75 thousand megawatt, cost of 16 bln dollars (the project is implemented with participation of the state company “RusHydro”);
- the project of the development of the oil and gas fields Solimoins in Brazil with the participation of Rosneft company and perspective investments into the project 14 bln dollars including the construction of oil pipelines or gas transportation capacities.

Among the large infrastructural projects being implemented now, the “Eastern Siberia – Pacific Ocean” oil pipeline can be mentioned, and also Bureya Hydro Power Plant, buildings and structures built for the APEC Summit in 2012 in Primorye, etc. The project of construction of Kankun Hydro Power Plant on the Timpton River in the Southern Yakutia can be classified among mega-projects; its capacity is 1000 megawatt and average annual power production - 4.87 bln kWh. This construction is provided for by the Chart of Complex Development of the Production Forces, Transport and Power of the Republic of Sakha (Yakutia) till 2020 (Potravny et al. 2013).

In the modern economic history, such mega-projects can include the infrastructural project of construction of the pipeline via the Kerch Strait to provide the water supply for the agricultural consumers of the Crimea, the cost of which can be more than 100 bln roubles. And at the same time, the water supply intake of 1 cubic km per year can be implemented for these purposes in the offing of the Kuban River.

Such projects include certainly the project of The Power of Siberia gas pipeline construction that will start from the Kovyktinsk gas field in Irkutsk Region and Chayadinsk oil and gas field in Yakutia and go via Khabarovsk to Vladivostok with several branches to China. The term of implementation of this project that is one of the largest projects in the history of the gas contracts is 30 years. Annually, Russia will sell 38 bln cubic meters of fuel to China. The cost of deliveries will be 400 bln dollars. The length of the gas pipeline will be 4 thousand km and its route will go along the oil pipeline “Eastern Siberia – Pacific Ocean”. It should be mentioned that the said mega-project involves not only gas extraction but also the chemical utilization of natural gas, construction of the helium refinery, new enterprises, development of a new infrastructure, creation of thousands of jobs and also the development of the infrastructure of the extraction sites, transportation. The pipeline will go through the southern districts of Yakutia to gasify as many villages as possible. This mega-project will touch almost all branches of the economy: geological exploration, operating procedure, loading of heavy, chemical and pipe industry and also the enterprises that manufacture the machines and equipment. The construction of the first stage of the gas pipeline will engage 11.7 thousand specialists and about 3 thousand people will operate the gas pipeline.

As an example of infrastructural mega-projects, we can name the construction of the Baikal-Amur Mainline in 1974–2003 (Mitrofanova and Zhukov 2014). Evidently, the infrastructural mega-projects in the field of power industry, transport, health care and education are the engines of the development of the Russian economy.

The implementation of the project “Ural Industrial – Ural Polar”, the cost of which is 100 bln roubles, is aimed at the development of the natural resources of the northern regions of the Urals and Western Siberia. For this, Yugra, Yamal and Tyumen Region

established the corporation that should manage the project. This project is complex and is based upon the three interrelated components: development of the mineral resources base, development of the power industry and formation of the transport infrastructure. Within the framework of the project, every entity of the Ural Federal District was offered to create the working teams of the following directions: “Industry”, “Natural resources management”, “Transport”, “Power industry” that can develop the programs of complex development of the territory with regard to the interests of the entities – participants of the project (Lebedev et al. 2010).

One of the most significant moments when grounding and implementing the mega-projects is the attraction of the necessary financial resources and provision of investments. For example, the investments costs for the construction of the sports Olympic facilities in Sochi and infrastructure were 214 bln roubles. The budget funds were 99 bln roubles, the extrabudgetary funds – 111 bln roubles (Malinovskaya 2014). The total volume of investments for the implementation of the Russian-Chinese mega-project of construction of the pipeline system “Power of Siberia” from the Russian side will be 55 bln dollars that will be used for the development of the gas field and construction of the gas pipeline; and from the Chinese side, minimum 20 bln dollars will be invested (Podobedova 2014). Furthermore, the implementation of this mega-project will allow consolidating significantly the national industry, because the construction creates new jobs and provides the priority for the national manufacturers for the deliveries of the machinery and materials for the needs of the gas pipeline. When implementing the mega-project “Ural Industrial – Ural Polar”, it was presupposed that together with the financing from the entities of the Ural Federal District participating in the project, the funds from the Investment Fund of Russia will be attracted in the amount of 6.5 bln roubles (from 100 bln roubles announced by the corporation). Now, the idea of implementation of large infrastructural projects financed from the National Wealth Fund of Russia is widely discussed.

Thus it is evident that a rather big number of mega-projects are implemented in Russia now, the most part of which is infrastructural. It requires additional work in the field of prevention of environmental risks and avoidance of the harm to the environment.

As it was mentioned on the meeting of the Security Council of Russia regarding the provision of the national security in the field of protection of the environment and natural resources management on November 20, 2013, large infrastructural projects in the country shall be implemented according to the modern environmental requirements. We shall mention that when erecting the Olympic facilities in Sochi, the most strict norms and environmental standards, and “green” technologies were applied. The implementation of the environmental programs became an important part of the Olympic heritage.

“Fundamentals of the State Policy in the Field of Economic Development of the Russian Federation for the Period till 2030” approved by the Decree of the President of the Russian Federation of April 30, 2012 established that the implementation of the state policy in the field of economic development is provided, in particular, during the development, discussion and acceptance of the regulatory legal acts and regulatory technical documents, during the development of the long-term programs of the social and economic development, federal and regional programs in the field of the

environmental protection and also during planning and making decisions of the economic and other activity related to the possible negative impact on the environment in the territory of the Russian Federation, continental shelf and in the exclusive economic zone of the Russian Federation.

3 Methodology

When solving the set problems, we used the system analysis, statistic methods, the design and analytical, regulatory, and balance methods, the method of sociological research, environmental and economic estimations, etc.

The materials of the research included the regulatory legal acts:

- (1) “Environmental Protection”, Federal law dd January 10, 2002 No. 7-FZ;
- (2) “Protection of Atmosphere”, Federal law dd May 4, 1999 No. 96-FZ;
- (3) “Land Code of the Russian Federation”, Federal law dd October 25, 2001 No. 136-FZ;
- (4) “Water Code of the Russian Federation”, Federal law dd June 03, 2006 No. 74-FZ;
- (5) “Wastes of Production and Consumption”, Federal law dd June 24, 1998 No. 89-FZ;
- (6) “Concerning Ecological Appraisal”, Federal law dd November 23, 1995 No. 174-FZ;
- (7) “Forestry Code of the Russian Federation”, Federal law dd December 04, 2006 No. 200-FZ;
- (8) “Fundamentals of the State Policy in the Field of Environmental Development of the Russian Federation till 2030”, Decree of the President of Russia dd April 30, 2012.

The information from the official sources of the implemented mega-projects and those being implemented in Russia was used in the work: the Government of the Russian Federation (<http://government.ru/>), the Ministry of Economic Development of the Russian Federation (<http://economy.gov.ru>), the Ministry of Natural Resources and Environment of the Russian Federation (<http://www.mnr.gov.ru/>), and also the information from consulting agencies: “ExpertOnline” (<http://expert.ru>), “RBK” (<http://rbc.ru>).

4 Results and Discussion

The implementation of mega-projects has a positive effect because they help to destroy the infrastructural limitations forming the infrastructure for many years ahead and serve as a multiplier giving an impulse to the development of the most branches and changing lives. Figure 1 shows the large-sized diagram of the mega-project functioning (see Fig. 1).

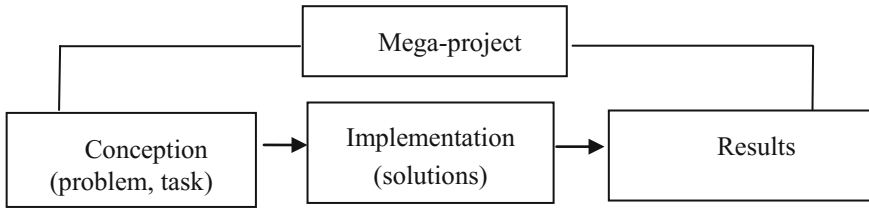


Fig. 1. Mega-project implementation. Composed by the author.

It should be mentioned that until now there is no clear classification of mega-projects in the Russian literature and it is apparently connected to the limitation of practice of their development and implementation. In our opinion, the following classification of mega-projects according to their types can be offered basing upon the international experience and scientific research. As the criterion of classification, we considered the following: the scale of a project and the volume of financing, the direction of project functioning (Table 1).

Table 1. Classification of mega-projects.

Criterion of classification	Classification
Volume of financing	<ol style="list-style-type: none"> 1. Projects up to 100 bln roubles 2. Projects above 100 bln roubles
Direction of development	<ol style="list-style-type: none"> 1. Mega-projects of natural resources development 2. Infrastructural mega-projects 3. Power mega-projects including resources development in the shelf area 4. Socially oriented mega-projects
Scale of implementation	<ol style="list-style-type: none"> 1. Regional and interregional 2. National 3. Interstate
Forms (sources) of financing	<ol style="list-style-type: none"> 1. Public funds of different levels 2. Funds of investors, enterprises 3. Loans, borrowings 4. Attraction of funds under public-private partnership

Source: composed by the authors.

In contrast with the objectives of the traditional projects aimed to obtain financial results only, mega-projects, as a rule, are aimed at the development of the economy, formation of the infrastructure (transport, social infrastructure), implementation of large economic tasks, providing the qualitatively new development of the territory, country and region.

The algorithm of interaction of the interested parties when implementing a mega-project (Fig. 2) was developed as a part of the analysis of the implemented and being implemented mega-projects in Russia for levelling of 4 groups of risks: economic, environmental, social and political.

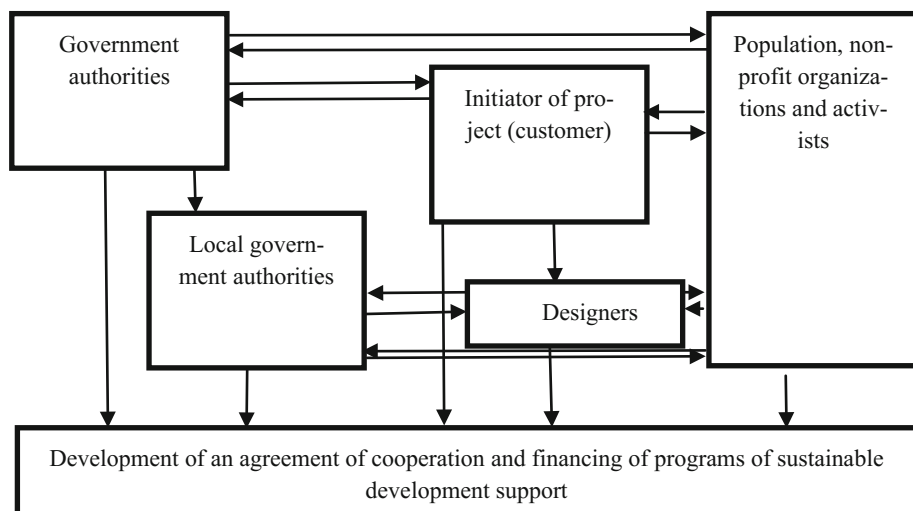


Fig. 2. Interaction of the interested parties when implementing a mega-project. Source: composed by the authors.

The analysis shows that each of the considered mega-projects is reasonable from the point of view of the generation of economic growth, but the state has limited resources. In this situation, one of the approaches to financing of such projects is to attract the investments from non-budgetary sources. The mechanisms of public-private partnership have a significant potential for attraction of non-budgetary investments (Vega 2013). Within the framework of the research, the plan of financing of a mega-project on the base of public-private partnership was offered (Table 2).

Table 2. Financing of mega-project under the tools of public-private partnership (Russian experience).

	Cost item	Executive bodies/local authorities	Authorized body	Private partner
1	Development of the project concept	++/-	+/-	-
2	Preparation of a feasibility study	++/1	+/-	-
3	Project appraisal, including environmental assessment	-	+	-
4	Tendering procedures			
5	Requirements specification	+/-	-	+/-
6	Technical (engineering and environmental survey)	+/-	-	+
7	Technical and environmental conditions. Design, including environmental design	+/-	-	+

Thus, it is evident that the implementation of a mega-project regardless the environmental requirements can make a significant harm to the environment (Kalavriy 2013). Therefore, now in Russia carrying out of all types of environmental measures when implementing a mega-project is obligatory.

5 Conclusion

In practical terms, the ecologization of some mega-projects is a rational combination (connection) of the interests of individuals and legal entities (citizens, enterprises, agencies) with public (state) interests, needs and preferences. As the analysis shows, the peculiarity of such combination is prevailing (absolutization) of the economic aspect of individual interests in the limited time intervals and the long-term growth of the role of environmental and social aspects of the public preference. At the same time, individual interests are usually related to a higher environmental risk of changes for certain natural resources users, and public interests give the opportunity to take this risk into account.

The encouragement of enterprises implementing the programs of the environmental modernization of production and environmental rehabilitation of the relevant territories and also the provision of a wide use of public-private partnership using the state financing (co-financing) for the measures of rehabilitation of the environmentally troubled territories, elimination of the environmental damage are related to the previous economic or other activity. It is known that the large international funds and corporations make decisions to participate in the projects depending upon the environmental policy implemented at the enterprise, in the territory. Thus, to attract the investments into large joint projects, and it regards, first of all, the Arctic Region and Pacific Ocean Shelf, it is necessary to use the principles of the “green” economy and environmental standards according to the international requirements.

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The World Oil Market and Its Influence on Russian Economy

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Abstract. There is a long and continuing struggle control over oil wealth direct or indirect through the regulation of the market of black gold. Internationally, many wars have already taken place which, upon closer examination turn out to be wars for oil. The purpose of this article is to analyze the factors which influence the formation of demand and supply in the oil market. Additionally, a general analysis of the current situation on the world oil market is performed, along with the identification of problems and prospects for its further development and the determination of the trends in the development of the world oil market. During the course of the research, various methods of analysis, synthesis, and methods of comparison and generalization were used. Proceeding from the conducted correlation analysis, the price of oil has the greatest impact on GDP and formation of Russia's balance of payments.

Keywords: Oil market · World trade organization · Reserve Fund · Volatility

1 Introduction

Oil is the most important but a scarce energy resource. Now, oil is not only raw materials it also a kind of asset, the value of which is associated with a multitude of financial processes. The impact of oil prices is particularly strong in those countries where the trade in energy raw materials has reached its high level of total exports. Russia belongs to such countries as well.

The situation, when the country's exports are mainly energy-oriented and the other industries are considerably lagged behind, is called "Dutch disease" in economic theory. This phenomenon is characterized by an increase in the extraction and export of raw materials; in addition, the influx of capital from exports promotes consumer demand but because of the pressure of Dutch disease the industrial sector does not keep up with the growth of people's incomes, which ultimately increases inflation. In addition, this leads to a lag in the process industry of the economy in comparison with extractive one.

The purpose of this study is to analyze the factors affecting supply and demand in the oil market. To achieve this goal, the following tasks are set: carrying-out of an

analysis of the current situation in the oil market; identifying trends in the development of the world oil market; determining the role of oil prices in the socio-economic development of Russia.

2 Literature Review

The bulk of research in the world oil market is devoted to the impact of fluctuations in oil prices on stock markets (Zhang 2017; Wangs and Liu 2016) and commodity markets (Krehlik and Barunik 2017). We are going to analyze briefly the oil market development and its influence on the exporting countries using Russia as an example.

The development of world oil production can be divided into two stages: The first stage was from the very beginning until 1979, when the first relative maximum of oil production was reached (3235 million tons). The second stage is from 1979 to the present.

During the period of 1920–1970, world oil production has been increased not only every year but every decade production grew almost geometrically (almost doubling in every 10 years). The world oil production growth rate has slowed down since 1979. In the early 80's, a short-term decline in oil production occurs. Then, the growth in oil production is resuming but not as rapidly as at the first stage.

Despite the decline in oil production in the early 80's and the occasional crises, the world's oil production was growing steadily. The average annual growth rate for the period from 1980 to 2016 amounted to 1.5%, and this figure is significantly less than the average annual growth rate of the world GDP. However, some developed economies in the last two decades were subjected to not only high oil prices but to high oil volatility as well (Aboura and Chevallier 2016).

3 Methodology

When analyzing the world oil market and its impact on the Russian economy, methods of analysis, synthesis, and methods of comparison and generalization are used.

4 Results and Discussion

To date, the largest oil reserves – about 25% of the world's reserves – are located in the territory of Saudi Arabia. Proven oil reserves in this country are more than 35 billion tons. Iraq is the second largest oil reserves country in the world. The volume of its proven reserves is about 16 billion tons of oil (11% of the world), predictive reserves – from 30 to 40 billion tons, by various estimates. The main deposits of the country are Majnun with proven reserves of about 3 billion tons of oil, West Kurna (2.4 billion tons) and Kirkuk (1.4 billion tons). Proved oil reserves in Russia make up about 5.5% of the world's 8 billion tons, the US has about 4 billion tons (2.2% of the world's total) (Bokareva et al. 2017).

The world leader in oil production is Saudi Arabia – more than 1.2 million tons/day. The world leader in oil consumption is the US – more than 2.6 million tons per day. The countries of the European Union consume less – about 1.9 million tons/day (Figs. 1 and 2).

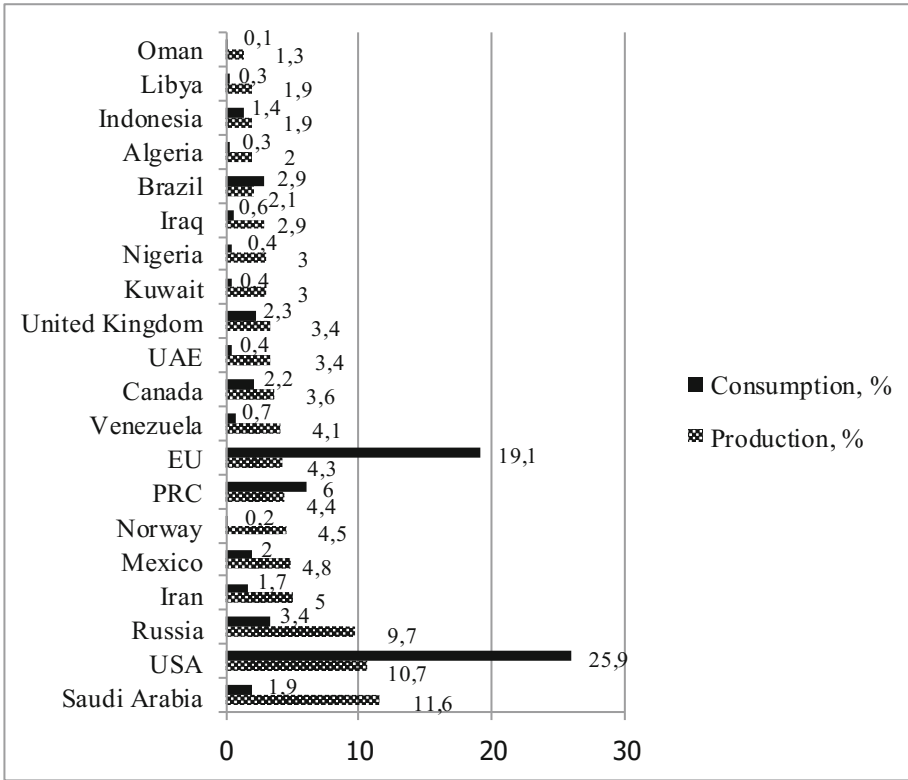


Fig. 1. Leading countries of oil production and oil consuming countries, 2016. Source: International Energy Agency (www.iea.org) according to the data for 2016.

The leaders of oil imports are currently the United States – about 1.5 million tons/day and the countries of the European Union – about 1.5 million tons/day too. The leaders of exports are Saudi Arabia with 1.2 million tons/day and Russia with 0.7 million tons/day (Fig. 2).

2016 was a record year for oil production in Russia in its newest history. Oil production has reached 500 million tons per year. The record of the Soviet-era when 570 million tons were produced in 1987 has not been broken yet; but it is the highest production rate in last 20 years. Russia has been holding the lead for oil production since 2009. In 2016, oil production accounted for 12.9% of global production.

Russia is one of the largest participants in the global energy market. During the period of 2010–2016, Russia's share in world oil production increased from 8.9% to

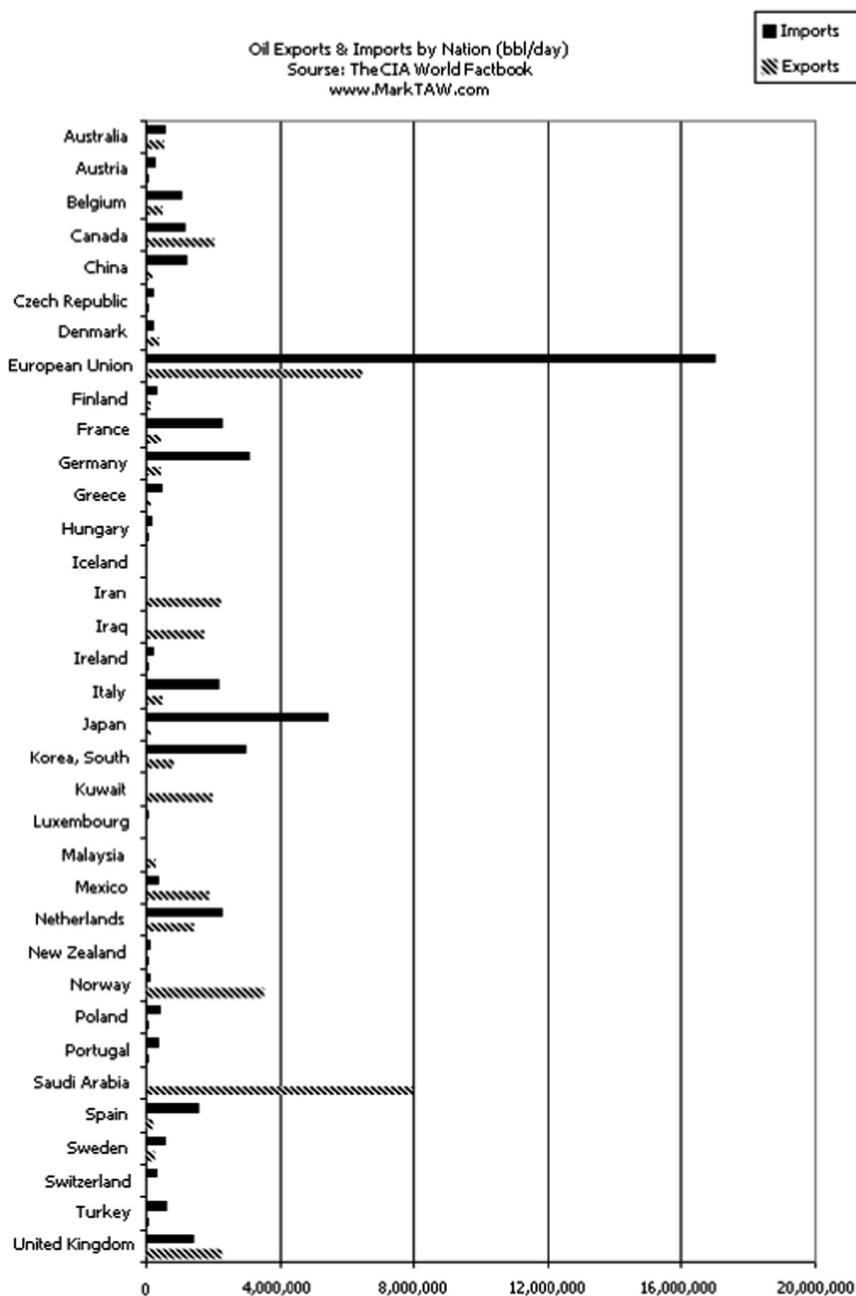


Fig. 2. Leading oil exporters/importers, bar/day, 2016. Source: International Energy Agency (www.iea.org) according to the data for 2016.

22.9%. Russia is a key supplier of oil and petroleum products to European countries; it increases oil supplies to the countries of the Asia-Pacific region. The fair share of Russia in the world oil market makes the country one of the leading participants in the system of global energy security.

The oil market can be characterized as a market of perfect competition, since basically the main factor in determining the price of oil is demand and supply (Espinasa et al. 2017).

The demand for oil is determined primarily by the growth rates of the world economy, as well as by a number of other factors including the structural characteristics of the demand for oil, energy intensity of the economy, climatic (weather) conditions, the level of efficiency of energy-consuming technologies and the relative competitiveness of other fuels.

The supply of oil in the world market is determined by world demand, geological and technological factors, the structural characteristics of world oil production and exports, the policy of oil-producing states, and a number of other factors including random ones, such as military actions in the oil-producing regions.

The world oil prices, being formed under the influence of world supply and demand, have a reverse effect on both global demand and oil supply. Extremely high oil prices restrain economic growth and increased demand. This also promotes the substitution of oil with other fuels. At the same time, high prices stimulate an increase in oil production in regions with relatively high production costs. As a result, such restraint of demand and expansion of supply lay the groundwork for the reduction of world oil prices. At low oil prices, on the contrary, demand is stimulated and supply decreases. As a result, the subsequent growth of oil prices is predetermined.

Let us consider the main factors that determine the development of the oil market (Minashkin and Zhan 2016).

The main factor that creates the world demand for oil is the growth of the world economy. This factor in recent decades has led to a steady increase in world oil demand. So, the growth of world GDP by 1% was accompanied by an increase in world oil consumption by an average of 0.35% during the period of 1999–2008.

The world oil market in 2016–87 million barrels per day and the maximum consumption by developed countries was about 42 million barrels in October 2015 with the decline to 37–38 million barrels. The rest is consumed mostly by the developing country. At present, supply and demand are balanced and there is almost no available capacity. The decline in demand for oil in the world in the period of crisis is about 3%.

Some industrialized countries have the leading role in creating the world demand for oil. In the regional context, there are three dominant centers of world oil consumption: North America, primarily the US, Western Europe and the Asia-Pacific region, primarily China and Japan.

The leading industrialized countries – the US, EU countries and Japan – account for 50% of world oil consumption. At the same time, Asian countries that are not members of the OECD, firstly China, begin to play an increasingly important role in creating the world's oil demand. As the analysis of trends of world oil consumption shows, these countries in recent years have provided much of the increase in world consumption.

The energy intensity of the world economy, that is, energy consumption per unit of GDP, has a significant impact on the world demand for oil. Energy intensity of the

economy depends on its structure and level of energy efficiency. The growth of the share of non-power-intensive industries and the increase in the efficiency of energy-consuming technologies lead to a decrease in the energy intensity of the economy. As the economy develops, its oil consumption, that is, oil consumption per unit of GDP, decreases as well.

The level of world oil prices has a significant impact on world demand. High oil prices restrain consumption and increase the competitiveness of other fuels (gas, first of all) in relation to the oil, which leads to substitution of oil with other fuels (for example, natural gas in electricity and heat generation). As a result, there is a relative decrease in demand for oil. Low oil prices have the opposite effect.

The situation in the oil market greatly affects the socio-economic development of countries doing trade in this market. This is especially evident in countries exporting oil. Energy prices significantly affect the welfare of the population of exporting countries (Aune 2017).

For example, the real GDP growth in Russia in the early 21st century was mainly due to the increase in prices for exported energy resources. For example, in 1999, the price of oil was at the pre-crisis level – \$ 15–20 per barrel; in 2000, it increased to \$ 28.5 per barrel, which undoubtedly affected the GDP growth rate of 10% by previous year; that is approximately \$ 383.4 billion (Bokareva et al. 2016).

The oil prices soared during the period of 2002–2010; all countries including Russia showed economic growth (Kuznetsov 2014) as we can see in Fig. 3. Such a sharp increase in oil prices was due to many factors: the war in Iraq, the reduction in oil production in Mexico, the UK and Indonesia, the increase in world oil consumption, and due to a large number of traders and buyers as well (Ageev et al. 2015).

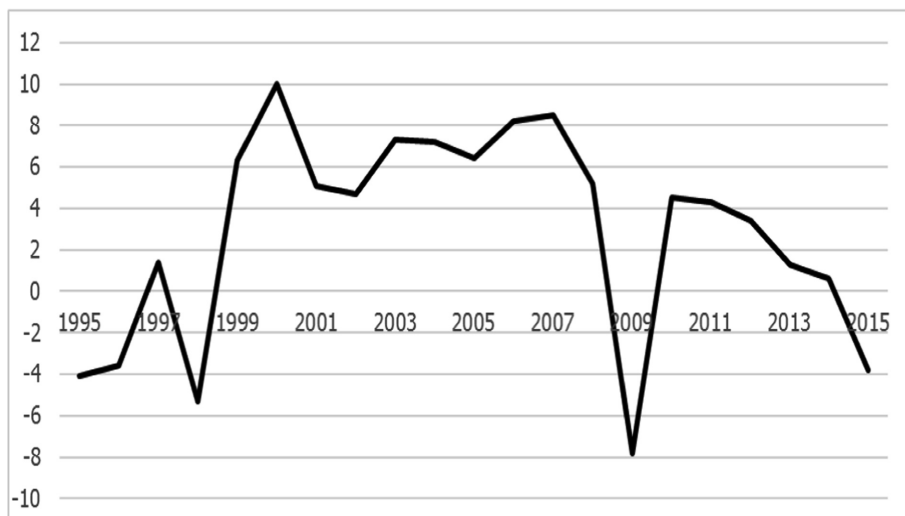


Fig. 3. Trend of GDP growth rates in Russia in relation to the previous year from 1990 to 2015, %. Source: The Federal Service of State Statistics of Russia (<http://www.gks.ru/>).

The financial crises in 2008 and 2014 strongly influenced the oil market (Watorek et al. 2016; Chiarucci et al. 2017). In mid-2010, the average annual price level stopped at around \$ 79.5 per barrel with GDP growth of 4.5%. Further, in the period of 2012–2013, due to the reduction of US oil imports and the decline in speculation in the world market, the average price of oil stops at \$ 105 per barrel. The growth of Russian GDP in, this case, was 3.4% and 1.3% (Kozemalov 2015).

In the first half of 2014, the average oil prices were \$ 107.75 per barrel, later, in the second half of the year, prices for oil sharply went down due to the drop in demand for fuel in China and the United States, and excessive supply of oil because of the increased supplies from Saudi Arabia. In October, the price of Brent oil was already \$ 90 per barrel, followed by lower prices for export contracts between Iran and Saudi Arabia; in November, the price was already \$ 80 per barrel. The total decline in prices for the year was approximately 25% (Kozemaslov 2015). The growth rate of Russia's GDP in 2014 amounted to 0.6% of the previous year, that is, 675.3 billion dollars.

In early 2015, the cost of oil fell below \$ 50 per barrel, followed by a slight increase and prices leveled to \$ 66.33 per barrel in May 2015. Nevertheless, the price drop began again in the summer of 2015. The first reason was the crisis in the stock market in China, and the second one – the increase in oil exports by Iran after sanctions removal. On August 24, the price of oil fell below \$ 45 per barrel. The rates of GDP growth in Russia in 2015 decreased by 3.83%–\$ 649.64 billion (Bokareva et al. 2016).

In the boom conditions, the government should carefully use the excess revenues from the sale of oil; otherwise, it will not be able to maintain expenditures at the same level during the period of falling oil prices. That leads either to an increase in public debt, or to an increase in inflation, or both (Ljubic 2016; Lahmiri 2017).

During the last 25 years, the price of Brent oil fluctuated greatly; almost every year the price dropped and rose.

As for Russia's dependence on the cost of oil in the world market, after the collapse of the Soviet Union, Russia often experienced financial difficulties: a reduction in tax discipline, a reduction in tax payments, sharp fluctuations in energy prices, and large expenditures for economic recovery; all these required additional foreign loans but Russia could not guarantee full debt servicing at that time. It is worth noting that before the collapse of the Soviet Union, the government somehow kept the emission financing of the budget deficit through international loans but later it has led to an increase in public debt from \$ 20 billion to \$ 67 billion (Yergin 2011). In 1991, the budget deficit reached 30% of GDP. The country lost its ability to meet its loan obligations, as a result, there was only one way out for financing the budget deficit – the increase in the money supply, because it was the period 1992–1995 that accounted for the main decline in prices on energy resources, which greatly reduced the receipt of monetary funds to the budget from the sale of oil and gas, so during this period, Russia began emission of currency to cover its debts, and as a result, it led to investment oscillations without control.

After some reforms tax revenues continue to decrease due to the decline in production and low domestic demand, and the following drop in oil prices, while Russia has gradually increased its oil and gas exports and hoped to fund the budget with income from their sale.

The revenues of the federal budget grew significantly in relation to previous years; such a sharp increase played an important role in balancing the budget, reducing debt and maintaining macroeconomic stability. This growth was connected with many factors. First of all, in 2012, the world price of oil has more than doubled compared to 1998 (Fig. 4).

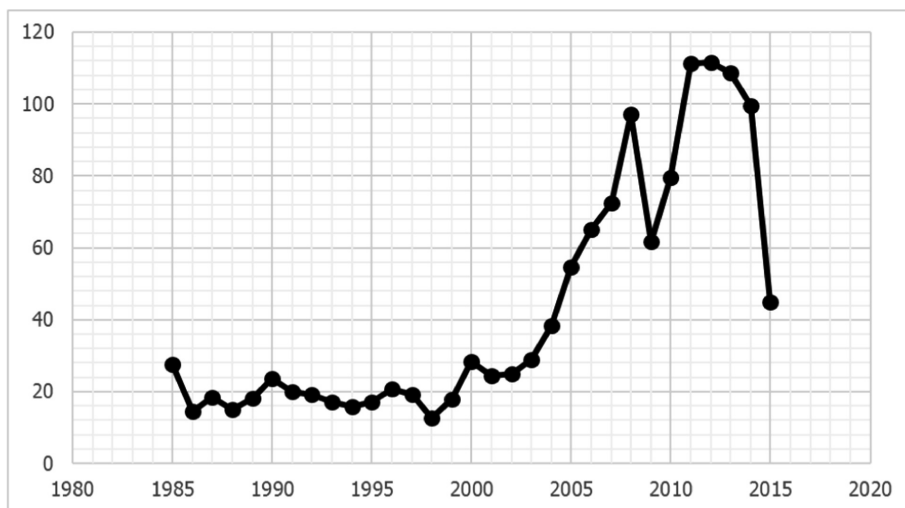


Fig. 4. Source: Organization of the Petroleum Exporting Countries (<http://www.opec.org/>).

As a result, large-scale tax reforms began; that resulted in the centralization of tax revenues in the federal budget.

An important change was the imposition of a new tax on oil production in 2002; it replaced three main oil taxes, which largely depended on world oil prices. These taxes account for more than a third of the federal budget revenues from the oil industry, which is approximately 15% of the total revenues of the federal budget. For illustration purposes of the changes in the balance of the federal budget, Fig. 5 is presented. As we see, thanks to this, the budget showed a surplus.

Later, in 2004, Russia created the Stabilization Fund; most of the funds from the sale of oil were directed into it. It was meant to support the budgetary system from possible negative things connected, first of all, with falling oil prices. In turn, its replenishment is mainly directed to revenues from oil exports. Gradually, the number of energy resources was increasing. The trends of export earnings remained at a high level with a steady increase in oil prices from \$ 54.52 per barrel to \$ 72.39 per barrel (Yergin 2011); that reflected positively on the budget of Russia. In 2014, the share of revenues from the export of energy resources increased significantly and amounted to at least 40% in the federal budget of the country.

Nevertheless, in 2008, due to the beginning of the global financial crisis, which caused a sharp drop in prices in the world oil market from \$ 97.26 per barrel in 2008 to

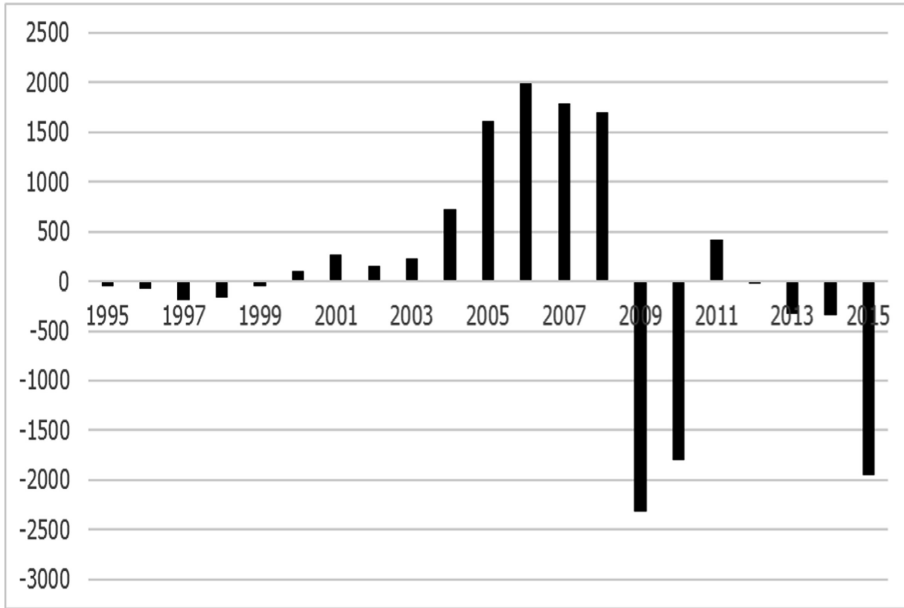


Fig. 5. The balance of the federal budget of the Russian Federation, billion rubles. Source: The Federal Service of State Statistics of Russia (<http://www.gks.ru/>).

\$ 61.67 per barrel in 2009, the decline in production and the crisis of the banking system, revenues decreased by 48.3% compared to the previous year.

During the crisis, it was the Stabilization Fund that covered most of the budget deficit. As a result, almost a quarter of the budget was spent by 2011. However, this was compensated by a sharp rise in prices in the world oil market to 111.26 dollars per barrel while oil production did not decrease. Oil and gas revenues in 2011 amounted to at least 50% of the federal budget (Yergin 2011).

The crisis that occurred in 2014–2015 strongly affected the budget of Russia, especially against the backdrop of a double decline in oil prices: in 2014–99.5 dollars per barrel, in 2015 – 44.89 dollars per barrel. In addition, the world oil market began to experience an oversupply of energy supply; West’s sanctions against Russia played an important role. The budget deficiency in 2015 was approximately \$ 60 billion. The deficiency payments were made from the Reserve Fund, thanks to which the deficit decreased by \$ 50 billion (Yergin 2011) by the beginning of 2016.

In conclusion, we can say that Russia’s dependence on the oil market at the moment is that the decline in oil prices about 45–50% caused a drop in imports of 50%, a fall in real GDP in dollars by about 40% and reduction revenues to the budget by one third.

5 Conclusion

As we have already explained, the oil industry is one of the most important directions for supporting the development of the economy in Russia. Therefore, there is a need to develop measures for the usual functioning of the oil industry, because it provides a significant share of Russia's GDP and budget revenues. In addition, about 80% of foreign investment goes to the oil and gas sector. In addition, the long-term dependence of the Russian economy on energy resources has led to a reduction in incentives for the development of other industries and the creation of new technologies.

To develop some effective anti-recessionary measures, as well as the ways to reduce the dependence of the Russian economy on the world oil market, it is necessary to assess the current state of the oil industry in Russia and determine its weaknesses.

At the moment, the state of the Russian oil industry can be characterized as unfavorable on the basis of such factors as: high degree of depletion of exploited oil reserves; decrease in quality; decrease in the volume of exploration and production drilling; the lack of reserves of large deposits, and, as a consequence, the need to bring into operation new unconfined deposits in hard-to-reach areas (Ageev et al. 2015). Additionally, you can note such factors as: lack of sources of investment; deterioration of the economic situation, both internal and global; large taxes, because of which a large part of the proceeds from production goes to pay various kinds of fees to the budget; low technological level.

The growth of the industry is important for the Russian economy. Therefore, to eliminate the above negative factors, it is necessary to have: improvement of the taxation system, reduction of oil transportation costs on the basis of improving the calculation methodology of the service rates, the resumption of deductions from oil extraction for exploration work to find new deposits, and improving the technical base.

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Russia's Agro Industrial Complex: Economic and Political Influence Factors and State Support

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Abstract. Authors consider changes in Russian agro-industrial complex un regard to international marketing, management and business strategies. The aim of the study is to identify the specifics of the differentiation trends in the socio-economic space of the Russia. Basing on the Russia's Federal Agency of State Statistics official materials (from 1991 to 2016), authors of the proposed research have estimated Russia's agricultural ability to react to external changes. They reveal natural and climatic factors which have direct and essential influence on agricultural development. Authors give practical recommendations for the formation of an agriculture state domestic support mechanism.

Keywords: Russian economy · Sanctions · Counter sanctions · Food safety · Economic and political factors · Agricultural production · State support

1 Introduction

The agriculture is the major sector of Russian economy. Domestic agricultural production underlies security of food safety of the country. The problem of working out measures of domestic state support of Russian agro industrial complex on the basis of analysis of external economic-political and other factors of its development is rather actual. A lot of under-mentioned aspects determine this urgency.

First, Russian economy in many ways continues to depend on external conditions, including political ones. Secondly, public management in Russia is absolutely centralized and as a result state resolutions often have influence on sectors of economy development. Thirdly, external and internal political factors have led to change of institutional conditions of production of agricultural products. Fourthly, agriculture development in Russia is restrained by some unfavourable natural and climatic conditions and absence of modern material and technical base. Fifthly, measures of domestic state support of Russian agriculture are limited with World Trade

Organization regulations. Sixthly, there is a necessity of Russian economy diversification which has pronounced raw character. One of diversification directions is agricultural production development. Thus, on the one hand, agro industrial complex development answers modern and perspective purposes of Russia's economy development. On the other hand, political resolutions have strong influence on agro industrial complex development.

The research problem consists in the following: external economic and political factors over a period of several years directly influence Russian agro industrial complex. And it affects social and economic development of Russia on the whole. Thus, the mechanism of domestic state support of Russian agro industrial complex is not finally developed.

The purpose of the article is the development of theoretical and methodological methods of studying economic and political factors influence the development of Russian agro industrial complex and the development of action-oriented recommendation directed at the formation of the mechanism of domestic state support of Russian agro industrial complex.

For the achievement of this purpose it is necessary to resolve a complex of interconnected problems:

- To reveal the dynamics of agro industrial complex development over a period of several years;
- To determine the agro industrial complex place in Russia's economy;
- To analyze the economic, political and other factors influence on the development of Russian agriculture;
- To develop action-oriented recommendations for the state domestic support of agricultural manufacturers under present-day conditions.

In the research we have come from some hypotheses:

- A. Agriculture is one of the most dynamically developing sectors in Russia's economy;
- B. Russia's agro industrial complex dynamically reacts to external changes;
- C. Besides natural and climatic factors some special economic and political ones have material influence on agriculture development;
- D. Countersanctions undoubtedly exert positive influence upon Russia's agricultural production development.

2 Literature Review

Economic and political factors to some extent had always influence on agriculture development worldwide. And governments of majority of countries tried to develop measures of domestic agrarian policy taking into account this influence. On the ground of historical documents studying, Johan F.M. Swinnen, for example, notes serious changes which took place in agricultural policy in Europe after 1860. During this period European countries had reconciled a number of trading agreements which then extended free trade on the continent. The author even calls these changes Dramatic

changes on the assumption of force of their influence on European countries' agro industrial complex in XIX-th century (Swinnen 2009).

In the XX-th century World War I and World War II had huge influence on agriculture development. In a period of time between the wars state support was caused with the necessity of economic recessions overcoming in 1920s and 1930s. Eva Fernandez wrote about it in detail (2016). The General Agreement on Tariffs and Trade (GATT) is worth mentioning. Its activity began in 1947. So is the World Trade Organization (WTO) which succeeded GATT in 1994. The effects of these documents approval for agriculture were considered in the works of such authors as Baldwin (1985), Olson (1965), Barberis (2013).

Activity within GATT/WTO framework for agriculture of the countries which have joined the agreement assumed their successful development in new institutional conditions but as it turned out a number of problems took place. Stigler (1971), Swinnen et al. (2016) and other researchers investigated a question of comparison of empirical data with theoretical models of agriculture development. The governments of the USA and some European countries sometimes broke GATT/WTO rules for the purpose of their countries protection against agricultural products import and increase of food safety. Anderson (2009), Bagwell and Staiger (2006), Josling (2000), de Gorter and Swinnen (2002), Guariso et al. (2014) in their works quantitatively estimated agriculture development, connected it with political changes and offered some measures for agriculture protection of rich and poor countries.

Russia has lived under market economy laws for only 26 years, joining the WTO only 5 years ago. These are extremely short terms. Russia's agriculture, as well as other sectors of economy, changes by leaps and bounds. The state support policy of national manufacturers is in the stage of formation. We wrote about it in our published works (Samarina et al. 2016). But many problems of economic and political factors influence on agriculture development are still unsolved.

3 Methodology

In order to corroborate or refute the hypothesis that agriculture plays an important part in Russia's economy Russia's Federal State Statistics Service data have been used (Gross Domestic Product 2017).

They were taken as a principle of calculations. The attraction of official sources of the information raises the degree of credibility of results. The long space of time allows to estimate the dynamics of indicators change and reveal objective laws.

The dynamics of agro industrial complex development was estimated by means of volume indexes of agriculture production. For comparability of results indexes have been calculated in percentage terms to the level of 1991. Calculations results for obviousness have been presented on the diagram.

Values of manufacturing work indicator on some principal kinds of economic activities have been examined. The gross added cost of Russia's domestic product is a margin between cost of goods and services produced in certain year and intermediate consumption for the purpose of other goods and services producing. Total values of gross added cost by economic activities kinds take part in calculation of Russia's gross

domestic product by means industrial method (Skufina et al. 2015). Values of gross added cost indicators of gross domestic product in established prices have been used in the article.

The change of indicators values of produced gross domestic product is connected firstly, with an inflation, and secondly, with a production activity intensity. The inflation leads to proportional growth of all indicators. Besides inflation exerts essential influence on indicators growth. It can prevent revealing of factors not connected with inflationary processes. For elimination of this lack values of gross added cost by kinds of economic activities and Russia's gross domestic product were converted in comparable prices. 2011 was taken as a principle. The procedure of recalculation of effective values of gross domestic product and its production components to the comparable prices was put into practice by means of extrapolation methods. They consist in multiplication of goods and services cost in appropriate previous period by the index reflecting change of goods and services volume. The data of Russia's Federal State Statistics Service from 2011 till 2016 have been used.

On the basis of Russia's Federal State Statistics Service data the author by means of a chain method calculates indexes of the volume of gross added cost on some principal kinds of economic activities: agriculture (AC), mining operations (MO) and processing manufacture (PM). By means of vertical and horizontal analyses indicators were compared with each other and with the index of Russia's gross domestic product volume. Indexes have been calculated and analyzed in established and comparable prices.

Russia's gross domestic product (GDP) structure was examined in sections of All-Russian Qualifier of Economic Activities Kinds (AQEAK). In Russia this qualifier was introduced into practice in February 2014. It is a part of structure of official All-Russian qualifiers of the technical and economic and social information. The European analogue of AQEAK is Statistical Classification of Economic Activities in the European Economic Community.

On the basis of the annual data about Russia's produced GDP values on AQEAK sections the author has calculated shares of separate kinds of economic activities in GDP structure. According to AQEAK structure the agriculture is merged in one section with hunting, fishery and fish culture. In our research we have not divided these kinds of activity and for the convenience designated them as "agriculture". We have compared the agriculture share in GDP structure with a share of mining operations and processing manufacture. According to the results of calculations the diagram which shows the dynamics of change of Russia's GDP structure according to principal activity category has been drawn.

For revealing of synchronism or asynchrony of index numbers changes the author has drawn up correlation matrix between gross added cost index numbers of agriculture, mining operations, processing manufacture and appropriate shares in Russia's GDP structure. This matrix has allowed to reveal proportional dependence between index numbers.

4 Results and Discussion

On the Fig. 1 we represent volume indexes of agro industrial complex production in percentage terms to the level of 1991.

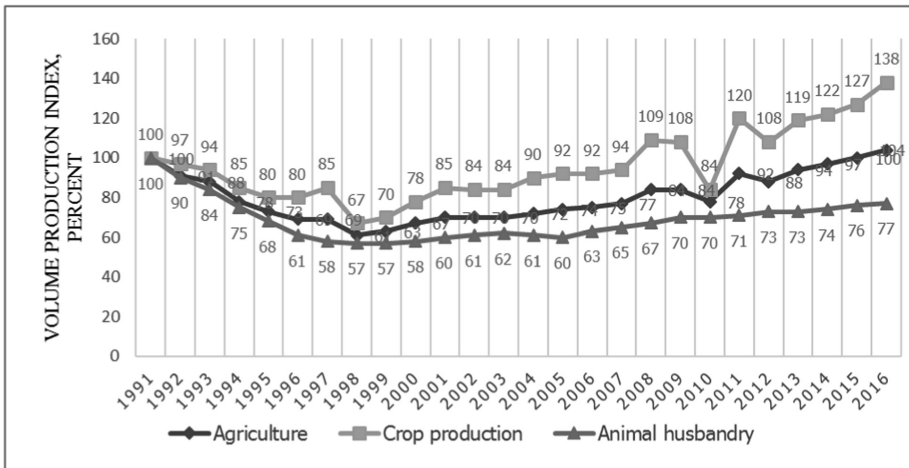


Fig. 1. Volume indexes of agro industrial complex production in percentage terms to the level of 1991. Source: the data of Russia's Federal State Statistics Service, 2017.

The analysis shows that volume indexes of agriculture products are very changeable. They react dynamically to external changes. In 1991 change of Russia's political system led to sharp reduction of production volume in agriculture. Then crisis in 1998 caused the decline of agriculture. Volumes of output were sharply reduced in 2010 and in 2012. Since 2014 stable growth of volume indexes of agriculture production in Russia has been observed.

Let's present some added cost index numbers of Russia's GDP according to following sections of economic activities: agriculture, mining operations and processing manufacture in established prices (Fig. 2).

The analysis shows the increase of gross added cost of Russia's GDP according to all kinds of economic activities. Herewith, growth rate of agriculture is behind of mining operations and processing manufacture growth rate. Really, the gross added cost of agriculture production for 15 years of research has increased from 573,75 billion rbl. in 2002 to 3456,30 billion rbl. in 2016 or 6,02 times as much. Gross added cost of processing manufacture production has increased from 2590,94 billion rbl. in 2002 to 10635,76 billion rbl. in 2016 or 6,46 times as much. Whereupon, gross added cost of mining operations production has increased from 1411,65 billion rbl. in 2002 to 7296,59 billion rbl. in 2016 or 11,43 times as much. It is the evidence of intensification of raw-materials nature of Russian economy.

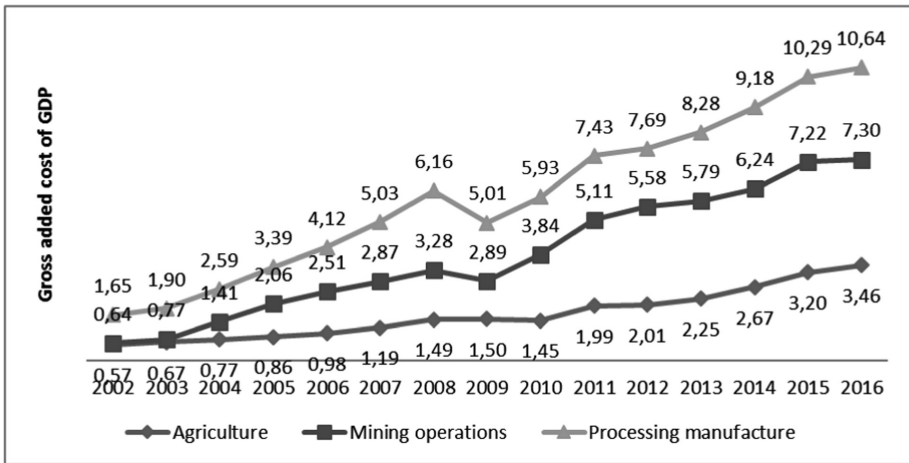


Fig. 2. Gross added cost of Russia's GDP according to some kinds of economic activities in established prices, billion rubl. Source: the data of Russia's Federal State Statistics Service, 2017.

For the better clearness the author has calculated index numbers of GDP volume in market prices and gross added cost according to kinds of economic activities: agriculture (AC), mining operations (MO) and processing manufacture (PM). The results are presented in Table 1.

Table 1. Index numbers of gross added cost volume according to the kinds of economic activities.

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
GDP	107,3	107,2	106,4	108,2	108,5	105,2	92,2	104,5	104,3	103,5	101,3	100,7	97,2	99,8
AC	98,2	101,0	100,3	102,7	101,3	106,4	101,5	87,9	114,7	98,5	104,8	102,0	103,0	103,6
MO	110,8	113,3	101,5	97,1	97,8	101,0	97,6	106,6	103,4	102,0	96,5	102,0	100,2	100,3
PM	108,8	108,1	104,4	106,6	107,5	97,9	85,4	108,6	106,3	105,4	104,4	100,8	95,4	101,1

Source: the data of Russia's Federal State Statistics Service, 2017, authors' calculations

In The analysis shows that tendencies of change of index numbers of the agriculture gross added cost volume do not coincide with change tendencies of other kinds of activity and GDP index numbers in whole. It is possible to single out some distinctive moments. Sharp decrease of gross added cost of processing manufacture and mining operations domestic product took place in 2009. It was the period when world economic crisis manifested itself most strongly. Agriculture indicators in 2009 continued to grow. Manufacture stagnation in agriculture matured in 2010 and in 2012. During this period of time indicators of processing manufacture and mining operations, on the contrary, grew. Therefore, besides influence of internal and external factors some special factors have an influence on agriculture developments.

Author produce the results of calculations of agriculture, mining operations and processing manufacture shares in Russia's GDP structure (Fig. 3).

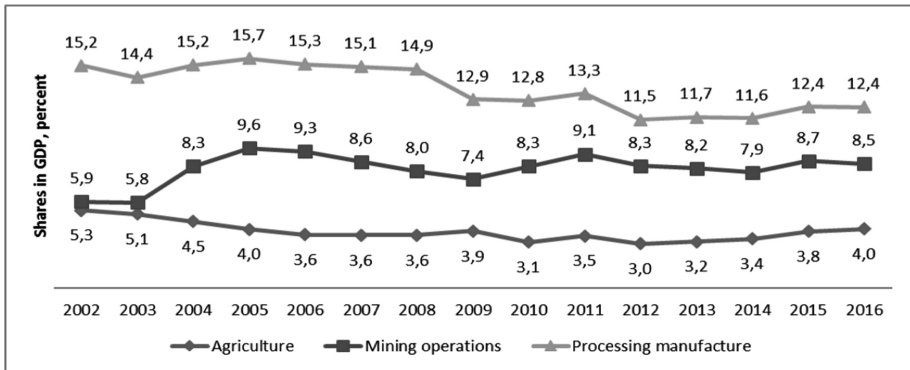


Fig. 3. Agriculture, mining operations and processing manufacture shares in Russia's gross domestic product structure. Source: the data of Russia's Federal State Statistics Service, 2017, authors' calculations.

The analysis shows that agriculture share in GDP structure has decreased since 2002. The first sharp leap downwards was marked in 2010: the indicator was 0,8 points down (9,33% down from the previous year value) and reached a 3,1% – point level in GDP structure. The second sharp leap downwards was marked in 2012: the indicator was 0,5 points down (5,21% down from the previous year value) and reached a 3,0% - point level in GDP structure. It was the least value over all research period. Constant and stable growth of agriculture share in Russia's GDP structure has been since 2014. In 2016 the agriculture share took up 4,0% position in GDP structure.

On the contrary, the mining operations share in Russia's GDP structure has essentially increased since 2002. The growth peak fell on 2003–2005 and 2009–2011. In 2016 mining operations share made up 8,5% position in GDP structure. It is twice as much as agriculture share.

The processing manufacture share in Russia's GDP structure is the greatest. The indicator value essentially fluctuated over a period of the research. The growth peak fell on 2003–2005 and 2010–2011. In this respect the tendency of the indicator change is similar to laws of change of the indicator of the mining operations share. In 2016 the processing manufacture share made up 12,4% in GDP structure. It is 3,1 times as much as agriculture share, and 1,5 times as much as mining operations share.

In Table 2 the correlation matrix between indicators of Russia's produced GDP in established prices according to AQEAK sections is presented: agriculture (AC), mining operations (MO) and processing manufacture (PM) and appropriate shares in Russia's GDP structure.

The analysis shows that the agriculture share in GDP structure is directly proportional to the processing manufacture share (correlation coefficient $k = 0,56$) and inversely proportional to mining operations share (correlation coefficient $k = 0,64$).

Thus, when mining sectors role of Russia's economy increases, agriculture role reduces. The volume of agriculture production increases and decreases synchronically with processing manufacture production.

High correlation of produced GDP indicators according to AQEAK sections is revealed. Correlation coefficients vary from 0,97 to 0,99. It can be explained by the fact that the inflation exerts material influence on indicators growth. Price surge caused by the inflation, influences all kinds of production (Fernández 2016; Stigler 1971; Swinnen et al. 2016; Bagwell and Staiger 2006; Skufina et al. 2015). Growth of indicators values of produced GDP is caused, first of all, by the inflation and secondly, by the intensity of production activity.

For elimination of the inflation influence a number of indicators of GDP and its components in comparable prices have been considered. 2011 was assumed as a basis. We will present a number of gross added cost indicators of Russia's GDP according to the following sections of economic activities: agriculture, mining operations and processing manufacture in comparable prices (Fig. 4).

Table 2. Correlation matrix between indicators of Russia's produced gross domestic product according to AQEAK sections and appropriate shares in Russia's gross domestic product structure.

		Share in GDP structure			GDP according to AQEAK sections			
		AC	MO	PM	AC	MO	PM	GDP
Share in GDP structure	AC	1						
	MO	-0,64	1					
	PM	0,56	-0,03	1				
GDP according to AQEAK sections	AC	-0,48	0,30	-0,79	1			
	MO	-0,64	0,42	-0,82	0,97	1		
	PM	-0,64	0,41	-0,80	0,98	0,99	1	
	GDP	-0,63	0,34	-0,86	0,97	0,99	0,99	1

Source: the data of Russia's Federal State Statistics Service, authors' calculations.

The analysis shows that domestic production growth (q.v. Fig. 1), was to a considerable degree caused by increase in prices because of inflation. Transfer of results to the comparable prices gave an opportunity to reveal following tendencies. Actually processing manufactures product slowly grew from 2011 to 2014. Mining operations product practically did not change. The agriculture product was reduced in 2012 and after that started to grow. Growth rate of agriculture have especially increased since 2014.

Correlation matrix between indicators of Russia's produced GDP according to AQEAK sections is presented in Table 3: agriculture (AC), mining operations (MO) and processing manufacture (PM) in established and comparable prices of 2011.

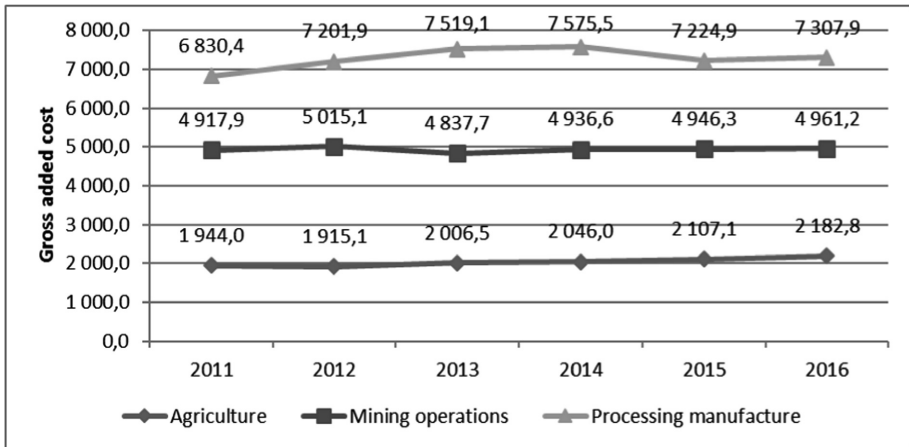


Fig. 4. Gross added cost of Russia's domestic product according to some kinds of economic activities in comparable prices, billion rbl. Source: the data of Russia's Federal State Statistics Service.

Table 3. Correlation matrix between indicators of produced gross domestic product according to AQEAK sections in established and comparable prices of 2011.

		GDP according to the sections in prices of 2011				GDP according to the sections in established prices			
		AC	MO	PM	GDP	AC	MO	PM	GDP
GDP according to the sections in prices of 2011	AC	1							
	MO	-0,02	1						
	PM	0,35	-0,27	1					
	GDP	0,07	-0,18	0,95	1				
GDP according to the sections in established prices	AC	0,93	0,19	0,36	0,14	1			
	MO	0,94	0,19	0,36	0,14	0,98	1		
	PM	0,97	0,12	0,37	0,13	0,99	0,99	1	
	GDP	0,89	0,13	0,62	0,42	0,92	0,95	0,95	1

Source: the data of Russia's Federal State Statistics Service.

AQEAK sections continues to show high indicators correlation. It confirms material influence of inflation on indicators change. The correlation of indicators in the comparable prices, on the contrary, has not been revealed with the exception of high coefficient of correlation between processing manufacture product and GDP ($k = 0,95$). Among the indicators in established and comparable prices only the correlation in agriculture ($k = 0,93$) has been revealed. For all other kinds of activity the correlation has not been revealed.

4.1 Discussion of Results

A. The dynamics of agriculture development in Russia's economy.

The fulfilled researches have shown that in whole in the course of 15 years of research the increase in output of agro industrial complex has been low. It is behind of mining operations and processing manufactures indicators. It can be seen in Table 1 and Fig. 2.

The agriculture share in GDP structure is small. From 2002 to 2016 it was 1,2% down. It can be seen in Fig. 3.

Thus, the hypothesis that agriculture is one of most dynamically developing sectors in Russia's economy has not been confirmed.

B. Reaction of Russia's agro industrial complex to external factors influence.

In 1991 Russia's political system change was followed by rupture of economic and financial ties and stoppage of industrial activity of enterprises. At a later date the situation in Russia's economy became stabilized (Skufina et al. 2015).

Agriculture development in Russia is associated with special problems. First of all, it is a question of objective problems of natural and climatic character (Samarina 2008). The most part of Russia's territory is located beyond the bounds of polar circle. Agricultural activity is complicated with low temperatures, long heating season and sunlight lack. It leads to increase of agricultural production costs and decrease of profitability of agricultural enterprises activity. The subjective reasons are the following: low level of post-Soviet agriculture technological development, rural population migration, lack of competent management.

It can be seen in Tables 2 and 3 that inflation and other macroeconomic factors have the same influence on all key sectors of Russian economy. Growth of GDP and its components is provided in many ways with increase in prices owing to inflation. Shared problems showed up in full in agriculture.

But the carried out analysis has also shown that tendencies of agriculture development are not always commensurate with tendencies of Russia's economy development in whole. The analysis of Table 3 shows that correlation between indicators of agriculture and other GDP components is absent. Moreover, only agriculture shows correlation between values in established and comparable prices. It makes possible to draw a conclusion that special factors have influence on Russian agro industrial complex development.

Thus, the hypothesis that Russia's agro industrial complex dynamically reacts to external changes has been confirmed.

C. Influence of economic and political factors on agro industrial complex development.

Russia's agro industrial complex is economically ineffective owing to climatic, economic and managerial reasons. It was shown up especially strongly during first ten years of modern Russia development. Focus of agricultural policy on farms development reduced the state support of factory-farm enterprises (Samarina et al. 2016). An efficiency of agriculture was reduced in leaps and bounds. It can be seen in Fig. 1.

The situation in Russia then was typical. State support decrease often and everywhere caused agricultural production crisis. It was noted by many researchers (Baldwin 1985; Olson 1965; Stigler 1971; Anderson 2009).

In the beginning of 21st century things in agrarian sector were put in order, agricultural loans issues were organized and nowadays agriculture is one of the most fast-growing sectors of economy. The package of state support measures was approved. In whole taking state support measures and other factors led to agricultural productivity growth in 21st century. Volumes of output in crop production increased especially strongly. It can be seen in Fig. 1. Natural conditions promoted overcoming the crisis as well. In 2008–2009 existing favorable climatic and weather conditions on the greater part of Russia's territory made it possible to get rich harvest of cereal crops and other plant growing products.

It was to be expected that common economic revival in Russia and the state support would bring about the agriculture becomes one of the most fast-growing sectors of economy. But the growth targets can not be called stable and dynamical.

In 2010 sharp decline in output of agriculture products was mentioned. Agriculture share in GDP structure was reduced as well. At the same time total economic expansion growth took place. The crisis was caused by the drought and as consequence poor harvest of cereal crops, vegetables and fruit. Sharp setback in crop sector production can be seen in Fig. 1. The latest period of time was not the most successful for Russian agro industrial complex.

The next crisis fell on 2012. This year climatic and weather conditions were favorable enough. The crisis was to a considerable degree caused by some economic and political reasons and weakening of state support of agro industrial complex. It was the consequence of Russia's joining the World Trade Organization.

Joining the World Trade Organization (WTO) in August, 2012 limited state possibilities of domestic producers support. Russia's food safety turned out under the threat.

And against this background a new factor suddenly appeared: the USA, countries of the European Union, Canada, Australia and Norway's sanctions limiting Russia's foreign trade activities.

It is necessary to note that foreign sanctions influence on Russian agriculture is insignificant, at least at present. First of all, sanctions infringe on financial, energy and defense-industrial branches, and also infringe on some officials, businessmen and companies' interests that are not related to agrarian and industrial complex. On the contrary, Russian retaliatory countersanctions directly related to agriculture and food industry. Veto on foodstuff import became a primary cause of sharp reduction in imports in 2014. Further countersanctions were prolonged for 2015, 2016 and 2017. To all appearance, food embargo will be prolonged at least till the end of 2018.

Realization of state protectionism policy led to agricultural production growth. This growth began in 2014 and has been in progress up to date. It can be seen in Figs. 1 and 2.

The gross added cost of Russia's agricultural products started to grow. Thus, volume indexes of gross added cost of processing manufacture and mining operations were behind of agriculture indicators. It can be seen in Table 1.

Thus, the hypothesis that economic and political factors besides natural and climatic ones exert a substantial influence on agriculture development has been confirmed.

D. Problems of agricultural manufacturers development in the conditions of countersanctions actions.

At the same time it is possible to note a number of substantive problems of agricultural manufacturers development in the conditions of sanctions and countersanctions actions.

Firstly, sanctions in financial field can complicate Russian enterprises (including agricultural) access to foreign investments and credits.

Secondly, import substitution is not quantitative but rather qualitative growth of manufacture. And it is not one day business. At the same time a ban on food import, including agricultural products, has been already put. In this situation the problem of price surge restraint for Russia's population and especially Russia's northern regions is the major.

Thirdly, despite the essential state support the question of Russian agriculture possibilities promptly compensate forbidden import agricultural production, raw materials and foodstuffs: meat products, vegetables, fruit, etc. remains open.

Fourthly, there might be such circumstances that niches appeared in the market of agricultural products will be filled up not with domestic production, but with import from those countries which did not attach punitive anti-Russian sanctions.

Finally, both western sanctions, and Russian countersanctions have political genesis. This implies that in case of a political situation change they can be instantly suspended or completely cancelled, or on the contrary intensified. Owing to unsolved Ukrainian crisis it is difficult enough to predict further development of relations between Russia and the West for any long period. It is not clear what sanctions will be adopted by the West in case of intensifying of confrontation: such ones which will damage Russian agro industrial complex directly can be among them. Therefore, along with chance of sustainable development with powerful state support which Russia's agriculture and its separate regions gained, some additional risks appeared and uncertainty increased.

The influence of problems on steady growth of agricultural production in the conditions of the state protectionism can be seen in Figs. 1 and 2. The domestic added cost of Russia's agricultural products in 2014 began to grow. But indicators research in comparable prices in Fig. 4 shows that growth rates were insignificant.

Thus, the hypothesis that countersanctions undoubtedly have positive influence on agricultural production development in Russia has not been confirmed.

The analysis has shown essential dependence of development of Russia's agriculture on some external conditions, including economic and political factors. In turn agrarian policy has no any essential influence upon policy. Therefore, it is necessary to strengthen agro industrial complex from within in order to increase external economic and political factors resistance.

It is a question of Russia's agriculture domestic support i.e. part of national agriculture state support, carried out in the area of domestic agrarian policy.

In conditions of economy globalization and according to WTO rules state support of the country should be carried out on the basis of certain mechanisms of rendering assistance to agriculture (Josling 2000; Alston and Pardey 2014). "Green box" provides measures of support which do not have perverse influence on international trade and can be used without any restrictions such as support to meet the institutional

development of agriculture. In our opinion, such measures as development of rural infrastructure, carrying out of agro industrial scientific research, working out of new kinds in plant growing and new breeds in animal industries, targeted payments to farmers in case of their wasteful production etc. will become effective. It should be noted that Russian Government has not enough promoted in the line of state support in the network of "Green box".

"Blue box" measures meet the restriction of certain agricultural products manufacture. In Russian agrarian policy these measures practically are not used. Considered analysis, loss estimate and prospects of conversion to a new kind of activity for agriculture enterprises should precede these measures use. The government should develop comprehensive support measures for these agricultural manufacturers. WTO rules do not restrict appropriated means for realization of "Blue box" measures.

At present the majority of state support measures apply to so called "Amber box". These direct and indirect measures of agro industrial complex support directly influence volumes and cost price of domestic manufacture products. The use of countersanctions and state protectionism applies to "Amber box" measures. At present these measures are effective. They give essential support to Russia's agriculture. But according to WTO rules, "Amber box" volume is subject to obligatory reduction.

At the present time conversion to rendering assistance of the state help to Russian agriculture by way of "Blue box" and "Green box" measures will have a negative effect. However, Russia's activity as a part of WTO compels Russia to give up "Amber box" protectionist measures.

5 Conclusion

1. Over a period of time from 2002 for 2016 the increment of agro industrial complex output was reduced. The agriculture share in GDP structure was reduced as well. The hypothesis that agriculture is one of most dynamically developing sectors in Russia's economy has not been confirmed.
2. Inflation and other macroeconomic factors have identical influence on all leading sectors of Russian economy. At the same time Russia's agriculture development is associated with a whole number of special problems. The hypothesis that Russia's agro industrial complex dynamically reacts to external changes has been confirmed.
3. In 2012 the crisis was revealed in agro industrial complex activity. That year climatic and weather conditions were favorable enough. The crisis was substantially caused by some economic and political reasons and weakening of agro industrial complex state support. On the contrary, the realization of state protectionism policy in 2014 led to agricultural production growth. Thus, the hypothesis that besides natural and climatic factors some special economic and political ones have material influence on agriculture development has been confirmed.
4. There is a number of problems of agricultural manufacturers development in the conditions of sanctions and countersanctions actions: complexity in drawing up and getting foreign investment of capital for agriculture enterprises; industrial and technological possibilities of import substitution; long term of import substitution process in agriculture; possibility of arrival of foreign suppliers with cheaper

agricultural production at the Russian market; uncertainty in countersanctions preservation and protectionism conditions. Thus, the hypothesis that countersanctions undoubtedly exert positive influence upon Russia's agricultural production development has not been confirmed.

5. At present the majority of state support measures apply to so called "Amber box". However Russia's activity as a part of WTO compels it to give up "Amber box" protectionist measures in favour of "Blue box" and "Green box" measures. In our opinion, such measures as development of rural infrastructure, carrying out of agroindustrial scientific research, working out of new kinds in plant growing and new breeds in animal industries, targeted payments for farmers in case of their wasteful production etc. It is necessary to lay special stress on working out measures of all-round help within WTO rules framework for agro industrial complex enterprises changing their line of business because of restriction of certain agricultural products manufacture.

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Road-Building Enterprise in a Risky Environment: Efficiency of Management

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Abstract. Currently, many construction companies have chosen a model of “steady state” - maintaining market share. The working model uses methods of historical and logical analysis, forecasting, economic and mathematical modeling. The work is devoted to the problems of road construction enterprises arising in determining the profitability of construction and installation works and economically justified calculations of the cost of investment projects for the construction, reconstruction and major repair of highways. The authors associate the prospect of the development of the construction company in direct participation in state programs both in the development of the country’s transport system in 2015–2020, and in the implementation of the program for the development of the northern territories.

Keywords: Financial policy · Risk localization · Risk management · Road construction

1 Introduction

The road industry is one of the sectors of the Russian economy. The geographical location of the country requires a brisk growth of the public network of highways to ensure the availability of transport services for both the public and the commercial sector. Roads are an important part of the transport infrastructure, which contributes to economic growth solving social problems and ensuring national security. It is the roads that determine the transport accessibility within the system ensuring the territorial integrity of the country; they also have a direct impact on the speed and way of development of the interrelationships of the elements of the economy as a whole.

In this regard, it becomes urgent to ensure the effective functioning of highway construction enterprises. The performance indicators of highway construction enterprises can be divided into several groups:

- (1) overall performance indicators of an enterprise;
- (2) indicators of the effectiveness of the use of labor resources;
- (3) indicators of the effectiveness of the use of fixed and circulating funds;
- (4) indicators of the effectiveness of investments and owners’ equity.

The main directions of increasing the efficiency of the activities of highway construction enterprises can be divided into two groups: internal and external. The first group includes those factors that depend on the production process, the style of management, decision-making, etc. The second group includes: specific market environment, prices for products, raw materials, components, fuels and lubricants and energy resources, loan rates, the taxation system, etc.

However, in Russia, the sphere of highway construction has a set of problems that hinders the development of the industry in particular and the economies of all countries in general.

The purpose of this study is to identify problems in the field of highway construction in Russia and to find the ways for solving them. Within the scope of the research, the following tasks are set: to analyze the experience of the development of the transport industry in other countries, to identify problems in the field of highway construction in Russia, and to offer solutions based on the world's experience.

2 Literature Review

The increase in domestic demand and the income of the population caused an increase in the motor vehicle fleet in Russia (7–10% per year). Every day, about 17 million tons of cargo and more than 62 million passengers are carried by road. Compared with the same indicator of rail transport, it is almost 6 times more in volumes of cargo transportation, and 17 times – for passenger transportation. Freight transport is one of the most “market” sectors of the economy. With the help of road transport, about 80% of the country's cargo is carried. Currently, the country's road network does not meet the social and economic needs of society. It prevents the development of interregional and economic ties (Vasilchishin 2017).

To compare the experience in the field of roads in Russia and other countries, we analyzed the work of foreign scientists. In the studies of foreign scientists, both internal and external factors of increasing the efficiency of highway construction enterprises are considered.

The planning of the road infrastructure is undergoing serious changes. The development of transport infrastructure is increasingly being considered in terms of environmental degradation, climatic influences and the trends in society. Within the concept of sustainable development, infrastructure planning increasingly focuses on the implementation of integrated planning goals. In this regard, it becomes necessary for highway construction enterprises to seek new approaches to planning and implementing their activities (Busscher et al. 2015).

Song and Luo in their work “Development and Optimization of the Building and Road Construction System based on the Enterprise MIS Platform” conduct the research on the development and optimization of the construction management system and road construction on the basis of the Enterprise MIS Platform. The main characteristics of the enterprise project management system are considered, the stages of the project management system development of the enterprise and business planning are discussed, and conclusions about the implementation of the system are given (Song and Luo 2015).

To solve the problem of the uncertainty of demand and risks when dealing with suppliers is possible through flexible build-operate-transfer contracts for road franchising (Tan and Yang 2012; Chen and Subprasom 2007; Shi et al. 2016).

This paper also analyzes the experience in the field of road construction of foreign countries: South Africa (Murwira and Bekker 2017), Norway (Lian 2008), Vietnam (Greiman 2017), and the Philippines (Hanaoka 2012). The choice of these countries is explained by the following reasons: Norway – similar natural and climatic conditions, South Africa and the Philippines – a similar type of the developing economy, Vietnam – similar processes of transition from a planned economy to a market economy.

3 Methodology

World experience in the development of road transport infrastructure was studied with the help of the method of literature analysis. When analyzing problems in the field of road construction in Russia and offering solutions, the methods of analysis, synthesis, and the methods of comparison and generalization are used.

4 Results and Discussion

The analysis of the activity of road industry enterprises made it possible to identify seven main problems that could adversely affect the process of the company's reproduction. These problems are as follows:

- (1) a weak relationship between the system-forming links;
- (2) insufficiently precise organization of work;
- (3) weak control of the efficiency of the production cycle;
- (4) lack of control of intra-firm "family interests";
- (5) waste is exceeding the limits of expenditure of resources;
- (6) lack of incentives for initiative and innovation;
- (7) ineffectiveness of financial incentives and penal systems.

With the purpose of a more detailed analysis of the impact of the above problems, it is necessary to identify the essence of the definition of the system in the road construction industry. What is a system for a company engaged in highway construction?

The system is a set of different components that are in relationships with each other, which forms a unified whole that is necessary for a certain user. The system in a company engaged in highway construction includes such elements as organization of activities, production process, resource support, organization of information flows, management, product quality control, availability of innovations and new technologies. The lack of interconnection of any elements or the existence of weak links leads to the emergence of failures in the mechanism of formation of the corresponding processes. The way how the system is set up and whether there is a complete relationship between the components can be assessed by determining the overall performance of the enterprise (Fig. 1).

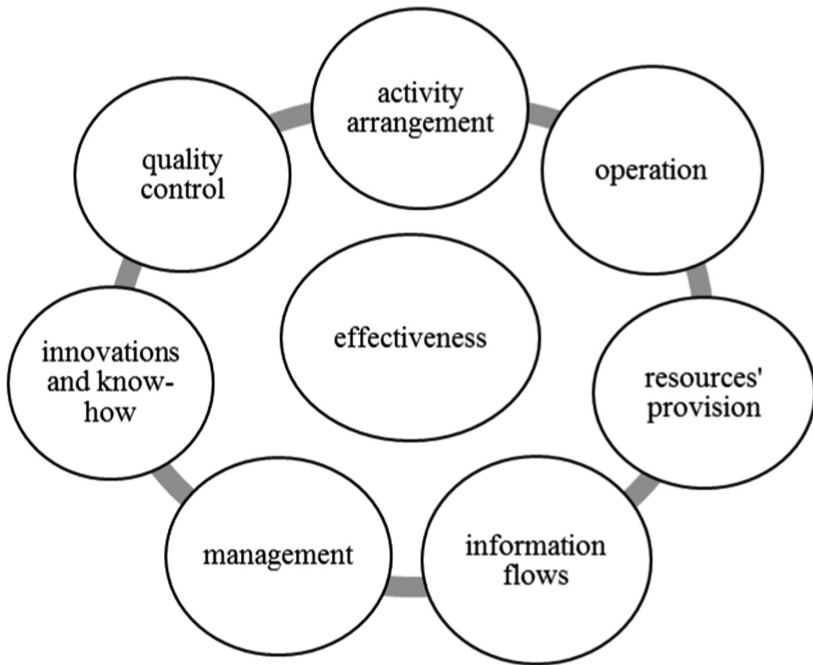


Fig. 1. Components of the systems of a highway construction company, author-developed.

The main thing for a supervisor is to distinguish the role of each constituent element with determination of its place and meaning in the common system.

The first signs of a failure in the effectiveness of the system are the failure to comply with orders, which refers to the control element. The management errors can nullify all the achievements of other components of the common system. In this matter, firm control and bringing to responsibility a guilty person should play a special part. There is little desire of supervisors to reach certain heights, to make real and optimistic plans for the organization. The task should be carried out by joint efforts and with attention of the top level of management, and with direct interest of middle and down management. A failure in the work of any link, disinterest in the set goals of some component will not allow achieving the desired results. And this will affect the overall efficiency of the enterprise.

An important place in assessing the effectiveness is the control over the execution of business processes. Timely control of various elements of the production process should ensure the quality performance of the required indicators, which in turn will improve the efficiency of not only the production process but the organization and management processes as well. If irregularities of standards are identified, it is worth immediately reacting and eliminating inconsistencies. A temporary gap in the solution of such a question could result in improvement orders for the company by the customer, as well as fines for many millions, which as a result will lead to a decrease in the company's performance indicators. Resources provision for the company is the most

costly element of a common system. Depending on the level of quality provision with material, financial, human resources, it is possible to determine the effectiveness of management. The fact of the availability of certain resources does not guarantee the required efficiency. Materials and energy have a positive effect on the level of efficiency of activities, if the problems of resource saving, reducing the material consumption and energy intensity of work are being solved, the management of the material resources and sources of supply are rationalized.

Highway construction companies need to monitor the resource base and determine the values of each component of the existing system of resource provision. It is necessary to analyze the structure and sources of the required resources. Here is an approximate scheme of resource provision for a construction company (Fig. 2).

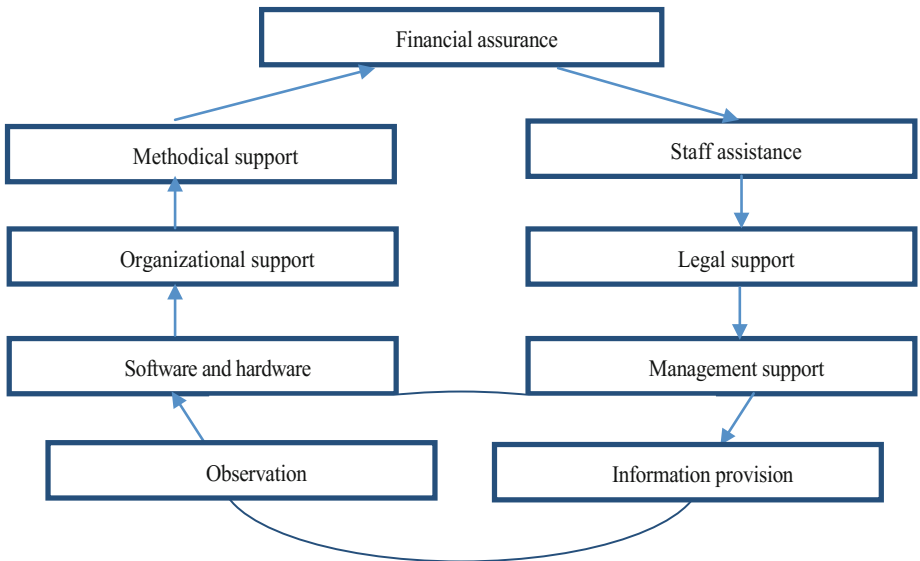


Fig. 2. Provision system of an enterprise.

The provision of highly qualified personnel, the necessary reserves of financial resources, inventories of material and technical resources allows the company to solve the most difficult tasks in the field of improving the quality and efficiency of its activities. However, much depends not only on the timely decision-making about the resources but on information and technical support as well.

Companies that own modern software and hardware of planning and analysis have a great advantage over their rivals in adjusting plans and making decisions. One of the effective ways of planning is budgeting, with the identification of cost centers, financial accounting and financial responsibility centers.

Much depends on the correct organization of work processes. Drawing up business processes on paper, their approval and introduction does not mean their high-quality implementation at all levels of management. Decision-making issues, efficiency,

consistency, and therefore timely adjustments to the relevant budgets allow us to intervene in the processes and improve the efficiency of the enterprise.

At what stage of the process is it necessary to determine the real rate of effectiveness: at the planning stage, at the initial stage of production or during the process of work? The planning stage gives us the opportunity to determine the required level of profitability taking into account the most realistic scenarios agreed in advance and approved by the management. The initial stage of the work actually confirms or refutes the planned indicators, and in the course of the work, all omissions, inconsistencies, unaccounted costs can be identified. Now the task for the supervisor is to find the most optimal option for reaching an effective level, with the least losses for the enterprise.

The causes of inefficiency can be divided into explicit and implicit factors. The obvious factors are as follows:

- (a) price;
- (b) temporary;
- (c) organizational;
- (d) management factors.

The implicit factors can be the following ones:

- (a) errors in calculations;
- (b) additions;
- (c) embezzlements;
- (d) irresponsibility, etc.

Both types of factors can cause huge damage to the production process. Working in an inefficient facility is an exception to the rule. When we observe this everywhere, it is a matter of organization and management of the enterprise as a whole. If there is a question of the survival of the company in any conditions, then the option of zero-yielding with the break-even point is the last resort. In other cases, efficiency should be in the first place; this is the reason for the existence of a commercial enterprise.

Each case of inefficiency, or otherwise, unprofitableness of the production cycle should be analyzed: the causes and factors leading to such a result should be revealed. The top-level of management should take tough measures to eradicate such factors, move to retrenchment, sharply reduce conditional-fixed costs, and tighten norms and standards for spending resources.

The human factor plays an important role in raising the efficiency of production. The staff is the main source and a crucial factor in the efficiency of a company's activity. The business qualities of employees, an increase in the productivity of their work are caused by the effective motivational mechanism at the enterprise, support of a favorable social microclimate in staff. Existing financial incentives in the enterprise should interest the employees of the lower levels in achieving higher performance indicators. In this issue, special attention should be given to control over the formation of a subclass with "family interests", when several representatives of one "family" (father, mother, brother and sister, and other close relatives) work in one enterprise. On the one hand, it can serve as an indicator of the transfer of skills and knowledge between generations for the benefit of the development of the enterprise, on the other

hand, – lead to the predominance of intra-family interests over corporate interests, especially if the representatives of one family work as a separate group. Sometimes the instantaneous “earnings” of a family can exceed their total annual income, which will undoubtedly lead to the choice of the first option giving up the issues of achieving a common goal – increasing the efficiency of the company’s activities. In this case, personal interest prevails over the general interests of the enterprise. Therefore, there should be control over the process of distribution of posts excluding family subordination within a single site (Feizullaev and Javadov 2016).

Another problem of the enterprises of Russia in the 21st century is economic waste and the absence of usual saving. Struggle against waste is the key to success in improving the efficiency of the enterprise. It is necessary to apply restrictive measures in all directions allowing and justifying the exceptional options for a possible increase in individual costs. It would also be worthwhile to interest the parties to do savings and to pay down part of the saved money into employee incentive funds. At the same time, it is necessary to take into account both the collective achievements in this matter and the individual merits of each participant in the corresponding process.

The use of advanced technologies and new materials is interrelated with the issues of quality control of the final product. A company that sets strategic goals cannot achieve them without applying innovations. A solution to this issue without the participation of personnel is not possible. Hence the conclusion that only incentive measures can lead to the desired results that suits all aspects of the business process.

Each company should independently develop its own system of encouragement and punishment. The absence of the system of punishment for the violation of labor discipline and the technological process can serve as a bad example and lead to irresponsibility in decision-making and risky operations.

One of the acutest problems in the road construction market in Russia today is the issue of increasing the transparency and efficiency of contract tenders and auctions. The auction form of bidding is one of the essential features of the road construction market, through which the competitive price of the relevant contract is revealed.

The gradual step-by-step introduction of the competitive system in the road construction industry should help solve many problems: creating a modern competitive environment, ensuring transparent and equal access of contractors to the market of roadwork, selecting the best performers for price and quality parameters, and technologies. All this would ensure the improvement of the quality of the final product and the achievement of efficiency in road construction and repair work with minimal expenditure of budgetary funds and strict observance of technological rules.

To date, the former ways are retained for the determination of suppliers (contractors, executors): open and closed tenders, electronic and closed auctions, request for quotations, the possibility of purchasing from a single supplier (contractor, performer), and new ones are established as well – a contest with limited participation, a two-stage tender, a closed competition with limited participation, a closed two-stage tender, a request for proposals. But despite this, the conducted studies of the process of organizing contract tenders in the road economy show that a lot of questions have been left without attention, especially concerning the interests of contractors.

Along with the goals of increasing efficiency for the state, the introduction of the competitive system was to create a competitive environment in the construction sector,

which in turn would allow construction organizations to plan their activities independently without guardianship and control of the higher administration, guided by agreements concluded with suppliers and buyers of products taking into account the specifics production and supply and demand. It appears from this, the basis of an effective activity of a road construction organization is the process of forming the value of construction products.

When drafting a commercial offer, the construction company takes into account the level of planned profitability and allowable price reduction. However, the point of self-repayment determined by the investor can be much higher, since the additional costs associated with concluding a work contract and performing work may not enter the proposed price range.

Analyzing the actual results of road construction companies, the author identified several serious omissions in the calculation of profitability using the example of one of the largest road construction companies in Russia, OAO Khanty-Mansiyskdorstroy, a member of the Avtoban Road-Building Company. An active campaign to conquer new markets and search for additional volumes for several thousand kilometers from the site force the company to organize a new approach to the process of determining the feasibility and effectiveness of the investment project. Territorial dispersion is an additional factor that reduces the efficiency of the organization of production leading to additional unaccounted costs, as well as to the failure to meet the targets and the disruption of work performance.

The main issue in the organization of work in the new region is the search for the necessary resources, such as material, labor, technical ones, etc. The company has limited time to determine the transport schemes for the delivery of materials, to search for subcontractors, to organize temporary settlements and the life of workers, to conclude business contracts. This is one of the problems of the bidding system; an omission at the legislative level. Therefore, to equate the opportunities of bidders, and to eliminate the advantages of local organizations, it is necessary to establish a minimum timeframe for acquaintance with the terms of the investment project within a period of two months or more.

Using OAO Khanty-Mansiyskdorstroy as an example, as a result of the analysis it was revealed that the conditions for admission to trading and contracting can also provide for additional costs that reduce the planned value of the profitability of the enterprise. This is, above all, the depositing of financial resources to secure an application in the amount of five percent of the value of the contract and the costs associated with obtaining bank guarantees. At first glance, it seems that these are insignificant expenses; in fact, these costs can reach up to three to five or more percent of the value of the contract. Taking into account unplanned and hidden costs, it can lead to zeroing values of planned profitability.

So, as experience shows, due to the postponement of tenders, sometimes, the period of alienation of financial resources to secure applications reaches two or more months, which leads to an increase in costs by 0.12–0.15%. If the average cost of obtaining bank guarantees is 1–2 percent per annum, the corresponding expenses for the entire period of implementation of the five-year contract will amount to 1.5–2% of the cost of work. However, in some cases, customers require not only a guarantee for the period of work performance but for the period of post-warranty maintenance of the contract as

well. In such cases, the period of coverage of the bank guarantee reaches 10–12 years, which increases the cost of servicing the bank guarantee by another 1.5–2%. As a result, only due to these two factors, the reduction in the planned size of profitability reaches from 3 to 5% of the contract price.

Another expensive item of the construction company is the insurance of risks. Despite the fact that the costs of insurance for construction and installation work can be compensated by the Customer (not always), the risks associated with the dishonest attitude towards their obligations of suppliers and subcontractors remain to the side. Often, the head contractor concludes with subcontractors the same agreements based on the points of the main contract with the Customer, where advances can be made for construction works in the amount of up to 30% of the contract price, as well as the insurance of the work performed. However, considering the fact that the head contractor, on the basis of the main contract, is obligated to fully assume the responsibility for insurance of construction and erection risks, the costs associated with insurance of the risks of the subcontractors' work are the additional expensive item that is jointly claimed by both contractors. Given the size of the subcontract works, these costs can reach up to 0.5% of the contract value. And the lack of an insurance contract for such work increases the risk of loss at times.

Meanwhile, the above additional costs are not limited to this list. The most dangerous and costly can be the omissions of design institutes during the development of design estimates. Often there are investment projects, where designer mistakes lead to a violation of the technology of organization of construction works, which the contractor naturally cannot admit. And the contractor has to at his own expense eliminate these violations in order to follow the sequence of the technological process, for the qualitative fulfillment of the obligations undertaken.

In order to achieve transparency in the conduct of bidding and increase the efficiency of the contract system, it is necessary to ensure that all acting persons, a customer, a tender organizer, the tender commission and the contracting organizations, fulfill their obligations in the best possible way.

5 Conclusion

In a market economy, road construction companies should conduct the deliberate but tough competition for each project, as the market of road construction industry is characterized by a number of characteristic features: first, a limited number of large paying customers; second, the inelasticity of products (price reduction by contractors does not affect the demand of customers); third, the cyclical demand, mainly due to changes in the investment policy of the state, revenues of the budget system; fourth, a high degree of risk associated with the loss of reputation due to unsuccessful selection of suppliers and subcontractors, non-compliance with deadlines for performance of work, etc.

At present, many construction companies in Russia do not actively compete implementing projects with the same customers (mainly state and municipal authorities). When determining the profitability of construction and installation works and economically feasible calculations of the cost of investment projects for the

construction, reconstruction and major repairs of highways in road enterprises, there are certain difficulties: accounting for the risks of road construction, the need to apply bank guarantees, unprofitable conditions for the insurance of liability of organizations and additional obligations from government and municipal customers.

The future of many construction companies in Russia today depends on participating in state and municipal programs for the development of the Russian transport system in 2015–2020 and the development program for the northern territories.

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Government of Import Substitution as a Factor of Russian Economy Development

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Abstract. The article concluded that economically literate policy of import substitution can be a catalyst for growth of the Russian economy, development of science, to overcome the technical gap, the revival of the investment climate. To reduce Russia's dependence on imports in the country, the political leadership adopted a program of import substitution.

The problems of import substitution become even more urgent in connection with the Western sanctions imposed against Russia in connection with the events in Ukraine. A number of Western countries announced the possibility of imposing harsh sanctions on the Russian economy. This stepped up the process of import substitution in Russia, including at the level of state policy. This was manifested in a decrease in imports and high growth rates in a number of industries oriented to the domestic market, including in manufacturing, construction, and agriculture. Concludes that despite numerous difficulties, the policy of import substitution in modern Russia has the real potential.

In this article, the authors not only analyze problems of import substitution, but also identify the main ways to accelerate these processes in Russia.

Keywords: Economic sanctions · Technological gap ·
The strategy of import substitution

1 Introduction

In recent years the growth of interest in the development of the theoretical and methodological foundations of import substitution has been very noticeable in domestic economic science. In the writings of Russian scientists, it is argued that in the stimulation of domestic demand for domestic products, the main role belongs to the state, and it should act as a source of final demand (A. Nekipelov); advantages and mechanism of import-substituting growth are justified (A. Kireev); the influence of macroeconomic processes on the development of import substitution is considered

(P. Kadochnikov); perspective directions of development of import-substituting industries in the regions are revealed (B. Zaitsev, L. Ismagilov); a substantiated conclusion is made about the positive impact of the policy of import substitution on the state of economic security of the country and regions (A. Kuklin) [1].

Most experts agree that an effective strategy of import substitution should be developed in Russia, designed for a near and more distant perspective, which ensures the development of the domestic market on the basis of national production. Unfortunately, in Russia a comprehensive strategy of import substitution is not yet available. In this regard, it would be useful to turn to the experience of our closest neighbors - Belarus and Kazakhstan, where import substitution programs are legislatively fixed at the state level.

The problem of effective import substitution in the Russian economy is not new, and is periodically raised in government and business circles, as well as in research and publications. Import substitution is a type of economic strategy and industrial policy of the state, aimed at protecting the domestic producer by replacing imported industrial goods with goods of national production. The strategy of import substitution presupposes a gradual transition from the production of simple goods to science-intensive and high-tech products by raising the level of development of production and technology. The strategy of import substitution itself is based on the development of production, improving the quality of the goods produced, the technologies used in enterprises, the development of innovations. The result of import substitution should be an increase in the competitiveness of domestic products by stimulating the technological modernization of production, increasing its efficiency and developing new competitive products with relatively high added value. A reasonable solution to this problem will not only reduce imports, while preserving a significant amount of foreign currency in the country, but also reduce the price of goods, support the domestic manufacturer, create new working conditions [2].

Substantial substitution of imports was observed in Russia after a strong devaluation of the ruble, which occurred in 1998. In 1998, the volume of imports to Russia fell by 20% (to \$74 billion), in 1999 - by another 28% (to \$53 billion). At the same time, the increased demand for domestic products after the crisis was quite easily satisfied on an extensive basis due to unloaded production capacities. The decline in imports caused by the devaluation was the most important factor of economic growth. In the future import substitution continued, but it was already less intensive. Additional impetus was given to him by the economic crisis of 2008–2009, accompanied by a significant fall in the ruble [2].

The problems of import substitution are periodically raised by the country's leadership. So, on November 5, 2009, President Vladimir Putin said that import substitution programs operate in many sectors of the real economy, especially where Russia has obvious competitive advantages, such as affordable raw materials, a large domestic market, long-standing traditions and experience. The head of state cited as examples of such branches forestry, light industry, pharmaceuticals, automotive industry. In his opinion, import substitution is not an end in itself, and it is sometimes more profitable to efficiently function within the framework of the international division of labor, to receive cheap quality products abroad. But in some cases, Russia should "pay attention to import substitution." The national leader stressed that the goal is not to close the domestic market and to preserve backwardness, but, on the contrary, to create truly competitive new industries that produce high-quality and sought-after consumer goods [3].

Vladimir Bessonov, head of the laboratory for research of problems of inflation and economic growth of the Higher School of Economics in 2012, noted that the recent slowdown in the rate of growth of imports to Russia is the result of a meaningful economic policy of the state to support the domestic producer and import substitution. According to him, support for domestic production led to the fact that passenger cars made in Russia surpassed the pre-crisis level in volume, and imports at the same time reached only 50% of what was at the peak before the crisis. In terms of value, the development of the automobile industry reduced imports by about \$20 billion for the year. A similar situation is observed in agriculture.” According to the researcher, at present there is a long-term positive trend of import substitution [4].

The following fact can convincingly confirm this conclusion of the famous Russian economist: in just 2 years 2015, the share of imports in the volume of retail sales in Russia fell to a record low level in the last decade - 34%, and exactly two years later, in II quarter of 2017, the share of imports decreased by another one percent - to 33%. The positive balance of trade with countries of the far and near abroad, regularly published in Russia, also supports this dynamic [4].

Russia begins to produce, and in some cases exports, what it imported earlier. So, linear, port and river icebreakers were supplied by Finland, and since 2008 icebreakers have been built either in Russia or in the framework of international cooperation; If diesel trains were traditionally supplied to our country by Hungary, then in 2011 new models of this equipment (DP-S) are produced and exported by Russia. Such import substitution occurred with passenger and cargo-passenger minibuses imported from Poland and some other industrial goods and equipment [5].

Thus, the facts show that the state policy of gradual import substitution began to operate in Russia.

2 Problem Statement

The investigating the problems of import substitution, the authors first of all set themselves the question: how are the state import substitution programs implemented in the leading sectors of the Russian economy and, first of all, in industry and agriculture. This problem was considered by the authors in connection with the technological backwardness of Russia.

The problem of Russia’s technological lag was formed not during the period of Western sanctions, but during the last quarter of a century. And if at the beginning of market reforms the Russian economy still had the production and technical capacities that had been delivered from the USSR, then after two and a half decades the production potential of the Russian economy significantly decreased, which had a negative impact on the production of domestic goods and technologies. This is clearly seen in the aircraft building industry, where aircraft production up to 2011 did not exceed 10 units per year (in 2005 only 6 and in 2010 - 9 aircraft), and only in the last two to three years in This area has a positive dynamics [6]. Insufficient investment of the industry from the state led to the curtailment of research and development work, a decrease in the innovative activity of airlines.

The lack of finance, including new investments from the state, adversely affected the renewal of fixed assets, re-equipping them with modern technologies for designing, manufacturing and servicing new-generation aircraft. As a result, Russian airlines were forced to buy foreign airliners. For example, the fleet of bankrupt airline “Transaero” more than 90% consisted of foreign-made aircrafts, mostly of “Boeing”, and only three Tu-214 from Russian air carrier [6]. In a large number of imported airbuses bought Aeroflot, Yu-Tayr, Kogalymavia and other air carriers. The call of the head of state to support the domestic manufacturer of Russian air carriers was not heard.

These and many other facts make it possible to make a well-founded conclusion that the current state of the domestic aviation industry, like some other sectors of the economy that are highly dependent on imports, can be called critical, which has passed the limits of national security.

The reason for the high dependence on imports of many sectors of the Russian economy (machine-tool building, shipbuilding, instrument making, pharmaceutical, etc.) was the incorrect economic policy pursued in the post-Soviet period. Suffice it to say that the economic policy of those years, the mistakes in the state regulation of the economy, was the fall in the volume of industrial production to the level of 1991, and for some industries and types of industrial products, the fall turned out to be multiple. The greatest concern is the current state of domestic machine-tool construction, where the share of imports today exceeds 90%, while the production of metal-cutting machine tools in comparison with the Soviet period has decreased in our country more than 10 times.

Under these conditions, an extremely clear economic program was required, including import substitution, aimed at overcoming the non-competition of the Russian economy. The reason for the high dependence on imports of many sectors of the Russian economy (machine-tool building, shipbuilding, instrument making, pharmaceutical, etc.) was the incorrect economic policy pursued in the post-Soviet period. Suffice it to say that the economic policy of those years, the mistakes in the state regulation of the economy, was the fall in the volume of industrial production to the level of 1991, and for some industries and types of industrial products, the fall turned out to be multiple. The greatest concern is the current state of domestic machine-tool construction, where the share of imports today exceeds 90%, while the production of metal-cutting machine tools in comparison with the Soviet period has decreased in our country more than 10 times.

Under these conditions an extremely clear economic program was required, including import substitution, aimed at overcoming the non-competition of the Russian economy.

By reducing its own industrial production, Russia increasingly became dependent on imports of goods, technologies and services. The import dependence of Russia in dollar terms increased almost 10 times: from 45 billion in 2000 to 341 billion dollars by 2013 [9]. According to a number of economists, the share of imports today exceeds the permissible limits for ensuring national and economic security of the country. When a sharp reduction in international reserves, a decrease in foreign exchange earnings to buy imports for everything that is necessary in conditions of sanctions becomes problematic. The state policy of import substitution in industry is largely dictated by the need to overcome dependence on imports and from unscrupulous partners who

resort to long-term economic sanctions. The situation was complicated by a collapse in the prices of oil and other commodities, which our country traditionally exports. As a result, the flow of petrodollars declined, access to cheap Western credits was cut, GDP growth fell, and Russia once again found itself in a difficult economic situation.

President of the Russian Federation Vladimir Putin, speaking in the Kremlin with an annual message on December 3, 2015, noted: “Last year we faced serious economic challenges. The prices for oil, other our traditional export goods fell, and the access of Russian financial institutions and companies to the world financial markets was limited ... And I understand that people are asking questions: when will we overcome difficulties and what will we do for this?” [10].

Economic policy, with its rate of export of oil and other raw materials, once again demonstrated its weak effectiveness. It is obvious that the economy of the Russian Federation currently depends heavily on imports of goods and technologies.

The fact is that our country has not developed its own industrial production in the last 15 years, especially in the manufacturing sector, but has formed a raw-type economy. In 2000, 45% of the oil produced in the country was exported, 35 - natural gas, 36 - oil products, 23 - finished rolled ferrous metals, 81 - produced mineral fertilizers, 39 - unprocessed timber, 84% - cellulose [11]. For 2000–2014 years. The share of raw materials in the structure of Russian exports rose to 81.1%. During the same period, the volume of imported foreign products increased by 8.4 times [8].

At present, the share of imports in various sectors of the economy is extremely high. This is evidenced by the following table (Table 1).

Table 1. Import Dependency certain branches of the Russian economy.

Industry	Import share
Heavy engineering	60–80%
Aircraft construction more than	более 80%
Radioelectronic industry	80–90%
Agricultural machinery construction (depending on the product)	50%–90%
Oil and gas equipment	60%
Pharmaceutical and medical industry	70–80%
Building sector (depending on the sector)	50%–90%

From the table we can see that in the most important sectors of the economy the dependence on imports is more than half of the demand. This fact is confirmed by the Ministry of Industry and Trade of Russia. According to him, the share of imports in the machine-tool industry today exceeds 90%, in heavy engineering - 60–80%, in light industry - 70–90%, in the electronics industry - 80–90%, in the pharmaceutical and medical industry - 70–80% [8]. It turns out that domestic producers in certain sectors of the economy today are able to saturate the market only by 10%.

Thus, own production in such important sectors as heavy engineering, machine tool building, radio electronic industry is only 20–30% of the demand, so Russia is forced to import metal-cutting machines and press-forging equipment, cars and road

machinery, computers and telephones, meat and dairy products, clothing and footwear, medical devices and medicines and much more.

What economic (and national) security can be argued at these rates? It is possible to imagine what will happen in the Russian Federation if imported medications cease to flow (such inhuman sanctions in case of aggravation of relations with the West are quite real). In this case, almost all cores, patients with diabetes mellitus and other categories of Russians who consume imported drugs in the absence of domestic ones will die before the term.

One of the ways to overcome the difficulties caused by the next economic crisis and Western sanctions, a sharp reduction in the prices of oil and other commodities, which Russia traditionally exports, is import substitution.

The government of the country, acting within the framework of the import reduction policy announced by the country's leadership, approved in April 2014 a new version of the state program of the Russian Federation "Development of Industry and Enhancing Its Competitiveness" (Decree No. 328 of 15 April 2014). One of the main tasks of the state program, calculated until 2020, declined a share of imports of products, including those used by domestic producers.

The political will of President Vladimir Putin played a prominent role in the development and implementation of the state policy of import substitution. Thus, in his message to the Federal Assembly of the Russian Federation on December 4, 2014, the task was to stimulate import substitution and facilitating the accelerated development of non-oil companies, designed to change the country's export potential [12]. This task was due to the need to develop a set of measures aimed at increasing the stability of the Russian economy in the conditions of the unstable ruble and anti-Russian sanctions and was aimed at enhancing the country's economic security by reducing dependence on imports.

In the spring of 2015, on behalf of the government, a number of ministries developed 19 sectoral import substitution programs for the coming years.

Practice has shown that modernization of the economy, implementation of state policy in the sphere of import substitution of goods and technologies is impossible without a large amount of investment, investment in own innovative production. Realizing this, the Russian authorities are taking measures to financially support the approved import substitution programs. The allocation of funds is not only through the expenditure side of budgets of all levels, but also in the form of subsidizing and co-financing research, as well as grants and preferences. So, in the fall of 2014, the government adopted a program to support investment production, which is being implemented in Russia on the basis of project financing.

However, the innovation-investment component of import substitution in modern Russia as a whole leaves much to be desired. The main reason is an increase administrative pressure on business. Placing new production in the framework of import substitution in Russia, many representatives of large and medium-sized businesses consider unprofitable, since, in their opinion, this work is associated with corruption and raiding [13]. It is no coincidence that in the world rating on the conditions of doing business, our country occupies far from the best positions.

One of the key indicators of the investment climate in the country is the Doing Business rating, which is compiled every year by the World Bank. The index is an

average indicator for 10 indicators, which include: starting a business, obtaining construction permits, registering property, connecting to transmission networks, access to credit, taxation, protecting investors' rights, enforcing contracts, cross-border trade, and bankruptcy regulation. On some of these parameters, Russia managed to achieve serious results. In 2014, Russia was included in the top three states, more active than others following the path of reform. It rose immediately to 20 positions and took 92nd place in the new international rating *Doing Business - 2014*. Moreover, for the first time Russia entered the first hundred rating, assessing the conditions of doing business, ahead of all three BRIC countries - China (96th), Brazil (116th) and India (134th).

The World Bank has called Russia one of the three states that have most actively advanced in the past year on the path of reforms aimed at improving the business climate. However, if you look at the positions of other former Soviet republics in this rating, it turns out that Russia's positions in it are at least not the best. Of the countries of the former USSR, Georgia was the highest in the ranking for 2013 (rising from 9th to 8th place for the year), Lithuania, located at the 17th position, Estonia and Latvia (22nd and 24th respectively). Also higher than Russia in the ranking are Kazakhstan (50th place) and Belarus (63rd place) [14].

Recently the country's leadership has taken efforts to improve the conditions for the creation of new industries and business. Thus, at the direction of the head of state, there was a reduction in the number of permits necessary for the implementation of construction projects. To get permission in the construction industry, for example, now you need to spend 297 days, not 344 days, as a year earlier. To go thus it is necessary on 6 procedures less, instead of 42, as earlier, and the time necessary for registration of new objects, ready for operation, too will be less. Also, Russia facilitated the procedure for access to electricity for enterprises, making electricity generation more simple and less expensive. The number of procedures was halved to five, and the number of days for their the passage from 281 to 162 [14]. Thus, barriers to entrepreneurs have become slightly smaller, but, nevertheless, they greatly complicate the conduct of business in Russia.

In 2014–2015 years. In the Russian Federation there were not very favorable conditions for investing in import substitution. First, credit policy with its high interest rates (in Russia loans for business are several times more expensive than, for example, in the European Union or the US), does not contribute to the development of a loan financing market. Thus the state, along with commercial banks, has practically narrowed the participation of small and medium-sized enterprises in import substitution programs. Secondly, the processes of import substitution largely restrain the lack of qualified personnel in a number of industries. It's no secret that at the beginning of market reforms many Russians, choosing a profession, focused on the humanitarian industry, and technical and even more work specialties were not popular.

A negative role was played by the so-called brain drain. Only from 2005 to 2011, according to official statistics, the number of scientists in Russia fell from 1,119 million to 381 thousand people, that is, almost three times. According to the Open Economy Fund, the departure of Russian scientists abroad is not only not decreasing, but has increased significantly in recent years. For example, in 2012, 122,751 left Russia for Russia, and another 186,382 people in 2013 [8]. As a result, many segments of the real sector of the Russian economy are currently experiencing a shortage of highly skilled

personnel, without which it is impossible to create new technologies, achieve high-performance work, and effectively solve the import substitution problem. Because of the brain drain, Russia has lost experienced specialists who are currently involved in the production of modern goods and technologies in the countries of the European Union, the United States, and other countries. Well-known fact: in the corporation Bill Gates, 22% of employees are from Russia. It is estimated that the US has been consuming Russian scientists for almost 20 years, accounting for about 30% of emigrated specialists from Russia. Germany accepts 20% of Russian scientists, in Israel they make up about 40% of the total number of scientists. The main reason for the migration of Russian scientists is insufficient funding. It is estimated that Russia spends 4 times less on research and development than in China, 7 times less than Japan and 17 times less than the US [8].

Another problem that the authors set themselves in the course of this study was the problem of import substitution in the agro-industrial complex (APC), aimed at ensuring its own production of food products, reducing imported food.

Due to a number of reasons, the main one of which is lack of financing, the Russian Federation currently has an underdeveloped agro-industrial complex that is not able to ensure the country's food security, to consistently produce its own food products that meet medical standards and requirements.

The problem of import substitution in the agrarian sector became even more urgent with the introduction of Western sanctions and a significant devaluation of the national currency, as well as the food embargo imposed by the decrees of the President of the Russian Federation. The first presidential decree of August 6, 2014 No. 560 "On the application of certain special economic measures to ensure the security of the Russian Federation, a ban was imposed on agricultural imports from countries that imposed sanctions on Russia (the United States, the EU countries, Canada and Japan) [15]. The second decree was signed by Russian President Vladimir Putin on November 28, 2015, which imposed an embargo against Turkey in connection with the shooting of the Russian Su-24 bomber. The decree was called "On Measures to Ensure the National Security of the Russian Federation and Protection of Citizens of the Russian Federation from Criminal and Other Illegal Actions and the Application of Special Economic Measures against the Republic of Turkey" [16]. He imposed a ban on the import of vegetables, fruits and other food to the territory of Russia.

In the conditions of the ban on the import of agricultural products, raw materials and foodstuffs, including meat and meat products, milk and dairy products, including cottage cheese, fish, vegetables, fruits, etc., into the Russian Federation, the problem of import substitution of basic foodstuffs has become aggravated. Sanctions and counter-demonstrations once again showed that Russia is not able to independently provide its citizens with all kinds of food, even at a minimum, not to mention balanced medical norms. It can not yet only grow the required volume of agricultural products, but also to process and preserve what the national agriculture produces.

If in 2000 the total food imports in the Russian Federation did not exceed 7.4 billion US dollars, then 13 years later, in 2013, it grew 6 times to 43.5 billion dollars [2]. But these huge money could go on the development of domestic agriculture and then everyone would benefit: both the agrarians, the country's budget, and ordinary Russians. But, unfortunately, there is no prophet in his native country, and hundreds of

billions of rubles in foreign currency converted to foreign producers instead of supporting their farmers. As a result, the production of food products fell sharply, and the defectiveness of such an agrarian policy became visible to the average consumer.

In 2014 according to Rosstat, import of beef was already 60%, the share of imported pork reached 31%, poultry meat - 13%, cheese was imported to 48% of total consumption by Russians, and the share of imports of milk and Dairy products have reached 60% [2].

Many economists and political scientists argue that the current plight of Russia's agriculture, the growth of imports and the rise in food prices are a consequence of the agrarian policy implemented during the Yeltsin reforms. With this it is difficult not to agree. The result of these reforms was the massive bankruptcy of collective farms, the outflow from the countryside of the workforce, and the reduction of crop areas. Sown areas in modern Russia declined by 41 million hectares. Currently, only 40% of agricultural land is actually used, half as much as in the USA. Average per capita grain production during the reign of President Boris Yeltsin (1990–1999) decreased more than 2 times, meat - 3 times, milk - 1.5 times; The total volume of all agricultural products as a result of the Yeltsin reforms fell by 45% [17].

The incorrect policy regarding financing and state support of domestic agriculture after Boris Yeltsin was continued by his successor V. Putin. As a result, because of a lack of funding, the livestock population in Russia has decreased almost threefold in a quarter of a century. If in 1988 there were 59.8 million, today the Russian herd of cattle does not exceed 20 million heads. The decline in livestock production led to a decrease in beef production from 4.3 million tons to 1.7 million tons, or 2.5 times, resulting in a decrease in beef consumption per capita from 29.3 kg to 11.9 kg [18].

Reducing the number of cattle, Russia sharply reduced the number of dairy herd. If in 1990 there were 20.5 million cows, then in 2015, according to the chairman of the Council of the Dairy Union of Russia A. Ponomarev, there were only 8.8 million cows [19]. Thus, over 25 years of reforms, thanks to the new agrarian policy, it was possible to reduce the dairy herd of the country by 2.5 times. Of the 39.2 million pigs that were numbered in 1988, the losses were 23.1 million [2]. This ruin did not know Russia's agriculture even during the Great Patriotic War.

An example of the development of their own livestock for capitalist Russia can serve the United States, where today there are over 92 million head of cattle. Applying advanced technologies, this country annually harvests grain 4 times more than our country (340–350 million tons), produces meat 5 times more than Russians [17]. These successes in the development of the agro-industrial complex became possible due to the effectiveness of public administration, the interaction of government and business. The US Food Security Act, in force since 1985, confirmed the state's attitude to the agro-industrial complex as a special branch of the economy of strategic importance. For decades, the state has been providing all-round support to its agriculture, while maintaining a policy of broad subsidizing of the two-million-dollar community of farmers at the expense of budgetary funds. In turn, the agrarian sector of this country with its well-functioning work allows us to ensure food security and US leadership in world food trade. The priority of US agrarian policy remains the provision of guaranteed access of Americans to healthy and nutritious food with increasing food aid to families with low incomes [17].

In modern Russia despite the import of foodstuffs to some extent supplementing the missing own production, there is a serious backlog in nutrition issues not only from the US, but also from the established norms of consumption for meat and meat products, milk and dairy products, vegetables and fruits, other food and does not meet medical standards.

In the 2000s, when there were the highest prices for oil, gas and other commodities, which formed the basis for Russia's exports, when there appeared large financial opportunities, it was possible to seriously engage in import substitution. As you know, the State Duma in those years took budgets with a surplus of 1.5–1.8 trillion rubles, but the financing of agriculture did not exceed 1% of the state budget. In these conditions, talking about the rapid replacement of food imports is absurd. All you need to make is a pedigree, a seed, a material and technical fund, and also modernize and expand production capacities for the processing of agricultural products.

For the sake of justice, it should be noted that, since 2005, the state has taken certain steps to develop the agro-industrial complex. The implementation of the national priority project “Development of the agro-industrial complex”, which aimed to accelerate the development of animal husbandry, create modern competitive agricultural production, stimulate the development of small forms of agribusiness, made a significant contribution to the development of animal husbandry. During the implementation, additional measures were included in the project, namely: state support for breeding livestock, sheep and goat breeding, reindeer herding and herd horse breeding, industrial fish farming.

Since 2008, the national project “Development of the AIC” has been transformed into the State Program for the Development of Agriculture for 2008–2012. To implement the program from the federal budget it was planned to allocate 551 billion rubles or 3 times more than in the previous five-year period. However, the amount of real government funding for this program was not sufficient for its implementation. The reason is the next financial and economic crisis of 2008–2009.

The new State Program for the Development of Agriculture and Regulation of the Agricultural Products, Raw Materials and Food Markets for 2013–2020 was approved by the Government in 2013. On December 19, 2014, amendments were made to it, related to import substitution and ensuring Russia's food independence in the face of Western sanctions. The volume of planned budget financing is impressive. So, for 2015 it was planned to allocate 187.864 billion from the state budget, 258.140 billion from 2016, and 350.363 billion rubles from 2020 [20]. Not the fact that all the planned financial resources will be allocated, but already one thing that the state seeks more and more resources to direct the agro-industrial complex, can not but rejoice. It should be noted here that, along with budgetary allocations to the agro-industrial complex, the inflow of borrowed funds is increasing due to loans and subsidizing interest rates to borrowers from the agricultural sector. Only Rosselkhozbank during the period of the State Development Programs of the AIC issued loans to the rural business, since 2008, 2.3 trillion. rub. loan funds. Of these, more than 34% falls on investment loans granted for the construction and purchase of fixed assets, the development of livestock complexes, poultry enterprises and other purposes.

As a result of the implementation of this state program for the development of the agro-industrial complex, by 2020 it is planned to increase own grain production to

99.7%, beet sugar to 93.2%, vegetable oil to 87.7%, potatoes to 98.7%, meat and meat products - up to 91.5%, milk and dairy products - up to 90.2% [21]. These indicators not only correspond, but also somewhat exceed the limits established by the Doctrine of Food Security of the Russian Federation, approved by the decree of the President of Russia.

Investments in the domestic agro-industrial complex could be more significant if the country's leadership managed to convince large businesses to abandon the export of capital and send trillions of rubles for the development of agriculture, the return of tens of millions of hectares of arable land, the production of new modern equipment for the agro-industrial complex, the construction of fattening complexes, equipped with new equipment, etc.

It should be noted that investments invested in animal husbandry are not returned to Russia in 10 years, but there are many risks associated with bureaucracy and corruption. Therefore, this niche, although attractive for business, but because of the shortage of "long" money so far is being mastered at an insignificant rate, and for a quarter of a century both the dairy and the meat herd have been reduced. Without developing specialized cattle breeding, Russia will remain a country importing beef and dairy products.

The current situation in the Russian agribusiness sector can be corrected only with a significant increase in financing, attracting investments in this sector of the economy. This can be done if we reduce the outflow of capital abroad. Estimated: over the past ten years, businessmen have withdrawn from Russia more than \$680 billion or about three annual budgets of the Russian Federation. This money would be more than enough for the implementation of all import substitution programs.

Import substitution in the agro-industrial complex became very important after Russia, in response to sanctions imposed by European countries, the USA, Canada, Australia and Japan, in 2014, banned the import of European and American food products. According to the Minister of Agriculture of the Russian Federation Alexander Tkachev, Russia will be able to fully meet its needs for pork and poultry meat for two to three years, to switch to full provision of Russian consumers with domestic fruits and vegetables - within three to five years. And as for milk, dairy farming, it will be required for serious investments and subsidies of the order of 7–10 years. Russians have to rely on the promises of the Minister of Agriculture and tighten the belts with the growth of prices for imported and domestic beef, cheese, milk and other food products. According to statistics, food in 2017 compared with 2014 has risen in price by an average of 20%. One of the reasons for such a significant increase in food prices was the devaluation of the ruble, implemented by the Central Bank of Russia in 2014–2015.

The solution of the task of import substitution is possible if the intensity of domestic agricultural production is increased based on the introduction of innovations and investments, the use of new, more productive technologies, and the development of the food and processing industries that form the agrifood market, food and economic security.

The main incentive for Russian agricultural producers, as you know, is the guarantee of sales of grown products, which should become an integral part of the implementation of programs and plans to replace imported products. Without investing considerable funds in the agro-industrial complex today, one can not seriously talk

about import substitution, filling of stores and markets with domestic food products, ensuring the food security of our state.

Thus without a serious increase in domestic production in modern Russia, it is impossible to solve the food problem.

For the real revival of domestic agriculture, the implementation of import substitution programs, in our opinion, it is required to conduct the following activities:

- to increase investment in agricultural production, allocating up to 5% of GDP annually to support the village;
- to renew the state order for agricultural products; the state in the person of the Ministry of Agriculture should guarantee to the peasants that at least 75% of the grain, milk, meat produced at them are sold at market prices through zagotkontory and zakupochnye cooperatives, etc.
- to help start-up farmers and other agricultural producers in marketing issues, in promoting their products to the market;
- to write off all debts to agricultural enterprises, reduce taxes;
- to pay a subsidy on the products produced, as is customary for farmers in the United States and a number of European countries;
- to compensate a part of expenses for fuel, fertilizers, new technics, reducing disparity of the prices;
- Investments should be directed not only to the re-equipment of agricultural production, modernization of machinery, construction of farms, workshops and storage facilities, but also to settle the village, create human conditions for work in order to make rural labor prestigious for young people to work in this industry;
- to restore privileges for young specialists who have started working in the countryside, including providing them with housing.

Thus in order to solve the problems associated with the development of the agro-industrial complex and import substitution in the new political and economic conditions caused by the next crisis and Western sanctions, there is a need for a radical review of the agrarian policy of the Russian state.

How effective will be the new plans and programs for the development of the Russian agro-industrial complex in the conditions of Western sanctions, time will tell.

President V. Putin, paying attention to the problems of implementation of the state policy in the field of import substitution, holds numerous meetings, State Council meetings and other events, during which he clarifies the situation and gives instructions on the activation of these processes in the economy. Thus, in November 2015, the head of state held a meeting of the Presidium of the State Council in Nizhny Tagil on the implementation of the state policy in the sphere of import substitution in the subjects of the Russian Federation, at which issues related to the modernization of the domestic economy were discussed. Speaking with a keynote speech at the event, V. Putin stressed: “It is necessary to establish a mass production of high-quality Russian products, and at an affordable, economically reasonable price, capable of equal competition with foreign counterparts in both the domestic and foreign markets”. According to the head of state, the implementation of state policy largely depends on

how coordinated and calculated the actions of federal, regional authorities and business. It is of fundamental importance in this matter to maintain a single line, “to coordinate import substitution projects taking into account the country’s needs, the priority tasks of economic development and the strengths of the regions” [22].

Thus, the implementation of the state policy of import substitution based on the combined efforts of federal, regional authorities and business can become an important factor in the development of the Russian economy.

President Putin, announcing the next message to the Federal Assembly on March 1, 2018, expressed his confidence that this and many other programs of economic modernization will be fulfilled. “We already have experience in implementing large-scale programs and social projects,” the head of state said. “Our economy has shown its stability, and the achieved stable macroeconomic situation opens new opportunities for breakthrough development, for long-term growth” [23].

3 Research Questions

In this study, the authors consider the following questions.

1. Identify the causes of import substitution in industry and agriculture, other sectors of the Russian economy.
2. Analyze the main directions of the state policy of import substitution in modern conditions.
3. Show the conditions under which the developed import substitution programs can be successfully implemented.

4 Purpose of the Study

The purpose of the study is to study the problems of import substitution in industry, agro-industrial complex, other branches of the Russian economy, to show the importance of import substitution for the social and economic development of Russia.

5 Research Methods

In studying the main issues of this topic, the authors use the following methods: (1) an institutional method that allows us to analyze the role of the president, government, other authorities in implementing the state policy of import substitution in Russia; (2) systemic and structural-functional approaches make it possible to form a holistic and objective view of the state of import substitution in Russia, to note both positive aspects and existing shortcomings in implementing state policy in this area.

6 Findings

1. The policy of import substitution in Russia, despite the mentioned difficulties, has chances for success under certain conditions. This is due to a large number of factors. First, Russian enterprises in most cases there is no problem with access to the necessary raw materials, natural resources. Secondly, production costs at the opening production in the Russian Federation in many cases will be lower than abroad, in fact, due to the relative cheapness of some natural resources and labor. Advantages to European firms in pay increased in connection with the devaluation of the ruble. Also in Russia is relatively cheap electricity. Thirdly, Russia has a tangible technological potential.

So far, it is being implemented in practice in a small number of industries, mainly in the military-industrial complex, in the space industry.

2. Thanks to the state policy of import substitution, import substitution programs have been developed and are now being implemented in many sectors of the real economy, especially where Russia has obvious competitive advantages, such as affordable raw materials, a large domestic market, long-standing traditions and experience.
3. It should be noted that the activation of state policy and real steps to develop a holistic strategy of import substitution in the economy, the Russian authorities undertook after the beginning of the next crisis, and in recent years even after the introduction of anti-Russian sanctions. "Import substitution" has become a fashionable word, it is repeated, like a mantra, by politicians and managers of all levels of state and municipal government.
4. The main results of the implementation of the adopted strategy of import substitution should be the substitution of imported goods by domestic and the growth of export volumes. For Russia, a real import substitution, not an industrial assembly of foreign components, is a good chance to realize the ideas of economic diversification, to end oil and gas dependence and to switch to the production of domestic high-tech products in accordance with market conditions.
5. And if the result of the program is the emergence of new competitive goods, attractive for both Russian and foreign markets, the campaign for import substitution can be considered successful. For Russia and ordinary Russians, success in import substitution will be noticeable, first of all, in improving the quality of domestic products, reducing its cost.

7 Conclusion

1. Thus, under the conditions of Western sanctions, a sharp drop in prices for oil and other energy carriers, the issue of import substitution of technologies and goods from abroad became acute in Russia. The article proves that in an uneasy economic situation, the way out of which is to diversify the Russian economy, transfer it from raw materials to an innovative development path, including the replacement of technologies and goods, an important role belongs to the state policy of import substitution in the economy.

2. Analysis of the state of the Russian economy, the dynamics of the export-import balance shows that the inertia of traditional principles and methods of management with a rate for the export of raw materials and goods with low processing has not yet been overcome. And while Russia is focusing on the export of raw materials, it will not be perceived as a sufficiently strong competitor or a serious trading partner in the economic sphere. Unprocessed raw materials are cheap, besides it has the property of falling in price or ending.
3. Import substitution of goods and technologies can become an essential factor in the development of the domestic economy under sanctions. It should be noted that in the Russian economy, import substitution programs and processes periodically appeared and were partially realized. As a rule, this was facilitated by the conjuncture of low prices for exported energy resources and other commodities, as well as the devaluation of the national currency relative to the dollar and euro, which directly affects the reduction of imports, accompanying this phenomenon.
4. The analysis of the main stages of import substitution in the Russian Federation shows that they began (and quite actively) with the beginning of the next financial and economic crisis (1998–1999, 2008–2009, 2014–2015). The beginning of a new stage of import substitution in the Russian economy was laid by another economic crisis, characterized by a sharp drop in oil prices, a reduction in foreign exchange earnings, a deficit in the state budget, and a devaluation of the ruble. The depreciation of the national currency in 2014–2015. Almost doubled in comparison with 2013, which contributed to the intensification of work on the implementation of new programs and plans for import substitution. However, it should be noted that after the crisis phenomena decreased, the world prices for oil and other raw materials exported from the country grew, the intensity of import substitution accordingly decreased.

This situation is due to a number of objective and subjective factors, chief among them is the government's inconsistent policy of implementing approved plans and programs to replace imports by its own production of goods and technologies based on innovation and investment.

5. The result of the policy of import substitution should be an increase in the competitiveness of the domestic economy, technological modernization of production, its efficiency and the development of new products capable of replacing foreign counterparts.

Reasonable implementation of this policy by all its subjects will allow not only to reduce imports, saving a considerable amount of foreign currency, but also to reduce the cost of goods, support the domestic producer, create new jobs, and increase the economic security of the state.

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Problems of Management of the Public Sector as Difficult System

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Abstract. Subject of consideration of article are the difficult systems and problems of their management which striking example is the public sector. The purpose of work is specification of complexity as independent object of the management demanding including, increases in a role and improvement of mechanisms of coordination in management of difficult system. Options of consideration of difficult system and elements of its complexity with allocation of four of its main types are stated: difficulties of plurality of affine components, their behavior and communication and cognitive difficulties in article.

Object of a research is the public sector having several perspectives of consideration, each of which forms certain specifics of functioning and the corresponding problems, approaches and elements of its management. A hypothesis of a research is the thesis about need of an independent vector of administrative activities for the solution of problems of complexity of system (the public sector) which includes the following functions: modeling and design, coordination, estimation, intellectual analysis and «clever» regulation.

The methodology of carrying out work is based on cross-disciplinary interaction of knowledge from area of the economic theory and the system analysis that allows to increase integrity of consideration of the public sector, to unite knowledge for the purpose of formation of the new ideas and concepts. System representation of a phenomenon of the public sector as the difficult system demanding the corresponding set of measures for management of its complexity is result of work. Results of work can be use both in the theory and in practice of management, and in aspect of development of economy of the public sector.

Keywords: Complexity · Difficult system · Public sector · Management of system · Interactions · Coordination

1 Introduction

Questions and problems of complexity gain the prime importance in the modern world owing to what experts speak about modern time as a century of the theory of complexity [15]. Experts [4, 19] disperse in estimates of this term while the ideas and theories of complexity give a broad set of understanding of this phenomenon, especially in communication by consideration of category of complexity in aspect of studying of difficult systems. Subject and object approach for which the human limitation of thinking is the reason of complexity of systems is the cornerstone of their

representations therefore these systems have no exact description, thus that an object and the subject of consideration shows stochastic behavior. As a result, the structure of characteristics of difficult system is very diverse that is connected with subjective aspect of understanding of complexity and illegibility of signs of difficult systems.

Systematization of complexity of system can be based on the basis of the direct, return and secondary principle. As a result, the difficult system represents plurality of the elements forming the integrity possessing the interconnected set of types of difficulties including difficulties of plurality of affine components, their behavior, communication and cognitive difficulties (see Table 1).

Table 1. Principles of consideration of complexity.

Difficult system		
Direct principle	Secondary principle	Return principle
Multilevel	1. Process and/or behavioral complexity 2. Communication complexity (difficulties of interaction)	Existence of difficulties in the form of limitation of resources for the description, understanding and management of system
Polystructural		
Diversified		
Multifunctional		
Elaborate		
Polysynthetic		

The scale of complexity of systems of Kenneth Boulding including nine hierarchical levels [1] including the level of the person and the social organization is most known. One of striking examples of difficult social and economic system is the public sector that is traditionally considered as the segment of non-market economy aimed at providing with the public benefits.

2 Problem Statement

In general, the public sector has several perspectives of consideration, including grocery, institutional, organizational, network, etc. (see Table 2).

Table 2. Options of consideration of the public sector.

Consideration approaches	Essence of consideration of the public sector
Grocery	Producer of the public benefits
Sectoral	Non-market sector of economy
Network	Public sector as wide network of various participants
Institutional	Three subsystems: state; society; economy
Organizational	Public and noncommercial sector
Administrative, etc.	The public sector as organizational and functional system on production, distribution, consumption, etc. public benefits

The most widespread approach is institutional which considers the public sector as set of three subsystems, each of which possesses complex structure: society, state, economy (see Table 3).

Table 3. Public sector as set of subsystems.

Subsystem: society (demand)			Public sector
Human capital	Level and qualities of life	System of the social rights and their providing	
Subsystem: state (management)			
State control system	Social capital	Institutional system	
Subsystem: economy (offer)			
Public benefit	Enterprise and establishment	Material objects and resources	

From an organizational position, the public sector represents set of two primary groups of objects: administrative (state and municipal) and civil (see Table 4).

Table 4. Structure of the public sector from organizational positions.

Administrative (state and municipal) group of objects of the public sector	Civil group of objects of the public sector
1. State enterprises (federal property and property of territorial subjects of the federation), including 1.1. State enterprises 1.1. Central bank and other institutes of infrastructure character 2. Budgetary sector 2.1. Defense 2.2. Education, culture and art 2.3. Health care, physical culture and social assistance 2.4. Science and scientific service 2.5. Judicial and law enforcement agencies 2.6. Public administration (office of governing bodies) 2.7. Housing and communal services; non-productive types of consumer services of the population	A civil segment of the public sector according to the satellite navigation system break into the following types – the non-profit organizations occupied in market economy – the serving state bodies – the serving households In turn the non-profit organizations occupied in market economy can include – consumer cooperatives – public and religious organizations (associations) – social movements – funds – institutions – bodies of public amateur performance – non-profit partnerships – autonomous nonprofit organizations – merging of legal entities (associations and unions) – associations of peasant farms – territorial public self-government – condominiums – gardening, market-gardening or country non-profit associations – other non-profit organizations

Options of further understanding and consideration of the public sector enough (see Table 5), at the same time each of the allocated structural elements represents an independent cut of understanding of activity of this sector.

Table 5. Criteria of consideration and structuring the public sector.

Criteria of consideration and structuring objects of the public sector	Sphere of distribution of activity of the public sector of	Function of the public sector	Products of functioning (public benefits)
On grocery (branch) sign	Economic	Reproduction	Reproduction and reconstruction of system
On organizational legal status	Social	Production	Process
On financial sign	Political	Budgetary	Service
On resource sign	Financial	Institutional	Relations
On social feature	Technical	Stabilizing, anti-recessionary the	Resource
On administrative sign	Infrastructure	Consolidating K	Organization, the power
On territorial sign	Administrative	Social	Project
On the consumer groups	Territorial	Financial and Investment	Budget
On financial sign	System safety	Educational	Idea, program
On technical characteristics, etc.	Educational and educational, etc.	City-forming, etc.	Environment

The feature of the public sector consists in multipurpose or cross-disciplinary interrelation of its levels and elements, in integration of its objects. As a result, the public sector represents the elaborate, multipurpose, polystructural and polycentric social and economic system which is functionally aimed at providing with the public benefits, involving at the same time society, the state and economy.

However to realize this purpose, as well as to solve burning issues of creation of the public benefits it is represented very difficult question in force, both internal specifics of the public sector, and organizational and administrative problems caused by it.

3 Research Questions

Questions of the analysis and search of overcoming complexity in most cases is under construction on the basis of the cybernetic approach forming the general principles of management of difficult system which in turn modern experts try to comprehend from different positions. Management of difficult system remains very disputable subject as from a position of first experts [8] the difficult social system cannot be operated as it is

more self-governed. From a position of others, «... in social systems the operating influence intertwines with self-government of an object of management» [5]. From a position, the third [16] role of self-organization in social and economic systems plays management. As a result the essence and functions of management concerning difficult system, remains an ambiguous and controversial issue. There is even an opinion that in relation to social systems the new understanding of the term «management» as for these systems «it is impossible to put the accurate purposes is necessary, to develop reliable procedures of realization of administrative process, to achieve exact achievement of the goals even if they are put» [6]. In this case, it is necessary to speak not about the operated and directed development of social systems.

Traditionally management of complexity of system is directing to overcoming complexity of an object that is offering to be carried out variation by its variety. In this case a set of administrative measures can include: decomposition; aggregation; principle of localization; block principle of creation of system, formation of hierarchical structure; reduction of a variety of the operated object, due to establishment of more accurate and certain rules of conduct of components of system: unification, standardization, typification, reduction of the nomenclature, etc.

At best all existing overcoming measures complexity have not system, chaotic character while the problem of complexity tends to constant growth and demands the anticipatory, large-scale, systemically interconnected actions. In other option, the problem of complexity predetermines full ignoring of the corresponding difficult object of management as it happens to the public sector. Approximately, it is possible to speak about the public sector as object of management in the person of set of the socially useful enterprises and institutions in most cases pursuing the noneconomic aims. Objective difficulties of the organization of a control system are connected with feature of an object as difficult system at its high dimension and public orientation of activity that has no internal efficiency.

Formation in these conditions of a control system of the public sector is based on the basis of difficult set of elements of management, each of which is formed proceeding from different concepts and approaches of management. The relevance of administrative approaches is defined by set of the system problems which are present at it which are caused by the choice of the most essential administrative approaches for the public sector.

For the public sector, the relevance of administrative approaches is defined by set of the system problems which are present at it which are caused by the choice of the most essential administrative approaches. Each concept and the applied approach gives own understanding of management and content of this activity on overcoming complexity. Using various administrative approaches, the stochastic complex of administrative strategy, mechanisms, decisions and other elements is formed thereby, each of which acts within the solution of a private task, a problem, the purpose. Modern option of set of administrative approaches for the solution of problems of the public sector is the following: reflexive and situational [10]; system and cybernetic [17]; integrative [12] as integration of structurally functional and program and target approaches to management; network. Questions of integration of difficult administrative manipulations and

the coordinated their use remain a little studied subject so far. Change of a situation contacts use of the system analysis for which the complexity is a fundamental, independent concept and thanks to its identification various classifications of difficult systems and laws of their functioning are offered.

4 Purpose of the Study

The public sector has the numerous options of the consideration revealing various specifics of functioning which create difficulties of management (see Table 6).

Table 6. Organizational and administrative specifics of the public sector.

Entity of consideration of the public sector	Specifics	Complexity of management
Public sector as producer of the public benefits	Lack of formal and informal typology of the public benefits	Cognitive difficulties
Public sector as non-market sector of economy	Political/public choice	Complexity of interaction (communication)
Public sector as social and economic	Integrity of the managing director and the operated system	Complexity of behavior system
Public sector as set of three subsystems: state; society; economy	Multifunctionality of the public sector	Complexity of plurality of components
Public sector as set of public and noncommercial sectors	Plurality of organizational structures of the public sector	Complexity of plurality of components
The public sector as organizational and functional system on production of the public benefits	Complexity and complexity of administrative norms and organizational powers	Complexity of behavior
Public sectors as set of closely interacting numerous actors of network	Numerous and difficult interactions of affine objects	Complexity of interaction (communication)

Formation of measures for overcoming complexity can be based on knowledge of laws of functioning of difficult systems that are installed by requirements for management of difficult systems. The last cause necessary elements of management of complexity (see Table 7).

The specified problems of management of complexity demands system tools of their decision.

Table 7. Necessary elements of development of a control system.

Laws of difficult systems [2]	Conditions or requirements of management of difficult systems	Necessary elements of management of complexity
1. Law of a necessary variety (principle Eshbi)	A variety of difficult system demands management that has a sufficient variety	Variation by a variety of a control system
2. The law of difference whole from private	The sizes of system determine degree and scale of differentiation of properties	Variation system by a variety of objects of management
3. The law of external addition	In difficult systems the forecast of a condition of the environment and elaboration of the operating influences can be carried out by formal methods only approximately that also its adjustment demands substantial control of work of the formalized scheme of management	Additional control and adjustment
4. Law of feedback	Existence of feedback between the interconnected and interacting elements, parts or systems is necessary	Feedback
5. Law of an antientropiynost	Is required strengthening of information awareness at decision-making	Intellectual technologies
6. The law of the choice of the decision	Is required development of multiple decisions and attraction of collective intelligence	Openness and diversity

5 Research Methods

Necessary conditions or requirements of management of difficult systems represent a set of measures and tasks of management of complexity which is thought has to be the independent block of administrative actions. These strategic elements of overcoming difficulties in aspect of specific actions form the corresponding set of administrative functions, including: modeling, estimation, intellectual analysis and «clever» regulation, coordination (see Table 8).

Each of the revealed administrative functions of fight against complexity forms the range of possible measures and operations which are discussed and develop modern theories still more: management of difficult systems, theory of intellectual management, etc. As a result, each of the revealed functions seems as set of the corresponding conceptual ideas and techniques of their realization (see Table 9).

Despite practical lack of real mechanisms of realization of the majority of functions of management of complexity, part of them it is to some extent put into practice. However coordination in modern option considers simply: or from macropositions so far as «process of mutual streamlining of plans of economic subjects which are provided through functioning of special institutes of which the market and the state» are

Table 8. Interrelation of difficulties of management, their strategic elements and administrative functions.

Difficulties of management	Strategic elements of management of complexity	Function of management of complexity
Difficulties of plurality of components	Variation by a variety of a control system and objects of management	Forecasting and modeling of system
Difficulties of behavior	Additional control and adjustment	Estimation
Difficulties of interaction (communication)	Feedback Openness and diversity	Coordination
Cognitive difficulties	Cognitive (intellectual) technologies of management	Intellectual analysis and «clever» regulation

Table 9. Options of realization of function of management of complexity.

Functions of management of complexity			
Forecasting and modeling	Estimation	Coordination	Intellectual Analysis system and «clever» regulation
Formation of model structure of system. Topology of elements of system, subjects, objects, their interrelations and communication, etc. [19] Systematization of observers and metaobservers	Assessment of a condition of elements of system from a position of observers and metaobservers, interrelation of estimates	Formation of horizontal and vertical coherence of interaction of elements of system and their work. Establishments of an expedient ratio between system elements	Identification of the hidden regularities and relations. Association various intellectual component of management: synthesis of opinions (observations, decisions) on the basis of the rich the logician, instructive conclusions, reflex reactions, etc.

main [20], or as a form of interaction between public authorities [11] within understanding that coordination means certain administrative «impact on elements of the coordinated system which forces to function these elements in coordination» [18]. The nature of this influence, as well as coordination, has no due theoretical base [9] yet while it, certainly, has to have the methodological, ideological, technological and other component of the concept and model of the realization formed including, for multi-element, difficult objects.

In lack of understanding of the public sector as complete object of management, coordination actions for it have the segment, simplified, technical character within groups of state bodies at implementation of certain projects and programs. At the same time, even such approach in many respects remains now innovative [13], forming separate difficult interdepartmental, interindustry, interterritorial interactions. Considering the existing options of coordination mechanisms of management within structural

and organizational and functional and target types of interactions creation of a matrix of their main operating types within the public sector (see Table 10) is possible.

Table 10. Structure of the existing processes of interaction of elements of the public sector.

Functional and target interaction	Structural and organizational interaction		
	Horizontal interaction (intersectoral, etc.)	Vertical (reproduction interaction, etc.)	The mixed or network interaction
Target interactions	System of social partnership	Target state, regional and municipal programs of social, economic and scientific and technical development	Complex infrastructure projects
Activity interactions	Various forms of possession and use of the resource base which is in a state property (trust management, rent, concession, a trust) [7]	State system of contracts [14]	Mixed public and private business and partnership

However, no specified designs of coordination of interaction are result of action of complete administrative system, decisive, including, a complexity problem. They do not consider structure and specifics of all elements of difficult system, so values, views and the interests of all its parties. Meanwhile coordination is many-sided on the scale, contents, structure, etc. that assumes its differentiation and systematization, at least, depending on structure and the nature of subjects and objects. Formation and development of the horizontal, vertical and mixed interactions in aspects of the relations is important for the public sector: state society, manufacturing consumer, management self-government, etc. As coordination development option as administrative mechanism the following matrix of interaction of elements of the public sector (see Table 11) can serve.

Coordination as the administrative mechanism assumes existence of both the technical, and conceptual party of the realization aimed at formation of prerequisites and conditions of emergence and realization of processes of interaction. For this purpose, certainly, the coordinated realization of all elements of management of complexity, including a stage of carrying out modeling of system, topology of elements of system, assessment of their state from a position of subjects and objects is important that it allows to create optimum conditions of interaction. Thus, coordination as the administrative mechanism aimed at a solution of the problem of complexity has to provide complex development of both internal structure and content of actions, and external coherence and systemacity with other functions of management of complexity.

Table 11. Perspective structure of processes of interaction of elements of the public sector.

Functional and target interaction	Structural and organizational interaction		
	Horizontal interaction (intersectoral, etc.)	Vertical (reproduction interaction, etc.)	The mixed or network interaction
Target interactions	Formation and development of civil, political culture of participation of the person and society in public administration	Development of the state and public information systems on open diagnostics, monitoring, the analysis, planning and control of a condition of social institutes	Formation and cultural development of network interaction through network events, network processes, etc.
Activity interactions	Political, economic, economic, etc. cooperation	Development of institutes of social and civil representation in governance process and productions (political representation, functional representation, expert representation, etc.)	Development of public associations and communities, network resources and network associations of the organizations, etc.

6 Conclusion

As a result, the public sector is a cross-disciplinary object or the difficult system binding an economic component of society from it not less important social, political, moral, etc. spheres of activity. Being by the principle of operation of economic mechanisms of managing a uniform object alternative to market economy, in fact, it represents a numerous and difficult organizational and technical complex or the system operating in different spheres of public life with different options of a combination of the elements.

The problem of complexity of system is traditionally considered in aspect of complexity of management which concerning the public sector represent a broad set of problems, including, cognitive difficulties, difficulties of interaction (communication), difficulties of behavior, complexity of plurality of components. In total their overcoming demands the additional administrative mechanism including modeling and forecasting of system, estimation, coordination, the intellectual analysis and «clever» regulation.

The public sector as difficult system demands system actions for management of its complexity where one of elements is coordination of interactions of its elements. This coordination allows to carry out correction of imbalances and dysfunctions between public requirements and public institutes on the basis of intersectoral, cross-disciplinary, network and other interactions and processes. Certainly, existence and development of all complex of methods and mechanisms of management of

complexity «... becomes the dominating efficiency factor» [3] not only works of the public sector, but also activity of society in general.

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Problems of Development of Tax Incentives in Spatial Aspect

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Abstract. Object of research are the tax concessions as the most important instrument of state regulation. The purpose of work is formation of measures of improvement of tax incentives on the basis of the analysis of their modern problems and approaches of use for spatial development of the country. In article an assessment of the central role of fiscal regulation which major part are tax incentives is given. Two major directions of spatial development of the country are considered (creation of effective regional and interregional areas of innovatively focused advancing development and mitigation of social inequality of regions, investments into the human capital) and problems of their modern realization are revealed. The analysis of measures of tax incentives of two main directions of realization of spatial strategy of Russia aimed at providing is carried out.

The system of tax incentives which has as the vertical orientation aimed at growth of enterprise, innovative, technological and other activity, and horizontal, connected with economic alignment of territories is offered. At the heart of the first type of stimulation by the author it is offered to establish consecutive and clear gradation of taxpayers, with allocation and support by tax incentives (regional and local level of taxes) of the profitable businessmen and the companies making the investments in technological, social and other development of territories. The second horizontal type of tax incentives is based on the system of social and economic zoning, with allocation of «peripheral» territories which development it is offered to carry out, including, at the expense of privileges and preferences of taxes of federal level.

Keywords: Tax benefits · Tax regulation · Spatial development · Strategy of spatial development · Tax incentives

1 Introduction

Modern spatial development according to the «Strategy of Spatial Development of the Russian Federation until 2030» project is based on two basic directions. The first is based on creation of effective regional and interregional areas of innovatively focused advancing development. Options of elements of such areas are artificially formed territories with special type of tax other regime.

Special economic conditions of such territories have various character and concern tax, administrative, customs, financial, etc. spheres. The most essential advantages to

participants of special territorial development are provided in the tax sphere (Gorbacheva 2014). At the same time, tax incentives are based on the basis of the aggregated territorial and organizational principle where privileges and preferences in large quantities, without assessment of result are provided for residents of the advanced areas of special economic or territorial development.

As a result, the stimulating actions have the simplified and formal character while the volume of preferences is very considerable. So by estimates of experts «now the total volume of the Russian tax concessions ... more 3 trillion rubles» . At the same time as all is recognized that the tax concessions do not give special effect, and the budget as a result of it loses the income. So «with 2014 losses of the federal budget because of the tax concessions grew from 2,19 trillion rubles to 2,4 trillion rubles last year, and dynamics says that by 2020 they will increase to 2,8 trillion rubles that is totally equal to 2,6 percent from the Russian GDP» (Gorskiy 2014).

Other priority of policy is mitigation of social inequality of regions, investments into the human capital. For realization of this priority the absolute importance has maintenance of balance of regional budgetary system for unconditional execution of social obligations to the population, assistance of employment of the population, preservation and creation of jobs, etc. (Tatarkin 2012). There is a wish to note that special economic conditions are focused generally on perspective in the investment relation and the most safe regions in Russia while in foreign countries preferential terms and preferences are used as the instrument of development of problem, depressive and backward regions and their population (Musayev and Reshiyev 2011). Development of protectionist policy for underdeveloped territories as the economy of these territories without the state support is subject to a bigger growth of polarization and inequality is required. Change of a situation contacts improvement stimulating, including, tax policy as Basic Element of management: «... in state regulation of economy the role of taxes is represented fundamental» (Moroz 2013).

2 Problem Statement

Importance of the coordinated interaction of tax policy with other its directions at substantial coherence with industrial policy and the economic strategy of the state in general is theoretically conventional. Meanwhile experts emphasize that «in Russia now nothing becomes to create the financial and tax mechanism of economic growth” and even on the contrary: «the analysis of a modern situation in the Russian economy leads to a conclusion that financial and, first of all, the taxation system have negative effect on development of economy» (Shvetsov 2016).

Modern spatial development according to the project of strategy spatial development of the Russian Federation is based on two basic directions. The first is based on creation of effective regional and interregional areas of innovatively focused advancing development. «Transport and logistic knots, zones of development of the industry and agricultural industry, a zone of innovative development and creation of high technologies, tourist, resort and other recreational areas, zones of cultural and natural landscapes act as such zones» (Uskova 2015).

Other priority of policy is mitigation of social inequality of regions, investments into the human capital. For realization of this priority absolute importance assistance of employment of the population, preservation and creation of jobs, etc. have maintenance of balance of regional budgetary system for unconditional execution of social obligations to the population (Tatarkin 2012). There is a wish to note that this priority often is contrary with the first as in Russia special economic conditions are focused generally on perspective in the investment relation and the most safe regions while in foreign countries preferential terms and preferences are used as the instrument of development of problem, depressive and backward regions and their population (Musayev 2011).

Keynote of domestic spatial economic policy is creation there is nobody «a framework of the regional and territorial centers of concentration of economic growth capable to form and transfer to adjacent subjects innovative impulses of development of economy» (Tatarkin 2013). Options of elements of such framework are on the one hand the large economically developed megalopolises, and with another artificially formed territories with special type of tax other regime: including:

1. Special Economic Zones (SEZ). In the territory of the Russian Federation SEZ of 4 types are created: industrial and production (SEZ PPT); technology development (SEZ TVT); tourist and recreational (SEZ TRT); port (POEZ). Now 25 SEZ (9 industrial and production, 6 technology development, 9 tourist and recreational and 1 port) function.
2. The zones of territorial development (ZTD) which are formed on the basis the Resolution of the Ministry of Economic Development of the Russian Federation «About the approval of the list of territorial subjects of the federation in which territories creation of zones of territorial development» of December 21, 2016 is allowed №1415. According to this document, it is allowed to 20 regions of the country to create at himself zones of territorial development which have an opportunity to develop, counting on a certain state support.
- 3 Territories of the advancing social and economic development (TASED), including TASED Khabarovsk and Komsomolsk in Khabarovsk Krai, Nadezhdinskaya and «A big stone» in Primorsky region, «Southern» and «Mountain air» in the Sakhalin region, TASED Kuriles on the Kuril Islands, monotown: Yurga and Anzhero-Sudzhensk in the Kemerovo region, Krasnoturyinsk in Sverdlovsk region, Dimitrovgrad in the Ulyanovsk region, Sarov in Nizhny Novgorod areas, Sarapul in the Udmurt Republic and Nevinnomyssk in Stavropol region, etc. Now the total number of TASED exceeds 25 objects.
4. Regional Investment Projects (RIP). According to the «Rules of formation and use of budgetary appropriations of Investment fund of the Russian Federation» approved by the resolution of the Government of the Russian Federation of 01.03.2008 two types of projects get to category RIP: project of regional value; project of interregional value. Analytical sources specify that in the territory of the Russian Federation more than 7000 investment projects in the sphere of industrial and civil engineering are implemented and also transport infrastructure at various stages which participants receive or can receive the state preferences.

The character and volumes of these preferences in tax, administrative, customs, financial spheres are rather diverse and large-scale. The most essential advantages to

participants of special territorial development are provided in the tax sphere (Vodopyanova 2016). At the same time, tax incentives are based on the basis of the aggregated territorial and organizational principle where privileges and preferences in large quantities, without assessment of result are provided for residents of generally advanced areas of special economic or territorial development.

3 Research Questions

Tax incentives, being the central element of fiscal regulation of economy (along with budgetary and tax balancing, administrative influence, measures of the authorized actions (Kuklina 2014)), can include various ways, such as:

- Applications of the special (lowered) tax rates (Art. 284, 288.1. of the Tax Code of the Russian Federation);
- Withdrawals of income from a taxable basis (Art. 251 of the Tax Code of the Russian Federation);
- The accelerated depreciation of fixed assets (Art. 259 of the Tax Code of the Russian Federation);
- Facilitation of conducting account (Art. 273 of the Tax Code of the Russian Federation);
- Remission of a tax (item 5 of Art. 284 of the Tax Code of the Russian Federation);
- Establishments of longer term on submission of reports and payments of advance fees (Art. 287 of the Tax Code of the Russian Federation);
- Tax holidays (Art. 288.1 of the Tax Code of the Russian Federation);
- Investment tax credits (Art. 66 of the Tax Code of the Russian Federation);
- Circulation of bills under a budget guarantee (Art. 149 of the Tax Code of the Russian Federation);
- Clearing of budgetary and tax debts (Art. 78 of the Tax Code of the Russian Federation), etc.

A similar variety is complemented with a wide range of conditions of their granting on various characteristics of taxpayers and processes of payment that creates a huge number of the privileges provided to taxpayers in the Russian Federation, which number more than 200 that considerably differs from number of the tax concessions in the USA (about 100), Great Britain and France (70–80) (Dandanyan 2014). Other sources speak about a bigger number of privileges: «as of January 1, 2015 there were 359 types of the tax concessions and preferences» (Goncharenko and Malis 2015).

We think in fact the tax concessions more much as the Russian legislation in this area very ambiguous, tangled and contradictory. First, there is no accurate concept of the tax concession allowing to give their exhaustive open list. Secondly, various normative documents, including the Tax code of the Russian Federation, declare tax preferences which are not confirmed by other sections and legal acts in certain sections, creating practically chaos in this sphere. Experts (Taxation systems 2012) recognize considerable terminological and legal confusion in the field of the tax concessions that creates conditions for violations of the tax legislation, complicates assessment of losses of the budget, etc. Thus, the unsystematic mechanism of incentivization that is sated

with various options of privileges directly not coordinated to achievement of result necessary to society from specific taxpayers is created.

The modern system of giving of the greatest activity in the field of the tax concessions at the level of regional and local budgets is accompanied by disinterest of territorial subjects of the Russian Federation and municipalities in development of business in the territory subordinated to them and attraction of investments. Experts [Current problems, 2012] change of a situation by means of redistribution of income between various levels of the budget, introduction of privileges on the federal taxes, the careful analysis of efficiency of the entered privileges (Gorbacheva 2014), their economic justification, gradation of types of privileges seems: social tax concessions (Bird 2004), privileges of investment and innovative character (Savina 2012), etc.

4 Purpose of the Study

We think that more careful methodological and methodical study of a procedure for granting of privileges has to be carried out. At the heart of methodological improvement the uniform concept of the national taxation system of incentivization which would define its purposes, priorities, types, the principles, etc. has to be put. Concerning the last the system of incentivization has to provide the principles, general for all taxation system, including:

- The concept of the tax concession and its types have to have the unambiguous interpretation recorded in the tax legislation;
- The structure and mechanisms of the tax concessions have to be systematized and concretized on all main conditions and characteristics of their use;
- The quantity of privileges has to be minimum, and the nature of their calculation has to be the simplest (the more the tax concessions and it is more difficult than the rule of their calculation, the there are more opportunities for tax abuses (Kuklina 2014));
- The privilege has to be the target, providing purposeful stimulation of the corresponding types economic activity and is most guaranteed to those who really needs;
- The design of a tax incentive has to correspond to effectiveness of work of the taxpayer;
- Privileges have to correspond to their importance for the taxpayer, a key element of any national model of privileges is decrease in the most significant taxes, including the profits tax, the Value added tax, etc.
- Privileges have to have the accurate and measurable system of criteria and transparency of the procedure of check of their use (Kuklina and Fedorkov 2013), and for this purpose the tax concessions have to have concrete requirements and conditions, both on granting, and according to the analysis of use, providing minimization of the subjective decision.

From the methodological point of view, other option of tax incentives within the solution of spatial problems is creation of the difficult complex mechanism of stimulation. This mechanism has to cover on the one hand all regions and territories of the country taking into account social, economic and other conditions and factors of their

development, and with another, the purposes, tasks and requirements of forward economic and social progress, both certain taxpayers, and society in general.

From the methodical point of view of the politician of tax incentives it has to be equipped with control and analytical tools of regulation, including a technique of the analysis of demand of the tax concessions, a technique of the analysis of efficiency of innovative activity, a technique of efficiency of tax policy, etc.

5 Research Methods

The complex mechanism of stimulation has to have the modern system of fiscal regulation. This system has to have as vertical orientation aimed at growth of enterprise, innovative, technological and other activity, providing the general economic growth at the expense of an investment component, and horizontal, connected with economic alignment of territories. At the heart of the first type of stimulation, the consecutive and clear gradation of taxpayers and specifics of their activity has to be put.

The vertical type of tax incentives has to be based on support and development of the profitable businessmen and the companies making the investments in technological, social and other development. Therefore, such investments can be current and capital an investment in all objects of territorial location, including human, production, intellectual and other capital. Existence of this sign is the most important condition of granting the tax concessions to specific productive taxpayers according to volumes of their investments, the sizes of the organization and results of their activity.

The second horizontal type of tax incentives has to be based on the modern system of social and economic zoning which in the conditions of modern pointed, focal development forms at least two groups of territories on the level of the state investment, the institutional or urbanization specificity creating the centripetal processes leading to polarization and inequality. All objects can enter into the first group of territories, supervised by the state projects and programs financed from the federal budget, which make an essential economic and social contribution to development of the concrete territory that objectively can and is compensated by regional and local privileges. It is necessary to bring large megalopolises and their suburbs which also carry out centripetal process of separation of resources from own periphery and the country in general in the same category.

All other groups of territories have to be referred to category of tax preferences to investors on the system of the tax holidays, tax credits, decrease in rates, etc. on the federal taxes depending on the nature of economic activity: production, technological, innovative, social, etc. This situation is extremely important for stimulation of regional and local government to search and expansion of number of various investors. Respectively, two groups of investors on the status of territories of managing which receive the federal help or in the form of institutional and infrastructure privileges, or in the form of individual preferences from the federal budget at investment and development of problem territories are formed.

Assessment of demand tax stimulation is important from the methodical point of view. In the macroeconomic theory (Zavyalov et al. 2015) there are two traditional ways of assessment of economic effects, including of taxes:

- First, by means of the multiplier (1), i.e. as a gain (investments, profit, GRP) on unit of change (decrease) of taxes:

$$M = \frac{\Delta AGDP}{\Delta AT}, \quad (1)$$

where, AGDP - gain size a GRP; AT - the size of change (decrease) of taxes;

- Secondly, by means of elasticity (2), i.e. as percentage change of GDP (investments, arrived) for 1% of change of taxes:

$$E = \frac{\%AGDP}{\%AT} \quad (2)$$

As a basis of calculation the thesis undertakes that change (decrease) of volume of the collected taxes in the regional and federal budget leads to increase in profit, investments and income (GRP), and at size, big, than change of taxes. The first indicator gives absolute value of the relations while the second defines percentage change that is more universal for calculations.

Creation of the stimulating favorable conditions through the tax concessions assumes improvement of economic indicators in a section of the analysis of dynamics of profit, investments and GRP at decrease in volume of the arriving taxes. At the same time it is supposed that if regions of the Russian Federation have a relative gain of the resulting economic indicators, then reduction in taxes for them will be demanded as the regulating measure. Otherwise, reduction in taxes will not affect macroeconomic indicators of economy of the territory and country and their use will not be rather expedient.

We calculated the parameters of tax elasticity of profit, investments and GRP on regions of the Russian Federation during 2015–2016 showing the attitudes of percent of change of profit, investments and GRP to 1 percent of change of volumes of taxes of the federal budget and taxes of the regional budget. Then these values were ranged by the principle: to elasticity level more than 1 Fig. 1 was equated, and to the extent of elasticity less than 1 figure 0 was equated. The received 3 values on each of regions were summarized separately on federal and regional taxes. As a result, the analysis showed that the majority of regions have primary positive interaction between volumes of taxes and profits, other interrelations have already less expressed character (see Fig. 1).

1 - Volume of profit of the region and volume of taxes of the federal budget of the region; 2 - Volume of investment of the region and volume of taxes of the federal budget of the region; 3 - Volume of GRP of the region and volumes of taxes of the federal budget of regions; 4 - Volume of profit of the region and volume of taxes of the regional budget of the region; 5 - Investments of the region and volumes of taxes of the regional budget of the region; 6 - Volumes of GRP of the region and volumes of taxes of the regional budget of the region.

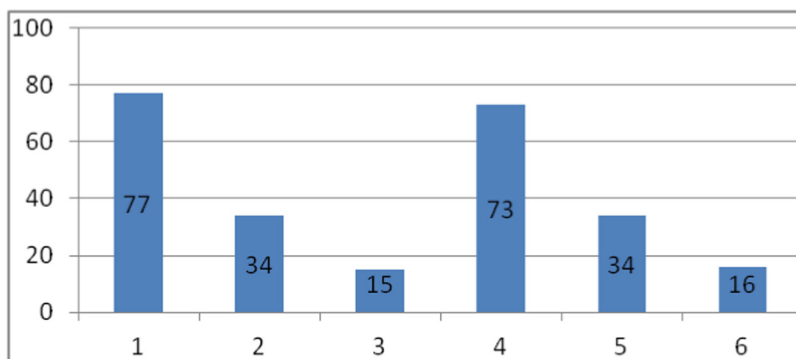


Fig. 1. The number of regions of the Russian Federation with high tax elasticity of interrelation for 2016 (1–6).

The largest level at value of coefficients 3 shows that in the region for 1% of change of taxes there are more than 1% of growth of economic indicators: profits, investments and GRP. Such regions there was only 11 of 85 considered, at the same time with the smallest interrelation (value 0 and 1) of tax changes of the regional budget and growth of the resulting parameters possess 50 (6 and 44) regions on the federal budget – 50 (10 and 40). Such result tells about low coherence of tax changes on economic the processes connected in particular with investments and GRP.

The similar result shows also the correlation analysis of economic indicators on regions of the country showing that the negative tendency between the level of elasticity of taxes of both federal, and regional level and volumes of GRP (see Figs. 2 and 3)

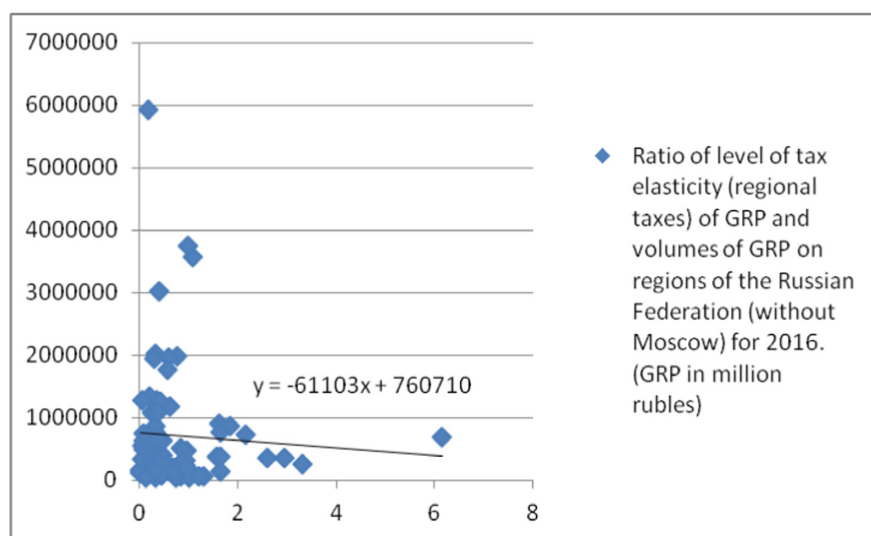


Fig. 2. Ratio of level of tax elasticity (regional taxes) of GRP and volumes of GRP on regions of the Russian Federation (without Moscow) for 2016. (GRP in million rubles).

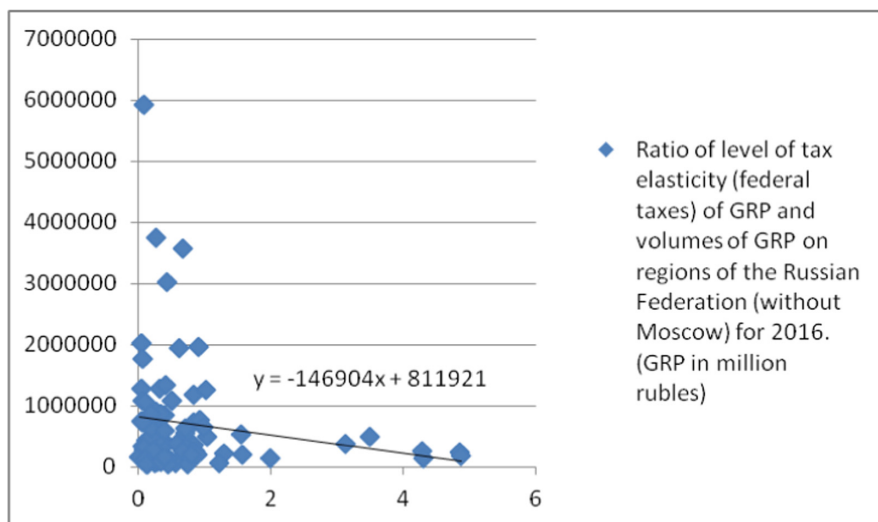


Fig. 3. Ratio of level of tax elasticity (federal taxes) of GRP and volumes of GRP on regions of the Russian Federation (without Moscow) for 2016. (GRP in million rubles).

prevails that speaks about lack of due demand of tax incentives in the country.

The analysis of indicators on regions of the country showed that there is a negative tendency between the level of elasticity of taxes and volumes of GRP, investments and profits that speaks about lack of due demand of tax incentives in the country.

6 Conclusion

Thus, the modern situation of regulation of spatial development of the country is characterized by a large number of the tax concessions and preferences, now in use is in most cases formal and chaotic. Such approach sets a task of revision of the purposes and a procedure for granting of the tax concessions. At the same time, a main goal is stimulation as perspective territories, and their alignment and decrease in economic differentiation.

Option of realization of improvement of tax incentives is creation of the difficult complex mechanism of the stimulation covering on the one hand all regions and territories of the country, and with another, tasks and requirements of economic and social development, both certain taxpayers, and society in general. The solution of

similar tasks is a complex problem which outcome is defined by the level of openness and systemacity of the regulating actions, including tax incentives.

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Trends and Prospects for the Small and Medium-Sized Businesses Development in the Northern Regions of Russia

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Abstract. Nowadays the Russian economy has a great interest in the small and medium-sized business, which is due to the prospects for labour market development, employment population, services expansion and production intensification. The study object was the entrepreneurship sphere of the Yamalo-Nenets Autonomous Area. The study subject was the small and medium-sized entrepreneurship in the northern region. The research method was a survey of management personnel. The empirical material analysis method was presented by the hierarchical clustering, which allow to collect the entrepreneurship representatives of the region. As a result of the research authors were able to obtain reliable information about the state, nature, trends and prospects development of the economically active subjects in the remote northern territories. There were revealed some specifics of entrepreneurship structures, geographical activity of labour market's subjects, difficulties and risks in the entrepreneurship sphere's development of economically active people.

Keywords: Middle models · Cosmology · Afterlife · Ternarity · Binarity · Purgatory · Small and medium-sized businesses · Remote region · Cluster analysis · Successful entrepreneurship · Market infrastructure · Geography of enterprises activity

1 Introduction

The developed entrepreneurship characterizes the economies of many western states. The entrepreneurship is an essential element of the market economy. In many respects it is determining rates of economic growth, structure and quality of the gross national product [13]. The formation of entrepreneurship was connected with cultural ideological features, it was described by Weber [5], and was formed evolutionarily, parallel with the economy sectors development. Firstly, it was the primary agrarian-industrial, then secondary (processing and construction) and tertiary, development of the services sphere. Today the small and middle-sized business of the developed countries is involved in the most high-tech spheres [14]. Modern start-ups arise, mainly, through the efforts of individuals or small enthusiasts groups which are in the constant search for reproducible and scalable business models [7]. This is a powerful factor in the local and global markets' development [19], and renders significant impact on the development of scientific and technological progress in general.

Category “remote region” does not contain unambiguous interpretation, particularly, Brednev V.S. names this territory, in broad sense, which is located at a considerable distance from the federal centre; in a narrow sense- territory, remote from various objects of social infrastructure [2]. When we are speaking about the remote region, we mean an isolated territory from key manufacturing, information and logistics centres. As a rule, it determines the presence of poorly developed road transport infrastructure, specific consumption structure, low level of innovative and marketing components using in business.

Satisfying the society needs of one side, the market economy institution gives the opportunity of self-realization [1], all socially useful qualities for individuals manifestation, (self-discipline, cooperation, creative activity). Thus, small and medium-sized businesses are socially, economically and politically important sectors overall determining the society development.

The Russian entrepreneurship did not get the development because of the administrative and planning system existence during the long period of time [4]. The USSR state property as the main means of production and the large industries and enterprises significance still determine the external appearance of the domestic economy. The Western- European countries produce the largest share of GDP by small and medium-sized businesses, but in Russia this share of GDP is about 20%. There is a similar situation with the amount of employed population. In Russia, small and medium-sized businesses provide only 25% of permanent workplaces, but in developed countries, this indicator ranges from 35% to 80% [11].

With the undeveloped entrepreneurship, the socio-economic effect that is capable to produce this institution is also lost [3]. This is an effective and rational use of labour and natural resources of the region, introduction of grass-roots innovations [8], diversification of the local economy, improvement of the goods and services quality using the competition, levelling of the population life level for redistribution resources. In this regard, the relevance of problems related to the development of small and medium-sized businesses is not reduced over the last two decades. Today, the business difficulties are aggravated by the crisis that arose due to the sanctions policy of some countries to the Russian Federation [9], a decrease in prices for energy, exports of which traditionally forms almost half of the budget of our country. In these terms the problems of entrepreneurs are most clearly manifested.

Modern domestic researchers note significant regional differences in the structure and nature of the business activity [14]. Best of all, it feels in large megacities with developed infrastructure and large sales markets. Outside of them, the situation is deteriorating noticeably. The another research point is in the remote regions of Russian entrepreneurship where it has a strong territorial orientation. It builds its own activity using the needs of the local market to the volume and structure of its demand, because of the geographically isolation. The research of the small and medium-sized businesses in a remote region can be useful in view of the current state of entrepreneurship assess in general.

2 Problem Statement

Modern Russian researchers note [6, 10] significant regional differences in structure and nature of business activity: business intensification in large megacities, with developed infrastructure, large sales markets and a recession beyond their borders. Entrepreneurship of remote Russian regions, the specificity of which is due to geographical isolation, brightly expresses the territorial orientation and builds its activities based primarily on needs of the local market, the volume and structure of local demand. The research position of small and medium-sized businesses in remote Russian regions allows to realise an independent examination of the entrepreneurship current state [20]. The centre-periphery system, applied to this research object, in a view of the dialectical method, allows to reach a higher generalization level of business problems in Russia.

The development of small business is considered by many authors as an instrument of powerful economic and social resistance to the poverty and the extremism manifestation. In developing countries, small business has been considered as a decisive factor capable to reduce the severity of social problems such as poverty and unemployment (India, Albania, Brazil) [12].

3 Research Questions

The idea of Roman Catholic Christianity purgatory was rooted in the west- patristic, in Augustine's time. Augustine's contribution to the development of the ALW middle model can be reduced to two concepts which later will be developed in the Middle century. The first concept gives triple definition of purgatorial fire (experienced by small number of sinners. In its effects, it will be highly painful, higher than in terrestrial life, as "temporary hell"). The second conception - "the timing of purgatory: - between individually death and the universal trial" [3]. In 109 Chapter Enchiridion Augustine pointed to the corpses place: "during time, which lies between man's death and final resurrection, the souls are in some secret places, depending on what each of them is worthy: or with calm, or with burden - corresponding to their accomplishments in body living" [11]. So, purgatory acted as an intermediary part of posthumous cosmology. Augustine defines exactly which group of people are available to this place "those who are not virtuous". For unrighteous, those "who are not entirely bad", and for saints the purgatory is not available, they would be sent either to the hell, or to the heaven.

Augustine argued the power of living for the dead intercession, noting that it is not available for cursed (atheists, sacrificials, etc.) has made a number of comments for the hell fire and the inhabitants the other world (based on the writings of the Holy fathers). According to Augustine, the damnation fire and purifying fire are different, because after this life, it would be or purifying fire, or eternal punishment.

Augustine did not tell directly when the soul achieved eternal abodes-either after death or on the doomsday. Analyzing the essence of the purifying fire, he noted that this is "dark matter"; however, in treatise "city Of God" Augustine expresses one of the key thoughts, which will be the main idea of medieval purgatory. A man may experience the purifying (redemptive) punishment during his life, and after death; they are temporary; and will cease on doomsday after which the person goes to the heaven.

His ideas were widely used in that time church and were used as fundament for creation and confirmation of a particular concept. Purgatory was one of such concept.

The paradox lies in the fact that the work of Augustine dated the fourth century but dogma of purgatory has spread only in the twelfth century. It dues to heavy situation in the Roman Empire: the barbarians foray, the ideology change, the Roman civilization crisis. The man under an unfair world relies on retribution in the afterlife world waiting for justice - atonement in the other world. The purgatory problem goes into the background and does not arouse a response in the public consciousness. And only in the twelfth century society has necessary changes and adopted this idea. The theoretical foundation finds its development within the scholastic doctrine.

Thomas Aquinas (one of the most important scholastic philosophers of the Middle Ages) suggested the Thomist system, which is more intellectual and substantial in the ALW using between all scholastic systems. He defined the soul afterlife abstractly: "souls, by the fact that I know, that they are prescribed to a place, experience joy or sadness: meanwhile, their abode contributes to either reward, or punishment" [5]. But it is possible "if only (...) debt before God's justice does not delay her ascent in obligation to a preliminary purification" [5]. Souls, whose condition is not definitely, fall into purgatory (unlike the righteous and hopeless sinners). Logically suggest that the number of souls in the "middle state" exceeded other souls. In such conditions the idea of purgatory was adopted by the social and individual reasons masses: purgatory made a person less vulnerable to the afterlife worldviews. Any sinner in this area was subjected to the purifying fire effect, after which the heaven (paradise) became more accessible to him.

Defining the afterlife existence cosmology, Aquinas put forward several hypotheses for the typology of the "receptacles" of the afterlife. Hypothesis No 1. "Receptacles are corresponding to merit or fault." Hypothesis No 2. "During the life, people acquire merits and commit the unworthy things in the same place." Hypothesis No 3. Places match types of sin (mortal, original, venial) [5]. Based on three hypotheses Thomas concludes that "the receptacles of souls are different, depending on the difference in their state" [3]. Thus, the ALW of Aquinas includes five areas of the other world, four of which can be defined as the hell hemisphere: the sky (or heaven paradise), the limb of babies, the limb of the patriarchs, hell and purgatory. Aquinas gave a description of each of these areas. Paradise is an ethereal world (located on heaven) in which the righteous dwell in eternal contemplation of God. They have transfigured bodies and are not hungry and thirsty. Babies' limb is a hell area. Its location is not precisely defined, but it can be assumed that it is on the first hell circle. Patriarchs limb is the hell area; a place of old Testaments righteous which was before the Christ descent into hell. The damned hell is a place of eternal torments for those who rejected Christ. He identified purgatory as one of the hell areas "the Scripture says nothing specific about the location of purgatory" [5].

Aquinas denies the view that it is closer to Heaven, "even so, the purgatory souls would be mediators between us and God", but this is impossible "because they are not punished for high things, but for low things inside of themselves" [3]. Purgatory has intermediate, temporary nature of existence. This statement indirectly confirms evolutionary process of changing ternary type by binary etc.

The Catholic idea of purgatory is identical to the Eastern idea of reincarnation and not in internal content, but in functional basis, in purifying effect. In Theosophical doctrine of salvation according to the teaching of H.P. Blavatskaya, there is a functional analogy of Catholic “purgatory” and it is “Devachan”, included in the reincarnation cycles. “Intermediate state between two terrestrial lives, which includes ego (atma-buddhi-manas, or one transforming in the Trinity), after their separation from kamarupa (form of “desires” or “passions”) and decomposition of the lower principles on earth” [2]. The believer’s soul in the salvation moves to Devachan, taking spiritual goods of kind deeds. The soul stays there approximately 1250 years, improving and getting ready for a new, more positive reincarnation, from which after death will go again with the spiritual goods of new kind deeds to the Devachan. And so on, until the soul will reach the salvation suitable for being closed with the divine monad. Devachan is the highest sphere to which the divine monad aims. The monastery is characterized by eternal bliss and grants the deceased recompense for the unfairness peculiar to the terrestrial existence.

Devachan is only available to a certain circle of people (the other souls are transmigrating), in contrast to Catholic purgatory into which almost all dead are falling. In Catholic purgatory dogma’s idea of reincarnation is missing unlike the Theosophical teaching and the Christian Gnosticism, but there is a functional identity on the basis of purifying, in favour to religions unity.

In the evolutionary-represented models of the ternary type, from Western Patristic to theosophy, cosmological interpretations about afterlife existence are structurally identical to each other. Middle models have the same socially epistemological basis, expressed in the public stratification: hopeless sinners, the chosen righteous and some people, not included in the first, nor in the second category.

4 Research Methods

The aim of our research was to analyze the small and medium-sized business subjects activity in the northern region (the territory of Yamalo-Nenets Autonomous Area) to obtain reliable and objective information about the state, nature, trends and prospects of its development. The research was carried out by telephone survey of the small and medium-size enterprises’ region heads. The use of quota sampling allowed to reproduce the structure of the general section of all large-administratively territorial units of this region. The total number of respondents was 300 people.

One of the empirical material analyzing method was hierarchical clustering. It allowed to collect the entrepreneurship of the region. The variables were proposed for clustering. These variables were used for the business state’s characterizing. They were expressed in matters reflecting: assessment of the business developing success; financial condition of the company; changes of business state in the current year; change in the number of jobs; changes in average labour payment to the company’s employees.

Data analysis was carried out in the statistical package IBM SPSS Statistics version 22.

5 Results

The first stage was the data's standardization. It consisted in the transformation of variables, originally based on different scales. To do this, each variable has been recorded into 3 categorical with conditional values: 1-negative indicator (-), 2-neutral indicator (0), 3-positive indicator (+).

There was a question of the questionnaire "Please evaluate how successfully your business is currently developing?". This question suggested some options for answers: "Very bad", "Rather bad", "Neither bad nor good", "Rather good", "Very good". Later it was recorded into the variable "Business success assessment" with variants "bad", "medium", "good". This was preceded by the combination of 1 and 2 variants, as well as 4 and 5. In the questionnaire question: "Please, currently evaluate the financial condition of your company?" suggested options for answers were: "Unfavourable", "Rather unfavourable", "Rather safely", "Safely". The 2 and 3 variants were combined [18]. The other questions were reorganized in the same way. The variant – "I find it difficult to answer" – was considered as a missed one, and notices containing one pass would be excluded from the analysis procedure. A total of 236 participants took part in clustering observations. It was 78.7% of the total number of respondents.

In the second stage, the hierarchical agglomeration cluster analysis was made with using the Ward method and the "Square distance of Euclid" for interval scales. The resulting dendrogram allowed visually assess the nature of clustering and identify three large groups of entrepreneurs. On the third stage, each of the groups was meaningfully analyzed and characterised by conjugation with other additional questions of the questionnaire.

In addition, in each of the clusters, subgroups were identified that allowed to characterize the entrepreneurs of the region in more detail.

These subgroups are equal in number, but different in their characteristics (Table 1).

Table 1. Cluster analysis results.

Variables	1 cluster (75 observations, 31,8%)			2 cluster (88 observations, 37,3%)			3 cluster (73 observations, 30,9%)		
	-	0	+	-	0	+	-	0	+
How successful is your business developing nowadays?	81,3	16,0	2,7	4,5	67,0	28,4	1,4	17,8	80,8
Please, rate your company financial state in current year	46,7	53,3	0	13,6	62,5	23,9	0	47,9	52,1
How did your business state change this year?	82,7	4,0	13,3	80,7	19,3	0	0	50,7	49,3
Did you change the number of workplaces in your company this year?	42,7	38,7	18,7	30,7	65,9	3,4	2,7	65,8	31,5
How can you characterize the average salary changes for your staff this year?	38,7	50,7	10,7	21,6	68,2	10,2	6,8	47,9	45,2

The first cluster was, mainly, for representatives of business, whose position in the economic system of the region is the most difficult. Most of the indicators in the respondents' answers were characterized negatively. More over 80% of them noted negative trends in business development at the present time and the deterioration of its condition in comparison with previous periods. The financial state of the companies, the change in the number of workplaces and the level of remuneration of the employees groups are also strongly biased in the negative direction.

The structure of the first cluster is characterized by three subgroups, two of which are close in their characteristics (1.1 and 1.2), and one is differ to them (1.3). It is the smallest one and has joined the first two on the last stage of agglomeration.

First and second entrepreneurs' subgroups of the first cluster vary among themselves by the workplaces number changing in the current year and changes in the amount of employees' remuneration. If the subgroup 1.1, despite an unfavourable situation of changes in the number of jobs did not occur in 61.1% of cases, and in 38.9% of cases, the number even increased, then in subgroup 1.2 the situation was mostly "disastrous" in all indicators (Table 2). The peculiarity of subgroup 1.3 was manifested by the improvement of the business state in this year, along with negative indicators according to the respondents.

Table 2. Content structure characteristic of the 1 (first) cluster.

	1.1 (36 answers – 48%)			1.2 (28 answers – 37,3%)			1.3 (11 answers – 14,7%)		
	–	0	+	–	0	+	–	0	+
State of affairs	83,3	16,7	0	85,7	14,3	0	63,6	18,2	18,2
Financial state	36,1	63,9	0	57,1	42,9	0	54,5	45,5	0
Business state changing	94,4	5,6	0	100	0	0	0	9,1	90,9
Workplaces number changing	0	61,1	38,9	89,3	10,7	0	63,6	36,4	0
Wages changing	25,0	72,2	2,8	50,0	25,0	25,0	54,5	45,5	0

Considering the typical activity areas to the first cluster representatives in general, it can be noted that very often there are hotel and restaurant business' owners (more often in subgroup 1.1), entrepreneurs engaged into the wholesale and retail trade (more often in subgroup 1.2). This includes virtually all realtors engaged in real estate and rental operations (Table 5).

The entrepreneurial success indicators of the second cluster representatives are for the most part, in the neutral zone. The exception is only into the business state changing this year. It is 80.7% indicated and deteriorated. In the same time there are small biases in the positive side of business development success assessing and company financial state in the current year. There is also the negative side of the personnel estimates: workplaces number and wages changes.

Differences between the first two of them, as in the previous case, are determined by the change in the workplaces number: in the first group - 100% of decreasing, and in the second case-almost 90% of cases without any changes. The minor differences are

observed for the rest of the indicators. In the third subgroup, the respondent's financial status is biased in the positive direction. The 90% of the cases were noted the deterioration of the respondents' business this year. A significant portion of this entrepreneurs subgroup decreased the level of employees' wages (Table 3).

Table 3. Content structure characteristics of the 2 (second) cluster.

	2.1 (24 answers – 27,3%)			2.2 (43 answers – 48,9%)			2.3 (21 answers – 23,9%)		
	–	0	+	–	0	+	–	0	+
State of affairs	0	45,8	54,2	0	72,1	27,9	19,0	81,0	0
Financial state	8,3	66,7	25,0	23,3	76,7	0	0	28,6	71,4
Business state changing	75,0	25,0	0	79,1	20,9	0	90,5	9,5	0
Workplaces number changing	100,0	0	0	7,0	88,4	4,7	0	95,2	4,8
Wages changing	8,3	91,7	0	16,3	62,8	20,9	47,6	52,4	0

Areas of the second cluster entrepreneurs' activity are associated with the oil and gas industry (extraction or transportation of oil, gas, geology and geophysics) (more often in 2.2), industrial production, utility sector (usually in 2.2 and 2.3), information activity (advertising, consulting, mass media) (more often 2.1 and 2.2). As well as in the first cluster, there are hotel and restaurant business owners (more often in 2.2). This area of activity is almost equally divided between the first and second clusters (Table 5).

In the third cluster the indicators of negative values are noted extremely rare by the respondents. The positive indicators dominated or are marked approximately in the same degree as neutral. The indicator of "workplaces number changing" is slightly less than the two-thirds respondents rated it neutrally (Table 4).

Table 4. Content structure characteristic of the 3 (third) cluster.

	3.1 (33 answers – 45,2%)			3.2 (40 answers – 54,8%)		
	–	0	+	–	0	+
State of affairs	3,0	27,3	69,7	0	10,0	90,0
Financial state	0	45,5	54,5	0	50,0	50,0
Business state changing	0	33,3	66,7	0	65,0	35,0
Workplaces number changing	6,1	51,5	42,4	0	77,5	22,5
Wages changing	0	0,0	100,0	12,5	87,5	0

The activity spheres in this most prosperous cluster, are mostly represented by the oil and gas industry (extraction or transportation oil, gas; geology and geophysics) (more often in subgroup 3.1), construction (more often in subgroup 2.3), transport and communication spheres (equally in subgroups 3.1 and 3.2). Here is also more frequently education, medicine, science and culture (more often in subgroup 3.2), as well as services (more often in subgroup 3.2) (Table 5).

Table 5. Table of the company activity sphere conjugation and their clusters accessory.

	1 cluser	2 cluser	3 cluser	Total
Extraction or oil, gas transportation; geology and geophysics	0,0%	50,0%	50,0%	100,0%
Construction	23,1%	30,8%	46,2%	100,0%
Industrial production	26,7%	40,0%	33,3%	100,0%
Transportation, communications	32,4%	29,4%	38,2%	100,0%
Utility sector	0,0%	85,7%	14,3%	100,0%
Education, medicine, science, culture	28,6%	28,6%	42,9%	100,0%
Hotel and restaurant business	40,0%	46,7%	13,3%	100,0%
Wholesale trade	37,5%	37,5%	25,0%	100,0%
Public service(service provision)	31,9%	29,8%	38,3%	100,0%
Retail	36,5%	39,7%	23,8%	100,0%
Advertising, consulting, mass media	25,0%	50,0%	25,0%	100,0%
Real estate operations, rent	60,0%	20,0%	20,0%	100,0%

The conjugation tables study has revealed another interesting pattern of the company. The company feels itself as better, as wider the geography of their activities are (Table 6). The overwhelming part of the companies is in the 1 and 2 clusters and they operate only on their registered territory. Most of the companies operated in several regions (cities) of Yamalo-Nenets Autonomous Area are located in the second and third clusters. The third cluster represents about half of the companies, working not only in the region, but also outside of it.

Small companies remote from the raw materials industry and the public sector, aware clearly their states in the regional economic system. They operate mainly in the sphere of the goods and services population providing.

Table 6. Geographical distribution of the studied companies activity among the clusters.

Geographical company activity	1	2	3	Total
Company working only on the registered territory (region, city)	35,8%	36,5%	27,7%	100,0%
Company working on several regions(cities) of YNAA	25,5%	41,8%	32,7%	100,0%
Company working in YNAA territory and in other Russian regions	19,0%	33,3%	47,6%	100,0%

6 Conclusion

On the specifics of the entrepreneurship structure, the regional sectoral-orientation imposes a big imprint. The regional administrative apparatus and all “social networks” are still one large area whose service is most beneficial for small and medium-sized businesses. The remoteness factor forms at the most important part of the regional population “psychology of a temporary resident”. It happens because of the harsh landscape, climatic conditions and understanding of the population, that oil and gas reserves will sooner or later come to an end. The low investment activity and the proportions violation of the specific weight of non-current and current assets is its consequence. Investments in basic funds, as a rule, occur only if they pay off quickly or if they have the state’s support. This fact significantly limits the opportunities for business development in the region, complicate the emergence of stable small enterprises that focus on long-term activity.

Relatively short period of territory settling, lack of large scientific and educational centres significantly hamper the development of the territory innovative business activities. The Nobel laureate E. Phelps, points to the “grassroots” innovations importance. In his opinion, at the level of prosperity there is a national due to the large-scale involvement of people in the innovative processes as a source of economic development dynamism energized by relevant values [17]. Today, the innovative activity of regional entrepreneurs is virtually lacking.

High intensity of migration processes in the region’s (seeing the large number of shift workers), ethno-confessional population diversity, especially in large cities, characterizes a high level of the regional society social dynamics. In these conditions, business faces some difficulties with overcoming a number of contradictions inevitably arising in the life activity of social groups with different interests. In the formation of the result there are difficulties with continuity and economic activity traditions of the population, family business, which are the necessary conditions for the development of sustainable entrepreneurship region.

Summarizing the above, we note that small and medium-sized business acts in difficult conditions in a remote region. Its role in the regional economy is very petty. In the Yamalo-Nenets Autonomous Area the number of SMB in the calculation of 1,000 residents exceeds the Russian level at all. However, the share of employed in SMB from the total average number of employed in the region is only 14.0%. It is one of the lowest indicators among others Russian subjects. The main reason is in the “small” enterprises’ size. In average the one SMB in the Yamalo-Nenets Autonomous Area has 1.9 employees. While the average Russian level is about 3.2 employees [16].

The enterprises types are allocated and characterized in the view of their economic well-being in the market. The spheres analysis of their activity allowed to highlight the features of entrepreneurship in the region. It is found that the designated business characteristics and the conditions of its functioning are, in varying degrees, inherent in other remote regions of Russia.

Despite the efforts made by the state, there are objective factors, that hamper the business development in the remote region. These factors are partially listed above. To overcome them, financial and informational support, motivation of the population to

the opening of their own business is not sufficient. It is important to promote the formation of the “master” mentality and the entrepreneurship culture among the population. Entrepreneurship should not be the workplace area for people, not managed to get a job in a budgetary institution or a large industrial enterprise. Opening of your own business should be associated, first of all, with the possibility of a personal potential and ability realizing for a fair profit receiving.

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Russian-Japanese Economic Cooperation in Historical Retrospective and Perspective

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Abstract. The article analyzes trends in Russian-Japanese economic relations. Areas of interaction include fuel and energy sectors, trade, economic and investment spheres. Far East is the region, where geopolitical and economic interests of countries resonate. Both countries continue to use natural resources, and solve social and economic problems of their peripheral regions. The purpose of the work is to determine promising grounds for Russian-Japanese economic cooperation in the Far East based on an analysis of the Soviet-Japanese experience of cooperation and study of current trends in economic relations between countries. The authors prove that a set of factors that limit implementation of economic projects in the region includes geopolitical, geo-economic and socio-cultural factors. The study's methodological basis is grounded in historicism and objectivity. To enable a comprehensive examination of the issue in question, the authors employ a set of specific methods, including comparative-historical, problem-chronological, and systemic methods. The influence of cultural and people's diplomacy on strengthening economic ties between countries is determined. The authors note that Russian-Japanese cooperation continues in mineral mining, trade and economic sectors in the Far East. At the same time, Russian region needs Japanese investments in high-tech industries. Inadequate infrastructure, small amounts of Research and Development activities and a lack of specialists with necessary competencies adversely affect Russian Far East investment image. Enhancing the competitiveness can be positively influenced by strengthening centuries-old traditions of communication between two countries, expansion of intercultural dialogue, which has always been a solid basis for economic interaction at different levels.

Keywords: Soviet-Japanese cooperation ·
Regional international economic integration · Cultural diplomacy ·
Intercultural communication · Regional identity · Spiritual values · Soft power

1 Introduction

Over the last few years, Russia has stepped up the Far Eastern trend of foreign policy, associated with a complex of internal and external factors. At present, Russian Far East economy is being modernized which is impossible without interaction with the states of the Asia-Pacific region (APR).

One of Russia's partners in the APR is Japan, but the relations between 2 countries are still complicated by unresolved issues. The key one is the territorial issue. Despite

existing contradictions in the 2nd half of the 20th - early 21st centuries, the parties experiencing mutual need for the economic cooperation development utilized various mechanisms that made it possible not only to implement major projects for the bilateral development of natural resources in Siberia and the Far East, but also to move to a qualitatively new level of interstate dialogue. An effective mechanism capable of giving an impetus to Russian-Japanese economic cooperation is humanitarian cooperation and people's diplomacy, actively developing in the post-war period but suffer need of revitalization. Insufficient knowledge of Russians and Japanese about the history, traditions and culture of each other, negative stereotypes, which perform orienting and regulating functions in the interethnic dialogue, can make it difficult to implement promising economic projects in the region.

In the proposed study, the authors taking into account the development of current trends in Russian-Japanese relations focus their attention on different aspects of interaction between the USSR and Japan in the 2nd half of the 20th century. The authors determine the ways for employing historical experience of cooperation between countries in implementing modern programs aimed at the development of the Russian Far East.

At present, the APR countries have significant investment and technological potential, firmly holding one of the leading places in the world in terms of economic development. Dynamically developing countries of the APR have a limited source of raw materials and are interested in an economic partner in the region. Russia could play the role of such a partner. The Russian Far Eastern territories possess huge natural resources, which allow expanding the direction of Russia's economic cooperation with countries of the region, making the Russian Far East and the entire economy more stable. The strengthening of Russia's position in the APR is greatly influenced by relations with Japan. Under the conditions of the "cold war" and almost complete absence of political dialogue, the countries cooperated in traditional spheres: raw materials, trade, and economic sectors.

At present, Russia and Japan managed to bring the relationship to a new level. Their maintenance demands modernization of the industrial, economic and information technology infrastructure in Russia.

The solution of the issue is possible when attracting Japanese investments into these industries. Enhancing the competitiveness can be positively influenced by the strengthening existing communication traditions between the countries, the expansion of intercultural dialogue, which has always been a solid basis for economic interaction at different levels. The constituent members of the Far Eastern Federal District can conduct Russian politics in the APR.

The analysis is based on the necessary body of research by specialists. Soviet-Japanese economic relations have been subjected to comprehensive study by P.D. Dolgorukov, M.I. Krupianko, Yu.V. Kadeshnikova, P.A. Minakir. The scientists single out the role of the Far East in trade and economic cooperation with Japan, and consider issues of coastal trade development. Soviet scientists hold to the opinion that the coincidence of the interests of both nations and their natural economic and geographical situation contributed to galvanizing cooperation. The issue in question has been the object of keen interest among scholars such as M. Nobukuni, N. Arai, Ts. Hasegawa. In general, the positions expressed by Sugumori Koji and Kazuo Ogawa are characteristic

for Japanese science. Sugumori Koji believes that “trade with Russia and the USSR did not appear to be the dominant factor in economic development for Japan. Japan supported relations with the USSR in sake of national security interests” [1].

Vectors for modern trade, economic and investment cooperation between the Russian Far East and Japan are subjected to a thorough analysis in the works of A.G. Adminin, I.M. Kuranova, V.N. Pavlyatenko, I.L. Timonina, K. Sakamoto, Sh. Ichimura.

However, cooperation between Russia and Japan in the field of humanitarian relations has been considered fragmentary in the scientific literature. Researchers are mainly involved in political and economic aspects of cooperation between the 2 countries. Despite the relentless focus on the issue in question, it has not so far been given a full examination and has not received a comprehensive and integrated coverage in the scientific literature.

The research hypothesis is that the economic interaction strategy between Russia and Japan should be determined taking into account the characteristics of the people mentality, national historical experience and cultural traditions of the 2 countries. Active political and economic cooperation in the humanitarian sphere between Russia and Japan will lead to the desired results only if the principles of mutual respect and sovereignty are among the top priorities in relations between states.

2 Theoretical Review

2.1 Soviet-Japanese Interaction in the Economic and Humanitarian Spheres

The USSR and Japan signed the joint declaration on the cessation of the war state between the nations on October 19, 1956 and the restoration of good-neighborly relations, as well as a number of agreements of the 1950's–1960's fixing the conditions for the development of bilateral trade and economic cooperation. That was evidence of establishing a constructive dialogue between the sides after World War II. The convergence of Moscow and Tokyo was facilitated by the existence of common economic interests for both countries, especially in the border areas. In order to develop economic relations in the USSR and Japan, special attention was paid to educational activity among the population, rightly believing that the means of “soft power” are effective and capable of meeting the most important tasks of interstate interaction. The Press Bureau of the Soviet part of the Union Council for Japan, All-Union Society for Cultural Relations with Foreign Countries pursued persistent information and propaganda efforts, cultivating the humanitarian dialogue with the Japanese, even before the official establishment of the relations between the 2 countries and the signing of the 1956 Joint Declaration. Thus, the foundations of friendly ties were laid, which were intensively developed in the 2nd half of the 20th century. The development of humanitarian cooperation was realized not only thanks to efforts of the Soviet state and public structures. Japanese organizations interested in rapprochement with the USSR made significant contribution to the establishment of bilateral dialogue. The movement for friendship with the Soviet state was represented by societies studying Russian

culture, the Peace Movement, choral musical bands, scientific organizations. In the 1950's–1960's, when bombing of Hiroshima and Nagasaki were still green in the mind; the Peace Movement of Japan enjoyed public support and represented a significant force. The activity of movement representatives such as composer Akutagawa Yasushi, conductor Akiko Seki, professor Ikuo Oyama, writer Tokunaga Sunao attracted the attention of the Japanese and contributed to the formation of a positive image of the Soviet state [2].

According to the USSR State Committee plan, a special role in the process of establishing Soviet-Japanese economic ties should have belonged to the Far East. Problems of this region largely coincided with problems of the far from the center northern prefectures of Japan: low economic development and low population density, territorial and economic disproportions in production distribution, transport problems, etc. Both countries expected to get new markets, develop industry and increase population of these regions. The State Committee of the USSR paid considerable attention not only to economic cooperation of the 2 nations, but also to humanitarian interaction of the territories of the Soviet State and prefectures of Japan. In December 1964 in Khabarovsk, Vladivostok, Nakhodka, and Yuzhno-Sakhalinsk, the posts of representatives of the State Committee on Cultural Relations were established, and the number of subjects of humanitarian exchange was expanded. On the part of Japan, it included a significant number of private companies and individuals. Cultural and scientific ties received a socio-legal basis in the form of agreements between public organizations of the USSR and Japan. Thus, the USSR and Japan cooperated in the Far East in the humanitarian sphere, which allowed expanding economic cooperation.

Qualitative changes in Soviet-Japanese economic relations took place in the 1970's. During the 2nd half of the 20th century, countries were able to form the regulated legislation for bilateral cooperation in the field of fisheries in the northwestern part of the Pacific Ocean. On average, in the 1970's the Soviet Union has assigned fishing quotas ranging from 60 to 90 thousand tons per year, in the 1st half of the 1980's - 42 thousand tons, and in the 2nd half of the 1980's – 10–15 thousand tons per year for Japan [3]. Japan increased the amount of supplies of machinery and equipment needed for Soviet fish breeding and fishery protection measures to the USSR as the compensation for the possibility of limited salmon fishing of Soviet origin. In the development of the Soviet Far East, a special role was assigned to the energy industry. Resolutions of the 20th Congress of the CPSU noted the need to expand the search for oil, gas, non-ferrous and rare metals, titanium, and manganese ore for the production of ferromanganese in eastern regions of the country [4]. Academician V.S. Nemchinov proposed a concept for the development of the USSR Far East, which assumed orienting toward foreign markets [5]. In the 1960's - early 1970's, Japan having a small amount of minerals and raw materials reserves was experiencing a period of rapid industrial growth and was in bad need of raw materials. Japan showed interest in the joint development of Soviet energy resources in Western Siberia and the Far East. However, the geopolitical situation did not allow realizing the plan. By the mid-1970's, the USSR government fostered the idea of using foreign investments in the Far Eastern oil and gas projects. The threat of undermining the industrial sector of the Japanese economy forced Tokyo to reconsider its position in energy cooperation with respect to Moscow. In 1975, the USSR and Japan signed the agreement on joint exploration and

development of offshore oil reserves on the Sakhalin Island. The USSR acquired new marine technology and experience, the country increased foreign exchange earnings, and Japan had access to new oil sources [6]. The timber industry complex was a significant component of Soviet-Japanese economic relations. However, two-thirds of the forestland was in private ownership, while only 0.1% of the owners had a forest area of more than 50 hectares [7]. Soviet imports of timber to Japan began in 1954 and continued throughout the 1950's and 1970's. The USSR exported wood to Japan in exchange for deliveries of equipment for the timber and woodworking industry. However, under the influence of the wood demand decline in Japan by the 1980's products volumes of the Soviet timber industry complex began to decline annually (Table 1).

Table 1. Roundwood exports to Japan (thous. cub. m) [8].

Year	1958	1959	1960	1963	1974	1975	1984	1985	1986	1987
Vol.	450,2	706,7	950,6	706,7	7890,3	8015,7	5838	5681	6528	6171

The construction and operation of the Baikal-Amur Mainline (BAM) gave a powerful impetus to economic cooperation between the USSR and Japan. In the early 1970's, Japan was interested in constructing BAM and exploring natural resources along the railway track. BAM passed along rich resource areas, which made the transportation of timber, oil, South-Yakut coking coals and other raw materials cheaper for Japanese markets. Tokyo's interest in the development of BAM in the 1970's can also be explained by the changes in relations between the USSR and the PRC. The implementation of projects required considerable capital investments from the Soviet government (at least 1 billion rubles were needed for the construction of BAM over the course of 10 years) [9] and the use of cutting-edge engineering developments. To construct the Baikal-Amur Mainline, only 166 excavators from «Kato», 199 «Komatsu» bulldozers were purchased from Japan alone. In accordance with the 1982 agreement, the USSR purchased 480 excavators, 1,100 bulldozers and 10,803 pipe layers from Japan [10]. The interest of the Japanese towards BAM began to weaken after the signing of an agreement on joint exploration and development of the shelf on the Sakhalin Island (1975). However, different economic systems of both countries, the high level of Soviet bureaucracy hampered Soviet-Japanese economic cooperation in the construction of the Baikal-Amur Mainline.

The collapse of the USSR did not allow the transfer of relations to a new level.

2.2 The Development of Russian-Japanese Relations in the Economic and Humanitarian Spheres

Japan recognized the Russian Federation as a successor state to the USSR on December 27, 1991. As in previous years, the main problem facing the all-round development of relations between the 2 nations was the dispute over the Kurils, which hinders the signing of a peace treaty.

At the end of the 20th century, Russian-Japanese economic cooperation entered a new stage, which was associated with fundamental changes within countries and in the international arena. Foreign trade remained the main format of economic interaction between Russia and Japan, but trade volumes were significantly reduced and kept at the level of the 1970's. At the end of the 20th century, economic ties of the Russian Far East with the central part of the country significantly weakened, and the process of strengthening the trade and economic interaction of this territory with the APR countries, including Japan, started. New factors began to affect the reduction of regional economic relations: weakening of mutual interest in expanding trade and economic cooperation, poorly regulated legislation for relations between countries, the emergence of non-state companies in Russian-Japanese trade and economic relations, and the state control loss over economic flows, shortage of hard currency in Russia as a whole, and in the Far East in particular. However, since the beginning of the 20th century Japan took the place of the largest investors in the economy of the Russian Far East. For example, in 2002, Russian Far East economy received \$ 1.14 billion of foreign investment, of these Japan accounted for 23.3%, the USA - 4.1%, Korea - 3%, China - 1, 4% [11]. At the turn of the 20th–21st centuries, Russian-Japanese economic cooperation continued in areas developed in the Soviet period: the fishing industry, the timber industry and the energy sector, i.e. Russia exported products of low processing to Japan. 85% of Japanese imports to Russia, as in Soviet times, are represented by equipment. A special place in the Far Eastern trade was occupied by the exports of second-hand Japanese cars. To maintain economic ties, countries focus on personal contacts between Russian and Japanese entrepreneurs.

In the first decade of the 21st century, seafood and timber products in almost unprocessed form were supplied from the Russian Far East to Japan markets. It is worth noting that Japan could receive the above-mentioned goods from Asia-Pacific countries (China), a large part of which was represented by the re-exports of Russian goods processed at the enterprises of these countries and imported to Japan [12] (Table 2).

Table 2. The share of the Far East in Russian-Japanese trade (%) [12].

Year	2000	2001	2002
Commodity circulation	17,2	20,4	22,9
Export	16,4	19,2	24,1
Import	23,3	27,3	20,5

The Russian government needs to take measures aimed at increasing the raw materials processing level.

Cooperation tested by time, is developing in present-day realities and, despite external challenges, has significantly expanded. In 2013, Russian President V.V. Putin and Japanese Prime Minister Shinzō Abe announced the need to expand Russian-Japanese partnership in energy, agriculture, transport infrastructure and other areas [13].

Russian leaders pursue a policy aimed at attracting Japanese investments to regional enterprises. The main volume of Japanese investments in the Far East is concentrated in the energy sector (oil and gas projects of Sakhalin-1, Sakhalin-2),

extracting and processing gas projects (the Chayanda field, the Yakutia gas production center), Primorsky Krai, energy development (Khabarovsk, Sakhalin, and Yakutia), the diamond-cutting sector (Yakutia), the mining and metallurgical sector (Yakutia), and the wood processing sector (Primorsky Krai and Khabarovsk Krai) [14].

The Russian leadership offers the Japanese business community joint projects in the Far East not related to energy resources [15].

Despite promising Russian-Japanese economic relations, the interest of parties in fostering the dialogue, problems that existed in previous years and hampered the project implementation still remain. Japanese companies operating in the Russian Far East are interested in specialized factors (R & D, qualified personnel, and favorable business environment). The development of bilateral trade and economic relations also makes it difficult for Russian companies to penetrate the Japanese market.

3 Proposals and Results of Implementation

The widening of the intercultural dialogue could help solve the mentioned problems. Representatives of the USSR (Russia) and Japan, planning to develop relations in different spheres and formats, have always taken into account the mentality of the region inhabitants.

Not only contacts of leaders of Russia and Japan, but also the intercultural cooperation of inhabitants of countries in different spheres play the important role in the cultivation of Russian-Japanese relations. Intercultural communication with the Japanese is associated with psychologically comfortable communication, which does not cause partners to feel a sense of rejection. This thesis is confirmed by the theory of the Dutch researcher of the intercultural management G. Hofstede. He is sure that Russians and Japanese are inclined to collectivism, which is an undoubted advantage for establishing mutual understanding. The West, in its turn, focuses on individualism [16]. Effective intercultural communication between nations can contribute to an understanding of the national character of Russians and Japanese.

The formation of the Russian character was significantly influenced by the territorial factor. The influence of a vast space on the Russian national character determines Russian positive traits and Russian shortcomings. Russian laziness, recklessness, lack of initiative can be identified among the shortcomings. Climatic conditions on the territory of Russia cannot be regarded as favorable ones. The shortness of the working season, which required a heavy permanent physical activity to be carried out qualitatively and quickly, formed diligence, skill, concentration of physical and spiritual forces. "When working seasons end, aimed at "fighting" with the harsh natural conditions for harvesting, etc., a person directs his activity to develop his creative abilities". The ingenuity and skill of the Russian people is widely known. Indulgence was accompanied by "agility", "flexibility, brought up from childhood" [17].

These features of a national character are typical of the Russian person as a whole. Inhabitants of Khabarovsk Krai indicate persistence in difficult life circumstances: *Opinion about the Far East - the ability to help, not to lose heart, staying in difficult climatic and economic conditions, people-direct, open, and honest* among positive traits in posts at various forums [18].

One of the Russian national character features is the critical attitude towards oneself as a nation. This is reflected in numerous critical reviews of the Far East. Therefore, people repeatedly emphasize their laziness and indifference: *In my opinion, the main features of the townspeople are indifference, incomprehension, lack of initiative, laziness* [18].

Thus, we can assert about the contradictory nature of the Russian national character, in which positive and negative qualities are closely intertwined.

The greater part of the territory occupied by Japan is covered by mountains. Nature on the Japanese islands has a harsh and ruthless power. The struggle against climate and nature is able to unite the Russian and Japanese, for both peoples this struggle can serve as a unifying principle and facilitate cooperation in various economic and industrial spheres.

T.G. Oryanskaya points out those characteristic features of the Japanese people as collectivism, the desire for concerted actions in the group, and discipline were developed because of the “mode of production” [19]. The Japanese are confident that you can master many skills on condition of a thoughtful and long training. Among the most important qualities of the Japanese national character researchers note diligence and the associated zeal in all spheres of work.

Throughout history, Japan has cultivated a sense of beauty that is transmitted from generation to generation, which is fixed in the Japanese language; in particular, there are concepts of *khanami*, meaning admiration for flowers, *tsukimi*, meaning admiration of the moon and *yuki*, meaning admiration for snow. The tradition of worshipping the beautiful is manifested in feelings, words and deeds. The Japanese themselves believe that their inherent special sense of beauty is their national heritage, which foreigners can only admire.

The combination of accuracy, cleanliness and frugality contributes to the fact that, the Japanese with amazing accuracy and perfection create high-tech products that many foreign companies cannot reproduce.

Thus, the most significant features of the Japanese mentality could be borrowed by inhabitants of the Russian Far East, to make their region more successful and attractive.

4 Conclusion

1. In the 2nd half of the 20th century, interaction between the USSR and Japan in the Far East developed in the economic sector and the humanitarian sphere. Economic cooperation between nations in the region was mutually beneficial. The USSR acquired high-tech products, and Japan gained the access to raw materials and transport communications. The decline in Soviet-Japanese economic relations, which occurred in the 1970's, was associated with Japan's transition to science-intensive production. However, parties adequately assessed the need to continue developing cooperation in the economic sphere and, since the 1990's, gradually brought the relationship to a new level.
2. A significant impact on Soviet-Japanese relations was provided by humanitarian contacts between the USSR and Japan, developed in the Russian Far East. Soviet leaders gave the right to regional authorities to take meaningful actions to establish

humanitarian ties, while maintaining state control and coordination functions. Carrying out cultural diplomacy in Japan, the USSR developed several areas of humanitarian interaction: cultural, scientific, educational, sports, tourist, and youth ties.

3. The Soviet-Japanese experience of interaction in the Far East can be beneficial in realities of the present day. Russian-Japanese relations continue to develop in the raw materials and energy sector; countries interact in the development of transport infrastructure and agriculture. Science-intensive production, medicine, and the introduction of new technologies should serve as promising areas of cooperation. Particular attention should be paid to the interaction of scientific organizations and universities.
4. Humanitarian space is created with the help of the language. The latter contributes to understanding of another nation. At present, it is necessary, taking into account modern opportunities and subjects of international humanitarian interaction, to develop programs for studying Russian and Japanese languages. In this case, interaction of small and medium-sized businesses of both countries, whose representatives will be educated, creative, and intelligent, can obtain an additional impetus. Consequently, economic contacts will expand.

If we utilize the similarities found in both cultures, try to understand intercultural differences, national character and national stereotypes and search for ways to overcome problems they cause, create and improve cultural competence, all these actions can contribute to weakening influence of cultural barriers in the development of Russian-Japanese economic relations in future.

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Didactic Support of Resource Component for Educational Environment of Higher Learning Institution for Development of Students' Information Literacy

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Abstract. Rapid development of information and communication technologies in modern society is applied to all spheres of human activities nowadays. These transformations have changed employers' requirements to young specialists. The specialists who are in demand in the labour market must have professional skills and abilities as well as capability of orientation in modern data flows and can get necessary information promptly, enlarge knowledge and put it into practice. Thus, the level of professional competence in the field of information technologies becomes very important. In this case the relevant problem to be solved in modern pedagogy of higher learning institution is the development of didactic support during the process of training further specialists to the effective information retrieval activity, forming skills of information self-sufficiency and developing information literacy as personal quality promoting them to compete in the labour market. In the result of this problem solution the particular relevance in teaching students to work with electronic informational resources gets the applying electronic educational papers applied as learning software and being didactic support of resource component for educational environment of higher learning institution.

Keywords: Information literacy · Professional competence · Computer training aids · Training simulator · Information retrieval · E-catalog · Educational environment of higher learning institution · Informatization of education · Didactic support

1 Introduction

The following peculiarities are typical for modern society [5]: constantly increasing volume of information and information flows; development of computer nets and active usage of virtual environment resulting in the formation of the open society; formation of a new cultural type of personality characterized as active, independent and responsible, able to make decisions and estimate moral importance of their action and choice; dynamism and intensity in developing technics and technology, continuously changing

quality and conditions of any kind of human activity which makes people master new ways and types of activities and upgrade professional competences within their lifespan.

Nowadays the necessity of information knowledge becomes greatly apparent in employers' requirements to young specialists whose competitiveness is determined not only by the level of professional training but the level of professional competence acquired, information competence in particular. Graduates' qualities in the field of interaction with information such as computer literacy, ability to accept and analyze new information and new ideas, willingness and ability for further education and development play an important role for modern employers.

Effectiveness of labour activity in modern conditions greatly depends on information outlook and informational competence of a specialist: the specialist knowing presentation, composition and fullness of information resources is able to get necessary and relevant information, enlarge knowledge and professional level and competence easily and promptly. In this case the formation of further professional personality competed in the field of interaction with information obtains the particular relevance in modern system of higher learning. Rita Kop citing CIBER notes in her research «Information literacy is acquired at a young age and “information behavior” is a developmental process at a deep level that will be very difficult to advance substantially later in life, for instance, a course at university» [3]. According to the opinions of such scientists as Badke, Snavelly, Horng-Ji Lai «Since IL competencies have been identified as a crucial element to foster lifelong learning and keep up with the fast changing world, integrating IL learning into education at all levels should be a priority concern» [4]. The development of information literacy of personality becomes one of the most important aspects in training young specialists to professional activity.

2 Information Literacy of a Personality

Under the information literacy of personality we understand the integrative quality of a personality based on their information worldview and their self-awareness of the place in the world which allows to implement effective professional activity as well as activities of a different kind using morally-valued attitude, the level of training and rational activity style concerning the information interaction. The structure of information literacy of a personality includes world outlook, cognitive, incentive-valuable and effectively-practical components.

World outlook component of information literacy includes worldview knowledge of information functioning patterns in the world, the influence of information on a personality and its role in general culture.

Cognitive component of information literacy includes knowledge of computer equipment; widely-used professional software, information technologies for solving educational and professional tasks as well as knowledge of creating, editing and transmitting different informational objects with the help of modern information and communication technologies; skills of information retrieval activity; skills of dealing with information such as structuration, systematization, generalization and presentation in a clear accessible way; ability of using modern information and communication technologies for socializing with people.

Incentive-valuable component comprises informational needs, incentives of appealing to sources of information subject's expectations from information activity, moral and ethical norms of appealing to information and its usage.

Effectively-practical component consists of transferring of training in interaction with information to new situations, ability of using obtained information in educational, cognitive and professional activity as well mastering informational self-sufficiency technology. The following professional competences and particular practical abilities and skills of using information sources are the part of the component: ways of information retrieval, selection of receiving information ways, intensity of using information sources, using information in different spheres of activity, involvement in Internet-community.

3 Resource Component of Informative Educational Environment of Higher Learning Institution

Educational environment of higher learning institution presents a complex of factors determining training and development of a personality, sociocultural and economic conditions of society which influence education, information and interpersonal relations and interaction with social environment. Having analyzed researches of some authors (O.V. Artyushkin, V.A. Novikova, E.A. Masyaykina) on the problem we came to the conclusion that informative educational environment of the institution of higher learning includes the following components [1, 6–8]:

- content component (subject training of students)
- technical component (programmed devices and technical appliances functioning on the base of ICT)
- communicative component (ways of participants' interaction in educational process)
- resource component (informational and educational recourses)
- technological component (methods and forms of educational process organizing)
- organizational goal component.

Content component is subject training of students, i.e. educational and academic programmes, subject curriculum, academic and methodological complexes of subjects.

Technical component includes programmed devices and technical appliances functioning on the basis of information computer technologies (ICT). They are subdivided into ICT devices integrated in educational process (equipment of the lecture rooms and laboratories) and ICT devices having external position towards to educational process (technical equipment of the university library allowing participants of educational process to implement information retrieval using new information technologies and obtaining access to remote sources of information, and appliances providing operation of the local university net and access to Internet).

Communicative component implies participants' interaction in educational process that may be realized both in reality (information exchange during lessons and after them) and virtually by means of ICT (during forums, in chats, with the help of e-mail, in the institute of higher learning local net).

Resource component implies availability of information and education recourses in the educational environment of institution of higher learning. Information and education recourses have both verbal and non-verbal data which can be classified according to the kind of presenting information (print issues of educational and scientific purpose books, periodic issues and electronic issues such as electronic text-books, educational courses, etc.) and the place of storing information (libraries of the institution of higher learning, methodological rooms of faculties, departments' libraries, electronic libraries, virtual laboratories and remote access laboratories, Internet-resources).

Technological component includes methods and forms of educational process organizing. According to the educational standards, realization of the competence approach should provide wide usage of active and interactive forms in conducting studies (computer simulators, role games, business games, seminars, conferences, disputes, problem training, self-training work, reports, testing, research work, etc.) taken with extra-curriculum work contribute to students' professional skill formation and development of their information literacy as well.

Organizational goal component accomplishes arrangement of all component interaction in order to create conditions for personal self-development in all subjects of educational process and determines educational environment structure, provides the opportunity of result diagnosis, correction and control.

The development process of students' information literacy in the educational process of the institution of higher learning is closely connected with the usage of resource component of information and education environment of the institution of higher learning as it is the resource component that introduces opportunities for working with information resources. In the process of using resource component students' informational world outlook (world outlook of information literacy) is widen, information competence (cognitive component of information literacy) is formed, experience of interacting with information (its receiving, analyzing, processing, storing and transmitting to other people in clear view) is accumulated (effectively-practical component of information literacy). As a result, information type of mentality is formed. Students understand and formulate their own information needs. Students' educational activity in the informative educational environment obtains information character (incentive-valuable component of information literacy).

For successful educational activity it is necessary for students to find essential information timely and process great information volume quickly and qualitatively. In modern conditions students' information activity becomes prevailing.

Starting device inducing a subject to informational activity is data requirements. For successful informational activity it is necessary for students to realize their data requirements and have positive motivation.

In psychology motivation is regarded as complex of external and internal conditions that induce a subject to act, as well as a subject-matter and an object to which this activity is applied. In sociology motivation is regarded as conscious need to reach certain benefits or certain activity conditions.

Informational motivation, according to Novikova V.A., describes ambition extent of students to information activity, conscious degree of own information needs in educational and professional performance and ability to realize them in educational process and beyond it.

Informational motivation has the following peculiarities:

- motivation process is closely connected with the development of the main brain functions: on the one hand, mentation and memory depend on the motivation level; on the other hand, the level of main brain function development influences motivation formation;
- creation of psychologically comfortable climate is an important condition for motivation formation. A person perceiving information not only realizes it, but expresses his or her attitudes to it. Information is able to provoke different emotions: surprise, joy, negation etc. The following conclusion may be drawn: emotional supporting of informational activity enhances students' interest, induce their cognitive activity and motivation.

Mastering the ways of information retrieval is an important and earnest component of success in students' information activity, i.e. mastering retrieval ways those documents that match information inquiry in any subset of documents or contain necessary facts and information, and mastering processing ways and information presentation as well. In this case, information retrieval activity is marked out in the system of students' informational activity. It reflects the level of student's information competence and is the main factor of its development. The distinctive peculiarity of information retrieval activity is its organization that has purposeful nature: a student realizes the need of obtaining information that induces him or her to retrieve a way of obtaining necessary information. At the same time the student realizes why he or she does this or that action in retrieval (he or she realizes the purpose of his or her actions) and realizes what he or she is planning to obtain in the result of the actions. Specific actions in information retrieval direct to matching the image required to retrieval descriptions of information objects that make part of information resources or system. The ability to retrieve necessary knowledge from the information is the ultimate aim of information retrieval activity of students.

Information in students' educational environment is presented not only in traditional (paper) manner, but in electronic one. Integration of electronic documents in information resources (data bases) which are provided by navigation and retrieval system is typical for electronic manner. That is, electronic resources of information are software having proper design, content and retrieval opportunity. They are libraries' electronic catalogues, electronic libraries and library electronic systems, informational legal systems, data bases, etc. Using the electronic informational source students face the difficulties of mastering design, applying retrieval opportunities of software and formulating retrieval prompt. In the federal state educational standards of the institution of higher learning there is no special subject teaching students to work with information resources.

In this case the necessity of teaching participants of educational process information retrieval of electronic informational sources and developing didactic support in resource component of educational environment of the institution of higher learning appears. Horng-Ji Lai holds the same opinion citing the researchers of Riedling, Barnard, Nash, & O'Brien, Hohlfeld, Ritzhaupt, Barron, & Kemker, Probert, Shanahan «teaching IL can permit students to navigate the technology effectively and become efficient seekers and users of information. Recent studies have revealed that students'

IL skills need to be enhanced and careful attention must be paid to these skills in primary, secondary and even in higher education sectors» [4]. As some authors mention the important role of teaching students to work with information sources belongs to librarians, Snavelly suggested «the best way to teach IL is to integrate it into the most important parts of schools' curricula, and school administrators can look for ways to connect the public libraries and librarians with the curricula to integrate IL into courses». Training may be organized in the form of frontal work (in the course of "Bases of information literacy" which is absent in the educational standards, but the subject is introduced in the curriculum optionally; in the way of training seminars in working with information resources) or in the form of individual form (personal tutorials, independent mastering skills of working with information sources).

4 Using Computer Training Aids

High results both in frontal form and individual work are obtained by using computer training aids to work with electronic information sources.

We refer computer training simulators (both imitating and non-imitating) and multimedia lectures to computer training aids used for formation professional competences and improvement of information retrieval activity skills. The usage of computer training aids is possible both in teaching subjects and non-educational activity of students, e.g., in the activity of universities' libraries which are specialized in providing access to electronic information sources and training to work with them. If the computer training aids have an important quality – mobility – they may be used in any classroom equipped with computer devices regardless of access availability to educational resource.

Competence, personality-oriented activities and socially directed approaches lie in the basis of using computer training aids.

Competence approach orients obtaining the results of process for developing students' information literacy, for ability and readiness of a person to successful informational activity. These results, named competences, are considered as ability to solve difficult problems: professional, social, worldview, informational, communicative, and personal. The analysis of state educational standards shows that one of the results in mastering educational program should become the formation of the key competence – informational that means ability to retrieve, analyze, transform and apply the obtained information to professional activity and personal purposes.

Personality-oriented approach supposes that in the process of information literacy development students' age-related and personal peculiarities are taken into account. Besides, personality-oriented approach allows to consider personal significance of information literacy components: student's ability to select information sources, skill to reflex his or her informational activity, to solve problems raised in the field of interaction with information constructively.

Activity approach allows to develop students' information literacy in the process of informational activity on the basis of the experience of interaction with information, i.e. obtaining students' personal experience of interaction with information and integrating it into the experience system the student has already mastered.

Socially-directed approach reflects the connection between students' information literacy in accordance with the needs of society and professional activity.

In the process of working with electronic information sources good results were obtained while applying educational computer simulator (training) aimed at acquainting with library's electronic catalogue and practise users' information retrieval skills [2].

Educational simulators have the aim to form certain abilities and skills. That means practical training: a student not only gets some knowledge volume but goes through the processes of realization and receiving knowledge, i.e. new experience organically integrates in common system of personal experience a student has already mastered.

Educational simulators contain only the necessary theoretical minimum that does not contradict practice. The main content of educational simulators is to simulate and reveal those real vital situations in which knowledge and skills are necessary to be used. The simulator trains the knowledge and skills, i.e. simulates the real process.

To simulate means to reproduce or copy someone or something with great accuracy. In practice it means to understand the essence of phenomenon without conducting experience with the real object. Educational simulator supposes training certain special skills and abilities in working with different technical devices and appliances. The effectiveness of educational simulators is the result of:

- getting an opportunity to train by means of doing practical exercises and obtaining experience;
- taking into account individual personal peculiarities;
- absence of negative consequences in introduced errors;
- absence of marks and other 'penalty' means of estimating new knowledge.

The goals of educational simulator in working with e-catalogue are: the development of cognitive level of students' information literacy in the way of widening their informational world outlook of knowledge in the field of applying library' electronic retrieval systems; the formation of students' information competence by means of processing skills of effective information retrieval and abilities of formulating retrieval query correctly.

To achieve the raised goals the following tasks may be implemented by:

- practicing students' skills of information retrieval in library's electronic catalogue;
- promoting students' realization of effective retrieval ways, their systematization and summarizing;
- developing students' abilities in formulating correctly retrieval query.

5 The Development of Computer Simulator «Electronic Catalogue»

While developing educational computer simulator the following software was used:

- Retrieval model of automated informational library system MarcSQL 1.7
- Visual Training
- Paint

- Microsoft Office FrontPage 2003
- Html Help Workshop.

The algorithm of designing the computer simulator “Electronic catalogue”:

1. Tasks’ composition of the stimulator (stepwise). The experience of practical classes in the course “Bases of information literacy” taught in the technical scientific library of Komsomolsk-na-Amure State Technical University determines the main points of working with library’s electronic catalogue to which special students’ attention should be paid. It means the electronic catalogue data base navigation, users’ teaching of informational retrieval ways (common retrieval, widen retrieval, widen retrieval with priority subqueries, retrieval with grading elements, retrieval on the base of home dictionaries), the work with the results of retrieval (the analysis of selected documents appropriate to the retrieval query, the navigation between documents’ description; documents’ selection; storing retrieval results). On the base of the main points of working with e-catalogue the tasks are formulated and recorded stepwise. While formulating the task it is necessary to pay attention to practice skills of using software interface and eliminate the opportunity of user’s doing tasks mechanically. E.g., while applying to the element of software interface for the second time the task may be formulated as follows “Open the retrieval form pressing the appropriate button on the toolbar”.
2. Storing images of stepwise implemented tasks in the software retrieval model MarcSQL 1.7 (library’ electronic catalogue). To store images one may use standard Windows software – Paint.

To each step of the tasks it is necessary to store the image illustrating the implementation of the given task. Thus, from one to seven images are stored for every task according to steps.

3. Creating computer simulator in the software Visual Training.

It is necessary to create new training in the software Visual Training and put prepared images in it and write down the text to the tasks. It should be generated after the tasks for the simulator have been completed. In the result the developer obtains the ready computer simulator consisting of sets of the simulator’s folders and files and the started file index.htm. The simulator is ready for operating in the Internet Explorer browser. It may be placed in the University’s site in the section of working with electronic resources for users to master information retrieval skills in library’s e-catalogue at remote mode and in available environment. The simulator may be compiled for using in the local mode and transferring convenience from one computer to another.

4. To make the developed computer simulator more mobile and convenient for using in the local mode it is necessary to do some modernizations added the title and simulator’s instruction and compelled simulator’s folders and files in one file of chm. format.
 - 4.1 Creating the title list and instructions and linking simulator’s files. In this case we used Microsoft Office FrontPage 2003 software.
 - 4.2 Compiling simulator’s files in chm. format. Files’ is conducted in Html Help Workshop software and allows to convert the simulator’s folders and files in

the single file of chm. format. As the result the developer obtains one file of the computer simulator instead of several folders and files which may be lost (using the local mode) while transferring from one device to another or because of incorrect user's actions. Thus, the compiling of the simulator's files promotes its mobility and simplifies the user's work.

Firstly the title is loaded when the user begins to work with the training computer simulator (Fig. 1).



Fig. 1. The title of the training computer simulator “Electronic catalogue”.

The name, the author, the place and year of the development, the reference to the instruction of working with the simulator and the start button is presented in the title. Before starting students are recommended to get acquainted with the training instruction (Fig. 2). The training purpose, short description of the simulator's modes and functional buttons are shown. To return to the main page of the simulator the user presses the reference “Back”.

When pressing the button “Start training” (Fig. 1) the user begins to do tasks starting with the first stage – the loading of the e-catalogue by clicking twice the left mouse button on the appropriate icon on the computer's desk in the simulator's work area (Fig. 3).

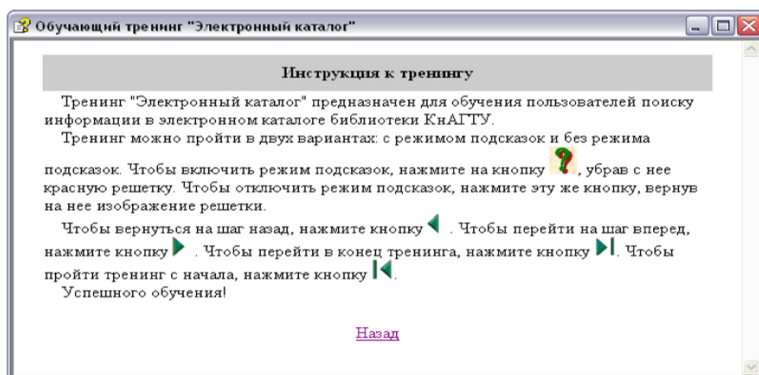


Fig. 2. The instruction for working with the training simulator.

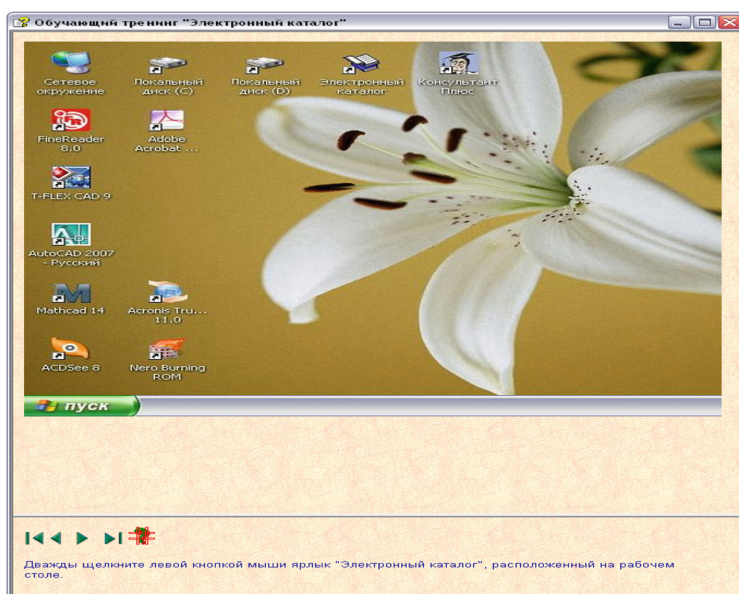


Fig. 3. The work window of the training simulator.

The simulator's work area is located in the upper part of the window. The graphic object illustrating the task is located in it. The user does the task in this window's part. The navigation button and the task text are located in the down part of the window. The user may regulate the size of the window's bottom part by hand if necessary. The user is able to do it by putting the mouse cursor on its edge and moving up or down.

The user may learn to work with e-catalogue by means of training simulator in two modes: in the mode with prompts and in the mode without prompts. Using the mode with prompts is relevant in the individual (without assistance) form of training, and training for the first time as well. To switch on the mode with prompts the user should put away the grid with the functional button showing question mark (as described in the instruction).

All training tasks are based on the development of effective informational retrieval skills. While working with the training simulator the students master such skills as common retrieval, grading document retrieval according to given parameters, widen retrieval, widen retrieval with priority subqueries, dictionary retrieval, list making of found or selected documents. The retrieval technique in the tasks is described stepwise in proper examples:

Task: Make a retrieval of books written by Petrov.

Solution.

Step 1 (Fig. 4). Put "tick (✓)" on the field for retrieval "Authors".

Step 2 (Fig. 5). In the field "Terms" put the author's name – Petrov.

Step 3 (Fig. 6). Press the button "Search".

Result (Fig. 7): the system selected 133 documents.

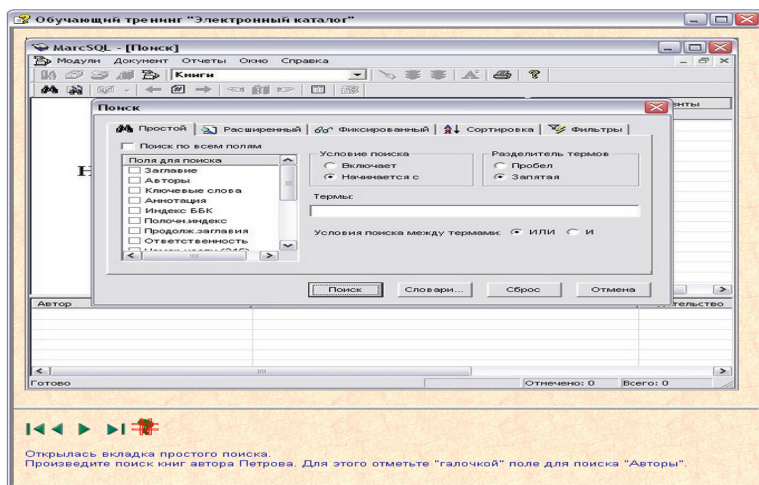


Fig. 4. Doing the tasks of the first step.

While doing the tasks the student has an opportunity to return to the task and do it once again by pressing the button "Back". The button is located on the stimulator's navigation bar. The student may miss the task and do the next by pressing the button "Next".

The training computer simulator contains the necessary theoretical minimum appropriate to practical tasks. The main content of the simulator is directed to open abilities of the retrieval model for automated library's informational system MarcSQL

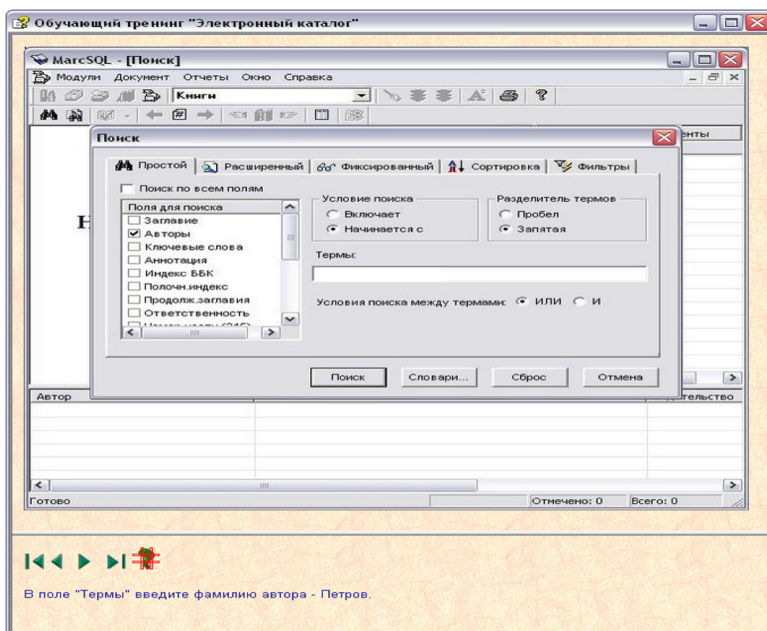


Fig. 5. Doing the tasks of the second step.

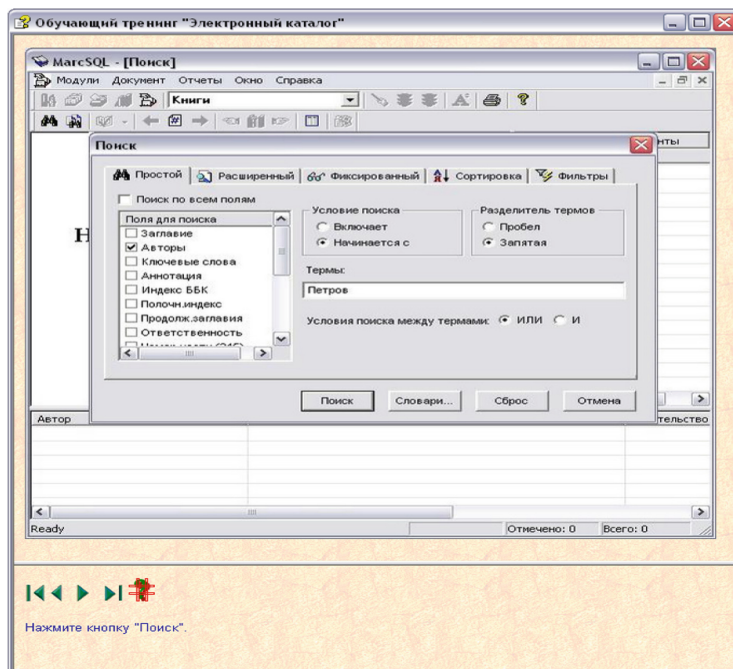


Fig. 6. Doing the tasks of the third step.

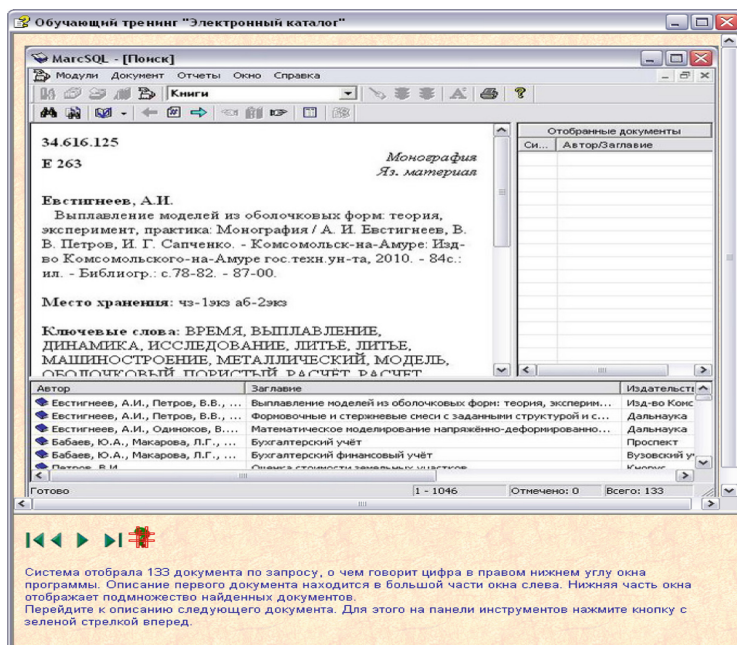


Fig. 7. Obtaining the retrieval results and transferring them to the next step.

1.7 and practice users' retrieval skills by means of simulating the real process of information retrieval in library's electronic catalogue. The effective results of the training simulator are the following:

- a student has an opportunity to train, doing practical actions and obtaining his/her own experience;
- individual peculiarities are taken into account: a student may train at any appropriate rate;
- made mistakes don't involve negative consequences; the mode with prompts allows to pay attention to the correct answer, the mode without prompts allows to think over the correct action and the reason of the mistake made;
- there are no marks and other kinds of assessing new knowledge: in the way of successful training the software sends the appropriate message without any mark.

The training simulator "Electronic catalogue" may be used in educational process of the institution of higher learning both for individual students' work and other people concerned and for conducting practical classes.

Locating web-version of the training simulator on the site allows students and other concerned persons to use the simulator any appropriate time they like and train in appropriate mode and comfortable environment. These conditions allow to raise the quality of training greatly. According to the fact that the local version of the simulator has an important advantage – mobility – it can be used not only in the University library but anywhere, e.g., in classrooms.

6 Conclusion

The training simulator “Electronic catalogue” is successfully introduced in the activity of the technical scientific library of Komsomolsk-na-Amure State Technical University. Nowadays the first-year students have got training in information retrieval with the help of the training simulator during the course “Bases of information literacy”. Teachers and senior students have training during the ten-day period of information support for the educational process. The students highly estimated the working advantages of the simulator, its service ability, its content simplicity and its design.

On the basis of the training simulator “Electronic catalogue” the following conclusion may be drawn: the didactic support of the resource component for educational environment of higher learning institution by training computer simulators in the work with electronic information sources influences positively on the formation of participants’ information competence of the educational process, and as a result on the development of students’ information literacy and professional competence of the further specialist.

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Forecasting the Prime Cost of Milk Production in an Uncertain Environment

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Abstract. In the context of unstable economy, the importance of the quality of information required in the process of business management increases. The possibility of obtaining information that objectively reflects the economic situation of an enterprise is provided by the use of economic and statistical methods. In the article the possibility of the prime cost forecasting of milk production was studied based on the calculation of the complex influence of production factors on this indicator. As a result, a list of factors was determined that had the greatest impact on the effective feature – the prime cost, and statistically significant regression models for its prediction were built. The econometric regression model of the prime cost forecasting of milk taking into account the factor of cyclicity was developed, which allowed obtaining refined estimates of the prospective values of the indicator. The algorithm of construction of additive and multiplicative models of the forecasting of the prime cost taking into account the cyclic component that allowed increasing accuracy of the calculated forecasts was offered.

Keywords: Prime cost · Forecasting · Model · Regression · Correlation · Factors · Cyclicity

1 Introduction

Unsteadiness of the economic situation makes the process of taking managerial decisions more complicated, partly reducing their economic effect and increasing risks [1]. The possibility of receiving information that really features the economic situation of an enterprise is provided by the use of economic-statistical methods of study which allow forecasting its results for the long term based on the identified regularities in development of economic processes at an enterprise [7, 16].

Application of forecasting information has important meaning in cost management for milk production. A forecasting level of the prime cost of milk production serves as the basis for performing functions of planning and control at an enterprise [11]. The purpose of forecasting in this case is in taking into account the influence of the most essential production factors as more as possible which form the cost level for a centner of milk, in relation with their dynamics and development peculiarities [13]. This will allow defining the level of the cost for the nearest perspective quite exactly based on building of an econometric regression model.

2 Data and Methods

The prime cost forecasting of milk production was made through the example of the agricultural enterprise SHPK (APC - agricultural production cooperative) the collective farm "Peredovoy" of Vologda district, the Vologda region. The chosen time period was 17 years (from 1997 till 2013). The prime cost of production of 1 centner of milk was determined as a resultative characteristic (Y). An econometric model was built by means of a pack of the statistical data analysis of spreadsheet Microsoft Excel XP. From 62 variables by means of the step-by-step analysis of interrelations, revealed in the matrix of double correlation ratios, six factors were identified which influenced the resultative characteristic mostly [2, 3]. Three statistically important two-factor models were made introduced by the formulas (1–3).

The constraint equation characterizing the influence of the levels of power available and fodder consumption per the prime cost of 1 center of milk looks as follows:

$$Y = 5775,21 - 5,97 X_1 - 3710,93 X_2 \quad (1)$$

where X_1 - power available per 100 ha of agricultural lands, horse power; X_2 - fodder consumption per 1 centner of milk, centners of fodder units (cfu).

Degree indexes of interdependent influence of the factors in this model (multiple correlation ratios and determination) are relatively equal to: $R = 0,772$; $R^2 = 0,596$. The received model (1) testifies that in the conditions of production intensification the use of power resources increases (X_1) that leads to reduction of labour input and rise in labour productivity, hereby leading to reduction of the prime cost of milk production. The second factor leads to reduction of the resultative characteristic following the increase of gross milk yield because of the growth in fodder consumption per 1 centner of milk (X_2). This model turned out to be statistically significant, the share of referable variation made 59,6%.

The following model shows the influence of the cost levels on energy and fodder consumption on the prime cost of 1 centner of milk:

$$Y = -2850,08 + 1,3073 X_3 + 0,5421 X_4 \quad (2)$$

where X_3 – energy costs per 100 ha of agricultural lands, thousand, kWh; X_4 - fodder consumption per 100 heads, cfu.

The degree indexes of interdependent influence of the factors in this model are relatively equal to: $R = 0,905$; $R^2 = 0,819$. In this model (2) the dependence of prime cost of milk on the level of electrification of agricultural production is shown. The ramp-up of energy consumption (X_3) under its growing tariffs is leading to the increase of the prime cost, as well as the increase of fodder consumption per 100 heads (X_4). The determination ratio indicates that the change of the resultative characteristic by 81,9% is determined by the factors included into the model (3).

The constraint equation characterizing the influence of the levels of payment for labour and energy consumption per the prime cost of 1 centner of milk is as follows:

$$Y = -53,46 + 9,862 X_5 + 0,0004 X_6 \quad (3)$$

where X_5 – a level of payment for labour per 1 man-hour, rubles; X_6 – energy consumption per 100 heads, kW/h.

The degree indexes of interdependent influence of the factors in this model are relatively equal to: $R = 0,992$; $R^2 = 0,984$. The received model (3) points to sufficiently high dependence between the resultative characteristic and the level of payment for labour per 1 man-hour (X_5) and used energy per 100 heads (X_6). Constraint force of predictors included into it with the result is very high, as evidenced by the value of the determination ratio which is equal to 0,984. It can be seen from the equation that the increase of the level of payment for labour of a man-hour per 1 ruble and the quantity of used energy for 100 heads per 1 kW/h causes the growth of prime cost of 1 c. of milk by 9,862 rub. and 0,0004 rub. relatively.

The value of the determination ratios (R^2) for given models points to their high quality. As a result of calculation of values of the mean approximation error, the models (1) and (2) proved to be unsuitable for the forecasting (the percentage value of the error exceeded 7%). The following analysis was carried out in relation to the model (3), which turned out to be suitable for the forecasting.

Based on the method of analytic adjustment, the trend models were identified and projected values for analyzable factor characteristics were calculated.

For the first factor (X_5 – a level of payment for labour per 1 man-hour, rub.) the best model approximating of its dynamics for the analyzed period from 1997 to 2013 proved to be a linear model of the trend shown in the Fig. 1, the quality of which was confirmed by a high index of the determination ratio $R^2 = 0,9691$:

$$X_5(t) = 9,8495 \cdot t - 18,5, \quad (4)$$

where

$X_5(t)$ – theoretic value of the level of payment for labour per 1 man-hour, rub., calculated with the trend equation;

t – time factor.

For the second factor (X_6 – energy used for 100 heads, kW/h) the best model approximating its dynamics proved to be a poly-nominal trend model of the second order shown in the Fig. 2, the quality of which is confirmed by the high index of the determination ratio $R^2 = 0,8362$:

$$X_6(t) = 3476,8 \cdot t^2 - 68186 \cdot t + 463854 \quad (5)$$

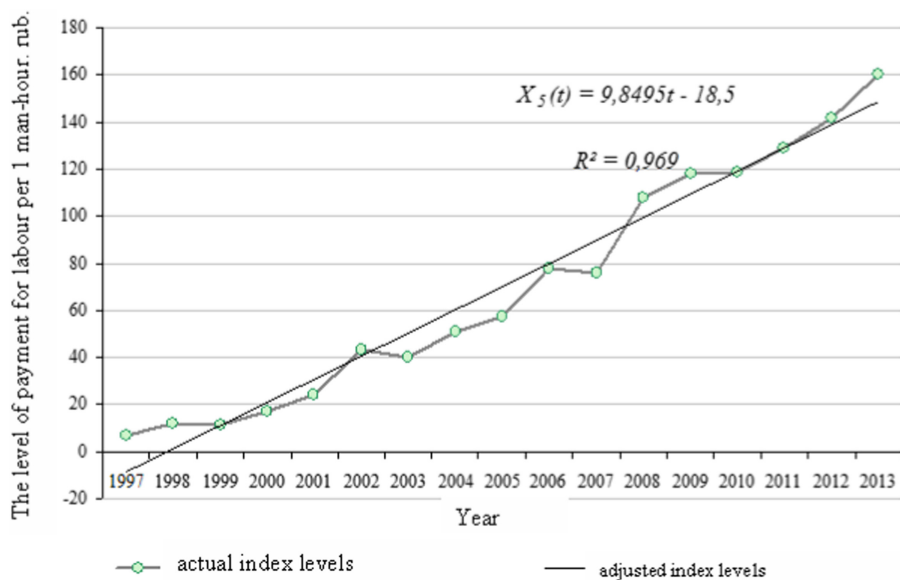


Fig. 1. Actual and trend dynamics of the level of payment for labour per 1 man-hour in SHPK (APC) the collective farm "Peredovoy" from 1997 to 2013.

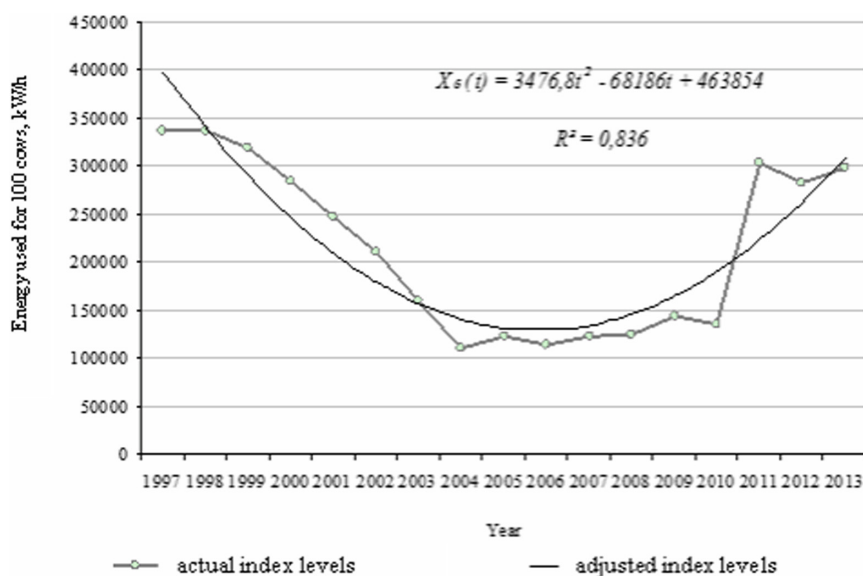


Fig. 2. Actual and trend dynamics of the energy consumption level for 100 heads in SHPK (APC) "Peredovoy" from 1991 to 2013.

where

$X_6(t)$ – theoretical value of the level of energy consumption for 100 heads, kW/h, calculated by the trend equation;
 t – time factor.

A testing of the found trends for adaptability to the forecasting was carried out with the help of the ratio of residual autocorrelation (r_{al}), Durbin-Watson model (D-W) and the mean error of approximation (A) [5, 6]. The results of the calculation are presented in Table 1.

Table 1. The results of the testing of trends for adaptability to the forecasting.

Index	Trend	
	$X_5(t) = 9,8495 \cdot t - 18,5$	$X_6(t) = 3476,8 \cdot t^2 - 68186 \cdot t + 463854$
The ratio of residual autocorrelation (r_{al})	0,415	0,192
Durbin-Watson model (D-W)	1,282	1,824
d_L (tabular)	1,13	1,02
d_U (tabular)	1,38	1,54
The presence of residual autocorrelation	Is absent	Is absent
The mean error of approximation (\bar{A} , %)	2,83	1,57
The adaptability to the forecasting	Suitable	Suitable

The data of Table 1 shows that for both trends the calculated indexes point to the absence of residual autocorrelation, the high quality of the models (the value of the mean error of approximation is no more than 7%) and their adaptability to the forecasting. The results of the calculation of point and interval forecasts of the levels of the factor characteristics according to the found trends are given in Table 2.

Table 2. Point and interval forecasts of the levels of the factor characteristics for 2014.

Index	Factor	
	X_5 - the level of payment for labour per 1 man-hour	X_6 - energy consumption per 100 heads, kW/h
Point forecast	158,791	362987,634
Interval forecast		
Standard error of a forecast	9,167	38603,492
Student statistic (t_{tabl}) for 5% level of significance	2,132	2,145
Lower bound	139,251	280190,865
Upper bound	178,331	445784,403

Therefore, with a probability of 0,95 the growth of the values of the labor payment levels per 1 man-hour and energy consumption for 100 heads in SHPK (APC) “Pere-dovoy” can be expected in 2014 within the limits from 139,3 to 178,3 rubles and from 280190,9 to 445784,4 kW/h relatively.

3 Results and Discussion

Based on the calculated point estimators of the forecast of the factor characteristics (Table 2) and the received constraint model (3) the forecast of the prime cost level of 1 centner of milk was calculated in SHPK (APC) “Pere-dovoy” for the year 2014:

$$Y = -53,46 + 9,862 \cdot 158,191 + 0,0004 \cdot 362987,634 = 1657,73 \text{ rub.}$$

Therefore, in 2014 the prime cost for the production of 1 centner of milk taking into account the dynamics and influence of the factors included into the analysis will make 1657,73 rubles.

The received projected value was compared to the results of the forecast of the prime cost for 1 centner of milk received on the basis of the linear trend of this index, shown in Fig. 3. However, in spite of the fact that the received trend approximates the dynamics of the prime cost well enough ($R^2 = 0,9426$), the testing of this trend shows the presence of a high level of residual autocorrelation ($r_{at} = 0,817$, $D-W = 0,505$) and its unsuitability for a forecasting ($\bar{A} = 24,3\%$).

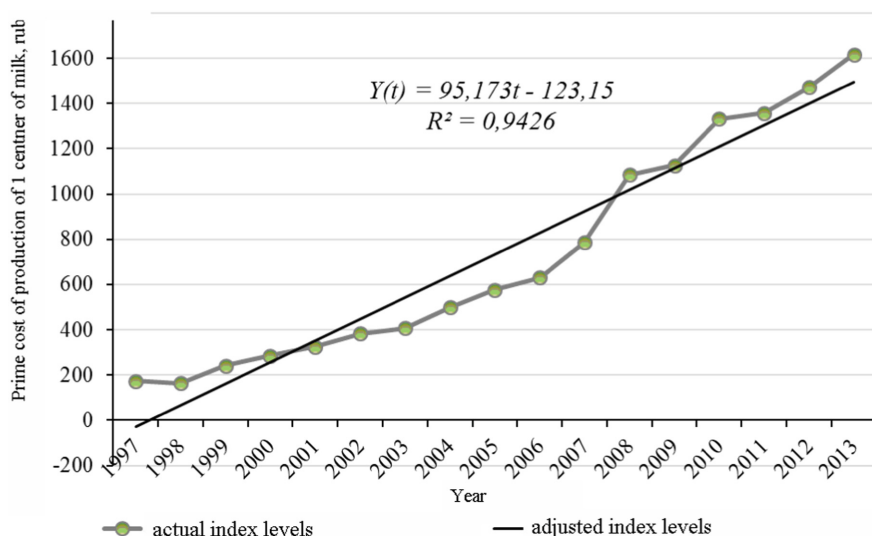


Fig. 3. Actual and trend dynamics of the prime cost of 1 centner of milk in SHPK (APC) “Pere-dovoy” from 1991 to 2013.

The calculated point forecast of the level of the prime cost of 1 centner for 2014 on the given trend equal to 1589,96 rub., significantly differs from the expected level, received according to the constraint model (1657,73 rub.). However the forecast interval according to the trend (from 1328,83 rub. to 1851,10 rub.) includes this value.

Unsuitability which is typical for the development of economic processes including agriculture can have cyclic occurrence by some of them [8]. Taking this fact into account by the forecasting allows receiving the adjusted estimates of potential values of the indexes. Certainty of the estimated values of the given index for the long term depends on the accuracy degree of the projected values of the factors influencing the level of the prime cost for 1 c. of milk. This allows evaluating a possible cost amount for milk production precisely enough in operative planning for the coming period and also specifying the index of common costs of an enterprise in the coming period.

In connection with this in the process of the analysis of the prime cost dynamics of 1 c. of milk in SHPK (APC) “Peredovoy” and the factors the influence of which was described above using the constraint model, a question about detecting cyclicity in the changing of the values of the given indexes for the review period and taking it into account by the developed forecast adjustment came up. Detecting cyclicity in the dynamics is realized based on the calculation of the autocorrelation ratio index of the levels of temporal series of the first, the second and the following orders, building a correlogram based on the results of the made calculations [10].

The autocorrelation ratio of the levels of the temporal series of the first order measuring the dependency between the neighboring levels of series t and $t-1$, that is by the time lag $L = 1$, is calculated according to the formula (6):

$$r_1 = \frac{\sum_{t=2}^n (y_t - \bar{y}_1)(y_{t-1} - \bar{y}_2)}{\sqrt{\sum_{t=2}^n (y_t - \bar{y}_1)^2 * \sum_{t=2}^n (y_{t-1} - \bar{y}_2)^2}}, \quad (6)$$

where $\bar{y}_1 = \frac{\sum_{t=2}^n y_t}{n-1}$; $\bar{y}_2 = \frac{\sum_{t=2}^n y_{t-1}}{n-1}$ - an average value of the levels of initials and with the shift on one lag.

In a similar way the autocorrelation ratio of the second and higher orders can be defined.

Based on the formula (6) the indexes of autocorrelation of the first seven orders were calculated and correlograms were built for the temporal series of the levels of the prime cost of 1 c. of milk, payment for labour per 1 man-hour and energy consumption per 100 heads in SHPK (APC) “Peredovoy”. The results of the calculations are shown in Tables 3, 4 and 5.

The sustainably high values of the autocorrelation ratios and the correlogram presented in Table 3 allow estimating the fact that in the dynamics of the prime cost of 1 c. of milk a linear tendency can be observed because all the ratios essentially differ from zero and are approximately equal and it points to the absence of a cyclical component [9, 15]. Thus, the choice as the best approximative model of the prime cost dynamics of 1 c. of milk of the linear trend (Fig. 3) is reasonable and correct.

Table 3. The autocorrelation ratio of the levels and the correlogram of the temporal series of the prime cost of 1 c. of milk in SHPK (APC) “Peredovoy”.

Lag	Autocorrelation ratio of the levels	Correlogram
1	0,988891771	*****
2	0,980161028	*****
3	0,962664568	*****
4	0,949199197	*****
5	0,936299192	*****
6	0,968209374	*****
7	0,96849478	*****

The similar conclusion can be made concerning a structure of the temporal series of the levels of labour payment per 1 man-hour, based on the data from Table 4.

Table 4. The autocorrelation ratios of the levels and the correlogram of the temporal series of the levels of labour payment per 1 man-hour in SHPK (APC) “Peredovoy”.

Lag	Autocorrelation ratios of the levels	Correlogram
1	0,983170205	*****
2	0,977924229	*****
3	0,968244753	*****
4	0,970200472	*****
5	0,958712572	*****
6	0,971511904	*****
7	0,963437702	*****

The structure of the temporal series of energy consumption for 100 heads according to the data of Table 5 has the following peculiarities which should be taken into account by the adjustment of the projected values of the indexes:

- (1) the presence of a tendency, that is a trend component (because the first autocorrelation ratio is significant and essentially differs from zero);
- (2) the presence of cyclical fluctuations in the level of energy consumption with the 6 – years periodicity, because beginning with the lag $L = 6$ the significance of the value of the autocorrelation ratio increases.

Table 5. The autocorrelation ratios of the levels and the correlogram of the temporal series of energy consumption for 100 heads in SHPK (APC) “Peredovoy”.

Lag	Autocorrelation ratios of the levels	Correlogram
1	0,831661329	*****
2	0,616211108	*****
3	0,201203356	**
4	−0,102442353	*
5	−0,436226666	****
6	−0,66840502	*****
7	−0,85465036	*****

4 Conclusion

In consequence of the carried out analysis of the temporal series structure of the indexes the presence of the trend component in all three series and the presence of the cyclical component of one of the factor characteristics were revealed (X_6). Highlighting the cyclical component in the series of the dynamics of energy consumption, taking it into account by receiving the projected value of the given index for 2014 will allow specifying a long-term evaluation of the prime cost level of 1 c. of milk according to the constraint model (3) for this period.

The general view of the additive model including together with the trend component (T) the cyclical (S) and accidental ones (E) looks as follows [4]:

$$Y = T + S + E. \quad (7)$$

This model suggests that each level of the temporal series Y can be presented as the sum of these components. The general view of a multiplicative model is formulated as follows:

$$Y = T \cdot S \cdot E. \quad (8)$$

The choice of one out of the two models is carried out based on the analysis of a structure of seasonal fluctuations:

- (1) if the fluctuation amplitude is approximately constant the additive model of the temporal series is built, in which the values of the cyclical component are supposed to be constant for different cycles;
- (2) if the seasonal fluctuation amplitude increases or decreases, the multiplicative model of the temporal series is built, which puts the levels of the series in dependence from the values of the cyclical component. [12]

The building of the additive and multiplicative models results in the calculation of the values T, S and E for each level of the series. The algorithm of a model building is realized through six stages (Fig. 4).

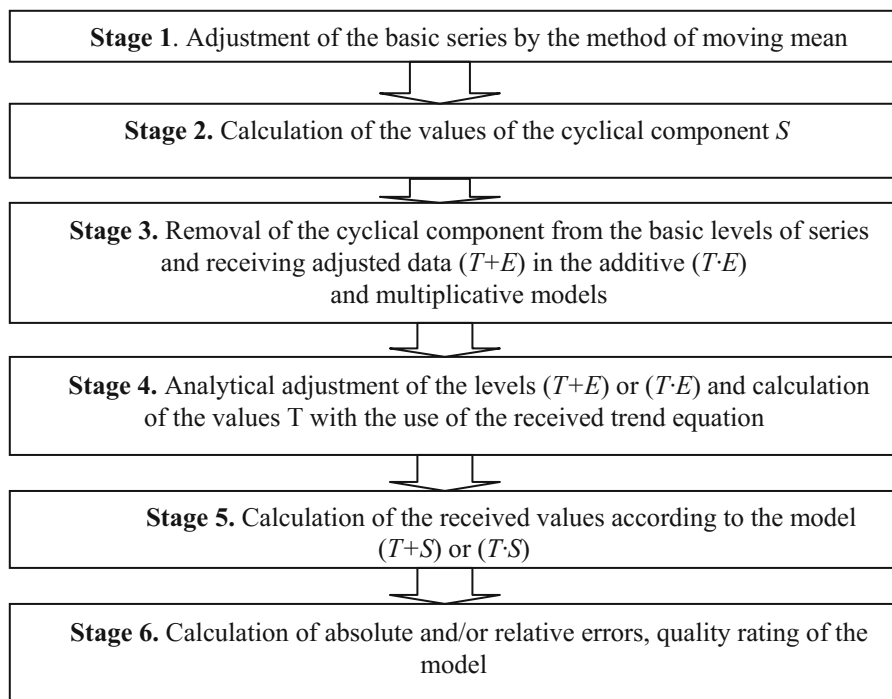


Fig. 4. The algorithm of building of the additive and multiplicative models taking into account the cyclical component [4, 14].

The implementation of this algorithm allowed receiving the additive model (7) for the temporal series of the energy consumption for 100 heads. The results of the calculations in accordance with the stages of the algorithm are shown in Tables 6, 7 and 8.

Stage 1. Adjustment of the basic series by the method of moving mean

- (1) the sums calculation of the series levels successively for each 6 years with the shift in one year and finding of conditional moving mean levels of the index, division of each sum on 6 (row 3 in Table 6); the received mean values in the result of such an adjustment won't have 6-years cyclical component;
- (2) coordinating the received mean values with the actual time periods by their centering: the calculation of the mean value from each two successive moving means, receiving the centered moving means (row 4);
- (3) the calculation of the estimators of the cyclical component values as the difference between the actual levels Y and the centered moving means (row 5).

Table 6. The calculation of the estimators of the cyclical component in the additive model of the temporal series of energy consumption for 100 heads in SHPK (APC) “Peredovoy” using the method of the moving mean, kW/h.

Years	Energy used for 100 heads	Total for 6 years	Moving mean for 6 years	Centered moving mean for 6 years	Estimator of the cyclical component
1	2	3	4	5	6
1997	338333,3	—	—	—	—
1998	337606,8	—	—	—	—
1999	319256,8	1739780,3	289963,38	—	—
2000	285416,7	1560577,4	260096,23	275029,80	10386,86
2001	248333,3	1333770,4	222295,06	241195,64	7137,69
2002	210833,3	1137072,4	189512,07	205903,56	4929,77
2003	159130,4	965644,6	160940,77	175226,42	−16095,98
2004	110799,8	840040,8	140006,79	150473,78	−39673,95
2005	122558,8	753994,7	125665,78	132836,29	−10277,45
2006	113988,8	738903,2	123150,54	124408,16	−10419,33
2007	122729,5	764118,5	127353,08	125251,81	−2522,31
2008	124787,3	946226,3	157704,39	142528,74	−17741,49
2009	144039,0	1114737,5	185789,58	171746,99	−27707,99
2010	136015,1	1290258,0	215043,00	200416,29	−64401,21
2011	304666,7	—	—	—	—
2012	282500,0	—	—	—	—
2013	298250,0	—	—	—	—

Stage 2. The calculation of the values of the cyclical component S:

Using the received estimators of the cyclical component S, the average values of the cyclical component were found for each year in each 6-years period (Table 7).

In the models with the cyclical component usually is supposed that seasonal influences for the period (lag) are mutually compensated. In this additive model it is expressed in that the sum of the values of the cyclical component according to years in 6-years period must be equal to zero:

$$\sum \bar{S}_i = 0. \quad (9)$$

According to the Table 7 for the given model:

$$\begin{aligned} \sum \bar{S}_i &= -21902,0 + (-52037,6) + (10277,5) + (-16,2) + 2307,7 + (6405,9) \\ &= -88331,4 \neq 0. \end{aligned}$$

Table 7. The calculation of the values of the cyclical component in the additive model of the temporal series of energy consumption for 100 heads in SHPK (APC) “Peredovoy”.

6-years period	The number of a year, <i>i</i>					
	1	2	3	4	5	6
1	–	–	–	10386,9	7137,7	4929,8
2	–16096,0	–39674,0	–10277,5	–10419,3	–2522,3	–17741,5
3	–27708,0	–64401,2	–	–	–	–
Total for <i>i</i> year (for all 6-years periods)	–43804,0	–104075,2	–10277,5	–32,5	4615,4	–12811,7
Average estimator of the cyclical component for <i>i</i> year, <i>Scp i</i>	–21902,0	–52037,6	–10277,5	–16,2	2307,7	–6405,9
Adjusting ratio ($k = \sum Scp\ i/6$)	–14721,9					
Adjusted seasonal component, $S_i = Scp\ i - k$	–7180,1	–37315,7	4444,5	14705,7	17029,6	8316,0

Hence, an adjusting ratio is identified:

$$k = \frac{\sum \bar{S}_i}{6} = \frac{-88331,4}{6} = -14721,9.$$

The calculation of adjusted values of the cyclical component was carried out as the difference between its average estimator and the adjusting ratio *k*:

$$S_i = \bar{S}_i - k. \quad (10)$$

According to the received results in the Table 8, feasibility was checked (9):

$$\sum \bar{S}_i = -7180,1 + (-37315,7) + 4444,5 + 14705,7 + 17029,6 + 8316,0 = 0$$

Therefore, the following values of the cyclical component were received for each year in 6-years period: 1 year: $S_1 = -7180,1$; 2 year: $S_2 = -37315,7$; 3 year: $S_3 = 4444,5$; 4 year: $S_4 = 14705,7$; 5 year: $S_5 = 17029,6$; 6 year: $S_6 = 8316,0$.

Stage 3. Removal of the cyclical component from the basic levels of series and receiving adjusted data ($T + E$) in the additive ($T \cdot E$) model.

For carrying out the calculations Table 8 was made, in which the basic actual levels of energy consumption (*Y*) and also the values of the cyclical component (*S*) with frequency in each 6-years period were included.

*Stage 4. Analytical adjustment of the levels ($T + E$) or ($T \cdot E$) and calculation of the values *T* with the use of the received trend equation ($T + E$) (Fig. 5 and Table 8).*

Stage 5. The calculation of the received values according to the model ($T + S$) in Table 8.

Table 8. The calculation of the adjusted values T and accidental errors E in the additive model of the temporal series of energy consumption for 100 heads SHPK (APC) “Peredovoy”, kW/h.

Years	Energy consumption for 100 heads	S	$T + E = Y - S$	T (trend component)	$T + S$	$E = Y - (T + S)$	E^2
1997	338333,3	-7180,1	345513,4	406569,5	399389,4	-61056,1	3727845517,4
1998	337606,8	-37315,7	374922,5	347690,0	310374,3	27232,5	741609888,1
1999	319256,8	4444,5	314812,3	295815,5	300260,0	18996,8	360878665,0
2000	285416,7	14705,7	270711,0	250946,0	265651,7	19765,0	390655003,9
2001	248333,3	17029,6	231303,7	213081,5	230111,1	18222,2	332050058,2
2002	210833,3	8316,0	202517,3	182222,0	190538,0	20295,3	411898751,8
2003	159130,4	-7180,1	166310,5	158367,5	151187,4	7943,0	63091510,1
2004	110799,8	-37315,7	148115,5	141518,0	104202,3	6597,5	43527055,8
2005	122558,8	4444,5	118114,4	131673,5	136118,0	-13559,1	183849646,2
2006	113988,8	14705,7	99283,2	128834,0	143539,7	-29550,8	873252081,3
2007	122729,5	17029,6	105699,9	132999,5	150029,1	-27299,6	745267754,9
2008	124787,3	8316,0	116471,2	144170,0	152486,0	-27698,8	767223212,7
2009	144039,0	-7180,1	151219,1	162345,5	155165,4	-11126,4	123797185,3
2010	136015,1	-37315,7	173330,8	187526,0	150210,3	-14195,2	201504810,3
2011	304666,7	4444,5	300222,2	219711,5	224156,0	80510,7	6481975489,8
2012	282500,0	14705,7	267794,3	258902,0	273607,7	8892,3	79073492,6
2013	298250,0	17029,6	281220,4	305097,5	322127,1	-23877,1	570115550,0

The figure allows judging the fact that the values of the sums of the trend and cyclical components are close enough to the actual levels of energy consumption (Y), herewith, the dynamics line ($T + S$) practically repeats the dynamics of the analyzable index. The value of accidental errors (E) between these diagrams is inconspicuous and it can be estimated quantitatively.

A graphics rendition of the received values ($T + S$) is presented in Fig. 6.

Stage 6. The calculation of absolute errors (E) is presented in Table 8. The quality of the model is evaluated by its dispersion analysis and the calculation of total, directed and residual dispersions of the values of energy consumption and also the determination ratio (R^2):

$$D_{ost} = \frac{\sum E^2}{n} = \frac{570115550,0}{17} = 946918569,0$$

$$D_{obh} = \frac{\sum (y_i - \bar{y})^2}{n} = \frac{127379837162,7}{17} = 7492931597,8$$

$$D_{napr} = D_{obh} - D_{ost} = 7492931597,8 - 946918569,0 = 6546013028,8$$

$$R^2 = \frac{D_{napr}}{D_{obh}} = \frac{6546013028,8}{7492931597,8} = 0,874 \text{ or } 87,4\%$$

The received value of the determination ratio shows that the trend and cyclical components in this additive model explain 87,4% of the level dynamics of energy consumption for 100 heads. The quality of this model is higher than the poly-nominal

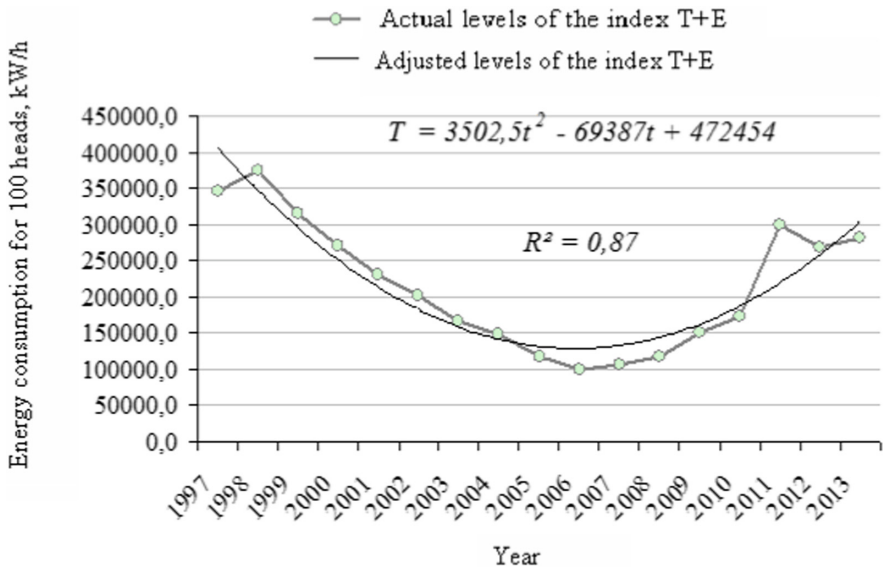


Fig. 5. A modeling of the trend component (T) in the dynamics of energy consumption for 100 heads in SHPK (APC) “Peredovoy”, from 1997 to 2013.

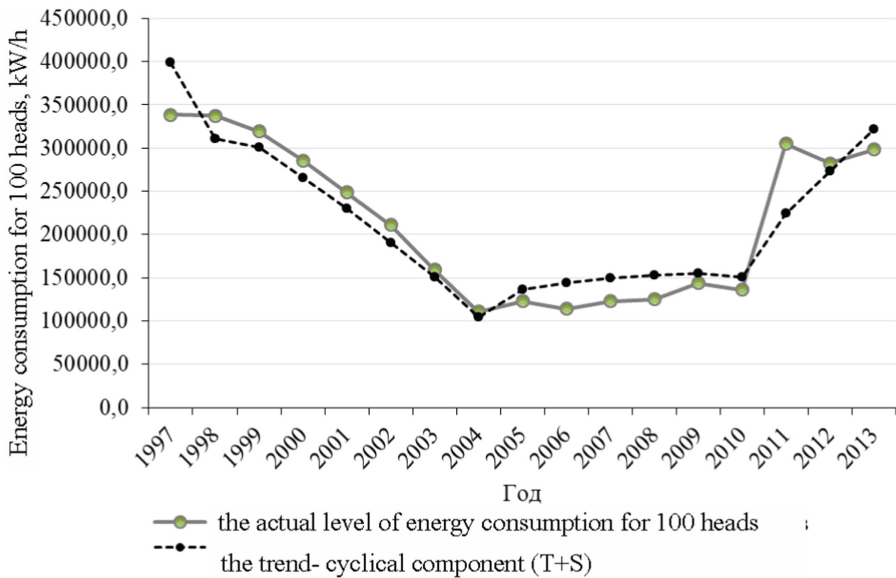


Fig. 6. Actual (Y) and trend-cyclical (T + S) dynamics of energy consumption for 100 heads in SHPK (APC) “Peredovoy”, from 1997 to 2013.

model (4) of the second order, for which $R^2 = 0,8362$ or 83,6%, therefore the forecast of the level of energy consumption for 2014 can be calculated more accurate:

$$X_6(T + S) = T_{(t=18)} + S_6 = 35898,0 + 8316,0 = 366614,0 \text{ kW/h}$$

Taking into account the cyclicity emerging in the dynamics of the energy consumption for 100 heads every 6 years, it can be expected that the level of this index in 2014 in SHPK (APC) “Peredovoy” will make 366614,0 kW/h that is higher according to the poly-nominal model of the level which is equal to 362987,6 kW/h. Putting the received more accurate projected value of the factor X_6 in the constraint Eq. (4) the adjusted perspective value of the prime cost level of 1 c. of milk in SHPK (APC) “Peredovoy” for 2014 was received:

$$Y = -53,46 + 9,862 \cdot 158,191 + 0,0004 \cdot 366614,0 = 1659,18 \text{ rub.}$$

Therefore, in 2014 because of the sustainable growth of payment for labour of 1 man-hour and 6-years period cyclicity characterized by the growth at the end of each 6-years period, in the dynamics of the level of the energy consumption for 100 heads, the production prime cost per 1 c. of milk in SHPK (APC) “Peredovoy” will make 1659,18 rubles.

If the cyclicity appears in the dynamics of all factors included into the constraint model then the record of these peculiarities of the structure of the terminal series explaining variables will allow increasing the level of accuracy of calculated forecasts.

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State Policy of Decreasing the Effectiveness of Western Sanctions

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Abstract. The article considers the anti-Russian sanctions introduced by the US by a number of Western states. In 2014, after the reunification of the Crimea with Russia, and in connection with the assistance of our country to compatriots in the southeast of Ukraine a number of Western states have introduced quite severe economic and political measures (sanctions) in order to force her to change the chosen policy. The initiators of the introduction of anti-Russian sanctions were the United States and the leading states of the European Union. Among the “sanctioners” were also Australia, Canada, Norway, Switzerland, Japan and other states. In their view, the reunification of Russia and the Crimean Republic, formerly part of Ukraine, was illegal, as it violated the universally recognized borders and territorial integrity of a sovereign state, a member of the UN Security Council.

The authors not only describe in sufficient detail the phased introduction of anti-Russian sanctions, but also make a well-founded conclusion that the state policy of counteraction to Western sanctions, conducted in 2014–2016, gave its positive results both in political and economic spheres, in particular, accelerated the implementation of programs to overcome import dependence in a number of areas of the economy, including in industry and agro-industrial complex of our country. It is summarized that, despite numerous difficulties, the state policy of counteracting Western sanctions played a positive role in Russia’s socio-political and economic development.

Keywords: Anti-Russian sanctions · State policy ·
Counteraction to Western sanctions

1 Introduction

The US, in order to achieve far-reaching political goals aimed at weakening Russia, called on the Allies to completely isolate it. The theme of the need to apply sanctions against Russia was its participation in the events that unfolded on the territory of the neighboring state - Ukraine.

By the end of 2013, a civil revolution had begun in Ukraine, which led to a coup d'état. Since the conflict of political and other interests was accompanied by acts of violence in different parts of the country, separatism in the southeast of the country sharply increased in Ukraine. On March 17, the leadership of the Republic of Crimea asked Russia to join as a subject. The Russian Federation recognized the referendum in the Crimea and granted a request for the annexation of the peninsula to Russia, since Crimea has an important strategic importance for the Russian Federation in the Black Sea region.

The international community, in the person of states with developed market economies, primarily the United States, did not recognize the referendum in the Crimea and found the Crimea's joining Russia, despite the will of the population of Crimea itself, an act of military aggression towards Ukraine's territorial integrity. Separate trends covered the east of Ukraine - the Donbass region. On the basis of the Luhansk and Donetsk regions of Ukraine on May 11, 2014, the Luhansk People's Republic and the Donetsk People's Republic were proclaimed through a referendum. In Ukraine, a war broke out on the one hand for preserving the territorial integrity of the unitary Ukrainian state, on the other hand, for the formation of a new [con] federal state formation, Novorossiia, on the basis of the south-eastern regions of Ukraine. Despite the fact that the Russian Federation has not officially recognized LDP and the DNR until today, it did not introduce its peacekeeping troops into the territory of Ukraine, nevertheless, the blame for the events and the escalation of the conflict and violence in southeast of Ukraine are western countries, including Australia and Japan, try to entrust exclusively to Russia. Although the Western countries themselves provide financial, humanitarian, technical and other assistance to the Ukrainian authorities in the current civil war, which automatically makes them involved, that is, equally responsible. Mutual participation of the parties in the Ukrainian conflict indicates the nature of the geopolitical confrontation. Therefore, the first reason is geopolitics.

Initially, anti-Russian sanctions had a pronounced economic pressure: financial and other assets were frozen, companies were forbidden any economic cooperation with our country.

Simultaneously with attempts to force Russia to give up actions in Ukraine, the pressure was exerted on the environment of the Russian president through the introduction of visa restrictions for persons included in special lists. So, under President Barack Obama's decision, sanctions were imposed against a number of Russian officials in the form of refusal to issue entry visas, as well as by freezing their bank accounts, seizing property allegedly located in the United States. Under the sanctions, one of the first to fall: VI Matvienko, S. Yu. Glazyev, DO Rogozin, V. Yu. Surkov and other official persons. Restrictive measures were also taken against a number of companies and banks, for example against Bank Rossiya, which allegedly is a "personal bank of high-level officials of the Russian Federation." At the same time, they tried to harm major Russian businessmen who were somehow related to President Vladimir Putin, and in a number of countries such Russian citizens as the brothers A.R. and B.R. Rotenberg, Yu. V. Kovalchuk, G. N. Timchenko, who became dollar billionaires with the support of the first person of the state, believed that this would affect Vladimir Putin and his decision.

When these restrictive measures did not bring the desired results to the initiators of anti-Russian sanctions, the United States and its allies began to exert pressure on our state by political methods. Thus, the above facts indicate that the introduction of anti-Russian sanctions was carried out with a constant increase, beginning with the restriction of officials of the Russian Federation and individual companies and ending with sanctions against key sectors of the Russian economy. At the same time, political pressure on our state was intensified with the aim of forcing it to give up assistance to the Donbas and return the Crimea to Ukraine.

A number of Western countries, acting in the wake of the United States anti-Russian policy, began to impose economic and political restrictions on cooperation with Russia. So, Japan, supporting the US sanctions, in March 2014 ceased negotiations on the liberalization of the visa regime for Russian citizens, and then canceled and stopped issuing visas to 23 employees of state structures of Russia. At the same time, in order to please Uncle Sam, Japan stopped consultations on the issue of disputed islands, suspended negotiations on signing investment treaties.

The World Bank, based on the above facts, issued a negative outlook for the development of the Russian economy in the face of Western sanctions. According to the forecast, Russian enterprises, faced with restrictions in terms of access to international capital markets, will have to reduce their investment activity, and Russian banks, exempt due to favorable borrowing abroad, will worsen their credit policy, as a result of which “in the Russian economy will be a long recession” [1].

Thus, the money resources aimed at maintaining the liquidity of the banking system and the real sector of the economy contributed to overcoming the negative impact of Western sanctions.

Seeing that the imposed restrictions practically do not affect Russia, the European Union on May 12, 2014 expanded the list of persons against whom sanctions were imposed for 13 people, and imposed sanctions against the companies “Chernomorneftegaz” and “Theodosia.”

Canada, acting in sync with the United States, extended sanctions to sixteen Russian banks and companies, and in July 2014 this state expanded its sanctions list to include another 190 large Russian companies. Thus, Canada almost completely duplicated the US sanctions list.

Similar measures of economic impact on Russia were taken by the European Union. On July 30, the European Union imposed sanctions against the Russian National Commercial Bank, Almaz-Antey Concern and Dobrolet Air Company, a subsidiary of Aeroflot. EU countries closed access to Russian banks and key companies for the lending market, where our businessmen could earlier take on their shares cheap foreign currency loans, which were much more profitable than domestic borrowing. At the same time, the European Union has banned investments in the Russian economy, including in the energy sector, oil, gas and other raw materials. It is forbidden to supply equipment for these sectors. This was a serious blow to the commodity economy.

On August 6, 2014, the US administration set out to strike at the most vulnerable place in the Russian raw materials economy - in its oil and gas sector, which brings the main revenue to the state budget. It banned the supply of equipment to Russia for oil

production, as well as drilling rigs and platforms, high-pressure pumps, marine equipment for work in the Arctic. In addition, the United States introduced a mandatory verification that Russia could not acquire unique equipment through third countries.

Bulgaria, a former USSR ally in the Warsaw Pact, a member of the Council for Mutual Economic Assistance, through which it received financial and other assistance from the Soviet Union, joined the EU sanctions imposed on Russia on April 11, 2014. On June 8, 2014, Bulgaria suspended work on the South Stream gas pipeline project, which was built to supply Russian gas to Europe bypassing Ukraine. It was one of the most painful blows for our country.

However, it was not possible to completely break the raw export of Russia to Europe because of the economic interest of European states in Russian oil: Russia accounts for 46.38% of the European structure of oil consumption. Russia sells 67.5% of its export oil to Europe, and the United States only 6% [2, p. 158].

It should be recognized that as a result of the imposed economic sanctions of the West, the banking, defense and energy sectors of the Russian economy suffered to varying degrees. Although the media were pretending in every possible way that they did not achieve their effect. This is not true. Suffice it to say that Russian banks, having lost access to cheap Western loans (where they took financial means and instruments at very low interest rates - from 2 to 5% per annum, and borrowers in the homeland gave them already with a large margin - at 15–20% per annum) lost profits in the hundreds of billions of dollars.

The US Treasury Secretary, by the law of 2.08.2017, received the right to impose sanctions on Russian state-owned companies operating in the railway, metallurgical and mining sectors. In the original version, shipping was also indicated, which threatened to trouble the state operator of the tanker fleet Sovcomflot.

The document also implies tougher sectoral sanctions against Russian oil and gas companies. In particular, the term of lending to Rosneft, Gazprom Neft, NOVATEK and Transneft is proposed to be cut from 90 to 60 days. In the original version it was suggested to shorten this period to 30 days. Another change concerns the restrictions on the transfer of American technologies for the exploration and production of Russian oil in the deep water, on the Arctic shelf and in shale formations. Earlier, American companies were prohibited from supplying goods, services or technologies for such projects, if they are led by Gazprom Neft, Gazprom, Surgutneftegaz, Rosneft or LUKOIL, projects in which one of the five of these Russian companies owns a share of 33%. The ban will only concern “new” oil projects in the deep water, the Arctic shelf and in the shale formations. They see the desire of the senior partner to squeeze Russian natural gas from Europe and replace it with American liquefied gas. The law allows the US president to impose sanctions related to the exchange of energy between Russia and Europe and financial institutions. The law also may be applied to new pipelines in the construction phase, as well as to maintenance of the existing pipelines (including those passing through the territory of Ukraine). However, if Gazprom does not complete the construction of new pipelines by 2019, gas supplies from Russia to Europe will depend on the results of negotiations with Ukraine on transit. At the same time, there is the possibility of a temporary cessation of gas supplies. The “Nord Stream-2” gas pipeline depends on the degree of firmness of the West European partners, and they need it.

It should be recalled that both the first oil pipeline and the Druzhba gas pipeline met strong resistance from the United States, it made every effort to prevent them from being built. But Europe insisted, because they needed it [3].

A tangible blow to Western economic sanctions could inflict on Russia's financial sector. International payment systems Visa and MasterCard in 2014, at the request of the Ministry of Finance, temporarily stopped servicing the cards issued by Russian banks. This prompted Russia to create its own system for servicing bank cards and on March 27, 2014, President V.V. Putin instructed relevant structures this work [4]. In late October 2016, Sberbank started issuing cards of the national payment system "MIR". This is quite a welcome event, as many banks in Russia have long been offering similar cards to their customers. The payment system "Mir" will become mandatory for state employees, who make up almost half of all workers in Russia. From July 1, 2018, all employees of the budgetary sphere (civil servants, state employees, beneficiaries of social payments) will be transferred to the Mir card. And pensioners already having cards of other payment systems will be able to change them to "Mir" cards after the expiration of their validity, but not later than July 1, 2020.

It should be emphasized that, in connection with the sanctions imposed, the flow of foreign investment in Russia is gradually decreasing. If before the introduction of sanctions in the Russian economy, only 40.14 billion dollars were invested in the first quarter of 2013, then in 2014 there was a sharp decline and the volume of direct investments amounted to only \$ 20.958 billion, which is 30.3% compared with the previous year. Foreign businessmen who want to invest in the economy of the Russian Federation realize that investments are not only related to high levels of corruption, bureaucratic obstacles, but also to increased economic and political risks due to imposed sanctions [5]. In 2015, the production of Opel cars was closed, in the IT sector closed offices of Google, Skype, Adobe Systems, significantly reduced its presence Raiffesen Bank [6]. In 2015, foreign investment in Russia fell to 6.853 billion US dollars [6]. The dynamics of foreign investment reflects the increased risks faced by investors conducting business in the territory of the Russian Federation. Foreign investors, even if they do not agree with the policy of sanctions against our country, will not go to confrontation with their authorities. Therefore, Russia has to rely more on its own resources.

It should be noted that because of economic backwardness, Russia is extremely dependent not only on foreign investment, but also on imported technologies and goods. At present, the share of imports in various sectors of the economy is extremely high. According to the Ministry of Industry and Trade of the Russian Federation, its own production in such important sectors as heavy engineering, machine-tool construction, radio-electronic industry is only 20–30% of the demand, and the share of imports exceeds the permissible limits to ensure national and economic security of the country. The lack of financial and material resources, political instability, and crisis phenomena in the economy did not facilitate the implementation of the state policy of import substitution.

The course towards Russia's international isolation, limiting its access to world financial markets, modern technologies can increase the already substantial technological gap in Russia from Western countries.

2 Problem Statement

When investigating the problems of anti-Russian sanctions, the authors mainly focused on analyzing their impact on the economy of the Russian Federation. The greatest interest of researchers was caused by such problem, as mutual losses from the imposed sanctions both from Russia, and from those who introduced or supported them. France, implementing the decisions of the European Union, thwarted the supply of two paid helicopter carriers “Mistral” to Russia, despite financial losses and penalties. In the Western press, it was suggested that the dissolution of a military contract beneficial to France was caused by fears that Russia could use its “Mistrals” in the Crimea or elsewhere in the alleged conflict with Ukraine.

Of course, the Russian leadership could not leave the political and economic sanctions of the West without an adequate response. One of these answers was the Decree of the Head of State of August 6, 2014 No. 560 “On the application of certain special economic measures to ensure the security of the Russian Federation, a ban was imposed on agricultural imports from countries that imposed sanctions on Russia” [7] (USA, the country EU, Canada and Japan).

The second decree was signed by the president in November 2015, which established a ban on the import of vegetables, fruits and other food to Russia from Turkey, Ukraine and other countries-sanctioners. Import of meat, fish, some confectionery products, chocolate, baby food, as well as cigarettes with a filter, beer and vodka was banned. This was a fairly effective response: in 2015 the Ministry of Economic Development of Ukraine estimated the losses from the trade war with Russia at \$ 98 billion.

Russian countermeasures have caused some concern among economically vulnerable countries, in particular, Turkey, Poland and Italy. Due to the closure of the Russian agricultural market in these countries, the number of jobs is decreasing, which negatively affects the performance of their agricultural sector. The European Union has already announced the estimated losses of its farmers in the amount of 400 million euros, which they suffered from the sanction war.

The Russian government, together with key oil companies, has taken preventive measures to reorient its energy resources to the markets of China, India and Japan. As a result, it was possible to conclude a number of trade agreements that increase the stability of oil exports. Only in China, 16.85% of the share of Russian oil was brought to almost 17%. In autumn of 2016, the Rosneft oil company agreed on the supply of crude oil to India for 10 years ahead. The preliminary contract with the Indian company provides for the supply of 10 million tons of oil.

Counter-sentences imposed by Russia on a number of EU countries have had a negative impact on their economies. So, according to the calculations of the agency “Reuters”, Germany, Russia’s largest trading partner, suffered serious losses due to sanctions. According to the calculations of the head of the Russian branch of the Chamber of Industry and Commerce of Germany Tobias Braumann, German exports to Russia in 2014 fell by almost 20%, with the largest losses suffered by machine-building companies. Note that before the introduction of sanctions, Germany sold goods to Russia worth 36 billion euros, and then this commodity turnover has significantly decreased through the fault of the European Union.

The European Union was forced to create a special group to reduce losses from Russia's foreign trade restrictions. According to expert estimates, Russia's economic losses from EU sanctions will amount to approximately 100 billion euros in two years. The EU countries will suffer from the restriction of Russia's access to the financial market, as well as from the ban on the supply of arms, dual-use goods and technologies [8].

On August 2, 2017, US President Donald Trump signed a new law on sanctions against the Russian economy and financial system. It is obvious that the next sanctions initiated by Washington are aimed at weakening the Russian economy, its financial stability and the decline of international authority. The American law on tightening anti-Russian sanctions, first of all, as analysts say, increases uncertainty for European participants in the gas market [9].

From the introduction of economic sanctions, the leading companies of Russia, primarily the oil and gas sector of the economy, suffered notable losses. Rosneft asked the government for financial assistance because of sanctions in the amount of 1.9 trillion rubles. The money was needed to maintain the liquidity of the technologies that it needs to extract oil from the Arctic shelf [10]. The oil company LUKOIL, due to sanctions, was forced to reduce its investment program.

The US law under number H.R. 3364 obliges the Ministry of Justice, the Office of the Director of National Intelligence, the Ministry of Internal Security to work to "identify the most significant high-ranking politicians and oligarchs, determined by their proximity to the Russian regime and the size of their fortune" as well as the identification of "the sources of income of these individuals and their families (including marrieds, children, parents and siblings), their assets, investments and business interests." Art. 252 of the law on sanctions says that the United States will work "with individual countries in Europe and Eurasia" in order to "guarantee the non-use of their financial systems to conceal the illegal financial activities of the members of the government of the Russian Federation that profit from corruption" [11].

In the Kremlin, the bill was rated "extremely negative." After its approval in the Congress, Moscow ordered the reduction of personnel of American diplomatic missions in Russia. President V.V. Putin suspended an agreement with the US on the disposal of plutonium because of their unfriendly actions.

New package of US sanctions is causing growing concern in European business. In particular, German entrepreneurs are afraid of fines because of their projects in Russia and call on European politicians and diplomats not to allow further tightening of the sanctions regime. From the introduction of sanctions against Russia, the EU economy loses \$ 3.2 billion a month. The Russian economy lost \$ 55 billion due to sanctions in 2014. According to the calculations of the Institute of Strategic Analysis FBK, each year the continuation of sanctions costs the Russian economy of about 900 billion rubles [12].

Today, Europe, being convinced of the unprofitable continuation of economic sanctions against Russia, is trying to find its own ways of developing relations, without US dictates. At the EU summit on March 19, 2017, a political statement was adopted that the effect of economic sanctions against the Russian Federation should be tied to the full implementation of the Minsk accords. Some countries do not support the sanctions policy towards Russia. On May 3, 2017, in an exclusive TASS interview,

Czech President Miloš Zeman announced that Western sanctions against Russia should be abolished, as they increased tensions and did not lead to a detente. “Sanctions are not only ineffective, but, on the contrary, counterproductive, they increase tensions rather than promote détente.” Austrian Chancellor Werner Faymann says the same, the same opinion is shared by Slovak Prime Minister Robert Fico and Hungarian Prime Minister Viktor Orbán,” the President of the Czech Republic underlined. Miloš Zeman supported the early abolition of anti-Russian sanctions. According to him the pressure on Russia is unsuccessful and leads to increased tensions in relations with the West. Europe will be less united.

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3 Research Questions

One of the main research questions was the study of the impact of sanctions on the Russian economy. The macroeconomic effect of sanctions for the Russian economy is still difficult to determine, but it is already clear that Western sanctions did not lead to the collapse of the Russian economy, as the US and its allies counted on, but some negative phenomena in the Russian economy, as mentioned above, all the same was not possible. The Prime Minister of the Russian Federation stressed that due to the sanctions there were “not the best conditions” for external borrowing, the situation also “does not contribute” to the inflow of foreign investments. In an interview with the largest news agency Bloomberg, Dmitry Medvedev said that “sanctions will not have catastrophic consequences on the Russian economy” [15].

The second important issue was the state policy in the conditions of sanctions, the response of the president and the government of Russia.

4 Purpose of the Study

The aim of the study is to analyze the situation and determine further steps on both sides to improve relations between Russia and the EU, despite anti-Russian sanctions.

5 Research Methods

The following methods are used in this study. One of them is the comparative method, which makes it possible to compare the various political, economic socio-historical, national-cultural contexts of Russia's relations with European states. At the same time, the main emphasis is on generalizing the polishing experience in the past. Comparing the relationship before and after the introduction of sanctions can be traced the dynamics, the main trend of these relations in our days.

Systemic and structural-functional approaches allow to form a holistic view of the mechanisms of relations between the state, civil society and political parties. The institutional approach makes it possible to analyze the influence of various state institutions of the USA, European Union and Russia on the ongoing processes.

6 Findings

As a conclusion, the following should be noted.

1. The economic sanctions imposed by the Western countries led by the United States can significantly slow down the growth of the Russian economy. The fact that in 2015 and 2016, Russia's GDP showed negative values, there is a certain negative impact on Western economic sanctions.
2. Apart from the negative consequences of the imposed sanctions, it is hoped that they will be an additional incentive for the modernization of the Russian economy, its transfer from the raw material to the innovative, industrial development path. And this work began with the implementation of the president's instructions on the need for import substitution, both in industry and in agriculture.
3. The reduction of foreign investment in the Russian economy forces the Russian government to take long-overdue measures, including more efficient use of domestic sources for the growth of the domestic economy. President of the Russian Federation V.V. Putin, speaking at a press conference in India on the results of the BRICS summit on October 17, 2016, referring to Western sanctions and retaliatory measures, stressed that the Western states "have never managed to achieve the goals for which they were committed with the help of sanctions." At the same time, the head of the Russian state noted that our country has regained its position as a full-fledged player in the political arena, and therefore, "the West seeks to hinder strengthening of our positions by any means" [16].
4. The response measures taken by the leadership of our country are capable of causing notable damage not only to Western economies, but also to introduce complications for domestic entrepreneurs.

7 Conclusion

1. The consequences of imposing sanctions against Russia, their influence on the economy of different countries are being investigated by both Russian and Western scientists and specialists. So, in August 2017 a survey was conducted among 193 German companies operating in the Russian Federation. The study showed that 97% of the polled representatives of German business assess the new American law on sanctions negatively, among them 77% - "unambiguously negative." In a positive light, only 3% of the polled companies expressed their opinion about the new sanctions.

More than half of the respondents (52%) reported that the new sanctions, directly or indirectly, but will affect their business. "At the same time, most companies are afraid of indirect consequences. About a third of respondents (30%) indicated that the new US sanctions would not affect them. And for 18% of respondents it is not yet clear whether sanctions will affect their business. Two-thirds of companies (65%) expect that sanctions will have a negative impact on their business. Entrepreneurs are afraid of fines from the US. In addition, the survey revealed an increased degree of uncertainty: one third of respondents at the time of its holding did not know whether new sanctions would be applied to their current projects or not." Despite the tightening of sanctions, almost three-quarters of respondents (72%) plan to keep the level of business activity and investments in Russia at the same level, and 15% are going to even increase their activity and increase the volume of investments in the Russian economy. Only 13% of respondents are going to reduce their activity because of sanctions.

According to many respondents, sanctions are designed to promote the economic interests of the United States, as a result, almost three quarters of companies (73%) "call on the EU and the government of Germany to respond." Based on this survey, the researchers made an unambiguous conclusion: "The position of the German business is unequivocal: economic sanctions in any form and on any side only harm business and economic relations" [17].

2. The Ukrainian conflict has become a convenient formal reason for the restriction, with subsequent elimination of competition from Russian companies in the world and primarily the European market, as transnational US companies are interested in increasing their share in the world, including the European market, where Russia delivers its oil and gas, trying to diversify their supply to the EU countries. Mechanisms for eliminating competition from Russian companies, primarily in the oil and gas industry, are chosen not market-oriented, but political, through sanctions. Since the European Union consumes a lot of hydrocarbons and is solvent, American and British oil companies are seeking to squeeze out Russian oil and gas companies by any means from the European market.

It seems to us that sanctions against Russian companies and banks will increase in order to try to get the Russian companies out of the European markets. Our conclusions are confirmed by the latest events that occurred in April 2018, when the US introduced new sanctions against Russian companies, businessmen and officials, collapsing the stock market and the ruble exchange rate.

3. Anti-Russian sanctions have been introduced seriously and for a long time, at least until Russia changes its political course. "Sanctions against Russia will remain in force until the Russian side changes its course" - said NATO Secretary General Jens Stoltenberg in an interview with *Süddeutsche Zeitung*, April 11, 2018 [18].
4. The study showed that the president and the government of Russia are pursuing an effective policy to minimize the consequences of Western sanctions. The result of this policy was the collapse of the plans of the US and its allies to weaken Russia. President Vladimir Putin, in his message to the Federal Assembly on March 1, 2018, stated that the supporters of the sanctions policy could not restrain the development of our country. He said: "And those who have been trying to inflate

the arms race over the past 15 years are trying to obtain unilateral advantages against Russia, introducing restrictions and sanctions illegal from the international legal point of view in order to contain the development of our country, including in the military sphere. I will say: everything that you were trying to prevent, pursuing such a policy, has already happened: You did not manage to restrain Russia!" [19].

Prime Minister D. Medvedev, speaking on April 12, 2018 at a meeting on import substitution, said: "Those companies that are in a difficult situation should receive support... And those decisions that will be offered as support will not be aimed at compensating the losses of the company's owners, but, first of all, for preserving production, for preserving jobs" [20].

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Social Policy of Russia as the Factor of Development of Human Capital

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Abstract. The article is devoted to the problems of social policy of modern Russia. The practice of developed countries of the world has convincingly shown that correct social policy is an important factor in the formation of human capital. The experience of many European countries shows that thanks to a purposeful social policy the state together with educational institutions, parents can not only form a harmoniously developed personality, but also provide a high standard of living, develop abilities and talents that are in demand by society.

Human capital, as is known, is a collection of knowledge, skills, and other personality traits that are used in socially useful work. The application of the concept of “human capital” allows us to understand the role of social institutions, to clarify not only social parameters, but also to conduct an economic analysis of the influence of the social factor on the market economy.

According to the theory of “human capital”, which was developed in the last century, the improvement of human qualities in the spheres of education and health provides the creation of economic resources of durable use. Education provides the necessary knowledge, forms skills, transforms the labor force, giving it the ability to highly skilled productive work, and healthcare increases the time and intensity of the use of human capital.

In analyzing the problems of social policy in modern capitalist Russia, the authors of the article concentrated mainly on an analysis of the causes that led to social stratification and the growth of poverty. Considerable attention is paid to social policy during the period of permanent economic crises that have become a characteristic phenomenon for post-Soviet Russia.

Keywords: Social policy · Human capital

1 Introduction

The Basic Law of the Russian Federation proclaimed our country in 1993 a social state. Article 7 of the Constitution reads: “The Russian Federation is a social state whose policy is aimed at creating conditions that ensure a decent life and free development of

a person” [1]. The legislation developed on the basis of the Constitution, federal government bodies form the main directions of social policy in both normal and critical times, focusing on financial support for planned activities. The Russian Federation protects labor and people’s health, guarantees a minimum wage, provides state support for the family, motherhood and childhood, disabled people and older citizens, develops a system of social services, establishes state pensions, benefits and other guarantees for social protection.

The main achievements of the social policy of the last decade are the growth of real incomes of individual groups in comparison with the Soviet period, as well as in the reduction of poverty from 42.3 (under B. Yeltsin) to 24.5 million people (with V. Putine). For comparison, in 1990, that is, on the eve of the Yeltsin reforms, only 2.3 million people or only 1.6% were officially considered poor. One of the most acute problems of modern Russia is the poverty of Russians. Even according to official statistics of the poor today there are more than 20 000 000 Russians [2]. Consequently, in the social state the number of poor with the onset of market reforms has increased twenty-fold, despite the operation of Article 7 of the Constitution of the Russian Federation.

Accepted in our country poverty assessment, the concept of the subsistence minimum leads to distortion of reality. The choice of the cost of living is, in one way or another, rather subjective, carried out practically without consulting with science, the public and trade unions. And most importantly: the subsistence minimum does not correspond to medical indicators, for example, the norms established by him for bread and meat and other important foodstuffs are 1.5–2 times less than medical and biological recommendations for both the adult population and children. Moreover, the Russian laws established a subsistence minimum set so meager that for calories it does not reach 30% before the soldering of a German captive officer during the Great Patriotic War.

As practice shows, after twenty-five years of permanent reforms, our country, in fact, has never become a social state. Russia’s social policy continues to be characterized by low wages (compared to developed countries it is 10–15 times less), modest pensions, which are barely enough to make ends meet.

Therefore, it can not be unequivocally asserted that state social policy is at present ideal, and it has no visible shortcomings. Suffice it to say that due to gaps in this sphere, Russia has a meager financial support for such an important indicator as life expectancy, 157th place in the world at the level of African states: almost every second man does not live to the retirement age. One of the reasons for the high death rate of Russians (only 1.6 million people die from cardiovascular diseases each year in our country) is still a low level of domestic health care. Its modernization is allocated a minimum of financial resources, no more than 4% of GDP, which is ten times less than in the US, which allocates up to 15% of GDP for these purposes, almost the same in developed European countries - Germany, France and the United Kingdom. Even by education, our country has fallen to the 30th position. The demographic situation is alarming, as during the period of reforms our country missed almost 9 million Russians. Russian leaders understand that the financing of social policy, its effectiveness largely depends on the state of the economy and the availability of free resources. This understanding becomes especially clear in the population during the crisis, when the possibilities of the state are limited. It is worth mentioning here that the foundation of

the economy, laid down in the Brezhnev era, undeservedly called “the era of stagnation and stagnation,” the explored reserves of oil and gas made it possible to survive the failure of Gorbachev’s restructuring, almost a decade and a half of Yeltsin’s systemic crisis and failure in Putin-Medvedev management.

Before analyzing the current social policy of Russia, unable to fulfill the constitutional requirement of a dignified life for all Russians and significantly increase the country’s human capital, the authors show what inheritance in the social sphere our country lost after the collapse of the USSR.

During the epoch of Khrushchev’s reforms, science-intensive branches of industry were rapidly developing: electronics, aircraft building, space exploration and others. Under Khrushchev, the world’s first artificial satellite was launched (October 4, 1957) and the world’s first manned space flight (April 12, 1961), which became the triumph of advanced Soviet science and technology.

Success in the economic field enabled the former socialist state to solve many social problems.

In the Brezhnev period, due attention was paid to the quality of education, to the high level of training of specialists. The quality of the professional training of that time can be judged at least by the fact that the current leaders of the Russian state, regional authorities and management, rectors of leading universities (the list can be continued) were educated under L.I. Brezhnev. Health care allowed to successfully combat child mortality, epidemics and other diseases. Operations, even the most complex, would be free for people. Pensions to miners, workers of ferrous metallurgy, to other categories of workers with difficult conditions of labor activity have been raised. Additions were made for continuous work experience at one enterprise, in an institution or organization.

It should be emphasized that the housing legislation of that period also provided for the improvement of housing conditions for citizens at the expense of the state. The law established categories of citizens who had privileges in providing housing. Citizens who lived in cramped conditions (less than 12 square meters of living space per person) also had the right to free improvement of living conditions [3].

During the reign of Brezhnev, a five-day working week was introduced with two days off. The wages of the main categories of working people grew. Women were entitled to partially paid leave to care for a child under one year of age. The rights of pregnant women were protected: no one could deprive them of their work and earnings, refuse maternity leave, and so on.

In the Brezhnev period, the supply of food and consumer goods to the population reached the highest level in comparison with other periods of the socialist development of the country. And the prices for goods and services were relatively low, available to the average consumer. For example, with a salary of 200 rubles a month, you could buy four trips to a sanatorium on the Black Sea (with treatment, meals and living in furnished rooms) for a period of 24 days. Perhaps, for this reason, the 100th anniversary of the birth of L.I. Brezhnev in Russia “was held under a friendly nostalgic sigh: many people remembered the stagnation as a” golden age”.

Leaders of modern Russia understand that the financing of social policy, its effectiveness largely depends on the state of the economy and the availability of free resources. Due to the scarce funds-tion failed to solve not only the acute housing

problem, but also the problem of Russian poverty. According to the President of the Russian Federation, V.V. Putin, more than 60% of Russians need better housing.

Russia has a meager financial support for measures such as life expectancy, 157th place in the world, at the level of African states: almost every second man does not survive to a pension of the age. One of the reasons for the high death rate of Russians (only 1.6 million people die from cardiovascular diseases each year in our country) is still a low level of domestic health care. A minimum of financial resources is allocated for its modernization, not more than 4% of GDP, which is ten times less than in the US, which allocates up to 15% of GDP for these purposes, almost the same in developed European countries - Germany, France, and the United Kingdom. Even by education, our country has fallen to the 30th position. The demographic situation is alarming, as during the period of reforms our country missed almost 9 million Russians [4].

The Scandinavian countries, such as Sweden, Norway, Finland, can serve as an example for Russia in solving social problems. In these social states today, high salaries and decent pensions, minimal unemployment, modern education and health care, providing a higher standard of living than in Russia. No wonder there was such a concept as "Swedish socialism". Scandinavian states in practice have made a difference in what Russia still can not achieve - social protection and social justice. The basis of Scandinavian society is the middle class. In such a society, there will never be global social conflicts and "color" revolutions.

Unlike the developed countries in the world, very low salaries are practiced in Russia, which are difficult to survive. Even a significant proportion of working Russians receive incomes below the subsistence level.

The attitude of the Russian state to ordinary people can be judged by the salaries that it pays to state employees. In Russia, the average salary of a teacher does not exceed 20 thousand rubles, and the salary of a professor in a state university is less than 40 thousand rubles, which is equivalent to only 600 US dollars. For comparison: in the US and Singapore university professors receive 48–54 thousand dollars a year, and the most highly paid have 90–100 thousand dollars annually or more than 500,000 rubles a month. The highest paid the teacher is in Luxembourg, his average annual income is from 80 to 100 000 euros or more than 600 thousand rubles a month [5].

In official documents of the company, the annual basic salary of the chairman of board of JSC Gazprom Alexey Miller is \$1.4 million. Twice less than that of the chairman of the board, \$700 thousand a year, six vice-chairmen of the board, the chief of staff of board and the chief accountant of Gazprom earn. The basic salary of eight board members and CEOs of twenty largest subsidiaries with the exception of Sibneft) is \$500 thousand a year. Other managers who are CEO of 20 more "subsidiaries", five deputy heads of the office of board, three advisers to the chairman of the board, the head of the secretariat of board of directors and the chairman of tender committee get paid the sum of \$400 thousand annually. In 2016 the salary of the chairman of board of Gazprom Alexey Miller, according to Forbes, increased from \$25 million to \$27 million, and taking the first rating place among the highest paid heads of state corporations. We get to know a lot through comparison and if the salary of the teacher is compared to that of the head of a State Corporation, it is seen that the difference will be several hundreds of times more. A simple example: the revenues of the head of Rosneft I. Sechin (1.5 million dollars per year) exceed the average salary of the average

teacher by 360 times [3]. Such a huge differentiation of income is observed in capitalist Russian society, which is not found in the developed countries of the world.

Such a situation, in which the incomes of some categories are hundreds and thousands of times different from the incomes of other categories of Russians, has developed as a result of the incorrect social policy of the Russian leadership. The state does not fulfill one of its main functions - the redistribution of revenues from the sale of oil, gas, diamonds, metals, other types of raw materials and goods in favor of poor citizens. Some missteps are seen in the tax policy: both oligarchs and ordinary workers pay at the same rate of 13%, since Russia does not have a progressive taxation scale.

2 Problem Statement

In analyzing the problems of social policy in modern capitalist Russia, the authors mainly focused on an analysis of the causes that led to social stratification and the growth of poverty during President V. Putin's reign.

First of all, the state's financing of such important spheres of social policy as education and healthcare was analyzed. Public health financing is not increasing, says Guzel Ulumbekova, MD, Chairman of the Board of the Association of Medical Quality Societies. As a consequence, the basic problems in health care are growing and among them the main indicator of the state of domestic medicine is the death rate. According to the scientist, he will grow. For example, in 2013, it amounted to 13 cases per 1000 population per year, and in the first half of 2014 this indicator rose to 13.3 cases per 1000 population. The increase in the death rate is due to the actual reduction in the funding of medical care. And this is half a million additional deaths of Russian citizens. This is the price of public underfunding of health care from 2013 to 2017 [6]. The well-known authority in the field of health The president of the Scientific Research Institute of Emergency Children's Surgery and Traumatology, Doctor of Medical Sciences, Professor Leonid Roshal, bitterly stated that only 3.4% of GDP is allocated to health care in Russia, and these figures are decreasing year by year. In countries with which we want to compare by the level of health care, allocate 9–10% [7].

As a result of the so-called optimization of health care, whose goal is to reduce government spending on traditional medicine, the number of hospitals has declined. In 2000, there were 10,700 hospitals in the country. In 2015, their number has significantly decreased - to 5.4 thousand. Experts stressed that if the closure of hospitals will go at the same pace, then by 2022 the Russian Federation will equal the number of hospitals with the Russian Empire - according to data for 1913–3,000 hospitals. At the same time, the remaining hospitals can accept a smaller number of patients because of the lack of beds, which in the course of 15 years became less by 27.5%, and if you take data only in rural areas - it is 40% [8].

As the facts show, the result of a significant reduction in medical institutions in some regions of the Russian Federation, the death rate increased by more than 6–8% (Yamalo-Nenets Autonomous District, the Republic of Karelia, the Sakhalin Region, the Republic of Khakassia, the Kostroma Oblast, etc.). In some regions of the country, the mortality rate as diseases of the respiratory system, digestion, infectious diseases, tuberculosis increased from 36% to 74% in six months, which requires urgent analysis

and appropriate actions. In April 2015, the Public Opinion Foundation conducted a large-scale study of public health problems in 85 regions of Russia. The results of this study showed rising prices for medicines, a shortage of medical workers, an increase in the share of paid medicine, a long wait for medical care and poor reception of people in polyclinics [9]. To the mistakes of V. Putin and D. Medvedev, the party “United Russia”, which passed laws on the financing of health in 2000–2018, include numerous publications in the Russian mass media that contain requests for help in the treatment of children, including abroad. In the same series, there are many queues of sick Russians to obtain quotas for complex, high-tech operations. According to the media, a large part of the seriously ill Russian citizens die and did not wait for organ transplant surgery. This testifies to the growing acuteness of the key problems in the field of health care and the growing alarming symptoms in the health care system.

These and other facts indicate that the promises of the state to improve medical care for Russians are not being met. The implementation of both the “Strategy for the Socio-Economic Development of the Russian Federation until 2020, approved by the government, and the May decrees of President Vladimir V. Putin has been disrupted. This conclusion equally applies to another important area of social policy - education.

The evidence suggests a reduction in public funding for education. This can be seen in the reduction of allocations from the state budget for the needs of educational institutions, and in reducing their total number in the country, and in reducing budgetary places in state universities, increasing the number of paid services in education. In 2016, the share of spending on education has declined to 3.7% of GDP, by 2019, it will fall to 3.5% of GDP. This is due to both the decline in the cost of oil, and the increasing priority of defense spending and pensions [10]. Over the past four years, according to Rosstat, about 12,000 schools have been closed in the country. At the same time, experts note another stable trend - growing costs for parents to educate and educate children. Almost half of Russian families pay for school lessons, repetition, sections, mugs and gifts for teachers. From 1995 to 2009, the number of preschool institutions in the country decreased from 68,600 to 45,300, and from daytime general education institutions from 68,900 to 52,400. Over the past decade, the number of state and municipal schools in cities has decreased by 19%, and in rural areas - by 24%. In recent years, sociologists have recorded the fact that, despite social slogans, the Russian state is steadily reducing the number of budgetary institutions in the sphere of education, shifting more and more expenses to the shoulders of parents [11].

Insufficient financing of educational institutions affects the remuneration of teachers: teachers, university professors, professors. With respect to teachers' salaries, Russia lags behind not only the United States of America, but also the developed countries of Asia and Africa, which were formerly considered to be the “third world”. According to the rector of the North Caucasus Academy of Public Service, Professor VG. Ignatova, the salary of teachers in Russia in 2004 (under VV Putin) was lower than in Turkey 9 times, lower than in Tunis (North Africa) 16 times. But the most unfortunate comparison for Putin's Russia will be a comparison with South Korea, where the salaries of teachers are 38 times higher [12]. A young teacher in a public school after graduation before the crisis of 2008–2009. received only \$100 a month. This is below the officially established subsistence level for working citizens of Russia. Such salaries left the young school teacher at the poverty line, that is, on the verge of

physiological survival. Such a miserable, humiliating salary, which school teachers receive in the Russian Federation, is not found in any European country. Why is Teacher highly appreciated on the Teachers' Day, and not on the day of salary?

According to the Decree of the President of the Russian Federation VV Putin on 07/05/2012, No. 597 "On measures to implement state social policy" by 2018, the government was instructed to bring the average salary of teachers of higher education to 200% by 2018 to an average salary in the region³. And if we are now 29,297 rubles (the average salary in the Belgorod region) will be doubled, then by 2018 the salary of teachers in the university should be at least 58,594 rubles. And according to the statement of employees of the higher school, the salary of the professor in the state university does not exceed today 39,000 rubles a month [13].

In the "Strategy 2020", approved by the government were promised an average salary teachers and professors of 2,700 US dollars by 2020 [14]. Russian Prime Minister Dmitry Medvedev, speaking in August 2016: there is no money in the country, teachers must learn to earn money themselves, to do business. It turns out that the head of government openly offers enterprising young people not to complain about beggarly salaries in schools and universities, but to go to business [15]. But if everyone goes into business, they become entrepreneurs, then who will remain in schools and universities transfer knowledge to the new generation? These and other facts show that the state allows mistakes and miscalculations in the field of education.

Do members of the Russian government do not understand that education is the basis of human capital? But if they understand the importance of education for obtaining knowledge, skills and other qualities necessary for creative work, then why do they treat Russian education badly, do not provide teachers and professors, schools, colleges, universities everything necessary to create and increase human capital?

Meanwhile, the complexities of modern production processes, the changing demands for creating working conditions, living standards, the quality of education and health, necessitate a diversified development of human capital.

3 Research Questions

Having set a goal to explore the state of social policy and its impact on the development of human capital in modern Russia, the authors attempted to analyze the state's concern for the development of such important areas of social policy as education and health. To show the true picture, not only the dry figures of official statistics were given, but also numerous examples showing that the country's leadership does not allocate enough financial and other resources for these purposes. In addition, the article contains statements on these issues by respected scientists and public figures. All this allows us to make a substantiated conclusion that in 2000–2018 neither education, nor health care, nor other spheres of social policy received the necessary development in Russia. In turn, insufficient financing of social policy inevitably led to a slowdown in the development of human capital and brain drain abroad in search of a better life.

4 Purpose of the Study

The aim of the study is to analyze the state of Russia's social policy, to identify its main problems, mistakes and miscalculations in implementation, to identify further ways to improve social policy to overcome poverty and the comprehensive development of human capital.

5 Research Methods

1. The following methods are used in this study. Comparative method that allows you to compare Russia's social policy, the level and quality of life of its citizens with advanced European and even Asian states. This method, together with the method of historicism, makes it possible to show a significant difference in social policy that was conducted under Soviet power, that is, under socialism, and under modern Russian capitalism.
2. Systemic and structural-functional approaches allow to form a holistic view of the social policy implemented by President Vladimir Putin, its achievements and shortcomings, mistakes and miscalculations made in 2000–2018.
3. Institutional approach allows analyzing the influence of various state institutions on the formation of social policy in Russia, eliminating the causes that generate social inequality and growing poverty, already now exceeding tens of millions of citizens. Mass poverty can not contribute to the all-round development of human capital, it only reduces it.

6 Findings

1. Thus, as a result of many reasons, the main constitutional principle of the social state - the creation of conditions that ensure a dignified life for all citizens - has not yet been implemented. One of the contradictions of the Russian reality that emerged during the restoration of capitalism is that the welfare of the overwhelming majority of Russians does not directly depend on high prices for oil and other energy carriers. In fact: oil and gas prices rose before the crisis, and tens of millions of people still languished in poverty, receiving incomes below the subsistence level.
2. Therefore, social policy needs to be modernized, so as to sharply reduce poverty, reduce the large gap in income between the poor and the rich, create conditions for free and all-round development of the individual. Today, it is necessary to change the strategy of social policy, its priorities and funding, so that Russia could rightly be called a social state with developed human capital.

7 Conclusion

1. President Vladimir Putin, speaking at the annual press conference on December 14, 2017, described the development of health, education and infrastructure as priority areas for Russia and promised that the May decrees on increasing salaries for doctors, teachers and public sector workers would be fully implemented implemented by 2018.
2. By early 2018, the promises of the head of state were not fulfilled in the part of salaries of teachers, doctors, professors. According to a survey of the Health Foundation, only 8% of doctors receive salaries over 50 thousand rubles. Interrogation of the average medical staff showed that three quarters of them (79%) earn up to 25 thousand rubles per rate and only 6% - above 35 thousand rubles. More than half (55%) of them work for more than one bet [16].
The same situation with the May decrees and in the field of education. The president did not insist, and the government ignored the decree of the head of state on bringing teachers' salaries to the average by 2018. The same situation applies to the payment of labor of professors and teachers of higher educational institutions. One of the authors of this article testifies that as of March 1, 2018, his official salary is only 38,700 rubles, whereas, according to President V. Putin's decree, the professor should receive almost twice as much - 200% of the average salaries in the region. Because of low pay, some of the teachers leave the higher school, while the other part, in search of the lucrative share, leaves for abroad, where working citizens with high qualifications receive several times more than in Russia.
3. To remedy the situation it is necessary to modernize the social policy of the state. Finally, it is necessary, in our opinion, to reduce defense spending (out of the 20,000,000,000,000 rubles allocated for the preparation for war), the maintenance of a huge bureaucratic apparatus, law enforcement structures, the budget maneuver announced by the president and part of the funds for the full realization of the social policy, including the "Strategy for the socio-economic development of the Russian Federation until 2020," the May decrees and other election promises of V. Putin, set out in a message to the Federal Assembly on March 1, 2018 [2]. In this case, Russians will have confidence that the state cares about them not in words, but in deeds.
4. Thus, the numerous arguments and facts stated in the article indicate that the Russian state can not rightly be called a social state. Therefore, social policy should be radically changed to create conditions for a dignified life for all citizens in a rich country so that every Russian can be proud of the fact that he lives and works in a great power that cares about his safety and well-being.
In the era of the scientific and technological revolution, post-industrial development based on the knowledge economy, human capital has a new ability to create innovations based on IT technologies without the participation of raw capital. At the heart of this ability lie first of all the new knowledge necessary for its development. If this important conclusion is not understood by Russia's political leadership, if appropriate measures are taken to improve human capital, the country risks losing hope hopelessly. This is the price of the question.

5. Against the backdrop of a rapid drop in incomes, a growing social stratification, there is an accelerating process of emigration. An increasing number of our fellow citizens come to the conclusion that they have nothing to do in modern Russia. The most dangerous thing in this situation is that half the young people are morally ready to leave the country. According to the forecast of the analytical center Stratfor, soon Russia may face another wave of mass emigration, which will be “perhaps the biggest in the last 20 years.” Indirectly, the opinion of foreign experts is confirmed by Rosstat’s data, which fixes the increase in the number of departing for six years already. And the dynamics can seriously upset the patriotically minded public: in 2010, 35 thousand people went abroad, in 2015 - almost 350 thousand [17]. Russian Deputy Prime Minister Olga Golodets, who oversees the social block, recently reported that “according to various estimates, more than 1.5 million Russians with Russian passports, well-trained, highly competitive personnel work outside the Russian Federation. Today it is difficult to find a university in the world, a company where Russians are not present, where Russians do not work, and this is a dangerous tendency”. According to the vice-premier, the brain drain abroad is due to low salaries in Russia. “If we are underpaid for work, and the market is open, then we encourage our young people, the most creative and mobile workforce, to travel outside Russia,” she said, urging the business to create high-performance jobs so that highly qualified specialists could implement themselves [18]. These figures indicate that hundreds of thousands, millions of citizens simply do not see prospects for themselves in Russia. They are not satisfied with the low level of wages, combined with the need to constantly earn extra money, unstable economic conditions, increasing risks to personal and business security, and lack of opportunities for promotion on the social ladder, and failure to fulfill the promises of the country’s leadership in social policy, and so on.
6. These and other negative facts do not contribute to the accumulation of human capital in Russia. What will happen next and whether the country will be able to solve numerous problems in this sphere under the leadership of President V. Putin will be shown by time.

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Actual Problems of Investments in Russia

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Abstract. In 2014–2015 years. As a result of the collapse in oil prices, the inflow of petrodollars into the economy declined, and with the introduction of anti-Russian sanctions, access to cheap Western credits was blocked. So the economic policy, which relied on the export of crude oil and other raw materials, once again demonstrated its complete failure.

The Russian economy, with its raw material orientation, not only depends on world energy prices, but also on imports of goods and technologies. According to the data of the Ministry of Industry and Trade, the share of imports in heavy engineering today exceeds 60–80%, in light industry 70–90%, in machine building 90%, in the electronics industry 80–90%, in the pharmaceutical and medical industry 70–80% [1]. From this it follows that own production in such important sectors as heavy engineering, machine tool construction, radio electronic industry is only 20–30% of the demand. In this situation, Russia, without developing its own economy, imports metal-cutting machines, forge-and-press equipment, cars, road machinery, computers, telephones, food, clothing, footwear, medical devices, medicines and much more. Hundreds of billions of dollars are spent annually on the acquisition of goods and technology abroad. Russia's import dependence on the dollar equivalent has increased almost 10-fold over the past 15 years: from 45 billion in 2000 to 341 billion dollars by 2013 [2]. As a consequence, Russia's strongest economic dependence on other countries is taking place. It is not hard to imagine the consequences, for example, the introduction of sanctions for the supply of vital medicines to our country, if their own production is less than a fifth of the demand. The share of imports today exceeds the permissible limits for ensuring national and economic security of the country.

The reason for the high dependence on imports of many sectors of the Russian economy was the incorrect economic policy pursued in the post-Soviet period. Suffice it to say that the economic policy of those years, the mistakes in the state regulation of the economy, was the fall in the volume of industrial production to the level of 1991, and for some industries and types of industrial products, the fall turned out to be multiple.

The problem of technological backwardness of Russia was formed not in the period of Western sanctions, but during the last quarter of a century. And if at the beginning of market reforms the Russian economy still had the production

and technical capacities that had been delivered from the USSR, then after two and a half decades the production potential of the Russian economy significantly decreased, which had a negative impact on the production of domestic goods and technologies.

To increase the production of domestic goods, it is necessary to build new factories and plants with innovative equipment, and this requires multibillion-dollar investments in the Russian economy.

Unfortunately, the influx of Western investment in the Russian Federation in connection with the introduction of sanctions fell sharply. And for the domestic investment has not created a favorable investment climate. These and other problems of investment in the Russian economy are discussed in this article.

Keywords: Western sanctions · Technological backwardness · Import substitution · Investment climate

1 Introduction

According to President Vladimir Putin's plans, Russia had to rebuild and modernize its economy in such a way as to take the leading place in the international division of labor. At the same time, the main branches of the economy were supposed to be equipped with modern technologies for the production of competitive goods. Otherwise, Russia will, according to the national leader, "constantly lose resources, paying them for new, increasingly complex and expensive technologies of industrial goods, materials and medical products that we can not create ourselves" [3]. However, these and other plans and directions of the political leadership on the modernization of the domestic economy, its transfer from the raw material to the innovative way of development, were practically not realized.

According to nominal GDP, Russia occupies a place in the middle of the second ten. It lags behind the United States, Britain, France, Germany, Italy, Japan, Canada, China, but even countries such as India, Brazil, Mexico, South Korea. China's GDP in 2016 exceeded 11.2 trillion dollars, United States 18.6 trillion, and Russia's GDP - 1.3 trillion dollars [4].

As for South Korea, this country is 3 times less than Russia in terms of population and even less in area than our Kamchatka, but it produces more products and services than our huge country. So, in 2016, South Korea produced \$ 128 billion more than the Russian Federation. The success of the Republic of Korea and other economically developed countries is that their economic strategy is based on a knowledge economy based on modern science, innovation and investment. And the current Russian economy, due to the ineffectiveness of the state administration, mass corruption is practically an outsider of technical and technological progress, and therefore fairly belongs to the category of "developing" countries, that is, to countries that are not sufficiently developed both economically and socially.

In his next message, on March 1, 2018, V. Putin set the task to enter the top five states with high GDP and increase GDP per capita by one and a half times. "Russia should not only firmly gain a foothold in the five largest economies of the world," he

said, “but to increase GDP per capita by half by the middle of the next decade. “This is a very difficult task, I’m sure we are ready to solve this problem” [5].

This is a very ambitious task, and in order to achieve it, it is necessary, firstly, to make a lot of efforts to get the idea mastered by the masses, and secondly, to carry out purposeful organizational work in the government bodies, thirdly, change the tax policy, make it so that it contributes to the development of the economy, and not hampered it, as it is currently happening. In other words, it is necessary to improve the investment climate in Russia, make it favorable for business, for new investments, for the return of domestic capital to the country.

Only under these conditions can an investment boom be launched in Russia, thanks to which new enterprises will be built in our country, with modern equipment and technologies needed to produce innovative products capable of competing with the best world standards.

An example for Russia in attracting investment may be the policy of the Chinese leadership. If in 1991 (in the year of the collapse of the USSR) the volume of actually invested direct investments amounted to only 4.4 billion dollars, then in 2013 they grew to \$ 117.59 billion or more than 26 times! [6].

During the first two decades of the “openness policy” for enterprises with foreign participation in the PRC, a more favorable management regime was established than that provided to national enterprises. Enterprises with foreign investments paid income tax at a lower rate than Chinese enterprises. They used numerous tax, customs privileges, privileges in the system of currency regulation, etc. Thus, the state sought at least partly to compensate foreign entrepreneurs for obvious imperfections in the investment climate in China. Particularly ramified system of fiscal benefits for investors has developed in the free economic zones of various types existing in China (“special economic zones”, “zones of economic and technological development”, “free trade zones”, etc.). At the same time, to protect national economic interests, the authorities restricted foreign investments in certain sectors of the economy (primarily financial, in the military-industrial complex and other).

On similar principles was created in 1994 and a specialized “Singapore Investment Park” in Suzhou. Here the idea was to create in a market environment close to that with which Singaporean businessmen are used to dealing in their country. The park introduced a simplified registration of enterprises, removed restrictions on foreign investment in the financial sector. The local government of Suzhou, by analogy with the administrations of the “special economic zones”, was given the right to independently issue regulatory acts governing the activities of the zone. The progressive convergence of economic conditions for Chinese enterprises and enterprises with foreign participation is evidenced by the growing diversity of institutional and sectoral forms of attracting foreign investment. The leading organizational forms of investment cooperation are joint ventures and enterprises of full foreign ownership. And the role of the latter especially increased in the conditions of deflation, when the Chinese partners began to experience problems with financing their contributions to the authorized capital of the joint venture. But at the present time, the issue of connecting foreign investors to the processes of reforming the state sector in industry is becoming more and more active. In this regard, the role of such a form of attracting investments, such as the sale of shares of Chinese enterprises to foreign investors, should increase. It is

supposed, in particular, to open to foreign investors access to purchase of shares of Chinese enterprises that were transferred in 1999–2000. in the course of restructuring their debts to state banks under the “debt-for-ownership” scheme under the control of four state-owned asset management corporations.

From the Chinese investment laws, the requirements for the approval by government agencies of manufacturing plans of enterprises with foreign participation and plans for exports and imports were withdrawn. The articles of laws that ordered enterprises with foreign investments to purchase raw materials mainly on the domestic market were abolished [7].

It should be noted here that along with foreign direct investment in the People’s Republic of China (PRC), modern technologies also came. All this allowed China to bring its nominal GDP to 11.232 trillion dollars by 2017, surpassing Russia’s GDP by 8.7 times. These and other forms and methods of attracting foreign capital, increasing gross domestic product can be creatively used in Russia.

Obviously, it is necessary to solve the problem of attracting investments in our country with a change in the investment climate in Russia.

Most researchers consider the investment climate as a combination of economic, political, financial conditions that affect the flow of domestic and foreign investment in the country’s economy. A favorable climate is characterized by political stability, the presence of a legislative base, moderate taxes, benefits presented to investors.

But, as it turned out during the Davos forum, the investment climate in our country is far from being all right: potential investors are frightened off by inefficient Russian bureaucracy, high corruption and insufficient protection of property rights. The Russian authorities have nothing to oppose to these fears except for “manual control”, whose effectiveness is inexorably decreasing. During the session, a vote was taken, according to which 77.9% of the participants considered the main task of the Russian authorities to attract investment and combat corruption in state structures [8].

The head of the government tried to convince potential investors that the country’s leadership would take all measures for doing business and investing in the economy. “But how successful it will be depends on all of us - depends on Russian business, depends on Russian civil society, ultimately depends on the people of Russia and on our friends who help us create an effective state and build a modern economy”, - said the head of the Russian government in January 2013 [9].

Very correct words were said by the head of the government. For their implementation, only specific measures and adequate steps in the economic policy of the ruling tandem are lacking. This is evidenced by the arguments and facts given in the next section.

2 Problem Statement

The main obstacle to increasing the volume of investment in the Russian economy, the development of the country is the withdrawal of capital into offshore zones. By these actions, Russian businessmen show that they do not believe either the president or the government that call on them to invest their profits in Russia, and not abroad.

According to the Russian press, the statements of Russian politicians, 90% of large Russian business does not have Russian jurisdiction, but is registered offshore. Explaining the reasons for the situation, the chairman of the State Duma Committee on Economic Policy and Entrepreneurship, Yevgeny Fedorov, said in January 2010 that “95% of Russia’s major property: industry, banks and everything else is registered offshore - in Cyprus, Gibraltar, Luxembourg, Cayman islands”. When asked why this happened, the politician replied: “Any large entrepreneur in Russia hides his property right abroad, because it is better protected there, because of the specifics of the construction of the entire Russian statehood” [10].

Having registered in Cyprus, Monaco, the Bahamas and other offshore companies, Russian companies minimize their costs by significantly reducing tax payments. If in Russia the basic rate of profit tax is 20%, then in an offshore, say, Cyprus, this tax is only 10%, that is, 2 times lower. The tax on dividends in our country is 9%, in offshore only 5% or completely absent, as, for example, in the Bahamas. In addition, in many offshore companies there are no strict requirements for accounting, financial control by the authorities. Offshore schemes allow you to evade many Russian taxes (VAT, personal income tax, dividends), pay various excises and duties, as well as from social payments to budgets of different levels. As a result, the Russian budget loses hundreds of billions of rubles.

With the help of offshore companies, they not only avoid taxes, but also protect property from raider seizures. The scheme is simple: a wealthy Russian who does not want to advertise himself for any reason, registers the company in offshore. And if it is possible to learn about the owners of the largest enterprises in Russia from the annual reports of the companies, then in many offshore companies, the owners of the companies are not disclosed.

According to S.M. Mironov, the former head of the Federation Council, today 70% of the Russian economy is managed from offshore, which is confirmed by many facts. For example, a controlling stake in the largest domestic steel company Novolipetsk Metallurgical Plant worth \$ 13.3 billion belongs to Fletcher Group Holdings Limited, based in Cyprus. The main owner of NLMK V. Lisin, who owns 82% of the combine, is at the top of the list of Russia’s richest businessmen. Another well-known Russian businessman O. Deripaska also keeps his assets away from his homeland. His United Company “Russian Aluminum” (UC RUSAL, United Company RUSAL, UC Rusal), the world’s second largest producer of aluminum and alumina, is registered on the British island of Jersey. The assets of R. Abramovich (9th in the list of the country’s richest businessmen according to the Forbes version), are posted abroad, mainly in off-shores [11].

This situation can hardly be considered normal, acceptable for the domestic economy. And this is realized by the leaders of the country. “The withdrawal of the national economy and its strategic industries from offshore shade is our priority for the coming period,” Putin said at a meeting of the Electricity Industry Commission on December 19, 2011.

At the Congress of Business Russia on Dec. 21, 2011 V. Putin said: “It is absolutely clear that we need to launch our own, domestic investment engine, support the manufacturing business, create the conditions to invest in the domestic economy and industry was profitable.” In President Putin’s message of December 4, 2014, it was proposed to

hold a full amnesty for the capital returning to Russia. “We all understand that the origin of money is different, in different ways they are earned and received. But, I am sure, we need to close down completely, turn over the offshore page in the history of our economy and our country. This is very important and needs to be done” [12].

The idea of returning capital from abroad to the Russian economy was voiced by the President in a message to the Federal Assembly in December 2014 and repeated in the following reports that Putin made in December 2015 and March 2018. However, despite the statements of the country’s leadership, the export of capital from Russia continues to this day. This is clearly seen from the following table (Table 1).

Table 1. Export of capital from Russia in 2008–2017.

Year	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
\$ billion	133,7	56,1	33,6	84,2	53,9	59,7	151,5	56,9	19,8	31,3

As follows from the table, over the past ten years, businessmen have withdrawn from our country more than 680 billion US dollars or almost three annual budget of the Russian Federation. The highest outflow of capital from Russia occurred in 2014 in the amount of 151.5 billion dollars. He broke all records and was much higher than the forecasts of the Ministry of Economic Development and the Central Bank of Russia. Note that in 2014, anti-Russian economic and political sanctions were introduced. If the Russian investment climate were consistent with the demands and ideas of entrepreneurs, they would not take as much money out of the country that is so needed today to solve the problems of investment in the economy and, in general, for the social and economic development of the Russian Federation.

Our state has repeatedly declared on the lips of political leaders that it wants to transfer the economy to an innovative development path, but it never managed to organize work either through financing from the state budget, through tax preferences, or through interaction with business, including within the framework of public-private partnership. The raw orientation of the economy remains, the intention to diversify it is not realized.

According to the results of the research of the independent scientific institution Legatum Institute, whose scientists annually compose the ratings of the countries of the world, Russia dropped to the 72nd place in terms of economic indicators, took the 50th place in terms of entrepreneurship, 96th in terms of corruption and management effectiveness. In the overall ranking among the countries of the world, Russia has an uncommitted 63rd place, between Morocco and the Philippines.

The best country where it’s easy to start a business and implement new ideas, get real support from the state in opening your business, was recognized Denmark. The most effective country from the point of view of public administration (fair elections, efficiency of state administration, lack of corruption, citizens’ satisfaction with the actions of the authorities and the judiciary) is called Switzerland.

Singapore, being deprived of the most important mineral resources, was able to rise from the level of the country of the “third world” to the level of an advanced state with a high standard of living. The main way to achieve such a phenomenal result was the victory over corruption and a large amount of investment in the economy of this

country. In terms of GDP per capita, Singapore is about 7 times ahead of Russia. The index of prosperity in 2017 in Singapore corresponded to the 17th place in the world between Belgium and the US, while Russia in this indicator fell to 101 in the world, being between India and Tajikistan [13].

The state and volume of investment processes in Russia are affected by a number of factors: political, including foreign policy - sanctions, economic, financial and other, which together constitute the investment climate. The importance of the investment climate for the socio-economic development of the country as a whole and its individual regions can not be overestimated. Suffice it to say that with a favorable climate in the region, new financial resources of both domestic and foreign origin are received. And the more money comes to the region, the more opportunities the local authorities have for comprehensive socio-economic development based on modernization. Considering the fact that without investments it is impossible either to implement numerous programs and plans for economic modernization, including import substitution, or to raise the technical level of production and the competitiveness of domestic products in the domestic and world markets. "If we do not want to talk and talk about modernization, and start it," said former President Dmitry Medvedev, "the central element of successful modernization is a dramatic improvement in the investment climate." Modernization practically requires hundreds of billions of dollars in direct investment. so that these billions of dollars come, we need not the kind of investment climate that we have [14]. Placing a new production in Russia should be more profitable than in other countries, then the influx of investments into the country will increase, V. Putin said. "The state will seek to create conditions for investment growth at least to 25% of GDP by mid-decade against today's 20%." This promise was also contained in the pre-election program of Vladimir Putin, a presidential candidate in 2012 [15].

In Russia, within the federal government, the institution of the Investment Ombudsman has recently become operational. In the Ministry of Economic Development of the Russian Federation, a department for investment policy and the development of public-private partnership was established, where appeals of investors faced with administrative barriers flow. The first vice-premier supervises all this work in the government. Shuvalov. It ensures the coordination of the activities of the federal executive authorities to consider appeals from Russian and foreign investors. Investors were also given the right to appeal to deputy plenipotentiary representatives of the President of the Russian Federation in federal districts, for which the status of investment commissioners is fixed. However, the institution of the Investment Ombudsman is more suitable for large investors, hence the need to establish an ombudsman institution at the regional level for small and medium-sized businesses. In the regions there should be regional ombudsmen for the rights of entrepreneurs.

These and other measures of the government to increase the volume of investments in the economy of the country have yielded certain positive results. So, according to the press service of the government, only in the period from May 2012 to April 2013 in Russia earned from 400 to 450 new manufacturing plants/plants and shops. At the same time, the total amount of investments in production data amounted to approximately 500 billion rubles. In addition, in 2013, technical re-equipment was carried out at almost 500 enterprises, of which 35 as a result have already put into operation new capacities [16].

However, the tightening of anti-Russian sanctions reduces the amount of investment in the country's economy. This was particularly reflected in the business owned by O. Deripaska, which was in 2018 included in the list of new US sanctions. After the publication of new orders of President Trump in April, shares of UC Rusal on the Hong Kong Stock Exchange fell in price by 50%. Investors refused to support money the company, which fell under the new American sanctions [17]. The fall in the share price of UC Rusal was largely due to the withdrawal from the shares of foreign investors who were frightened of the new US sanctions on the SDN list. A similar situation arose with foreign investment in 2014, when the US first announced anti-Russian sanctions. Only in 2014, the volume of direct foreign investment in the Russian economy fell by 70 percent compared to 2013 [18].

3 Research Questions

Starting to study the problems of investment in the Russian economy, the authors set themselves the following basic questions. First, show the reasons for the decline in investment. Secondly, to analyze the main problems faced by domestic entrepreneurs in the process of investing in the construction of new enterprises, with the financing of their own business projects and programs in certain regions. Third, to show the importance of a favorable investment climate for changing the negative trends associated with capital flight to offshore. Fourth, identify the main ways to improve the state investment policy in order to develop the Russian economy in the face of Western sanctions.

4 Purpose of the Study

The purpose of the study is to study the problems of investing in Russia, including in the context of Western sanctions.

5 Research Methods

The following methods are used in this study.

1. Comparative method, which allowed to compare the flow of investment in the Russian economy, with direct investment in the Chinese economy, with the main emphasis on the forms and methods of work of the Chinese leadership to attract foreign investment. In China, considerable experience has been accumulated in this field. Suffice it to say that foreign direct investment in the PRC is annually 5–7 times more than in Russia.
2. Systemic and structural-functional approaches allow to form an integral view on the processes of investment in the Russian economy and analyze the progress of their implementation.

3. Institutional approach allowed to analyze the role of the government, its individual ministries and departments in the development and implementation of state policy to create a favorable investment climate. Thanks to this method, it was possible to uncover the acute problems of interaction between government and business in Russia, to analyze some of the reasons for the low innovative activity of the private sector of the economy.

6 Findings

Investigating the influence of the investment climate on investment processes, the authors came to the following conclusions.

1. The investment activity of businessmen in Russia is strongly influenced by the legal insecurity of property, economic rights and legitimate interests of the entrepreneur's personality. About how unlawfully criminal cases are brought against successful businessmen and their enterprises are taken away is mentioned above. We only note that after the so-called "Khodorkovsky case," the volume of investment in the Russian economy has plummeted, and large companies and banks have opted to register in offshore for business security purposes, withdrawing from the jurisdiction of the Russian Federation.
2. With the introduction in 2014 of sanctions by the United States, the European Union, Japan, Canada and other states against Russia in connection with its actions in the Crimea and the Donbas, the volume of foreign investment in the Russian economy fell sharply. Only in the first year of sanctions restrictions, the inflow of foreign direct investment fell by 70%. The restrictions imposed by Western banks on credit resources imposed by sanctions significantly reduced the investment opportunities of Russian banks. They could no longer lend to domestic entrepreneurs in the previous volumes, jeopardizing the implementation of many business projects.
3. The modernization of the state investment policy can play a positive role in improving the dynamics of investment processes in the country. Here, creative use of the successful policies of China and other countries of the world can be useful, especially in creating a favorable investment climate for attracting foreign investors.
4. In the attraction of investors for the construction of new factories and plants, the creation of industrial clusters, territories of advanced development and other initiatives of the government play a positive role, as shown by practice. They are positioned as measures that create the most comfortable conditions for the creation of new industries. At the same time, the government, the regional authorities undertake to fully prepare for the investor a site: at the expense of the budget to buy out land plots, to form their cadastral passport, to communicate, including roads, electricity, gas, water. Such conditions attract those investors who previously hesitated because of the forthcoming bureaucratic and corruption costs to invest their own financial and other means in the construction of new production facilities.

7 Conclusion

1. In the Strategy for Social and Economic Development of the Russian Federation until 2030, to which V. Mau, E. Yasin and many other well-known economists were involved, on the instructions of the Chairman of the Government of the Russian Federation, set to overcome the raw material orientation of the economy, the country's transition to an innovative path development, quality improvement of life of the population.
2. It is obvious that such grandiose transformations are possible only if the efforts of the state and society, business and government are consolidated. And it would be wrong to believe that in the relations between Russian business and government today everything is smooth, that all major problems are solved, especially in the field of investment and innovation. With the introduction of anti-Russian sanctions, foreign investment in the economy fell sharply.
3. In the changed conditions, the main emphasis should be on own forces, on investments of domestic, and not foreign businessmen. For the development of the country's economy, the Russian state must first of all establish the right interaction with business.

However, practice shows that until now clear and unchanging "rules of the game" have not been established, all conditions for a favorable investment climate have not been created, and the existing legal framework does not guarantee the inviolability of private property. This was clearly demonstrated by the so-called Yukos affair. After one of the successful oil companies was plundered and its owners were sent to jail, the overwhelming majority of large Russian entrepreneurs began to register their companies abroad.

4. Investing in the Russian economy, overall economic development of the country and the growth of the well-being of citizens are largely determined by the level of development of entrepreneurship. And if the business does not have prospects, and the businessman himself is deprived of legal guarantees of his rights and legitimate interests, then there can be no question of any investments. Unfortunately, the vicious practice of raider seizures, power pressure on business in Russia continues. In 2014, 200 thousand criminal cases were filed on economic items. In 2015, the number of criminal cases against entrepreneurs increased by another 15% and reached 235 thousand [19]. According to official statistics of the Prosecutor General's Office, in 2015, 5 million procedural violations committed by law enforcers during the preliminary investigation were revealed. According to the survey, only 6% of entrepreneurs after the criminal prosecution fully retain their business, another 24% retain business partially, the remaining 70% lose their business completely. Annually more than 100 thousand companies stop their entrepreneurial activity because of the criminal prosecution of managers [20].

This negative fact was recognized by President Vladimir Putin. Criminal prosecution is inadmissible to be turned into an instrument in disassembly or corporate disputes, the head of state said at a seminar-meeting of chairmen of the courts. He called on the judiciary to block those who "use criminal prosecution as a cudgel" in corporate disputes or "to take away property from legitimate owners" [21].

5. In our opinion, to attract foreign investment, first of all, comfortable conditions for investment should be created, and the investment climate improved. To improve the conditions for Russian and foreign investors in our country, it is necessary to implement a number of measures, including: create a favorable regime for businessmen, using the positive experience of China; to provide state support to investors by providing tax and other benefits for the period of construction of new industrial and other facilities; to develop the necessary infrastructure, to provide assistance with energy networks and other communications; suppress corruption, which is used by government agencies against investors, and so on.

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Devaluation of the Ruble: Losses and Benefits

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Abstract. The article deals with the problem of the weakening of the national currency in crisis and Western sanctions caused by the events in Ukraine. As a result of a sharp and prolonged drop in oil prices and other commodities, foreign currency earnings to our country has decreased significantly, there were problems with the filling of a profitable part of the federal budget.

With the economic crisis, burdened with anti-Russian sanctions, the Central Bank of the Russian Federation together with the government, it was decided to devalue the national currency. Saving the international reserves, the central bank refused to interventions to stabilize the exchange rate. The article shows how the devaluation of the ruble contributes to filling the state budget it affects the economy, the living standards of citizens.

The latest developments in Syria, related to the missile strikes of the United States, Britain and France, convincingly showed the weakness of the national currency of Russia. It falls down not only because of the decline in its economy, but also from negative news reported by the media.

Keywords: Anti-Russian sanctions · State policy ·
The devaluation of the ruble

1 Introduction

Under the devaluation in Russia it is customary to understand the fall of the ruble relative to the “currency basket” or to the so-called “hard” currencies - the dollar and euro. Regular depreciation of the ruble, as shown by practice, occurs in our country due to economic and financial crises. So, in the crisis year of 1998, the ruble fell sharply: in just two months, its exchange rate relative to the dollar declined 3 times, from 6 to 18 rubles. As a result of the massive devaluation of the national currency, the Russian economy received a powerful impetus for further development, foreign investment came to the country, production began to be adjusted, and new jobs appeared. With the high cost of the dollar, active import substitution began [1].

The next stage of the devaluation of the national currency began in September 2008 during the global financial and economic crisis. The Russian authorities tried to calm the population, worried by the sharp fall in the ruble’s exchange rate against the dollar

and the euro. Thus, V. Putin, then the head of the Government of the Russian Federation, through the mass media in October 2008, urged Russians not to transfer their savings to foreign currency. "The case is doubtful," declared the national leader, "because it is not yet known what the dollar will be like." Communicating with the people in live TV, the Prime Minister assured the Russians: "There will not be any sharp fluctuations in the ruble's exchange rate." DA Medvedev, at that time the President of the Russian Federation, in an interview with the weekly *Argumenty i Fakty* on October 29, 2008, stated: "I have kept all my bank accounts. Money did not take off, did not translate rubles into dollars. I am sure that my savings, as well as the money of other Russian depositors, do not threaten anything" [2].

The CBR admitted that the devaluation of the ruble only two months after the fait accompli - November 10, 2008, when the national currency had already fallen in price by 17%. A few months later, on the official website of the Russian President, it was veiled to report on the devaluation: "We need to maintain it (the ruble's exchange rate) within certain limits, but at the same time this course should be slightly more flexible than it was recently, so as not to create internal economic problems." It is characteristic that after a few months, during which the hidden devaluation of the ruble lasted, DA Medvedev made an important reservation: "But everything that will be done will be done openly. And, of course, this should not lead to losses for citizens of the Russian Federation. Because the line of conduct of the authorities can not be the same as in 1998, when some decisions were made, and the next morning everyone woke up robbed, they felt that they had lost very, very much." On August 17, 1998, the Russians were declared defaulting and a large-scale devaluation of the ruble against the dollar: from 6 to 26 rubles per US dollar [2].

Prior to the 2008 crisis, Russia had international reserves that reached almost \$ 600 billion, ranking third in the world in this respect. To support the ruble in a crisis year 2008, a currency equal to 40% of the National Welfare Fund was spent in a short period of time. If the international reserves of the Russian Federation as of August 1, 2008 amounted to \$ 596.6 billion, then by March 13, 2009 they decreased by 220.5 billion to 376.1 billion dollars.

Here the question is quite pertinent: why about \$ 400 billion was not enough to avoid further devaluation? Perhaps because an impressive portion of these reserves were at that time in assets, to put it mildly, of questionable quality. Chairman of the Central Bank S. Ignatiev, reporting to the State Duma on November 19, 2008, confirmed the fact that Russia purchased dubious assets for petrodollars. Due to the imprudent placement of its international reserves in US securities in the amount of \$ 120.9 billion, on the eve of the global crisis it was in a very difficult situation and could not withstand foreign exchange interventions to deter speculative attacks on the ruble. Stronger than the Russian currency fell in the crisis only Icelandic krona - by 45.9%, Ukrainian hryvnia - by 42% and Polish zloty - by 41.3%. During this period, the Japanese yen added 17% against the US dollar [2]. The conclusion is unambiguous: what kind of economy, such and currency.

2 Problem Statement

In the situation that emerged in 2014, when the interbank market demanded new dollars and euros from international reserves to maintain the stability of the national currency of Russia, the Central Bank of Russia officially refused to provide financial support to the ruble. One of the strongest arguments in favor of this step is the preservation of the country's gold and currency reserves.

Note that the amount of currency in the country is sharply reduced due to the export of capital abroad. In recalculation on rubles the country left in a difficult time about 10 trillion. As if this large sum could not be spent in the form of investments to support the domestic economy, import substitution and equalization of the ruble exchange rate. The government, fixing the leakage of money from the country, tried somehow to prevent this negative process. First Deputy Prime Minister I. Shuvalov, speaking at a closed session of the Troika Dialog forum in Moscow, said that VEB's program to refinance a private external debt from the National Welfare Fund was closing. Recall that the government promised the oligarchs to allocate 50 billion rubles for this purpose. However, Vnesheconombank managed to distribute \$ 11 billion from the planned \$ 50 billion to the oligarchs who did not return the withdrawn money from the country. Among those who received state financial support: oligarchs O. Deripaska (\$ 4.5 billion) and R. Abramovich (\$ 1.8 billion), as well as State Corporation Rosneft (\$ 800 million) and a number of other commercial structures.

After the crisis, the export of capital from Russia did not end. Over the past eight years, businessmen have withdrawn from our country more than 700.7 billion US dollars, which at the rate of the CBR on November 30, 2015 exceeds 46 trillion rubles or more than three annual budgets of the Russian Federation.

Let's consider how to distinguish devaluation depending on its pace and size, what are its consequences in a country with a commodity economy, and how can devaluation affect the population?

Gradual (soft) devaluation is characterized by a gradual, as in 2014, almost daily change in the ruble against other currencies. Very decent money could be earned by the soft devaluation of the national currency against the dollar or the euro. If, as of 01.01.2014, one euro was worth 45.06 rubles, and after 10 months - 59.32 or 14.26 rubles more [3]. Consequently, converting Russian rubles on the eve of a mild devaluation or at the very beginning, you could not only save your savings, but also increase them by 32%. And a little waiting, that is, without fixing the profit received during the reverse conversion, it is possible, with continued devaluation, to increase its accumulations: in 2015, at the exchange rate of the Central Bank of the Russian Federation as of November 30, 2015, 1 euro is worth 70.39 rubles [3]. Feel the difference: 45.06 rubles for 1 euro as of 01.01.2014 and 70.39 rubles after less than two years.

Cheaper oil, anti-Russian sanctions, as well as tensions with Turkey due to the Su-24 bomber shot down over Syria and other negative factors have a negative impact on the ruble. So, in November 2015, prices for Brent crude oil fell below \$ 45 per barrel, reaching its minimum for the past four years. Recall that the price of a barrel of

oil (159 L) in the best years exceeded 145 dollars. The difference of \$ 100 per barrel affected the inflow of petrodollars to Russia and adversely affected the exchange rate of the national currency.

There are two types of changes in the exchange rate of the national currency: a phased or partial devaluation and a large or large devaluation. A phased (partial) devaluation is, as a rule, a slow, gradual change in the exchange rate. “Creeping” devaluation of the Russian ruble was used by financial authorities quite often, including in 2014–2015.

Large-scale or large devaluation is a one-time, but very large drop in the exchange rate of the national currency relative to stable currencies, which may be a multiple. The Russian state chose a soft or gradual devaluation from the very beginning of the new crisis. One by one, government officials reassure the population, arguing that there are no fundamental trends towards a large ruble weakening, and in general, it is not the ruble that fell, but “the euro and the dollar went up.” On their own experience, some of them (Finance Minister A. Siluanov, Minister of Economic Development A. Ulyukaev, head of the Central Bank of Russia E. Nabiullina, etc.) know how a bad forecast can damage not only the ruble exchange rate, but also the banking system, the stock market, economy in general. If you follow the recommendations of members of our government, then it is not worth translating your savings and savings into foreign currency. Let the money set aside for the purchase of imported refrigerators, washing machines, cars, apartments, etc., become cheaper from devaluation. However, Russians are slow to believe the authorities and prefer to visit exchange offices from time to time.

Commercial banks at this time can freely use the money of depositors to extract the maximum profit. For example: bought the bank for deposited money of depositors in January 2015, 10 billion US dollars, sold them (even at the official rate of the Central Bank of the Russian Federation) in November of the same year, it will actually receive a profit of at least 30–40%, and in good market conditions (depreciation of the ruble) - and even more. In absolute numbers, its gross profit will be about \$ 5,000,000,000 or 230 billion rubles. With such exchange rates, will this bank invest money in the real sector of the economy, in the production of cars, for example, where the rate of profit does not exceed 8–10%, according to different estimates, or even unprofitable, as in the case of the car factory in Togliatti.

Who benefits from the devaluation? First of all, raw materials exporters are interested in it. By selling their goods for more expensive dollars and euros, they will receive much more rubles for them, which they pay with their suppliers and employees, as well as tax authorities. According to some estimates, oil corporations received real benefits in this amount of 500–700 billion rubles.

The devaluation of the ruble is beneficial to banks earning huge profits at exchange rates. Turning the money depositors into dollars and euros, bankers throughout the period of devaluation in the country. After that, ruble deposits can be returned to the population and remain with a large margin.

Devaluation is beneficial to the state, since it allows improving the balance of payments, trade balance and capital inflow. As of April 6, 2018, the international reserves of the Russian Federation are \$458,9 billion [3], which, if necessary, will take effective measures to stabilize the exchange rate of the Russian ruble. In the existing conditions, the question is whether the further weakening of the ruble will be more

large-scale or it will remain smooth and controlled by the Central Bank. A large-scale devaluation may occur when the Central Bank is unable to influence the ruble's exchange rate against foreign currencies. These scenarios differ not only in economic but also in political consequences. As noted above, the country's currency reserves are not infinite. After the last dollar is spent on the currency exchange, the ruble will go into an uncontrollable fall. Some experts do not hesitate to call the rate of the Russian currency at 60, 70 and even 100 rubles. for the dollar. When his reserves run out, then the market will establish cross-rates. If no other order is introduced by an administrative (non-market) way. As of April 14, 2018 for 1 US dollar offered 63.4 rubles [4].

It is estimated that the appreciation of the dollar by only 1 ruble allows replenishing the state budget by 84 billion rubles. Having devalued the national currency against the US dollar by 30 points, the state was able to credit over 2.5 trillion additional rubles into the revenue part. If you want, you can easily calculate how many hundreds of billions were added to the state budget, the Reserve Fund and the National Wealth Fund at the expense of the exchange difference between the ruble and the dollar. Thus, the main beneficiary of the benefit from the devaluation of the ruble is the state.

Who does not benefit from the devaluation? First of all, the importers, and those enterprises that have debts in foreign currency, and the proceeds in rubles. Is it possible to expect that domestic entrepreneurs will now establish import-substituting production, as the government claims? Probably not. For more than eight years, they have been trying to establish their own production of high-tech equipment - machine tools, press-forging units, etc., but even under favorable conditions they could not complete the task.

What will the devaluation bring to the population? The answer is unequivocal: it worsens the situation of ordinary Russians, as it entails an increase in prices for imported goods. Devaluation implemented in 2014–2015. already felt by all the Russians. The prices for foreign cars, household appliances, clothing, footwear, cosmetics, foodstuffs and other goods from abroad increased 1.5–2 times in 2015 compared to 2013, and in 2016 it has significantly increased will increase. It will be harder with imported food. In the absence of imports, including fruit and vegetable from Turkey and EU countries, banned by decrees of the President of the Russian Federation V.V. Putin of August 6, 2014 and November 28, 2015, Russian producers of products, of course, will try to inflate prices, the more so the situation with Western sanctions and Russian anti-sanctions (embargo).

I would like to believe that the activation of the antimonopoly service will smooth out the price spike. Was it possible to solve problems with a deficit of the state budget in a different way without resorting to such a significant depreciation of the ruble and the indirect robbery of an already poor population?

It seems that other ways could be found in the social state. First, it can be painless for society, but with benefit for the state budget to reduce the bureaucratic apparatus. Initially, at least a third, if not half. Recall that over the past 10 years, the number of bureaucrats in our country has doubled. Secondly, by 15–20% you can cut government spending on investment projects. A well-known fact: when they undertook to recalculate the estimate for the Olympic facilities in Sochi, a reserve of “optimization of financing” was revealed by 15%. And if you count better? And not only Sochi projects, but also numerous federal targeted programs.

Was it worth spending 800 billion rubles for the preparation of the APEC summit, held only a few days in the Far East, if there is a beautifully restored for these purposes Konstantinovskiy Palace on the shore of the Gulf of Finland near St. Petersburg? After all, more than 200 billion rubles [5] were spent on building a bridge on the Russian Island, while in a number of regions the child benefit does not exceed 500 rubles a month. In crisis, the social state should take more care of its citizens, and support the poor. It is no secret that today in the Russian Federation, which declared itself a social state (Article 7 of the Constitution of the Russian Federation in 1993), more than 20 million citizens live below the poverty line.

Who else will lose on devaluation? Perhaps, it will lose the financial and economic block of the government. This is his unprofessional work brought the Russian business to critical borrowings abroad. They led the Russian economy to a prolonged recession and a new crisis in 2014–2016. and, the constant decline in the country's GDP, the constantly growing inflation and the deterioration of the lives of ordinary Russians.

Representatives of the Ministry of Finance and the Central Bank, advising Russians to keep their savings in the falling ruble, thereby contributed to the impoverishment of people. On their ruble savings, depreciating the beginning of the devaluation of 2013 to the present time by 2 times, the Russians will be able to buy now much less food and essential commodities due to the depreciation of their money. Many millions of people will feel the difference not only in their wallet. They can now see the difference between what is asserted on television, and what is happening in reality. Thus, citizens of Russia, having believed the members of the government and did not turn their ruble savings into foreign currency in time, suffered great losses. The volume of these losses practically corresponds to the degree of devaluation of the ruble and the percentage of its depreciation due to the growth of goods and services.

Devaluation and the accompanying inflation undermined confidence in the ruble. It's not just that our savings are depreciating. In fact, citizens from their savings are called upon to finance the budget deficit of the state. But in this case they were not only not asked, but even did not explain anything. And so the patriotic impulse did not take place. There was only bewilderment and irritation.

The entire gravity of the consequences of the devaluation of the ruble in Russia, coupled with the growing inflation, will increasingly be attributed to the government and political leadership, their inability to protect the population through anti-crisis measures. Our authorities are losing the opportunity to explain Russian economic problems only through the influence of the anti-Russian policy of the United States. This is evident from the letters of ordinary Russians to the mass media. For example, a resident of the city on the Neva River asks: "Is our government led by Prime Minister does not understand that it is not in savings, which many simply do not have, and that as a result of the collapse of the ruble immediately jump up the price of everything, and we again will we be robbed by our own state?" [6].

People of the older generation recall the 1998 crisis as a powerful but short shake, followed by a steady rise in the economy and the standard of living of Russians. In the new economic conditions, devaluation, according to many economists, will not give the same effect. The main reason is that, after the ruble devaluation a decade ago began to

increase world prices for oil, gas, metals, under those conditions contributed to the devaluation of the growth of exports (reduced its cost, multiply the ruble increased the profits of exporting capitalists).

Thanks to petrodollars, the incomes of subcontractors that served mining and processing of minerals increased. Together with the revenues of the treasury, the incomes of the population and the demand for goods, both domestic and imported, grew. But unlike the situation in 1998, at the end of 2015 - beginning of 2016, world consumers of Russian raw materials experienced a decline in production and did not need the same volumes and at the same high prices as before. European gas consumers, supporting Ukraine, provide it with reverse supplies of blue fuel, reducing at the expense of other revenues gas imports from Russia. And if the Nord Stream-2 gas pipeline is blocked, how the South Stream construction project was destroyed through Bulgaria [7], then external demand will not be as powerful a locomotive for the Russian economy as it used to be.

In the absence of high commodity prices, the state can resort to stimulating economic growth through cheap government loans. One of the key areas here is the allocation of money to the real sector for import substitution - the production of new modern technologies, equipment and replacement of obsolete production facilities, as in the conditions of Western sanctions, it is more than problematic to acquire new equipment and technologies abroad. You can also resort to incentives at the expense of tax benefits and other preferences to the real sector. Meanwhile, the government and the State Duma are not taking any serious steps in this direction. Apparently waiting for the high prices for Russian export raw materials to return.

Analyzing the situation, many Russian companies and banks often get rid of the weakening ruble to the detriment of their main activity. On the increase in demand for foreign currency can be judged by the volume of trading on the MICEX [8]. The dollar strengthens also because the Russians do not believe their government. This conclusion is not very pleasant to our government, but it corresponds to reality more than its forecasts about the development of the economy and the inflow of investment into it.

Thus, with the smooth devaluation of the ruble, there was a redistribution of the state's currency reserves and budget funds into the currency assets of banks, companies and the population. Most of all, banks, which, during the devaluation period, used their ruble reserves for converting into dollars and euros won, no doubt. As a result, the Russian economy is damaged because banks thereby reduce the volume of lending to the real sector of the economy.

3 Research Questions

Investigating the problems associated with the devaluation of the national currency, the authors attempted to disclose the following main issues. First, to show what causes affect the weakening of the ruble in modern conditions. Secondly, to determine how the devaluation of the national currency affects the Russian economy. Thirdly, on specific examples show who beneficially in Russia the weakening of the ruble, and who bears from this loss.

4 Purpose of the Study

The purpose of the study is to analyze the problems of the depreciation of the national currency in the conditions of the crisis and Western sanctions, to show the impact of the ruble devaluation on the economy and the standard of living of Russians.

5 Research Methods

The following basic methods are used in this study. The first and most important method of this study was the systemic and structural-functional approaches that allowed the authors to form a holistic view of the mechanisms of the ruble devaluation, to investigate the cause-effect relations of the weakening of the national currency in Russia. The institutional method made it possible to analyze the influence of various state institutions of Russia on the processes of devaluation or strengthening of the ruble.

6 Findings

As a conclusion, the following should be noted.

1. The economic sanctions imposed by the Western countries led by the United States can significantly slow down the growth of the Russian economy. The fact that in 2015 and 2016, Russia's GDP showed negative values, there is a certain negative impact on Western economic sanctions.
2. Apart from the negative consequences of the imposed sanctions, it is hoped that they will be an additional incentive for the modernization of the Russian economy, its transfer from the raw material to the innovative, industrial development path. And this work began with the implementation of the president's instructions on the need for import substitution, both in industry and in agriculture.
3. The reduction of foreign investment in the Russian economy forces the Russian government to take long-overdue measures, including more efficient use of domestic sources for the growth of the domestic economy. President of the Russian Federation V.V. Putin, speaking at a press conference in India on the results of the BRICS summit on October 17, 2016, referring to Western sanctions and retaliatory measures, stressed that the Western states "have never managed to achieve the goals for which they were committed with the help of sanctions." At the same time, the head of the Russian state noted that our country has regained its position as a full-fledged player in the political arena, and therefore, "the West seeks to hinder strengthening of our positions by any means" [9].
4. The response measures taken by the leadership of our country are capable of causing notable damage not only to Western economies, but also to introduce complications for domestic entrepreneurs.

5. The national currency rate is, in fact, the most reliable indicator of the strength of its economy. Assuming that the state of the ruble reflects the state of the economy, the conclusion will not be comforting. The weakening of the ruble against the dollar and euro means that all previous statements of the authorities about our “dynamically developing economy” have not been confirmed with the fall in oil prices. The fall of the national currency rate in half is an indicator that there is simply no sustainable economic development in Russia. It still depends on the world prices of raw materials, which sells to other countries.

7 Conclusion

1. Taking into account the prevailing oil prices, the success of American businessmen in increasing the extraction of shale oil, it can be assumed that the ruble exchange rate against the dollar and the euro will continue its decline. The devaluation of the national currency is accelerated by other factors, including the massive purchase of dollars by the Ministry of Finance of Russia (up to 2 trillion rubles) [10] to replenish reserve funds, as well as aggravation of tension in connection with the events in Syria and the Donbas. Therefore, in the opinion of the authors, not all are late with the conversion of the ruble into dollars and euros. This is also indicated by the increased demand for foreign currency in Russian banks recently.

2. Officials will voice the psychologically acceptable for citizens the bar so as not to cause panic, and over time will change it for the worse. As you know, we have not been punished for the mistakes in the forecasts for a long time. 3. In the conditions of the general recession in the Russian economy, each new forecast of members of the government is perceived as another recognition of a large-scale crisis and the inability of officials to cope with its consequences.

There is no doubt that with a deficit in the state budget, a further decline in the price of oil and other Russian exports on the world market, and a decrease in foreign exchange earnings, the Central Bank will again have to resort to devaluation, continuing the depreciation of the national currency.

4. Thus, the devaluation of the ruble, the most significant during the crises of 1998, 2008–2009, 2014–2016. continues and now because it is beneficial to the state, exporters, banks and exchange players. The real exchange rate of the ruble fell objectively as a result of the recession in the Russian economy, a decline in oil prices and a reduction in the country's gold and foreign currency reserves.

5. The best policy of the authorities would be to take effective measures for import substitution, modernization of production, not in words, but in reality to switch from raw materials to an innovative way of economic development. With the strengthening of the economy, the ruble would also be strengthened.

Time will tell which mark will end in 2018, the devaluation of the ruble. With the rise in prices for oil and other raw materials on world markets, the inflow of foreign currency will increase, and our ruble will be strengthened. But whether he will ever be equal to the dollar or the euro is a big question. For this to happen, the Russian economy should grow several times. And, of course, not by mining only minerals.

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The Development of Sociology in Russia: Methodological Positions and Praxeological Meanings

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Abstract. The article highlights the actual question of the origin, development and purpose of sociology in Russian society, its cognitive functions. Issues related to the subject of sociology, the search for methodological positions, principles and praxiological meanings are covered. The general historical aspects of science formation are considered from the point of view of conceptual approaches, traditions, knowledge, methods developed by joint efforts of sociologists. The authors set historical and sociological emphases, point out the originality of reasons for highlighting the processes of the formation of sociology in Russia as an independent scientific discipline, and note its role and significance. Being a part of a global process, Russian sociological thought has made a significant contribution to the development of world science. It has special features and original theories that reflect the features of the socio-political life in Russia, the state of social and philosophical sciences and the forms of their spiritual reflection in the self-consciousness of Russian rights. Sociological thought in Russian State arose due to the ideological aspiration to improve the personality and society and continues to be relevant today for the global, planetary development of humankind. Russian sociology was characterized in many respects by the fact that it had a humanistic orientation - an appeal to a person as to a creator, an active participant in transformations in society, the creator of a new reality.

Keywords: Sociological research · Development of sociology · Subject of sociology · History of sociology · Methodological positions

1 Introduction

Russian researchers made a significant contribution to the world sociology. In Russia, the development of this science took place in the second half of the XIX - early XX centuries and had a number of special features, in comparison with the countries of Western Europe. These features are due to two components: first, the features of Russian socio-political life; second, the state of social and philosophical sciences and forms of their spiritual reflection in the self-consciousness of Russian people.

By the second half of the XIX century there was an acute need for the reform in the state. The system of serfdom has outlived itself, burdened society with various

socio-economic problems. The Manifesto of 1861 proclaimed the abolition of serfdom; problems of economic, social and spiritual nature were existential ones.

The feudal system gradually disintegrated, and capitalist relations developed on its shaky basis with a clearly expressed world outlook of communal socialism. Among the consequences of these transformations is the fact that the positions of communal socialism have been weakened, bourgeois-liberal views have developed very actively, the social base has grown and on its basis the Marxist theory has been strengthened. So, the reform has provoked the formation of new social relations. There was a need for traditions and innovation interpretation with a constantly changing social structure. The existing sciences - history, ethnography, social statistics, metaphysics and philosophy - were unable to cope with this. In addition, a lot of sociological and demographic material HE ПРАВИТСЯ МАТЕРИАЛ on basis and new methods of cognition. (Dulina 2012).

2 The Formation of Sociology: Fundamental Beliefs

All this prepared conditions for the development in Russia of a new science - sociology. Its formation in Russian conditions took place along a special way; the worldview theories of Russian sociology had a number of differences from the social theories of the West:

- (1) In Russia, the issues of social science were discussed and interpreted for a long time using artistic means, i.e. through poetry, prose, journalism, etc. Actually, sociological thought in the Russian state arose from the ideological aspiration to improve the personality and society. The works of great figures as Yu. Krizhanich, M. Lomonosov, A. Radishchev, P. Chaadayev and due to the ideology of the Slavophiles and the works of B.C. Solovyov are still of great importance. The papers of these authors are excellent examples of the sociological analysis of society and personality that is emerging in our country. They succeeded in proving that Russian researchers understand the principles of the state system no worse than their colleagues from other countries, moreover, in some issues they significantly exceed them;
- (2) The formation and development of two polar theories - Westernism and Slavophilism. It is believed that this process is a preparatory stage in the formation of sociology as a science. Adherents of the Western theory were convinced that Russia in its development is passing the same way as other states. The Slavophiles held the view that Russia has its own destiny, and all the events and processes taking place in the country cannot be put into the framework of existing theories;
- (3) In the middle of the XIX century there were two currents based on Western ideas - positivism and Marxism. Researchers note that this is a completely natural historical process, since Russian sociology is very original; nevertheless, it developed in the general context of the world sociological process;
- (4) The praxeological meanings of the society's reforming concerning a worldview, closely aligned with the Marxist position, which combined with popular intentions, seemed to them to be the most understandable and humane.

So, the formation of national sociology was due to a number of factors, among which are the following ones:

- The increased interest of the intellectuals to the structure of society and its social problems;
- Active introduction of relations on the basis of capitalism, the complication of the society social structure and the growth of population's social mobility;
- The development of humanistic theories, through which oppressed people were helped to (Kravchenko 2014).

The creation and development of sociological science was of great importance for Russian culture, since a new form of thought arose. At the same time, sociology also had a profound social meaning: it theoretically showed that the rules operating in the country needed reorganization. Despite the Manifesto of 1861, survivals of serfdom continued to be present in the daily life of society. The old and the new were intertwined; this was the peculiarity of this period in the domestic history (Kravchenko 2010).

The formation and development of Russian sociology was influenced by the conservative views of a number of scientists who were either indifferent to the new science or opposed this discipline. It was not easy to break this resistance, so interdisciplinary relations changed only at the beginning of the 20th century. During this period, sociology was recognized everywhere and gradually the sociological point of view began to be widely applied in history, jurisprudence, psychology and other sciences precisely as a fruitful theoretical perspective in comparison with traditional approaches (Nemirovsky 2013).

The formation of Russian sociology took place in five stages:

The first stage – 1860–1890;

The second stage - 1890 - the beginning of the XX century;

The third stage is the first quarter of the 20th century;

The fourth stage - the 20 th–50 th years of the XX century;

The fifth stage - the end of the 50's– 90's of the XX century.

In Russia, as well in Western countries, by the mid-19th century, the ideas of Auguste Comte were known, but they were widely disseminated only in the early 1860s. Positivism was widely popularized. Its theoretical basis was the idea that society going through a historical evolution is developing regularly. Different sociological schools made this or that aspect of social life absolute, believing that it is worth taking it as the basis for the socio-historical development of society. Let us note that, being adherents of positivism, Russian sociologists did not blindly follow Western ideas: they criticized the philosophical views of O. Comte and other Western scholars. “Russian sociology in the XIX-early XX century in many respects characterized by the fact that it has a humanistic orientation - an appeal to a person as a creator, an active participant in transformations in society, the creator of a new reality” (Toshchenko 2009).

The first stage in the development of sociology as a science in Russia was marked by the initiation of various sociological schools and trends. One of them is the sociology of populism. Its adherents explained that Russia can go its own, non-capitalist way in its development; this can be achieved through active intervention in the

historical process. By the beginning of the 1880s, a revolutionary trend of Populistic Doctrine arose, striving for a peasant revolution. From the mid-1880s to the mid-1890s liberal ideas prevailed in this movement (Romanovsky 2012).

The middle of-1890's was marked by the decline of Populistic doctrine, since Marxism exerted a powerful pressure on it. Moreover, in 1902 a party of Socialist-Revolutionaries replaced Sociology of Populism. The revolutionary populists criticized the tsarist regime, tried to overthrow the autocracy and abolish feudal and serf remnants. The Populists did not support the development of capitalism in the country, idealized the peasant community, considering it the starting point of socialism. In general, they held the same views; their ideas differed only in the preparation and conduction of the revolution (Isachenko 2018).

One of the representatives of the Populist doctrine was P.L. Lavrov (1828–1900). He was a supporter of the longstanding propaganda of socialist ideas, because he believed that Russians are not ready to carry out a socialist revolution, not everyone realizes the need for a revolution.

Another representative of the Populistic doctrine should be considered M.A. Bakunin (1814–1876). Being the ancestor of domestic anarchism, Bakunin regarded sociology as a science of general laws that govern the entire development of society. He considered society as a natural way of existence of groups of people, regardless of any contracts. Bakunin believed that society is not subject to the will of legislators, it is developing very slowly, and it is influenced not by laws, but by individuals who show initiative (Romanovsky 2012).

Another representative of the populists was P.N. Tkachev (1844–1886), who paid great attention to the problems of progress. In his works, he expressed the view that progress reflects both nature and the individual organism, and human society. The main purpose of social progress is to balance people's needs and opportunities to meet them (Butorina 2009).

The next direction of sociological thought at the first stage is represented by a subjective school. Its brightest representatives are N.K. Mikhailovsky (1842–1904) and P.L. Lavrov. Their views tended more towards Subjectivism than towards Populism. He believed that the state and society are called upon to serve a person, and not vice versa, so they should not drown out the voice of progressive thinkers, since this can provoke stagnation and lead to death (Ponomarev 2007).

N.K. Mikhailovsky, examining the subject of sociology, emphasized the analysis of the processes of struggle for individuality, i.e. human integrity in its relationship with social structures. Respect for a person, his personality and identity can only the state with formed social order. According to Mikhailovsky, socialism is “the creation of a personal beginning through the mediation of a community one” (Romanovsky 2012).

In the second half of the 70's of XIX century Mikhailovsky began to study the psychology of the “crowd”. The most important merit for Russian sociological thought is the development of the theory of imitation (Yudashkina 2015).

During this period there was also a naturalistic trend. His best representative was L.I. Mechnikov (1838–1888). He spoke about two main problems: social progress and its criteria, the mechanism of social progress, which is a solidarity. A key indicator of social progress is the degree of freedom in the creation of cooperation. Mechnikov was

sure that it was characteristic of social progress to pass through the same stages of solidarity as to the organic world.

The fourth direction was organicism. A.I. Stronin (1826–1889), P.F. Lilienfeld (1826–1903) and other representatives of this movement hypothetically identified the society with an organism. Stronin represented the structure of society in the form of a pyramid, at the top of which there is elite (judges, legislators, administration), in the middle there are capitalists, and the bulk of society is represented by farmers and artisans which are the foundation of this pyramid.

From the point of view of P.F. Lilienfeld, society has the characteristic features of the body that performs physiological (economic), morphological (legal) and individual (political) functions. Class struggle and revolution, he regarded as abnormal phenomena, “pathology” of the organism.

Representatives of the psychological direction examined the psychological mechanism and social forms of an individual or a group of individuals’ behavior manifestation. E.V. De Roberti (1843–1915) believed that social evolution is the main factor of sociology. Evolution, in his opinion, consists of seven categories: psychological interaction, social groups, personality, science, philosophy, art and practical activity (Nemirovsky 2013).

In his turn, N.I. Kareyev (1850–1931) believed that society is a combination of psychological and practical interactions between people. He called it a “superorganic environment” composed of social organization and cultural groups that are the subject of sociology studies (Osipov 2012).

M.M. Kovalevsky (1851–1916) and his pluralistic school were a separate line of sociological thought in Russia. According to the researcher, sociology is a set of results obtained by specific social sciences. Sociology aims at establishing laws and trends of social development.

The last of the main trends that took place in Russia during that period was orthodox Marxism. Its ideological inspirer was G.V. Plekhanov (1856–1918). He subjected to profound and thorough criticism the methodological foundations of bourgeois sociology and philosophy, contrasted it with Marxist sociology. He developed key problems of sociology based on materialism. Plekhanov strictly criticized Kovalevsky’s views (Yadov 2011).

At the second stage of development (1890 - the beginning of the 20th century), Russian sociology had trouble. Mechanical natural science was in crisis, strengthening the ant positivist trend, opposed the study of social phenomena through the methods of natural sciences, against the fact that sociology was drawing closer to natural science. This caused the development of a neo-Kantianism; it was criticized by vulgar naturalism, evolutionism and mechanism (Isachenko 2014).

The main features of neo-Kantianism are the priority of logic, criticism of concepts and language of sociology and epistemological philosophizing. Russian sociologists believed that in Russia this current had several branches: a sociological epistemology, a subjective normative concept and the concept of individual psychologism (Yadov 2011).

Sociological gnoseology had an orthodox core, whose bright representatives were A.S. Lappo-Danilevsky (1863–1919) and B.A. Kistyakov (1868–1920). The first noted that it is necessary to move from “journalistic amateurism” to the scientific

professionalism of sociology, since this abstract, generalizing science cannot use the concepts of physics, mechanics or energy. In his turn, B.A. Kistiyakov believed that society is the mental interaction of people, so the spatial categories for its analysis will not work. He pointed to the crisis in modern social cognition, the methodology will help get out of it. Kistiyakov demanded to reconsider all the foundations of Russian sociology.

Representatives of the subjective-normative concept are P.I. Novgorodtsev (1866–1924) and V.M. Khvostov (1868–1920). The first researcher paid attention to the inner world of man; he believed that the person is not a passive product but a part of the social environment. He believed that society is the consciousness of individuals. He created the idea of a “system of moral idealism.” One can achieve idealism breaking the positivism.

L.I. Petrazhitsky (1867–1931) put forward the concept of individual psychologism. The researcher believed that sociology is a science that is aimed at studying human participation in the processes of society. The key concepts of sociology, in his opinion, are social behavior and motives (emotions), although it some commonly believed that they are society and values. The history of humankind according to Petrazhitsky suggests that the intelligence of norms and institutions is constantly growing, the humanity of the means for implementing norms is growing, and social action is accelerating.

Another direction of that historical period was legal Marxism. Its outstanding representatives were S.N. Bulgakov (1871–1944), N.A. Berdyaev (1874–1948), M.I. Tugan-Baranovsky (1865–1919), P.B. Struve (1870–1944). These figures criticized the populism. They believed that the only true way for Russia is capitalism. They were against the socialist revolution and the dictatorship of the proletariat. They built their liberal-bourgeois political program on borrowed Marxist economic ideas (Yadov 2011).

On this time interval, orthodox Marxism is further developed. Its theoretician continues to be Plekhanov, and V.I. Lenin (1870–1924). These two researchers looked directly at the problems of society. Lenin did not perceive the idealistic basis of the sociology of the Narodniks at a later stage in the development of Narodism. On the eve of the October Revolution, these contradictions provoked an irreconcilable struggle.

The third stage in the development of Russian sociology (the first quarter of the twentieth century) is characterized by the development of the neopositivism, its representatives are K.M. Takhtarev (1871–1925) and P.A. Sorokin (1889–1968). Takhtarev denied the Marxist understanding of the class struggle, contrasted it with inter-class cooperation and solidarity. Labor, according to the researcher, must win in the public struggle, but it must be creative and truly social.

P.A. Sorokin did not accept the socialist revolution and was an ardent opponent of it. He represented sociology as a science that independently studies the common ancestral properties of people’s interaction with each other. Sorokin believed that sociology should be “built” like other natural sciences. It can and must be a theoretical and objective science, and in order to be “experienced and accurate”, it should get away from the “barren” metaphysics and be based on facts. The rupture of sociology with philosophizing will entail a break with monism.

This process requires the following conditions:

- (1) The presence of one or more individuals.
- (2) The existence of acts that determine their actions.
- (3) The presence of conductors.

Sorokin presented a structural analysis of society and singled out two criteria for the classification of social groups:

- One-sided: individuals are divided into one group according to one characteristic;
- Multilateral: individuals are grouped into two or more features.

He believed that groups can be close (race, sex, age), open (party, association) and intermediate ones (class, estate, second family). Sorokin was also the author of the theory of social stratification. In his view three strata are distinguished: political, professional, economic. He created the theory of social mobility (vertical and horizontal) (Yadov 2011).

The fourth stage in the development of Russian sociology (the 1920s and 1950s) was marked by the wide dissemination of theoretical sociological literature that revealed the subject of Marxist sociology, formed the sociology of Marxism and defined its position among other social sciences.

Marxist sociology developed in several directions. Thus, a significant part of Marxist sociologists was influenced by the work of N.I. Bukharin's «Theory of Historical Materialism: A Popular Textbook of Marxist Sociology» (1921). This textbook equated sociology with historical materialism.

Other sociologists were of the opinion that sociology is a part of philosophy. This point of view was expressed by Wolfson, Chernyakov, and Katzenbogen. In accordance with the third concept, historical materialism distinguished philosophical (materialist understanding of history) and sociological (general theory of society) aspects. Another group of philosophers believed that Marxism is alien to any sociology (Luppol, Sarabyanov, Deborin). There were also other currents, called “social Darwinism”, “Freudianism”, “social reflexology”, “phytosociology”, etc.

Positivist and naturalistic interpretations of the life of society spread broadly in this period. They recognized naturalism: they studied society, relying on the appropriate laws of nature. Sociology, in their opinion, is a part of natural science, social processes are also biologized. There were also mechanistic views on the life understood phenomena of causality, necessity, repeatability, and also denial of chance (Dulina 2012).

3 The Development of Sociology in the Twentieth Century: Discussion Issues

In the twenties of the XX century, domestic sociology received the greatest development. At that time various discussion ideas were formed, scientific disputes were held, the most significant of which was a two-year discussion (1927–1929) in the journal «Vestnik». Opponents expressed their views on the structure and driving forces of society's productive forces development. At the same time, during that period there was

an active discussion of the class relations problems in the transition period, the creation of a new structure of society, which was formed due to the October Revolution.

It is worth saying that forming of Marxist's sociology had many difficulties in the USSR. It was necessary to solve the tasks of cultural construction, since there was a process of demarcation between Marxist and non-Marxist sociologists. In addition, a significant part of country's population was illiterate; there was a shortage of trained cadres of Marxist sociologists (Martseva 2017).

At the fourth stage of Russian's sociology formation much attention was paid to the problem of labor's management and organization. There was a "boom" of sociological research in the field of labor under the leadership of Gastev, Strumilin, Kerzhentsev, Yermansky, etc. Journals "Economics and Management", "Production, Labor and Management", etc. were published.

A number of sociological studies were devoted to family and marriage issues: for example, works of Lunacharsky, Kollontai. Certain shifts have been relieved in psychology and pedagogy (Shatsky), in the field of the sociology of criminality (Kufayev, Tarnovsky, Zmiev, Manns), studies in the field of the media (Marr), etc. In other words, sociology in Russia begins to be divided into various branches, widely empirical research is conducted.

In the following decades, the totalitarian regime of the USSR prevented sociological science from developing. Sociology was in decline, as Marxism became the ideological basis of all social life. Social science was not allowed to develop historical materialism, political economy and scientific communism (Devyatko, 2011).

Khrushchev's "thaw" in the late 1950's marked a new fifth stage in the development of sociology in Russia. Sociological science was under the yoke of dogmatism and scholasticism and needed rehabilitation, in the return to the mainstream of Marxism. It was to be proclaimed that historical materialism is actually sociology, and sociology is used only for carrying out applied research. There was a paradox: sociology was not recognized as a science, but sociological research was conducted.

The first studies were episodic. Later they acquired the necessary scale - the scale of social and sociological research. By the mid-60's. XX century there are works summarizing the results of many studies. Among them is the book by Kharchev "Marriage and Family in the USSR", collective monographs "Working Class and Technological Progress" by Osipov and "Man and his work" by Zdravomyslov et al. (Romanovsky 2012).

Further development of sociology (the 70–80-ies of XX century) was very controversial. So, only one part of sociology was recognized, but its development was slowed down as depended on party's decisions. However, the organizational development of sociology in Russia continued. In 1968 the Institute of sociological research began its work, in 1988—the Institute of sociology of Academy of Sciences. Social research departments have been established in the regions. Since 1974, takes roots the journal "Sociological research", which later became known as "Socis". The end of the 1970s was marked by administrative and bureaucratic interference in sociology on the part of the state. Theoretical sociology was again criticized and denied, sociological research began to be conducted less frequently, and its quality was low.

Such an invasion in sociology could lead to negative consequences for science. However, the new situation in the state had improved the situation of sociology: the

science was restored in the “civil rights” in 1986, This problem was solved at the state level, because the aim was to expand basic and applied research in the country. Modern Russian sociology is strengthened meaningfully and organizationally, it has revived as an educational discipline. Today, this science develops material about society in Russia, when the country is going through a turning point. Modern sociology not only assesses the social processes taking place in the country, but also predicts the further development of the Russian state (Romanovsky 2012).

4 Conclusion

The origin and formation of national sociology took place in the framework of the global sociological process, but had a number of features that were due to the specific socio-political life of the Russian state in the middle of XIX – early XX centuries. A significant role in this process played the state of social and philosophical sciences, methodological positions and praxiological meanings, as well as their spiritual reflection in the self-consciousness of the Russian people.

Sociology as a science was established in Russia during five stages. Throughout the history of the development of national sociology, public figures and philosophers raised questions related to its subject and its own methodological principles of scientific research. Sometimes they converged and sometimes there were irreconcilable contradictions, which became even more acute due to the political events that took place in the country.

“The history of sociology testifies the difficult way of formation, development and enrichment of methodology and methods of studying social reality. Both, Soviet and Russian literature, interpreted in different ways the basic positions concerning the analysis of the object and the subject of sociology, the levels and structure of sociological knowledge, the conceptual apparatus of sociology, the relationship of this discipline with other sciences and, first of all, with philosophy” (Toshchenko 2014). The contrast of conceptual approaches, the formation of methodological positions and the formulation of concepts once again confirms the dynamism of the development of Russian sociology, which is so important, necessary and expedient for the further development of the country.

Currently, applied and fundamental research is being conducted in Russia, which allows not only to objectively reflect social processes, to correct the modern worldview, but also to predict future trends and development strategies of Russia (Romanovsky 2015).

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Pension Practices of Russian Younger Generation

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Abstract. The article is devoted to the formation of pension practices of Russian younger generation. The article pays a special attention to the necessary conceptualization of the concepts of “practice retirement” and “retirement behavior of the youth.” Based on the results of empirical research carried out in line with the qualitative and quantitative strategy, the authors identify groups of young generation of Russians focused on different models of pension behavior. One of the most represented groups of young people are “pension nihilists”, characterized by the denial of institutional and non-institutional norms of pension behavior, the lack of relevant ideas about the pension future.

According to the authors, the Central problems of the “pension issue” of Russian youth is distrust of the existing state and non-state pension investment system, the lack of formation of pension plans and strategies. The paper also presents such aspects of “pension problems” of young people as nihilistic attitudes of young people regarding the formation of future pensions, lack of confidence in the effectiveness of the current pension system in the Russian Federation and understanding the principles of its functioning, illusory ideas about their own pension future. Reproduction of negative pension practices of young people will undoubtedly adversely affect the functioning of the entire future national pension system.

The need to develop relevant measures aimed at improving the General level of pension culture of the younger generation is actualized.

Keywords: Pension practices · Youth · Trust · “Pension nihilism”

1 Introduction

The problems associated with the functioning, formation, development of the pension system are multidisciplinary and cover statistical, demographic, socio-economic aspects.

The most pronounced, from our point of view, problems include:

- Problems caused by legislative instability of the system. Multiple, not always successful attempts to reform the pension system, the lack of sustainable state guarantees, form a spectrum of legal and socio-economic contradictions. The history of the current stage of reforms of the Russian pension system is counted from 1995, when the Government of the Russian Federation approved the concept of reform. The concept defined the general framework, mechanisms and structure of

the new pension system, identifying in it the basic, insurance and funded parts. Today's development of the pension reform was set up, in fact, not by this document, but by a government program developed in 2000 with the active participation of the Ministry of Economic Development (the "Gref program") [1].

- Problems of economic unpredictability of the pension situation. In 2012, the state failed to reach the level of pension provision in the late 1980s. not only by the replacement rate, as in 2016, but also by the structure of the pensions paid, according to their size [2]. In 2015, a new pension system began to operate in Russia, which includes changes in the procedure for the formation of financial savings and in their calculations [3].
3. Social contradictions: high differentiation of incomes of the working and non-working population, social polarization of pensioners, relative to different types of social activity, and, last but not least, the emergence of emergent groups that are not subjects of the pension system.

Initially, the concept of changing and reforming the pension system was focused on the transition from a distributive to a funded principle of the formation of pensions. Social accumulation, according to world practice, should be integrated during the active social and economic life from different social groups. Such a mechanism declares the postulate of social solidarity of generations. The leading role in the realization of these functions should be realized by young people, however, real youth practices do not yet show active participation either in the process of creating pension provision for current pensioners or investing in their own pension base.

The concept of "social practices", traditionally in sociological science is used in relation to the stable, repetitive, constant actions of individuals. However, the use of this category for the analysis of pension savings is used for the first time.

At the applied level, we formulated two main hypotheses, reflecting the most important aspects of the pension practices of young people. Firstly, in the structure of the younger generation of Russians, a youth group dominates, oriented toward nihilist pension practices; secondly, the source of nihilism is an extremely low level of trust in state and non-state pension mechanisms.

2 Urgency of the Research

The relevance of studying the pension practices of the younger generation of Russians is due to a number of theoretical and practical problems.

First, at the methodological level, there is no basic sectoral discipline that accumulates pension problems, accordingly, the blurring of the subject of "pension" research hinders its development. Secondly, issues related to the definition of a spectrum of theoretical concepts, such as pension practices, "retirement nihilism", the retirement culture of youth, are unresolved. Thirdly, the methodological basis of "pension research" is also insufficiently substantiated, often the methodological framework is omitted, yielding the niche to only fragmentary empirical studies.

At the methodological level, there is a shift in the themes of applied research towards the study of pension and pre-retirement groups of the population, leaving brackets for youth groups.

3 Theoretical Grounds and Degree of Elaboration of the Problem

3.1 Theory of Social Practices

Despite the existence of a list of unresolved problems, the aspects of the problem of pension practices of young people that are being studied already have a certain scientific elaboration.

Retirement practices in sociological literature are social practices, by which is meant “the totality of the methods of activity adopted in culture, the skills of dealing with various subjects; thinking or acting out of habit, following the rule, behavior that has a ritual character; private social institutions” [4].

In classical sociology, social practices are considered at the level of the following theories: P. Bourdieu’s constructivism [5], structuration theory of E. Giddens [6], the ethnomethodology of G. Garfinkel [7].

Proceeding from classical definitions, we can conclude that social security can include pension provision, which as practice is characterized by the fact that it is constantly reproduced in society, has some orderliness in time and space (getting a pension on a certain basis or after reaching the established age).

According to the indicated approaches to the disclosure of the concept of social practices, we can conclude that at the initial level, any action performed by an individual in society acquires the social significance. Further social action, which is often repeated, becomes a social practice and at the last stage reaches the highest, institutional level, becoming a social institution. The institutional principle is implemented on the basis of relevant normative legal acts and the ideology, money and material resources that exist in the society and includes direct organizational work of all levels [8].

Nihilist pension practices involve a complete or partial denial of the pension system functioning in modern conditions, an anomie of pension standards, a high level of mistrust of the existing mechanisms of pension investment, and the absence of formed life plans.

Despite the fact that young people do not yet represent an active participant in the pension system, it is a powerful resource for the subsequent reproduction and creative functioning of the latter. Some aspects of the pension behavior of young people are reflected in publications carried out with the financial support of the Russian State Foundation for the Humanities and the Russian Foundation for Basic Research. We can mention the works of S.E. Vershinin, O.I. Vlasova, N.B. Kostina [9–11]. Some attempts at a sociological comprehension of the problems of retirement nihilism of the younger generation are considered in the publications of S.B. Abramova, O.I. Vlasova, I.V. Chebykina [12, 13].

3.2 Concept of Social Trust

The study of the phenomenon of trust was carried out by such domestic researchers as S.E. Vershinin [14], I.V. Glushko [15], E.V. Zhukovskaya [16], as well as foreign scientists A. Seligmen [17], F. Fukuyama [18], however, an analysis of this category is of particular interest, presented by the Polish sociologist P. Shtompka [19].

Trust in existing pension state and non-state institutions is an important element in the formation of sustainable pension practices. So Fukuyama F. defines trust as one of the main factors that determine the economic growth of society: “the expectation among members of the community of the expectation that its other members will behave more or less predictably, honestly and with attention to the needs of others, in accordance with certain general norms.” Consequently, the level of trust inherent in different societies determines the pace of social capital formation and affects the economic development of countries [18]. Zhukovskaya E.V. defines the norm of trust as a norm of behavior, “in which the actions of the subject imply his positive opinion on the conscientiousness, reliability or quality of the object of trust and acceptance by the subject of risks associated with the unreasonableness of this opinion” [16]. In this regard, trust as a socio-cultural phenomenon and the basis for the formation of pension practices includes such valuable components as sincerity of relations, the mutually supportive nature of social interconnection and a certain dynamics in its development, the commonality of the interests of subjects of confidential relations.

3.3 Modern Concepts of Youth

Currently, the universally accepted definitions of young people in Russian sociology, developed in the 1960s and 1980s, are no longer relevant. XX century, considering the youth as a socio-demographic group [20].

Under real conditions, a transition is made from the linear concepts of young people, which assume a transition, from childhood and adolescence to adulthood, to nonlinear ones [21]. For modern youth, such changes as the transformation of age boundaries and types of activity become characteristic.

4 Methods of Research

As information and analytical sources of research are: analysis of statistical information, analysis of secondary sociological data.

The empirical basis of the work is qualitative and quantitative research conducted to study trust as the basis for the formation and implementation of pension practices. The study was carried out using the semi-formalized interview method. The method of quota sampling, the sample size of 400 people, the quotas for gender and age are chosen as quota marks. The sample represents the age and sex composition of youth in Yekaterinburg. Primary sociological data are subject to qualitative and quantitative treatment. The quantitative information block was processed using the statistical package SPSS.

5 Main Results of the Study and Their Practical Importance

Briefly describe the respondents. Among them, 53% of women and 47% of men are young people aged 18 to 23 years - 45%, from 24 to 29 years - 29% and at the age of 30 to 35 years - 26%. The majority (65%) have higher or incomplete higher education and are not married (74%). The ratio of working and unemployed youth is 52% to 48%. Most often, students do not work. Nonworkers more often as reasons are indicated by job search, difficulties in finding a job in their specialty, or lack of desire to work (36%, 21% and 18% respectively).

Working youth are officially employed and receive «white wages» (59%), two-fifths of respondents (41%) receive a «salary in the envelope». The number of people receiving unofficial wages may be higher, as indicated by a high proportion of those polled (70%) who negatively refer to non-working and self-employed citizens (traditional representatives of the “gray” employment market) banning travel abroad. We can assume that the payment of salaries “in the envelope” has become one of the norm in modern Russia, and in fact the formation of a culture of honest payment of taxes (including pension contributions), the practice of voluntary self-accumulation of pension funds by citizens is a topical task for the Russian Government.

What can be associated with such unformed everyday practices of independent investment and the consent of young people with informal wages, and, consequently, the uncertainty of the pension future? We will try to answer these questions.

First of all, young people do not understand how their future pension is being formed. Knowledge of this has only 43% of respondents, the rest either do not know about the principles of forming a future pension, or they find it difficult to assess their awareness (42% and 15%, respectively). Men are more informed, and women are more often uninformed or find it difficult to answer.

Only 39% of young people thought about ways to increase their pensions (while a concrete plan for the formation of savings is in 20%), and 58% did not even think about it. At the same time, the presence or absence of thoughts about the formation of a pension depends little on the age of the respondents.

The main source of income for reaching the retirement age is that young people see: continued work (48% of respondents will try to find a job, and 35% intend to continue working in the profession), every third (37%) intends to live on savings, every fourth (28%) expects to children’s help, one in five (19%) plans to receive income from the rental of real estate, one in every six (15%) hopes to live at the expense of products grown on their own in the country, in the subsidiary farm and independent management, one in ten (9%) will move to a smaller for the area of the apartment (house), and the resulting difference will be gradually spent, or dreams of obtaining an inheritance. Only 2 out of 5 respondents (18%) expect to receive an additional pension from the private pension savings system, to which they are currently making or are planning to make deductions. The received data confirm the low level of awareness of youth about the possibilities of independent formation of pension savings, as well as the expressed orientation of young people to solve the “pension issue” on their own.

Having information on the existence of non-state pension funds (71%), only half (54%) of respondents can make voluntary contributions to such funds from their

earnings to receive an additional non-state pension, and only 25% do them (21% in aged between 18 and 23, 26% between the ages of 24 and 29, and 31% between the ages of 30 and 35).

Among the reasons preventing donations to non-state pension funds (NSPF), the low awareness factor is leading - 67%, these respondents either do not know anything about NSPF, or do not have enough information to choose a specific NSPF. In 40% of cases, the reason is a banal shortage of funds for deductions, and one in five (21%) simply does not trust the NSPF. Also, one in five (21%) can't assess their incomes and expenses in the future and, accordingly, does not understand whether there is a need to start cooperation with NSPF.

The most reliable, according to the opinion of half of the young people (55%) is the state pension fund, only one in four respondents (25%) considers a reliable NSPF, and one in five (20%) has not yet formed a point of view on this issue. The state fund is more inclined to trust women than men with incomplete higher education. The relationship with age is equalized - the older the respondents become, the more of them the NSPF is ready to trust. Perhaps, this is facilitated by accumulated information on pension provision issues, and experience of interaction with non-governmental organizations.

The main "white spots" in the pension system for young people are the laws that protect the rights of consumers in the pension sphere, as well as actions in case of violation of rights (83% of respondents would like to know about it), risks in using and managing financial services of pension funds (81%), the structure of the pension system and the existing ways of creating savings for old age (76%), methods of setting financial goals and forming a personal financial plan (74%).

As a source of information on these issues, young people want to see representatives of pension funds (33%), as well as independent financial advisers (32%) and higher education institutions of economics and finance (30%). In addition, it could be representatives of non-governmental organizations or public organizations engaged in the protection of consumer rights (28%), as well as government organizations regulating these markets (21%).

Currently, the main information on the activities of pension funds is provided mainly by relatives and friends (60% of respondents), mass media and advertising (45%), approximately equal numbers of young people receive data from specialists of the RF pension fund (26%) and non-state pension funds (24%), as well as from employers (20%).

The main problem that young people are singling out in the current pension system in Russia is the low level of pensions (66%). In addition, the problem of unformed labor market for people of pension and pre-retirement age, creating difficulties in employment of this category of citizens (42%), and an annually increasing minimum length of service for retirement (40%) also represent a problem. There are also complaints about the work of the state pension fund. First of all, inefficient information work on the part of pension funds (45%) and non-earmarked expenses of the pension fund (construction of new buildings, a large staff of officials, etc.) that could be retired (27%), insufficient professional management of funds citizens, leading to a low level of profitability (below inflation) in both state and non-state pension funds (22%), the lack of people's ability to manage their pension savings independently (20%). All this leads

to an increase in the gap in the standard of living between workers and retirees (37%), the formation of a market for «black» and «gray» salaries, because of which the pension fund lacks pension contributions from working citizens (24%), the formation of a consumer attitude of Russians, as to the compulsory good that the state must provide (18%) (Table 1).

Table 1. Problems that can be identified in the current pension system in Russia.

Problems of the current pension system	%
Low pensions	66
Inefficient information work on the part of pension funds	45
The difficulty in recruiting retired people	42
Annual increase in minimum length of service for retirement	40
Increase in the gap in living standards between workers and pensioners	37
Non-earmarked expenses of the pension fund	27
Developed market of «black» and «gray» salaries	24
Low level of profitability (below inflation) in pension funds	22
Decrease in the able-bodied population and an annual increase in the number of pensioners	21
The lack of people's ability to manage their savings	20
Consumer installation of Russians	18
Absence of indexation of pensions to working pensioners	16
None of the above	1
Difficult to answer	1
Total	380

Effective measures to overcome the prevailing negative trends, according to the youth, could be, first of all, programs aimed at raising public awareness and transparency of information in general (Table 2).

Table 2. Actions by the state that could help increase confidence in the pension system.

Measures to increase confidence	%
Completeness and clarity of information on the existing pension system and on changes in it	55
Targeted implementation of programs to increase the pension literacy of the population	45
Availability of information on the existing pension system and on changes in it	34
Transparency of income and expenses of the pension fund	34
Awareness of citizens about their savings associated with deductions	28
Involving the media in covering the problems of pension provision	27
The possibility for citizens to determine the value of transfers to pension accumulations	18
Difficult to answer	4
Total	245

According to Table 2, the problem of informing, transparency of pension savings and pension fund activities is a key measure, the decision of which could change the attitude to the pension system and increase its credibility critically.

6 Conclusions

The results of the study allow us to draw the following conclusions:

- (1) despite the fact that young people are thinking about their retirement future, now they are applying or are ready to apply for this minimal effort. This is indicated by the significant employment in the shadow economy (at least, agreement with the payments “in the envelope” in full or in part, as well as a large proportion of calling themselves unemployed but not necessarily unemployed in fact young people) and the consent of young people to work on such terms.
- (2) the majority of young people believe that their pensions will not be enough to live on, therefore, as the main sources of financial security after reaching the retirement age, first of all they consider the continuation of their work activity, they rely on personal savings, as well as help of children. This indicates an unsatisfactory evaluation of their pension future, as well as a low assessment of the effectiveness of the existing pension system. Perhaps this is due to the negative experience of older relatives (parents, grandparents) and acquaintances, because it is from them that they receive basic information about the current pension system.
- (3) it is quite obvious that the level of pension activity is affected by such a factor as age - with increasing age, the involvement in the process of forming a future pension increases. At the same time, even among the most senior respondents, the activity in terms of forming a funded part of the pension through NSPF or other investment instruments is quite low and does not cover even half of the respondents. The main problem is not financial, but information. The young people do not have enough information about how and where to invest money, how their rights are protected, what risks are involved in investing in NSPF, about the structure of a modern pension system, etc. Information on these and other aspects of the pension system the youth would like to hear from professionals.
- (4) In general, information work on the part of both state and non-state pension funds is poorly conducted. Low awareness contributes to the tension, the search for alternative sources of saving their own funds, the withdrawal of young people to the “gray employment” zone, or causes passivity with regard to disposing of their savings in the state pension fund (so-called “silent”).

Pension provision is one of the main guarantees for the social protection of disabled citizens by the state, whose goal is to ensure social stability and sustainable economic development of the society. One of the urgent problems, both in the economic and social sphere, remains the social security of the aging generation. As a result of the instability of practices associated with the reform of the pension system, the trust of not only the population to this structure as a whole, but also the youth in particular, on which the financial security of current pensioners depends, is lost in the society.

Trust is an integral indicator, this component can be analyzed on the basis of allocated markers. The low confidence in the possibility of influencing their future retirement leads most of the youth to the idea that it will not be necessary to count on the state to help them with pensions, many plan to continue working (as long as they have enough strength) and live on personal savings. As regards the satisfaction with the financial situation, there is a pessimistic attitude, negative evaluations prevail. Despite some information about the current pension system and its structure, a more detailed analysis showed that this knowledge is at a low level, a significant part of the youth lacks the specifics and practical information. An equally important indicator of trust is the presence of stereotypes about the current pension system, the activities of state and non-state pension funds. All this indicates a low level of trust, both to state and non-state funds, to the pension system in modern Russia as a whole.

7 Practical Significance

Theoretical interpretation and practical approbation of the phenomenon of trust in relation to pension practices has undoubted practical significance in terms of searching for an optimal system of indicators that make it possible to translate a very shaky, emotionally filled category (trust) into a channel of empirical indicators. The data obtained can be useful for the development of monitoring systems for researching public confidence in the pension system (especially in the vein of the project to raise the retirement age for Russians) and can be used by various pension schemes: the Pension Fund of Russia, non-state funds and structures, and federal and regional authorities in the development of programs to increase the attractiveness of pension provision in Russia, the formation of positive pension practice in the youth environment.

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Managing Elements of the Service Sector as the Basis for Improving the Quality of Life of the Population

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Abstract. Improving the quality of life of the country's population is a task which solution is at the forefront of the government of any country in the world. Economic development, geopolitical situation, regional peculiarities and many other heterogeneous factors cause significant differences in the standard of living of the world population. Therefore, clarifying the patterns and features of managing the quality of life of the population at the level of the territory acquire special significance. The article is devoted to theoretical and applied aspects of the use of system-parametric analysis for the ordering of a set of heterogeneous indicators, most of which are formed in the service sector, and determine the quality of life of the population. The results of the research make it possible to partially satisfy the needs of management theory and practice in studies based on modern versions of the system approach to solving the problem of improving the quality of life management of the population not only on a national scale, but also on territorial entities, as for the whole population, the current and to individual social groups and layers.

Keywords: Management · Service sector · Quality of life of the population · Program-target method

1 Introduction

Improving the quality of life of the population is one of the priorities of modern Russian society. For post-perestroika Russia, for the first time in 1994, the conceptual framework of the federal law “On the quality of life of the population of the Russian Federation” was developed, in which the analyzed phenomenon was viewed as the degree of satisfaction of the material, spiritual and social needs of the individual, the provision of consumer goods, the observance of constitutional human and citizen rights. The document places special emphasis on the development of the service sector, as a basis for improving the quality of life of the population, and the management of its elements. In addition, the law paid attention to working time, rest, social security, housing, health care, medical service, the state of the environment, education and culture.

The quality of life of the population of the state in general and its territorial formation in particular primarily depends on the country's production and resource potential, as well as the level of development of the service sector. At the regional

level, the quality of life and approaches to its improvement are undergoing major changes related to differences in the climatic, ecological, socio-cultural environment, which widens the range of possible managerial decisions.

2 Relevance

Actual issues of the quality of life of the population were repeatedly considered in the last annual messages of the President of the Russian Federation to the country, there the fight against poverty is defined as the main national task. The problems of choosing priority areas in the management of the region's services to improve the quality of life of the population of Russia are due to cardinal changes in the social system and its individual links. There was a need for a combination of interests of territorial entities and subjects of economic, social and cultural activities. The basis for effective management should be a multi-dimensional systematic approach to assessing the quality of life of the population, involving serious research on the socio-economic development of society. Such an approach allows diagnosing the standard of living of the population, to reveal the tendency of development of the terms of this category and to offer economically justified variants of managerial decisions.

Improving the quality of life of an individual is possible only if there is an adequate system of economic criteria reflecting its level and well-functioning socio-economic management mechanisms.

Leveling of existing economic disproportions is one of the priority tasks of state administration, called to combine interests of territorial entities and all subjects of society. The state apparatus has to address the issues of quality of life management in a new way in conditions of delineation of powers between federal and regional authorities, and also to coordinate interests of the state, business and the population on the basis of partnership relations.

Known approaches to assessing the country level and the quality of life of the population used by international organizations do not allow them to be used fully for regional studies because of differences in the functioning of economic systems and methods for calculating baseline parameters.

The lack of methodological approaches to justifying the selection of priority areas in the management of the service sector from the perspective of improving the quality of life, adapted to regional specifics, determined the relevance of the article.

3 The Scientific Significance of the Issue with a Brief Review of Literature

Theoretical and practical issues of managing the service sector from the perspective of improving the quality of life require more substantive consideration. A modern methodology for the formation of quality criteria for managerial decisions and the standard of living of the population, adapted to the regional specifics of the Russian Federation is needed.

Economic methods of managing various spheres of activity within the framework of an integrated, systemic, program-target approach are reflected in the works of A.G. Aganbegyan [1], I. Ansoff [2], L.I. Evenko [5], O.V. Kozlova [9], D. Mercer [12], G.Kh. Popov [16], O.S. Vikhansky [22], A.A. Weyher [23] and others.

Methodology of statistical research and evaluation of various aspects of the level and quality of life of the population are researched in the works of I.I. Eliseeva [6], M.R. Efimova [7], E.V. Ilyenkova [8], L.L. Kozlova [9], A.E. Surinov [18], N.P. Tikhomirov [20], F.N. Zavyalov [24].

A wide range of problems in managing the quality of life of the population, a system analysis of this complex category, as well as issues of stabilizing the economy and its transition to sustainable development, were considered in the works of M.G. Delyagin [3], A.M. Lavrov [10], V.F. Mayer [11], R.I. Schniper [19], S.D. Valentey [21] and others.

Nevertheless, the task of ensuring effective quality of life management remains topical.

4 Formulation of the Problem

At the same time, we are aware that the management of the service sector from the standpoint of raising such a specific segment as the quality of life of the population, along with the general characteristics as a whole, has its own peculiarities, which intensify in the conditions of economic instability [14]. At the same time, the management of the above-mentioned system itself has a quite definite measure of complexity that is realized simultaneously on several aspects: methodological, methodical and concrete.

An analysis of the first aspect of the complexity of managing the quality of life of the population of the region showed that among the most significant methodological approaches to it, three approaches can be distinguished.

The first approach is aimed at studying the intra-organizational, intra-program cut of this type of activity.

The second approach focuses attention on the problems of the relationship between the object of research and the external environment.

And, finally, the specific nature of the third direction of the approach is precisely the scientific analysis of its procedural aspect.

To analyze the management of the phenomenon under study in the methodological aspect, simultaneous realization of all three approaches is necessary.

Simultaneous implementation of the above approaches to the management of the analyzed sphere does not mean that it does not have its own methodological specifics. The thing is that common concepts sometimes include, as part of the management of non-productive, social and regional spheres. At the same time, the system of regional management of the quality of life has its own specificity, which is connected, first of all, only with the beginning of the process of reproduction of the aggregate of favorable conditions for the population of a single regional administrative unit.

It follows that the main methodological feature of regional management of the sphere of services from the perspective of improving the quality of life is the

consolidation of the available opportunities in the territory (region) to produce effective conditions for the reproduction of favorable life-support factors for its population.

In philosophical terms, this problem reflects yet another type of dialectical contradiction between opportunity and reality. The resolution of the above variety of the identity of opposites between the subject and the object of control can be carried out in various ways. The beginning of the most optimal way of resolving the existing dialectical contradiction between the possibility and the reality is, in our opinion, a program-target, multidimensional, system-parametric approach to the analysis of the management of the service sector, with emphasis on the quality of life for the individual subject of the Russian Federation.

5 Theoretical Part

The methodological aspect of the complexity of the problem being studied involves the consideration of the main types of administration. In general, scientific management of society can be divided into the following types: economic, political, social, spiritual, each of which has its own specifics.

An analysis of the specifics indicates that the management of the quality of life of the population of the region is by no means confined to just one area of society's life. The first feature of the phenomenon being studied is, as it were, the blurriness, indistinctness, diffuseness, determined by its presence, albeit to varying degrees, in all the above-mentioned spheres of management, without exception.

At the same time, the regional administration of spheres that shape the quality of life of the population can be viewed as an independent, internally uniform, type of leadership that has only inherent characteristics. The fact is that this type of management includes a certain correlation of economic, political, social and spiritual standards. In addition, the autonomy and unity of such a sphere as the management of the region's services sector presupposes the existence of a separate, clearly verified program for its improvement.

It should also be noted that the problem of progressive management analysis has acquired a special sharpness only now, in the conditions of a sharp change in the system of qualitative life priorities for the economic situation of the population of the region and the country as a whole.

The basis of any kind of program-objective analysis should be models, including statistical-mathematical. In this case, several of their variants are used simultaneously: analogs at the level of elements and models at the level of structures.

The category "quality of life" is multidimensional. Therefore, for a more complete and in-depth study of this category as a system, it is necessary to use system analysis as a methodological tool for research. In turn, the system analysis allows to identify priorities in managing the quality of life of the population in the region.

System analysis is often defined as a methodical approach or a way of solving complex problems in conditions of uncertainty. It is used there and when other quantitative methods of analysis have not justified themselves and simply are not applicable. One of the main tasks of system analysis are: defining and detailing the components of the goals and ways of achieving them, identifying the existing

relationships between them, providing a certain logic for solving the problem (goals - ways to achieve goals - resources). The application of the structurization method contributes to the solution of these problems, which makes it possible to distinguish it among other methods of system analysis. The methodology of using the structuring method with the construction of a target tree for revealing the facts that allow improving the quality of life of the population has been considered in detail in [15].

The construction of the goal tree and decision tree is based on the application of system analysis.

Further contains coefficients of relative importance (CRI), which reflect the weight of the initial indicator of the system in management when the overall goal of its development is reached. The logic of constructing the potential function of the integral quality of life assessment within the framework of the block and in the whole system allows interpreting the weight coefficients of the standardized characteristic values as coefficients of relative importance.

The presented technology prioritization for managing the quality of life of the population provides, first of all, the ranking of the blocks by their weight in the potential function of an integrated assessment of the quality of life of the population and the further grading of the terms for the CRI in the potential function of each unit.

Calculation of indicators, the procedure for selecting the directions for the development of services and management decisions is based on the example of the Krasnoyarsk Territory. The processing of the initial data reflecting various aspects of the quality of life of the population of the Krasnoyarsk Territory was carried out in detail [13].

6 Practical Part

Initially, the ranking of priorities for managing the quality of life of the population was carried out according to two potential functions, constructed according to seven (1) and five (2) block systems (Table 1). For convenience of use, we add to the notation of the integral characteristic by the system, in the form of an index, the number of blocks entering into the function, which will allow us to represent the equation in seven blocks:

$$\tilde{y}(7) = 0,056y_1 + 0,253y_2 + 0,891y_3 + 0,073y_4 + 0,365y_5 + 0,025y_6 + 0,016y_7 \quad (1)$$

on five blocks:

$$\tilde{y}(5) = 0.124y_1 + 0.564y_2 + 0.814y_5 + 0.0557y_6 + 0.035y_7 \quad (2)$$

Achieved results of the five-element construction, give the highest priority to the fifth block - "Health and public healthcare", the second block - "income and consumption" and the first block - "mesoeconomics". In the seven group structure the first place belongs to the block "housing conditions", the second to the "health and healthcare" block, the third one - "income and consumption", the fourth - "education", the fifth - "mesoeconomics", etc. Thus, the ranking in the group of seven parameters shifts in relation to the five group gradations in two steps, without changing the order of priority.

Table 1. Ranking of priorities for quality management of the population of the Krasnoyarsk Territory in the system on two bases of the target state of the object.

Indicators	Method of calculation	Options	In the section of blocks						
			Block 1	Block 2	Block 3	Block 4	Block 5	Block 6	Block 7
Target value of the potential function	$y_k^* = \sum_{j=1}^n \beta_{jk} Z_{jk}^*$	Including the 3rd and 4th blocks	31.3	141.7	498.9	40.9	204.6	14.2	8,9
		Excluding the 3rd and 4th blocks	31.3	150.7	0.0	0.0	204.6	14.2	8,9
The square of the target value of the function	$(y_k^*)^2$	Including the 3rd and 4th blocks	977.3	20070.8	248973.3	1668.9	41872.3	201.9	78.4
		Excluding the 3rd and 4th blocks	977.3	22579.6	0.0	0.0	41872.3	201.865	78.373
The weighted value of the coefficients of standardized indicators of the quality of life of the population in the context of blocks	$\tilde{\beta}_{jk}^* = \frac{y_k^*}{\sqrt{\sum_{k=1}^m y_k^*{}^2}}$	Including the 3rd and 4th blocks	0.056	0.253	0.891	0.073	0.365	0.025	0.016
		Excluding the 3rd and 4th blocks	0.124	0.564	0.000	0.000	0.814	0.057	0.035
Ranking blocks by the weighted value of the coefficient to determine the priorities in the management	Rank method	Including the 3rd and 4th blocks	5	3	1	4	2	6	7
		Excluding the 3rd and 4th blocks	3	2	–	–	1	4	5

Therefore, the constructed hierarchy of blocks by significance in the potential function does not depend on their number, but is the result of the priority influence on the final integral indicator of the system of incoming initial parameters.

The results allow us to say with certain certainty about their correctness and the possibility of using the weighted values of the parameters of the potential equation as coefficients of relative importance.

The next step is to rank the indicators within each block by the weight of the characteristics in the potential function of the corresponding block. Let us compare the equations forming a complex assessment of the quality of life of the population in two blocks, where the threshold values of the parameters are determined both by subjective estimates of the population and by the boundaries of the “reference” region which is the Tomsk region.

To indicate the belongings of the function, additional symbols “B” were introduced according to the results of the sample survey, “I” - according to the region of the leader. The results of a selective survey of the population of the Krasnoyarsk Territory in determining the target value of the parameters for the “income and consumption” block formed the following intra-group dependence:

$$y2(B) = 0,024z_{12} + 0,028z_{22} + 0,029z_{32} + 0,965z_{42} + 0,178z_{52} + 0,304z_{62} + 0,276z_{72} + 0,208z_{82} \quad (3)$$

on the block “housing conditions”:

$$y3(c) = 0.106z_{13} + 0.043z_{23} + 1.347z_{33} + 0.061z_{43} \quad (4)$$

The equation for the second “income and consumption” block has the form:

$$y2(n) = 0,023z_{12} + 0,023z_{22} + 0,012z_{32} + 0,971z_{42} + 0,083z_{52} + 0,107z_{62} + 0,052z_{72} + 0,185z_{82} \quad (5)$$

for the third block - “housing conditions”:

$$y3(I) = 0,076z_{13} + 0,009z_{23} + 0,996z_{33} + 0,043z_{43} \quad (6)$$

Ranking of priorities in the context of the blocks established the following gradation of the terms of the complex evaluation by blocks (Table 2).

An ordered distribution of the parameters of the blocks in two variants of the threshold values revealed an identity in the results for the block “housing conditions” and insignificant differences in order of priority of the “income and consumption” block.

In the highest degree, the quality of life of the population in the second group of indicators depends on the proportion of the population whose incomes are higher than the subsistence minimum. The result obtained coincides with a subjective and objective approach to the definition of the target state, which has a logical explanation at this

Table 2. Ranking of priorities in determining the level of quality of life of the population of the Krasnoyarsk Territory in terms of blocks of “income and consumption” and “housing conditions”.

Blocks	Indicators	Symbol	Based on the results of the sample survey		At the achieved level of the region leader	
			The weighted value of the coefficient	Rank value	The weighted value of the coefficient	Rank value
Revenue and consumption II	Average monthly income, thousand rubles	x_{12}	0,024	VIII	0,023	VII
	Average monthly nominal accrued wages of workers in the economy, thousand rubles	x_{22}	0,028	VII	0,023	VI
	The average size of the designated monthly pensions, thousand rubles	x_{32}	0,029	VI	0,012	VIII
	The share of the population with cash incomes higher than the subsistence level, %	x_{42}	0,965	I	0,971	I
	Relation to the cost of living: – per capita monetary income	x_{52}	0,178	V	0,083	V
	– average monthly salary	x_{62}	0,304	II	0,107	IV
	– the average size of monthly pensions	x_{72}	0,276	III	0,052	III
	The share of incomes of the population remaining after payment of compulsory payments, services, goods	x_{82}	0,208	IV	0,185	II
Housing conditions III	Average housing availability per one resident, apt. m.	x_{13}	0,106	II	0,075	II
	Share of households (including singles) who received housing and improved housing conditions, %	x_{23}	0,043	IV	0,009	IV
	Proportion of usable of housing stock, %	x_{33}	1,347	I	0,996	I
	Share of well-maintained housing stock, %	x_{43}	0,061	III	0,043	III

stage in the development of society. The second place in terms of importance is given to the ratio of the average nominal wage and the subsistence minimum, according to the region - the leader, it belongs to the indicator characterizing the share of "free" money left by the population after paying the necessary expenses for life support.

The discrepancy between the "interests" in the population of the two regions is explained by the significant difference in the level of incomes, and the natural shift of priorities in their transition from one category of security to another. The ratio with the living wage of the accrued pension is on the third place in importance. The importance of the criterion characterizing the incomes of the most vulnerable population is due, on the one hand, to a significant proportion of pensioners in the total population of the regions. On the other hand, the meager excess of the average size of pensions over the subsistence minimum places this category of population on a state borderline with poverty. Together, both circumstances significantly reduce the quality of life of the population in the Krasnoyarsk Territory. The prioritization of the second group of terms is symptomatic and corresponds to a society with a low income level.

The differentiation of the parameters of the third block based on the results of the two approaches in the formation of the target state completely coincides in significance. At the same time, the key role in the group of factors belongs to the indicator reflecting the share of a suitable housing stock. The change of priorities and the transition from quantitative to qualitative assessments of housing conditions indicate an increase in the level of population satisfaction and a transition to a new stage of development in this sector.

Thus, we have consistently considered various options for setting targets and scenarios for their implementation in the preliminary stage of analyzing the constructed potential dependencies.

The obtained results once again clearly show a significant divergence in the range of target values of the components of the quality of life of the population, determined from the data of selective observation and the achieved level of a similar region, which leads to a discrepancy of priorities, and as a consequence to a different direction of the target vector. Therefore, the construction of the goal tree and, as a result, the event tree should be based on threshold values, determined collectively by objective and subjective approaches.

The identified sequence is an optimal scheme for managing the quality of life of the population of the region. When developing measures to achieve the threshold level of the target value of the criteria, it is necessary to adhere to the hierarchies contained in it.

The use of priority schemes based on the relative importance of objective functions for multicriteria tasks will make it possible to purposefully raise the level of vital activity and thereby bring the quality of life of the population in the region closer to the target state.

In fact, this scheme represents an optimal management of the improvement of the quality of life of the population in the region.

7 Conclusions

Summarizing the results obtained in this article, we can distinguish the following key provisions:

1. The task of defining methods for improving the management of the service sector as a basis for improving the quality of life of the population is solved on the basis of the program-target method. Its use is justified on the one hand by the presence of a significant set of indicators characterizing the quality of life of the population, grouped into nine groups, and on the other hand, by a significant variation of the particular characteristics included in each block. The obtained results, on the one hand, allow estimating the degree of population satisfaction with the actual quality of life level if the threshold value is determined from the survey data or the achieved level of life support if the target value is established by the parameters of a similar system. On the other hand, the size of the necessary growth of the main components of the social, financial, political well-being of the population.

2. The obtained results of the research allow to substantiate the primary influence on the level of quality of life of the population of the region group of indicators forming the blocks “housing conditions”, “health and healthcare” and “income and consumption”. Consequently, taking into account the specifics and trends of the development of the region, the peculiarities of geographical location, these aspects of life activity are prioritized in importance in the multi-criteria concept of “quality of life” for the population of the Krasnoyarsk Territory.

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High Technologies Is the Driver of Economic Growth of the Russian Economy

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Abstract. The paradigm of public administration in the field of high technologies is formulated and discussed in the article. It is stated that the development in the new Millennium is based on actual challenges, which include the transition to a new technological mode, the trend of globalization of economic systems, the phenomenon of the information economy, geo-economic and geopolitical changes, changes in the structure of the goods and services cost. The article presents evolutionary approaches, principles of public administration in the high-tech sector of the Russian economy. There is formed the structure of specific characteristics of innovative processes in the sphere of high technologies where three levels are distinguished: methodological, allowing to determine the vector of research areas, the development of scientific and technological knowledge and the drivers of economic development; theoretical, describing the organizational and economic mechanisms of developing the priority directions of innovative activity; logical, formulating methods of managing high-tech innovative projects implemented by the micro-level entities. The research based on a complex interrelated study of all 3 levels, allows to create a multi-faceted scientific approach to the management of innovation processes in the field of high technologies.

Keywords: Innovations · Management · Economy · High technologies · Growth driver · Economic growth

1 Introduction

The Russian Federation entry in the third millennium is caused by number of strategic challenges: change of technological wave (with V on VI); globalization and integration of world economic system; informatization of all processes of public and business life of society (phenomenon of information economy); change of polarity of the world (BRICS), geopolitical changes; downward influence rate of base material and power-generating sectors on products cost. Capability of the Russian economy to beat back these global challenges will define national competitiveness perspective, the nature of productive forces development and industrial relations and, finally, the welfare of the community [2, 17].

In modern conditions the development of the national innovative capacity impossible to implement isolated, within one country [19]. There are as world integration and cooperation tendencies in the research and production sphere, and competitive aspects of research, transfer and diffusion processes. Innovative projects more and more turn international, cooperative and network. Change of world technological wave (transition to VI) defines what research directions become dominating, and what form as the main directions of strategic investment. Within the VI wave new knowledge domains become subject to close attention, form and develop as “high technologies”: nano - bio - information and cognitive technologies [9]. Unfortunately, development of the national high-tech sphere faces a number of the objective difficulties reducing rates of transformations of the Russian economy at the present stage: there is no clear understanding of essence and contents of the notion of high technologies, and as a result, there are no principles of the priority directions allocation of the national innovative policy; there is no system, scientific school and, as a result, there is no forecasting methodology of complex scientific and technical development at the macro and meso levels which would allow to allocate perspective spheres of scientific research; the consecutive system of the research results embodiment in mass products (transfer of technologies) constraining not only development of scientific potential, but also forming of urgent technology base of industrial production is not created [13].

Real processes of transformation of the Russian economy, its transition to innovative way of development, on the one hand, and the objective difficulties caused, more, by insufficient development of organizational and economic controlling mechanisms high-tech innovative activity define the relevance of this scientific research. There is still the problem of the principles research and the innovation management theory forming in the field of high technologies which will propose the scientific and methodical solutions promoting development of management system by the high-tech sector economy of Russia on macro - meso - and micro levels [12].

2 Science Problem Readiness

The research of innovation management organizational and economic aspects in the field of high technologies is under the spotlight of the world scientific community. Today this field of theoretical economy is the most popular that is confirmed by the growth rates of scientific and practical publications number (more than 12% a year).

The scientific research specifics of innovative processes in the sphere of high technologies is the necessity of all 3 layers theoretical aspects studying. The first layer at the methodological level allows to define the tendency, also vector of research works relevant domain, scientific and technical knowledge development and drivers of economic development. On the second the theoretical principles, organizational and economic development mechanisms of the priority directions of innovative activity on macro - and meso - levels are developed. And, logically, the third level, relying on the 1st and 2nd, allows to create methods of the high-tech innovative projects management methods realized by subjects of micro level. The research based on the complex interconnected studying of all 3 layers allows to create complete scientific approach to innovative processes management in the field of high technologies [8].

At the same time, it should be noted that all set of innovative activity modern researches at the methodological and theoretical levels has no answer to a number of questions: about set of innovative processes management methods applicable to the sphere of high technologies; the choice of adequate management models for the accounting entities implementing high-tech projects; the adequate to the modern world processes to public administration principles of the high-tech sphere.

Relevance of answers to the matters, their importance for further development of the national high-tech sector, integrality from the theoretical point of view allow to consider them as problematique of this article.

The purpose of the scientific-research article - development of theoretical bases and methods of the innovative processes management in the field of high technologies [16]. The following tasks within the research purpose are set:

1. Scientific-theoretical analysis of high technologies, their phenomenal essence and their economic contents.
2. Forming of the conceptual scientific provisions opening role of scientific technology development in structure of modern economic processes.
3. Development of the theoretical principles and model of economy of the hi-tech sector.
4. Development of the theoretical paradigm of innovative process considering urgent institutional characteristics of the high-tech sector.

Research object - process of forming and development of high-tech innovative activity in the Russian economy in the conditions of forming of the VI technological wave.

Research question - the theoretical principles and methodical bases of innovation management in the field of high technologies.

Research methods - system and situation analysis. For the solution of applied tasks and innovative processes management models creation in the field of high technologies there were used economic-mathematical methods and models, structural analysis, the analysis of systems of creation and determinacy of linear trends, correlation analysis.

3 Results and Discussion

Reliability and validity of research results are based on the comprehensive analysis of the earlier performed research works on the research question; application of the approved scientific methodical system in the research; reasonable use of economic mathematical models and methods, modern achievements in the field of innovation management; approbation of researches results in practice.

Scientific novelty consists in forming and development of methodological provisions, management theory and practice of innovative activity in the field of high technologies, in the conditions of Russia economy transformation and transition to the VI technological wave.

The most meaningful research results:

1. Idea of high technologies is developed on the allocation signs such as innovation, knowledge intensity and systemacity of basic innovation; phenomenal essence is defined as the belonging to technological wave. Institutional changes of world economy within the VI perspective technological wave as characteristics of the environment of development of the high-tech sector are formulated.
2. Theoretical regulations on the economic categories interrelation; the notions of technological wave, innovative cycle and process are developed; the understanding of their reference to different levels of economic aggregation - macro - meso - and micro is offered. Infratrajectory of the VI technological wave on the basis of the 'innovation' as indicator of development of macrotechnology are synthesized.
3. The theoretical paradigm of innovative process considering urgent institutional characteristics of the high-tech sector and its driver factor system of fundamental knowledge are developed.

The theoretical implication of research is that the provisions offered by authors can be used in applied and fundamental researches in the field of high-tech sector management of the Russian economy, and also it is useful as the training course to the students and graduate students.

The practical implication of research consists in applicability of using its theoretical, algorithmic and methodical results in practice for forming the national technology development strategy, scientific justification of federal target programs of high-tech industries development, methods and models addressing to innovatively active enterprises of the high-tech sector.

Authors have created theoretical basis of scientific discussion concerning the innovative processes management theory of national economy high-tech sphere. Theoretical focus of scientific problem is created and the categorial device of research is offered. Formalization of high technologies as institutional category within the modern economic theory appeared as a result of scientific research.

Characteristics of high technologies having qualitative and quantitative categorization are put forward and proved:

1. "systemacity of basic innovation" is accepted as the concepts of NBIC convergence answering and connected in development with one of 4 urgent macrotechnologies (Roco M. C., Sims W.): information, bio - nano - or cognitive [14];
2. the level of innovation of the industry is the share of morally new products in goods turnover of $\geq 60\%$;
3. the level of knowledge intensity of the industry is SR&ED share in costs for innovations of $\geq 17\%$.

Notion of high technologies is developed as the scientific and technology directions having the high level of innovation and knowledge intensity, expressed and localized as strategic drivers ("locomotives") for all spheres of researches, productions and replications of innovations within the current technology wave [15]. Thus, the essence of technology wave and objective signs of its display are specified that are processed as the emergence of the new high technologies implementing the potential of system basic innovations, opening, inventions [4].

In the context of the put-forward provisions there are formulated scientific points: high technologies can be considered as the directions of scientific and technical development within only the current wave; technologies of the previous wave are the basis for development of the high scientific and technical directions of the following; on the development of G. G. Malinetsky scientific points it is said that groups of high technologies are expressed through macrotechnologies (NBIC in the VI wave), and the nature of their dynamic change through infratrajectory (Fig. 1) [6].

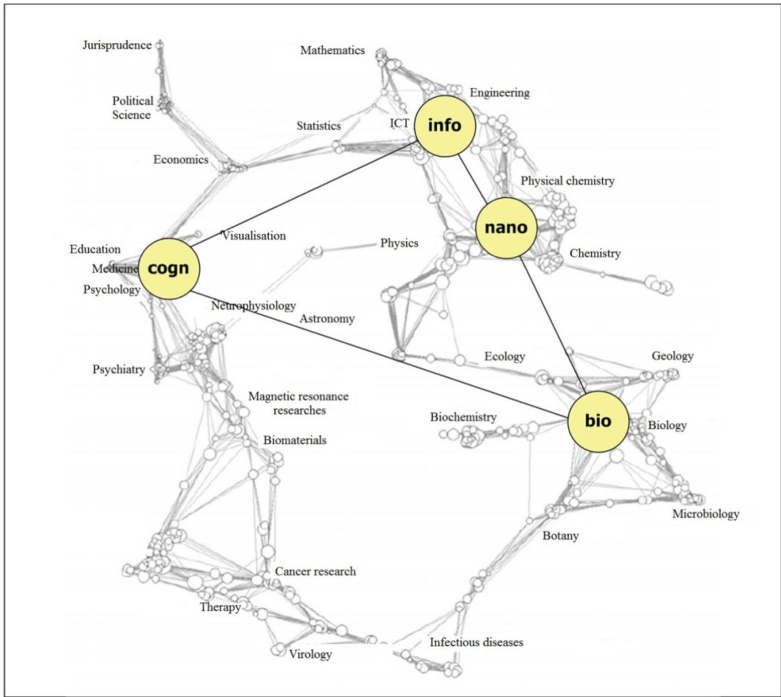


Fig. 1. Card of Scientific Knowledge Convergence with the placed structural accessory of macrotechnologies according to the NBIC convergence paradigm.

Within the VI perspective wave the following institutional changes treated as characteristics of the new environment of the hi-tech sector scientific technology development are expected:

1. Reduction of time of transformation of fundamental researches results into innovative products, merging of fundamental and applied research works institutions;
2. Knowledge forming as the new key scientific and technical development resource. Costs growth for SR&ED in the innovative expenses structure of the hi-tech sector leads to the new formation - “knowledge-driven economy”;

3. Informatization (Internet) and virtualization of economic communications based on the infocommunication technologies created in the V wave. Change of the principles and conditions of the transactional relations which are defined as “network economy” [5].

The formulated characteristics, the principles, notions and points are considered as methodology framework of urgent research object which is the high technologies [3].

Technological wave from the scientific-theoretical position is defined as global, universal tendency of “production function revolution” (Schumpeter J.), accumulation of essentially new, high technologies [11]. Wave shows its economic substance within specific innovative cycles and processes. As the principle of separation authors offer criteria of level of economic system: macro - meso - micro. It is accepted that wave is for macro -, cycle for meso - and process corresponds to micro- level.

Only processes of innovations of subjects of managing (enterprises) are objective in the practice of innovative activity. Innovative process is understood as the sequence of the idea transformation to commercial benefits or competitive products, the cycle and way are levels of aggregation, which are reflected the set of processes [7]. From this position allocation of industry tendencies through concept of cycle is justified. The cycle through indicator of innovation expresses the dynamics of meso-level processes.

The industry has also the general base of fundamental, often applied knowledge. Single innovative processes forming of the industry is based on the general scientific result [18]. Thus, authors offer the developed notion of innovative cycle as sets of industry innovation processes constructed on the single scientific-theoretical decision (the invention, discovery, technology).

Such concept of cycle has very important theoretical reading of the following contents. Implementation of single macrotechnology of wave means set of innovative cycles, which are consecutive (and) or parallel implementing the transfer of general fundamental developments (Table 1) for the industry. Each of developments representing technology is a source of variable (competitive) innovations, the processes realized by certain subjects of managing. Thus, wave, cycle and process are considered in the uniform field of description, i.e. in the innovation economic development of units through time [21].

For demonstration of inadequacy of the offered scientific-theoretical paradigm of communication between categories of wave, cycle and process there have been synthesized consecutive cycles and processes for info - macrotechnologies 6 of wave (Table 1).

Besides, statement has been brought that the dynamic description of infratrajectory of G. G. Malinetsky can be constructed through index of economic sector innovation [6].

Having investigated dynamics of number of high-tech industries, authors have come to the scientific conclusion that the high-tech industries monotonously grow on innovation indicator level within the current technological wave (in range from 25 to 75%) [10].

The put-forward points form the theoretical platform, the paradigm of economics and management questions research of the high-tech sector.

The research of high-tech innovative processes has allowed to allocate number of specific conditions of their implementation. They are caused both by development of

Table 1. Elements of technological wave, innovative cycles and processes interaction model [17].

Legend	Contents
The VI technological wave, macro - level	
Cogn	Infratrajectory of cognitive technologies development. It is synthesized on Beynon M., Nehaniv C.L., Dautenhahn K., 2001
Bio	Infratrajectory of bio – technologies development. It is offered on the basis of the allocated trends of Biotech 2010 Life Sciences, 2011
Nano	Infratrajectory of nano – technologies development. It is created on the basis of RUSNANO corporation forecasts (RUSNANO Corporation data of 2007–2015)
Info	Infratrajectory of information technologies development. It is made on futurological vision of Webster F., Robins K., 1986
Innovative cycle, meso - level	
The Info macrotrajectory components	
SPC	Supercomputers creation technologies, scientific and technical trend of development - speed and reliability of computing systems. Industrial automatic equipment is also considered as technology subsegment. Global suppliers of SR&ED decisions are corporate research centers, the companies Fujitsu, Tianhe, Cray, IBM, NEC, IBM, Intel, Hitachi
bPC	Technologies of mass consumer information and communication systems creation (computers, phones, tablets, etc.). The main trend of development of innovation is miniaturization and expansion of device functionality, telecommunication systems (TV, radio, the Internet) are considered as subsegment to the termination of cycle. SR&ED decisions are concentrated in global corporations: Apple, Sony, Samsung, LG and others
AI	Technologies of artificial intelligence, technology subsegment enter the biocomputers directions. One of key production cycles of the VI way, connected with development of decisions in spheres bio - nano - and cognitive technologies (NBIC convergence). At the moment is at stage of fundamental research works, development is concentrated in the USA research establishments (ACM/SIGART, Office of Naval Research, NASA/Ames Research Laboratory, National Institute of Statistical Sciences, National Science Foundation, US Defense Advanced Research Projects Agency (DARPA) and Russia (The Russian Research Institute of Artificial Intelligence)
GPS	Global Positioning and Navigation System (also known as GPS) provides determination of the exact time and coordinates of land objects. It is one of key technologies binding subsegments of information and telecommunication systems. 4 enlarged innovative processes are allocated (GPS 1–4, hereafter). Consumer segment development is performed simultaneously in alternative GPS systems, Galileo, GLONASS (The Russian system), and SR&ED is distributed in space segment and connected in consumer segment (signal receivers)
Innovative process, micro level	
GPS cycle components	
GPS 1	Forming of primary technology solution by the U.S. Department of Defense (start of satellites, creation of receivers) for military complex needs of the USA and NATO. Efficiency and innovative prospects of the technology direction is proved

(continued)

Table 1. (continued)

Legend	Contents
GPS 2	Start of the alternative GPS system: GLONASS system (Russia). Transition of basic technology to “regular”, available. Use of new technologies of global positioning
GPS 3	Differentiation of consumer segment (receivers) - search of “cheap” mass decisions (Garmin company, KFT), special purpose receivers for work in severe climate and extreme conditions - RIRT JSC, Navigator JSC (Almaz-Antey). The main trend of SR&ED development is process innovations, production replication with low cost value; marketing innovations - search of new scopes of technology application
GPS 4	Perspective technology is miniaturization and bio - compatibility of receivers, possibility of their use for biological objects coordinates tracking, more exactly, sensors implemented in living organisms. People and animal detection at the location of their stay

institutional structure of innovative activity, and change of logic in the financial, economic and contractual relations between the subjects of entrepreneurship. To the most significant, affected the configuration of the synthesized innovative process (Fig. 2) conditions it is possible to specify the following:

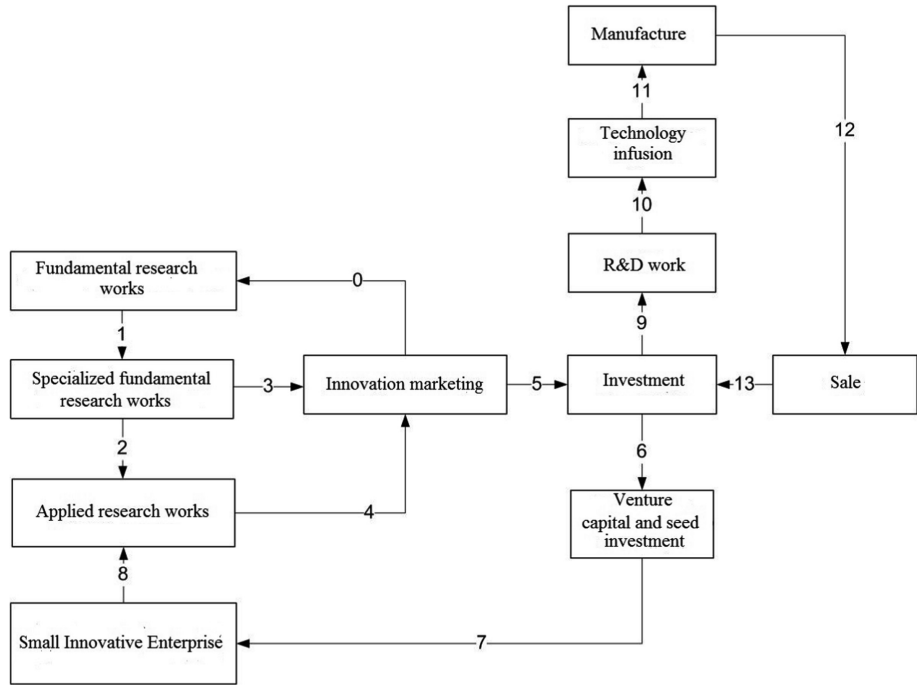


Fig. 2. Innovative process of high-tech sector [20].

1. Differentiation of the sphere of fundamental researches on “academic” and “profile”. Investors have begun to consider costs on the “profile” researches became investors as part of the budget financing of innovative process;
2. Results of fundamental research works are the general knowledge of the industry on the field of the created by the knowledge innovative cycle;
3. The concept of “open technological frameworks” is developing when the technology core freely extends among competitors for the synergy effect implementation in the industry;
4. The institute of small innovative entrepreneurship forming as the independent subject of managing with the expressed “applied research works” function;
5. Separation of SR&ED work into research works and R&D works (it is noted in the works of many russian and foreign scientists);
6. The institutionalization of innovative process financing function has led to their in the into the dependent stages which are found in actions of two different subjects: “portfolio” and “venture” investor.

Though, described institutional and economic changes refer to the national innovative system, but they are most accurately shown in the sector of high technologies.

Based on the determined specific conditions of the institutional and economic development environment of high-tech sphere authors have developed prototype - the integrated model. There is the model of innovative process consisting of 11 stages (Table 2) and 13 functional interrelations - transitions (Table 3) synthesized [1]. Authors have kept the academic display form of innovative process model which is known as the sequence of stages and interrelations in time, and through verticals and horizontals of processes consecutive and parallel lines of implementation of stages have been expressed.

Table 2. High-tech sector innovative process stages [17].

Stages	Contents
Innovation marketing	The block of the transactions directed to the assessment of market attractiveness of applied research works and small innovative enterprise results. Innovation marketing coordinates system of knowledge fomimng from position of innovations and commercialization vector
Fundamental research works	Global system of knowledge forming, development of basic and convergent scientific decisions
Profile fundamental research works	Development of the scientific “uninteresting” for academic practice questions, “uninteresting” which have commercialization potential. Development of fundamental knowledge, the know-how belonging to the high-tech commercial organizations
Applied research works	Process of fundamental knowledge transformation into applied innovative product or technology

(continued)

Table 2. (continued)

Stages	Contents
Small Innovative Enterprise	The SR&ED complex and test marketing concerning the “doubtful”, risk ideas with “weak” justification of research or commercial result expectancy
Venture capital and seed investments	Placement of investments in risk zones with low level of success probability, but with the expected excess profit in case of success
Investment	Investment into mass manufacture, replication of created innovative products or technology
R&D	Research and development works, the aim at preparation of the technology manufacturing documentation
Technology infusion	Complex of works on the embodiment of results of R&D in the form of engineering and manufacturing cycle
Manufacture	The process of innovative products replication or process innovation implementation
Sale	Innovative products distribution, i.e. merchandise flow from the owner (the investor, manufacture) to the consumer

Table 3. Operational interaction innovative process stages of high-tech sector [17].

No.	Content of interaction
1.	Initiation of high-tech innovative process: marketing assessment of knowledge domain as high-tech and perspective from the position of perspective development in innovative cycle
2.	Obtaining results of primary fundamental research works, fundamental knowledge within innovative cycle in wave (Fig. 1)
3.	Adaptation of primary fundamental research works, as potential of new knowledge transformation into applied technological innovations
4.	Transfer of applied research works results into the marketing system for assessment of knowledge commercialization potential
5.	Transfer applied research works results into the marketing system for assessment of investment appeal
6.	Offers forming for investment into new developments and implementation of technology innovations
7.	Making decision on venture investment of “doubtful” scientific projects and innovative developments
8.	Organizational and economic registration of small innovative enterprise process
9.	Acceptation (including absorption) results of small innovative enterprise
10.	Making decision on investment into replication of technology innovation - transfer applied research works results into R&D
11.	Design documentation transfer
12.	Technology documentation transfer, equipment acquisition, manufacture and technology chain forming
13.	The made products transfer for distribution (or directly to the consumer)
14.	Investment return in the form of profit on implementation of innovative products

It is necessary to pay attention (Table 3) that the innovative process model of the high-tech sphere offered by authors has continued and has specified the prototype paradigm more exactly the interactivity and recurrence of process. Interactivity is implemented in the form of transition from the generalized understanding of “outside margin (environment)” to specific stages and subjects of innovative process [2]. And recurrence is expressed by feedback and the closed innovative process contour of high technologies.

The idea of innovative process of the high-tech sector formulated by authors helps to the development of innovative management theory. Specifics of high technologies in innovative process were not discussed in scientific literature earlier.

4 Conclusion

The management of high technologies development from the position of declared principles will allow to create infrastructure for innovatively active enterprises. Finally it will allow to implement the base for crystallization of breakthrough high-tech projects and the state national economy platform of entry into the VI technology wave.

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Organizational and Methodological Providing of Financial and Economic Activity of Non-profit Organizations in the Sphere of Housing Services

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Abstract. The desire of citizens to control the process of managing operation of the housing stock contributed to the development of self-government in the housing sector and the emergence of non-profit organizations such as: homeowners' associations, housing cooperatives and condominiums. The absence of sectoral methods of accounting and analysis of financial and economic activity forces non-profit organizations of the housing sector to apply methods used by commercial enterprises, which, in turn, may not always be applicable to the specifics of their activities. The purpose of the article is to improve the organizational and methodological providing of financial and economic activities of non-profit organizations in the housing sector. The article defines the main problems faced by non-profit organizations in the organization of accounting and analytical process and the formation of reporting information. To solve these problems, an integrated assessment is proposed, which combines an assessment of the legal nature of the activities, the technical condition of the housing stock and the overall financial standing of non-profit organizations. This assessment allows estimating all aspects of the work of non-profit organization and increases the control function of accounting and analytical process. The article also presents a modification of indicators of financial and economic activity with considering the specifics of the activities of non-profit organizations. In general, the proposed recommendations will contribute to improving the quality of the information received, which meets such requirements as completeness, reliability, accessibility and analytics.

Keywords: Non-profit organizations · Housing services · Apartment house management · Financial and economic activity · Financial reporting

1 Introduction

Now among the organizations running apartment house management, the largest percentage falls on such non-profit organizations as: homeowners' associations, housing cooperatives and condominiums. So, for example in 2013 their share was 57%, in 2015 – 61.2%, in 2016 – 61.7%. And their total quantity increased by 1.78 times during the period under review [10]. Despite the non-commercial nature of activity this

organizations as well as commercial once need to optimize costs and find directions to improve the efficiency of financial and economic activity. In turn the evaluating of the effectiveness of financial and economic activity depends on the completeness and correctness of information support for the analysis of their activities. Thus, without taking into account the industry specifics of accounting and analytical process of non-profit organizations in the housing sphere, it is impossible to generate reliable reporting indicators for their subsequent evaluation. In addition, the existing shortcomings of accounting and analytical process in the housing sector not only reduce the control value of accounting but also affect the management decision-making. The consequence of this are: low efficiency in obtaining actual information about operational activities of the organization, imperfection of the system of internal financial reporting, ineffective and unsystematic procedures for planning income, expenditures and financial flows [5]. Insufficient development of organizational and methodical providing of financial and economic activity of non-profit organizations in the sphere of housing services does not allow their qualitative assessment that determined relevance of the topic.

For the evaluation of financial and operating activities of non-profit organizations in the sphere of housing services, the article proposes the development and application of a comprehensive rating methodology. This assessment combines monitoring of the legal nature of activities, the technical condition of the housing stock and the financial status of non-profit organizations, which in our view will provide users with reliable information and solve the problems of accounting and analytical process in the managerial aspect.

This paper consists of five sections. After this introduction we discuss the literature and pose our hypotheses in Sect. 2 and present our research design in Sect. 3. Section 4 conducts an empirical analysis and discusses the empirical results. Section 5 presents the conclusions and suggestions.

2 Literature Review and Hypotheses Development

At present, organization of accounting and analytical process in the enterprises of housing and communal services system differs significantly from its organization in other spheres of activity. Such differences are due to the civil-legal status of enterprises of this system and their classification, depending on the functionally-specific nature of activity [21]. One of the most important features of housing and communal services consists that the needs for services of this branch are always and everywhere. Therefore the current state of housing and communal services, on the one hand, is characterized by continuous retraction and concentration in itself huge resources, on the other hand, the control system of this sphere aren't capable to use them rationally [14]. Under current conditions, homogeneous sets of a complex and multifunctional structure of housing and communal services operate on the basis of different institutional norms according to certain laws and regulations, including those relating to accounting, management, tax and statistical accounting. However, the contradictions between accounting, taxation and civil regulation, existing in the housing and communal services system, often lead to negative results of financial and economic activities [7]. We can agree with the authors [7, 19] that the multidisciplinary nature of activity and the

“polyfunctionality” of the housing and communal services sector, as well as a significant number of factors affecting its operation and efficient functioning, necessitates organizational and managerial work, planning and spending of funds. Therefore, in the context of reforming housing and communal services, the development of a unified methodology of accounting and analytical process that will lead the industry to a higher civilized level acquires special significance [19]. This is very important for Russia which the long period experiences reform conversions which consequences are ineffective [16].

The greatest interest among enterprises of housing and communal services is caused by non-profit organizations managing housing apartment, because they are one of the most mass and economically significant segments of Russian non-profit sector. Organization of accounting and analytical process in such organizations should provide not only the implementation of tax and accounting legislation but also simultaneously give transparent and timely answers to questions arising from homeowners about the financial and economic activities of a non-profit organization managing housing apartment.

Nowadays, the efficiency of housing services is extremely low, in additional, in practice, non-profit organizations of this sector are faced with problems when organizing accounting and analytical process and formation of reporting information. Such problems are [11]:

- contradiction of a number of legislative and regulatory documents and rulings (decisions) of the Supreme arbitration court of the Russian Federation to each other;
- lack of sectoral methods for accounting and analysis;
- lack of unified forms of budgets and budgetary control reports;
- granted right to homeowners’ associations to use simplified methods of accounting and simplified forms of accounting (financial) statements, the articles of which do not allow a complete analysis of financial and economic activities, both for internal and external users;
- insufficient development or practical lack of management accounting, which in turn is explained by the lack of a unified methodological basis for organization of management accounting in certain sectors of the economy, as well as period of its formation and development in native practice [5].

As Barton (2011) says, cash, accrual and budgeting accounting systems can be integrated in a single comprehensive financial management information and reporting system useful for governments, parliaments, tax payers and other interested users [3]. Regulation of formation of accounting and analytical information about housing and organizations operating in the management of apartment buildings is carried out by the state authorities through the creation of a unified Federal information system of housing and communal services “GIS HCS” [6]. This system is aimed at planning and carrying out activities related to the implementation of state housing supervision of organizations in the sphere of housing and communal services and control disclosure of which include: general information about organization operating in the field of housing and communal services and information on its main indicators financial and operating activities [4]. Functionality of the “GIS HCS” also allows determining rating of organization that manages of housing apartment [17]. However, to significant

shortcomings in formation of information in accordance with the requirements of the “GIS HCS” can be attributed very short list of data necessary for their mandatory disclosure in the system, which practically does not allows to carry out a qualitative assessment of financial and economic activities of these organizations and to determine their rating. However, taking into account the insufficient quality of the disclosed information without assuming any uncertainty in information that is being subjected some severe examination where a minor perturbation can make a significant modification on the ranking [8]. In addition, the information to be disclosed does not sufficiently reveal the interconnection and interdependence of all business processes carried out in the process of financial and operating activities of organizations in question, which, in turn, makes it extremely difficult to generate analytical information for the subsequent assessment of financial and operating activities of non-profit organizations of the housing sector.

3 Research Design and Method

The current strengthening of the state housing supervision over housing and communal services organizations, in our opinion, particularly requires an evaluation of their activities to improve the quality of services provided to homeowners. Studying non-profit organizations in the sphere of housing services, we propose to evaluate their financial and operating activities through a comprehensive rating assessment conducted on the basis of multilateral monitoring. This assessment allows minimizing all violations and unsystematic procedures for planning revenues, expenditures and financial flows and improving the system of internal reporting. The proposed comprehensive rating assessment of non-profit organizations in the sphere of housing services combines the following elements:

1. Legal monitoring.
2. Technological monitoring.
3. Financial monitoring.

Thus, legal monitoring makes it possible to assess legality choice of method for apartment house management, compliance with the legislation on disclosure of information, compliance with the procedure for calculating fees for housing services and allocating utility costs for common house needs. Technological monitoring is aimed at assessing the technical condition and operation of the housing stock, engineering networks and nodes, the sanitary condition of the housing stock and the local area and monitoring the state of the soil massif. Financial monitoring provides an opportunity to assess the level of reliability of information used in calculating tariffs, the amount of receipt and expenditure of funds and the purpose of spending, to assess the financial condition of organization.

Legal monitoring is aimed at objective and independent control over the observance of homeowners’ rights in the field of quality of services for apartment house

management, which is not possible without the participation of homeowners'. The structure of such control is presented in the form of three elements guaranteeing independence and completeness of control:

- (1) regional control based on the principle of conducting one-time inspections - planned or according to homeowners' appeals;
- (2) control at the municipality level based on systematic work to control and prevent violations;
- (3) control of owners based on the assessment of social capital.

Taking into account the non-profit nature of activities such organizations, conducting legal monitoring first of all it is expedient to consider them as an element of civil society. It is known that the resources of non-profit organizations include not only state of apartment house, costs of ensuring uninterrupted support and management of it, but also social capital which affects efficiency through quality management [9]. Social capital, known as the negotiability of homeowners', has a high significance as a source of information and plays a major role in the management of housing and communal services. In our view, recommendations [20] on the organization of a special department for working with owners are not very useful either within the framework of each individual non-profit organization that manages housing apartment or to their totality. Since organization of an additional structure requires additional sources of funding and all activities of non-profit organizations under consideration are funded only by contributions from members, these additional costs will increase the tariff for housing services. Alternatively, the value of social capital (X) can be determined by conducting a questionnaire based on an average estimate of the number of positive answers ($\sum x_f$):

$$\bar{X} = \frac{\sum X_f}{\sum f} \quad (1)$$

At the same time, increasing the value of social capital will indicate an increasing the satisfaction of homeowners living quarters with the sanitary and technical state of the apartment house and the adjacent territory, the activity in collective decision-making and other interest, assessment of which is presented in the questionnaire.

Technological monitoring is characterized by the existing variety of approaches to its implementation, namely: among a number of economists, the opinion is widespread about assessment of technical condition of apartment house and its infrastructure in integer values with the definitions: "unsatisfactory" (2), "satisfactory" (3) and "good" (4). Other authors extend the assessment of technical condition "satisfactory" to: "quite satisfactory", "satisfactory" and "not quite satisfactory" [18]. There is also a different point of view [13], which assumes such assessments as: "E" - emergency, "U" - unsatisfactory, "S" - satisfactory. It is possible to give also such opinion on the conduct of the evaluation, which is based on the ratio between physical depreciation and estimated cost of overhaul on the scale: good, satisfactory, unsatisfactory, dilapidated, emergency [1]. Despite the variety of approaches, technological monitoring is possible to conduct and present the result in integer values (from 0 to 4). In this case, the received evaluation of technical condition of apartment house will largely depend on compliance with the requirements for operation and maintenance, upkeep and repair.

Such an assessment is especially necessary for monitoring consumer qualities, minimizing the number of failures in the work of structural elements and engineering systems of an apartment house, increasing period of its operation, minimizing cost of repairs, preventing the inadmissible under conditions of ensuring the safety requirements of its future operation [12]. However, at present, information on the percentage of depreciation of apartment house formed in the “GIS HCS” takes into account only the year of their commissioning. This approach does not allow monitoring the functioning and reliability of the entire structure, engineering networks and nodes and monitoring state of the soil massif. Therefore, in order to obtain a more accurate assessment at the legislative level, it is advisable to consider the introduction of mandatory monitoring of technical condition of all apartment houses with the placement of inspection results and monitoring of technical condition in the “GIS HCS”. The monitoring schedule may include:

- (1) total survey (1 every 5 years for capital repair planning);
- (2) repeated survey of emergency apartment house every 6 months, dilapidated apartment house - once a year, unsatisfactory apartment house - every 2 years;
- (3) sample survey of objects at the request of homeowners when they are out of order or damages - for planning the current repair.

Results of such monitoring will be:

- a real assessment of the current state of the apartment house: its physical, moral wear and individual structures;
- determination of the need for reinforcement of structures or repair of apartment house;
- an estimation of probability of failures, caving, destruction, subsidence of soils, etc.;
- an assessment of the impact of construction work carried out in close proximity to apartment house.

The “GIS HCS” provides for mandatory disclosure of information on the main indicators of financial and operating activities of non-profit organizations in the sphere of housing services to assess their financial condition. At the same time, such information is provided by: accounting (financial) statements, estimates of income and expenses, and a report on its implementation. However, the existing problems encountered by non-profit organizations in the organization of accounting and analytical process and formation of reporting information subject to mandatory disclosure in the “GIS HCS” significantly reduce the level of reliability of the information received. In addition, the possibility of applying simplified accounting methods by some non-profit organizations makes it difficult to further analyze the main indicators of financial and economic activities of these organizations. Currently, the methods of financial monitoring and calculation of financial and economic performance indicators are mainly oriented towards methods applicable to commercial organizations. Therefore, they cannot always be used by non-profit organizations in connection with the functionally-specific nature of their activities and their civil-legal status. Recommendations on the modification of indicators of financial and economic activities of organizations with a focus on non-profit nature of activities are discussed in more detail in Sect. 4.

4 Empirical Analysis and Results

Our study of the methodology for the formation of traditional indicators of the financial state of organizations has shown that their interpretation is reduced to almost the existing interpretation of their solvency as to the possibility of paying off existing obligations only as long as they are able to fulfill obligations realizing their assets [2]. This definition of solvency is not entirely correct for non-profit organizations due to the specific nature of their activities related to the implementation of the management of housing stock and, accordingly, the lack of sales of assets. In view of the fact that the activities of such organizations are services, this makes it impossible to assess the solvency with traditional methods. Since activity of non-profit organizations in the housing sector is financed by contributions from homeowners for the payment of services, therefore, the amount of unfulfilled obligations of non-profit organizations depends on the value of accounts receivable, the emergence and repayment of which is largely related to the existing risk of late payment or non-payment by homeowners'. In our opinion, when assessing the solvency (S) of non-profit organizations, it is necessary to exclude the share of homeowners' bad debt (BD) from the total amount of assets (A), which will allow more accurately determining the real solvency level of non-profit organizations (Table 1).

Table 1. Determining the solvency ratio of non-profit organizations.

Parameters	Amount, RUB'000	Existing calculation	Suggested calculation
Total assets, incl.:	6474	2,07	1,89
Debt of homeowners	2862		
Bad debt (limitation period > 3 years)	572		
Long-term liabilities	1350		
Short-term liabilities	1778		

$$S = \frac{A - BD}{\text{Liabilities}} \quad (2)$$

The data from Table 1 demonstrate that excluding from the total amount of available assets bad debt resulted in a decrease in the solvency ratio by 0.18 units (or 8.69%). Taking into account the recommended value of the solvency ratio (from 2 or more), the value of the coefficient (1.89) calculated by the proposed method is at a normal level but in the future a significant increase in the bad debt of homeowners' will indicate a risk of insolvency in the future and create threat of financial stability of non-profit organization [2]. To eliminate the risk of insolvency in economic sources, there is a recommendation [5] on the possibility of including in a tariff for housing services the amount of the alleged non-payment of the services provided in order to minimize the

shortage of funds but in our opinion this is not advisable, because leads to an artificial increase in the cost of the services provided. Besides, in small groups (e.g. in apartment building) it is rather easy to consider a contribution and efforts of each member and to apply public coercion in order that individuals bore the share of responsibility on ensuring joint use of any benefits [15]. Therefore, the achievement of sustainable solvency of non-profit organization of the housing sector can be achieved by reducing the amount of liabilities through effective work with homeowners on the emerging receivables and preventing the formation of a bad debt.

In conditions of limited amounts of own financial resources, their optimal distribution becomes especially important. However, the used target function expressed by the expected profit received from the sale of additional services to homeowners not included in the basic tariff for payment of housing services is not entirely correct for such organizations. In this regard, the resulting indicator will be considered the amount of possible additional cash flow (Table 2).

Table 2. Data for choosing the optimal option for additional services.

Additional services	Money demand, RUB'000				Additional cash inflow, RUB'000
	1st quarter	2nd quarter	3rd quarter	4th quarter	
A	50	50	70	70	150
B	40	60	60	90	130
C	25	50	50	60	110
D	75	40	45	60	120
Available resources	160	150	170	190	

The objective function is:

$$Z = 150x_1 + 130x_2 + 110x_3 + 120x_4 \quad (3)$$

In addition, it is necessary to take into account the limits for funds available in each quarter: Displayed equations are centered and set on a separate line.

$$\begin{cases} 50x_1 + 40x_2 + 25x_3 + 75x_4 \leq 160, \\ 50x_1 + 60x_2 + 50x_3 + 40x_4 \leq 150, \\ 70x_1 + 60x_2 + 50x_3 + 45x_4 \leq 170, \\ 70x_1 + 90x_2 + 60x_3 + 60x_4 \leq 190 \end{cases} \quad (4)$$

Solving this system of these inequalities, the variables: x_1, x_2, x_3, x_4 must be equal to either 0 or 1. The optimal options for the implementation of additional services found using the MS Excel are: A, C, D. With this choice, the maximum additional annual contribution from homeowners' in the amount of 380 RUB th., which will allow paying back 58.9% of the funds required for financing work in the amount of 645 RUB th. during the first year of the implementation of additional services.

In order to control the costs and incomes of organizations that manage the operation of housing stock, in addition to information on the indicators of their financial and operating activities, the “GIS HCS” requires disclosure of information on the cost of maintenance and repair of communal facilities in apartment house by placing in the system all contracts concluded with suppliers and contractors and service acceptance acts. In our opinion, such documents do not sufficiently disclose information on the cost of works on maintenance and repair of communal facilities in apartment house, since they only contain information on the cost of the works themselves, without taking into account the cost of consumables. And this, in turn, requires additional placement of almost all supporting documents, including requisition slips, invoices, advance reports on purchased supplies, etc., which significantly increases the labor input of personnel. At the same time, the obligatory placement of such financial documents in the system as: the budget of a non-profit organization and the budgetary control reports allow for the control over the receipt and targeted expenditure of funds. However, lack of unified reporting forms, as well as the desire to minimize document content, does not always provide complete information on the amount spent for specific work on the maintenance and repair of communal facilities. In this regard, a uniform approach to the adoption of unified reporting forms and its introduction into the “GIS HCS” will help ensure the quality of the information received, understandable to all categories of users.

5 Conclusions

Thus, recommendations proposed in the article on the evaluation of financial and operating activities of non-profit organizations in the sphere of housing services on the basis of development and application of the methodology of integrated rating assessment help to improve quality of their accounting and analytical information that meets such requirements as completeness, reliability, accessibility and transparency. The proposed method allows creating and delivering to users’ reliable and sufficiently complete information on the distribution of funds and financial and economic situation of non-profit organization, as well as to provide the following directions for improving its organizational and methodological support:

- observance of following principles of the conceptual direction of development these organizations: conscious participation, democratic governance, non-admission of conflict of interests, achieving transparency of information, self-regulation;
- improving the mechanisms for monitoring activities in order to prevent unfair acts and misuse or theft of funds of members of non-profit organizations;
- providing timely and reliable information on financial and operating activities that will satisfy both internal and external users.

Proposed methodology can also be used in the analysis of other non-profit organizations and public associations.

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Will Carbon Tax Constrain Oil Production in Canada?

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Abstract. The article aims to assess how introduction of carbon tax will impact oil production in Canada in the long run. Two oil exporting countries, Norway and Canada, introduced carbon tax in 1991 and 2018 respectively. In Norway carbon tax has not constrained oil production and development of costly hydrocarbon reserves in the Arctic areas. We build a simple econometric model for Canada's oil demand and supply until 2040 in reference and low carbon scenarios. Carbon tax is explicitly inbuilt into the model based on the assumption that producers fully pass costs of carbon tax onto consumers of petroleum products. Demand is modelled bottom-up individually for economic sectors, including road transport, air transport, marine and water transport, industry, commercial sector, etc. On the basis of modelling results we argue that in the projection period carbon tax will have a minor constraining impact on oil production growth in Canada. Demand for petroleum products will contract more deeply compared to crude oil production. The continuously increasing export orientation of the Canadian oil sector will partially shield it from the carbon tax. Given the global advancement of low carbon paradigm, analysis of Norway and Canada experience with carbon tax is crucially important for all large oil producing countries.

Keywords: Carbon tax · Canada · Oil production · Oil consumption · Low carbon paradigm · Stranded assets · Unburnable oil

1 Introduction

In October 2016 Canada, the sixth largest world oil producer, ratified the Paris Agreement on Climate Change and pledged to reduce greenhouse gases (GHG) emissions by 30% below 2005 levels by 2030. Canada is the second large oil exporting country which imposed carbon tax on oil and gas sector.

Norway introduced carbon tax on oil and gas in 1991 [27]. Almost three decades of experience doesn't confirm that carbon tax puts constraints on oil and gas production in Norway (see Fig. 1). Decrease in oil output since 2002 was caused by exhaustion of recoverable reserves. In 2020–2022 oil output is expected to increase as new reserves will be put into exploitation despite the high level of carbon tax rate.

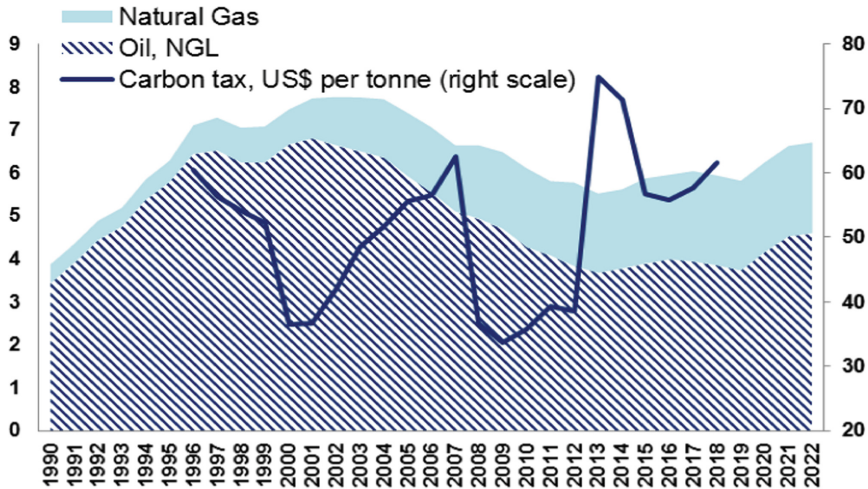


Fig. 1. Norway: oil and natural gas output forecast to 2022 (1970–2017: actual production), million barrels of oil equivalent per day and carbon tax rate, US\$ per ton of carbon emissions. [18, 19, 21, 25].

Given the relatively high CO₂ intensity of oil sands [12], the prospects for Canada’s oil production under constraints of low carbon paradigm are widely discussed in the literature. Greenpeace [8] states that increasing use of dirty bitumen from the tar sands will have dramatic negative implications for both the global climate and the economy and lead the international community toward a chaotic and volatile energy future. McGlade and Ekins [16] found that in order to achieve a 2 °C world temperature rise limit scenario by 2050 85% of Canadian bitumen reserves should remain in the ground. Carbon Tracker [4] calculated that in 2 °C scenario a large part of Canadian oil is stranded and 35% of capex planned by oil companies by 2025 is not needed. Taking a different perspective, Boskovic and Leach [1] argue that the cost of emissions policy is unlikely to have a meaningful impact on oil sands growth in the near term. McGlade and Ekins [17] show that oil bitumen production could be supported by Carbon capture and storage (CCS) development.

This article contributes to the literature by explicitly modelling the impact of federal carbon pricing backstop in Canada introduced from the beginning of 2018 on oil demand and supply in the long run. The simple model provides quantitative answers on how pricing of carbon will impact oil production and consumption in Canada by 2040. Direct inclusion of carbon tax into the modelling of oil balances is important not only for Canada, but for all large oil exporting countries, whose economic growth is highly dependent on oil production and exports. To check the relevance of the modelling results we compare them with the Canada’s National Energy Board forecast [20], which provides the estimates of oil demand and supply response to different levels of carbon price.

2 Modelling Framework

To assess the impact of carbon tax on Canada's oil sector we build a simple econometric model of oil demand and supply until 2040 on a yearly basis in the reference and low carbon scenarios. In the low carbon scenario higher carbon price is modelled after 2022 than in the reference scenario. In 2018 a minimum federal tax of 10 Canadian dollars is collected per ton of GHG emissions. In both scenarios it rises by 10 Canadian dollars each year until reaching 50 Canadian dollars per ton of CO₂-eq. in 2022. In the reference scenario carbon price is fixed at this level until the end of the projection period. In the low carbon scenario it continues to increase steadily at 5 Canadian dollars per year before reaching 140 dollars per ton in 2040. The base year of the forecast is 2015.

2.1 Data

Historical statistical data for the model was accumulated from the databases of Canada's National Energy Board (NEB), International Energy Agency (IEA), U.S. Energy Information Administration (EIA), the United Nations (UN), International Labour Organization (ILO), International Organization of Motor Vehicle Manufacturers (OICA) and the World Bank.

2.2 Exogenous Parameters

The following exogenous parameters are used in the model:

- WTI oil price in constant Canadian 2015 dollars (converted from EIA Annual Energy Outlook 2018, Reference Case [5]);
- carbon price (as explained above to correspond with the NEB Reference and Higher Carbon Price (HCP) Cases [20]);
- GDP forecast built with Solow-Swan production function*;
- population and labor force forecasts (according to the UN World Population Prospects: 2015 Revision, Medium Variant [24] and ILO Key Indicators of the Labour Market (KILM) 2015 [13]);
- vehicle fleet, including passenger cars, trucks, buses and motor cycles forecast built with Gompertz function and linear regressions*;
- passenger and freight traffic forecasts for air, railway, marine and water transport built with regression modelling.

2.3 Modelling Algorithms and Assumptions

We assume that oil producers will fully pass costs of carbon tax onto final consumers of petroleum products, thus prices of petroleum products will rise. Changes in stocks of crude oil and oil products are assumed to be zero, refinery losses are forecasted as a fixed share of oil refining output. Future oil production equals forecasted oil demand, including domestic oil product demand and net exports of crude oil and oil products.

Domestic oil demand is modelled bottom-up individually for economic sectors, including road transport, air transport, marine and water transport, railway transport, non-energy use, energy industry own use, industry, agriculture, residential and commercial sector, electricity.

It is assumed that oil consumption is sensitive to carbon price in the following sectors, responsible for 72% of overall oil consumption in Canada (see Table 1):

Table 1. Carbon tax impact on oil consumption modelling.

Sector	Share in Canada's oil consumption, 2016, %	Modelling approach
Road transport	43.9	Short-term and long-term price elasticity of oil consumption by the “composite” vehicle; assumptions on biofuel mandate and transport electrification
Air transport	5.4	Short-term and long-term price elasticity of oil consumption per unit of passenger and freight traffic; assumptions on biofuel promotion
Marine and water, railway transport	3.2	Short-term and long-term price elasticity of oil consumption per unit of freight traffic
Industry	4.7	Price elasticity of oil intensity (consumption per unit of value added) is estimated with linear regression
Energy industry own use	14.4	Share in overall oil consumption is fixed at 2015 level

Oil consumption by road transport (RC_t) is modelled taking into account oil consumption by the “composite” vehicle (U_t), the size and the structure of the vehicle fleet:

$$RC_t = (A_t \cdot k^a + Fr_t \cdot k^{fr} + M_t \cdot k^m + B_t \cdot k^b) \cdot U_t \quad (1)$$

where A_t , Fr_t , M_t , B_t are the number of automobiles, trucks, motor cycles and buses respectively; k is the weight of each vehicle type correspondingly taking into account the average distance travelled and fuel consumption per 100 km of travel.

Growth rate of the “composite” vehicle oil consumption (U_t) comprises two components – trend and structural ones. As Canada generally follows the U.S. fuel efficiency standards policy (CAFE), we calculated the trend component (BE) from EIA Annual Energy Outlook 2018, Reference Case [5]. The structural component depends on oil price dynamics (P_t) in-built through the short-term (E^{ST}) and long-term (E^{LT}) elasticities:

$$U_t = U_{t-1} \cdot (1 + BE + E^{ST} \cdot (P_t / P_{t-1} - 1) + 0.1 \cdot (E^{LT} - E^{ST}) \cdot (P_t / P_{t-10} - 1)) \quad (2)$$

Estimates of fuels demand price elasticities vary significantly in the literature. The range of estimates for Canada is presented in Table 2 [14]. Lawson [14, 15] argues that

taking into account the most recent special studies on Canada and the tendency for elasticities to decline in North America, lower elasticities are more reliable. We use lower elasticities estimates in both reference and low carbon scenarios.

Table 2. Price elasticity of oil product demand by Canada's transport sector.

Assumed elasticities	Road gasoline	Road diesel	Rail diesel	Aviation turbo	Marine diesel	Marine HFO
Higher elasticities						
Short-term (E^{ST})	-15%	-10%	-10%	-10%	-5%	-5%
Long-term (E^{LT})	-60%	-40%	-40%	-30%	-30%	-30%
Lower elasticities						
Short-term (E^{ST})	-5%	-5%	-10%	-10%	-5%	-5%
Long-term (E^{LT})	-20%	-20%	-40%	-30%	-30%	-30%

In the road transport oil faces competition from the promotion of biofuels and transport electrification. In the reference scenario five Canadian provinces which have already introduced biofuel mandates (E5 and B2), are supposed to keep them until the end of the projection period, other Canadian provinces do not introduce biofuel mandates. In the low carbon scenario all Canadian provinces start to implement stricter biofuel mandates since 2025 and achieve E10 and B2 by 2030. Projections of electricity substitution for gasoline and diesel in road transport are taken from the International Energy Agency forecast [10].

Oil consumption by each transport type, including air, railway, marine and water transport, is equal to the product of average oil consumption per ton-km and passenger and freight traffic volume. Growth rate of average oil consumption in each transport sector (UC_i^{TS}) is modelled through price elasticity (presented in Table 2):

$$UC_i^{TS} = UC_{i-1}^{TS} \cdot (1 + E^{ST} \cdot (P_i / P_{i-1} - 1) + 0.1 \cdot (E^{LT} - E^{ST}) \cdot (P_i / P_{i-10} - 1)) \quad (3)$$

We assume that after 2030 oil will face substitution by biofuels in aviation. It is modelled that the share of biofuels by 2040 will reach 1% of total fuel use in aviation in the reference scenario and 5% in the low carbon scenario.

Oil consumption by industry is calculated by multiplying industry value added and its oil intensity. Price sensitivity of industry's oil intensity (UC_i^{ind}), is estimated using historical data from 1986 to 2015 with the linear regression (4).

$$\ln(UC_i^{ind} / UC_{i-1}^{ind}) = -0.28 - 0.12 \cdot \ln(P_i / P_{i-1}) \quad (4)$$

In the projection period we fix the share of energy industry own use in total national oil consumption at 2015 level.

Oil consumption in other sectors, such as non-energy use (including petrochemicals), agriculture, residential and commercial, electricity sector, which is responsible for 28% of overall Canada's oil consumption in 2016, is considered insensitive to

carbon price. Oil consumption by petrochemicals sector is fixed in absolute terms at 2015 level. Oil consumption for other non-energy use purposes as well as by agriculture and commercial sector is modelled to decline at their respective 2006–2015 historical rates. Residential oil consumption per capita in the projection period is modelled to decrease at 2006–2015 historical rates. Oil demand in electricity sector is quite low and is projected to reach zero by 2025.

Exports and imports of crude oil and oil products are projected using the logical assumption, that Canada will maximally utilize its own oil reserves and refining capacities. The share of oil products imports in oil products consumption will reach its 2010–2015 average by 2020 and stabilize at this level until 2040. Oil products exports in the projection period are fixed at their 2015 absolute level under the assumption that incremental demand in the US, the largest market for Canadian products export, will be met by American refineries.

NEB estimates suggest that the share of crude oil imports in the total feedstock requirements stabilized at 27–30% during the last several years [20]. We assume that it will remain at 27% level up to 2040. Taking into account that Canada's crude oil exports almost entirely flow to the US, Canada's crude oil exports are forecasted using the EIA Annual Energy Outlook 2018 [5]. Canadian heavy crude oil competes on the U.S. market with heavy crudes from Venezuela and Mexico [3]. The combined share of these three countries in the U.S. oil imports equaled approximately 60% in 2017 [6]. We assume that Canada's share in the U.S. crude oil imports will increase from 43% in 2017 to 65% in 2040.

3 Oil Demand and Output Response to Carbon Tax

The model reveals that Canada's oil demand continues to decrease in both reference and low carbon scenarios (see Fig. 2). Since the middle of the 2020s the decline accelerates, especially in the low carbon scenario. Oil demand is projected to decline by 14% in 2030 compared to 2015 level in the reference scenario and by 19% in the low carbon scenario, in 2040 – by 19% and 28% respectively. In the low carbon scenario oil demand in Canada in 2040 is 0.19 mbd lower than in the reference scenario.

The structure of oil demand response to the federal carbon tax by economic sectors shows that road transport will be the most affected (see Fig. 3). Our modelling reveals that in 2040 75% of the oil demand difference between the reference and low carbon scenarios falls on the road transport.

It is worth noting that oil demand response to the carbon price backstop at the national level could be smoothed because several Canadian provinces, including Alberta, British Columbia, Ontario and Quebec have implemented carbon pricing schemes before the federal government introduced the carbon tax. According to OECD [22], in 2012 Canada priced 43% of its energy related GHG emissions.

Our modelling shows that in the reference scenario oil production in Canada is going to rise significantly up to 2020 (see Fig. 2). In 2021–2030 oil output will remain stable but afterwards start to increase, reaching 6.2 mbd in 2040. Projected oil output in the low carbon scenario does not differ materially from the reference case.

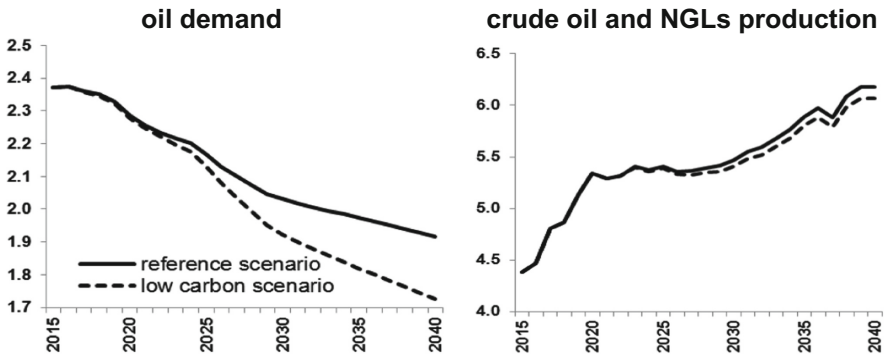


Fig. 2. Projections of oil demand and crude oil and NGLs production in Canada in the reference and low carbon scenarios until 2040, mbd.

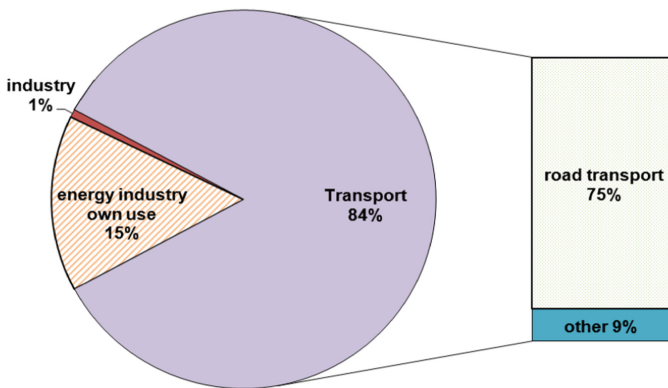


Fig. 3. Breakdown of oil demand difference between low carbon and reference scenarios in 2040 by economic sectors.

Oil production in Canada in the medium term could be supported by the projects that have been launched before oil price collapse in 2014–2016 and are going to be put into operation in the upcoming several years. They include Fort Hills with the peak oil production of 195 kbd, Horizon (phase 3) – 80 kbd, Christina Lake (phase G) – 50 kbd and Kirby North – 40 kbd [9]. In November 2017 ExxonMobil started production at Hebron field, which could produce up to 150 kbd of oil at peak [7]. Also, shale formations Montney and Duvernay are expected to increase oil production. After 2020 oil production in Canada could be affected by sharp capital expenditures reduction in 2015 and 2016 due to the oil price collapse.

In order to check the modelling results for robustness we use the higher levels of short-term and long-term price elasticities of demand in transportation sector provided by Lawson [14, 15] (see Table 2). The use of higher price elasticities of fuels demand does not crucially change the modelling results (see Figs. 4 and 5).

Also, we compare our modelling results with projection of the Canada’s National Energy Board reference scenario (NEB-reference) and high carbon price scenario (NEB-HCP) [20]. Both the National Energy Board’s reference and high carbon price scenarios of future demand for oil are more optimistic than our projections (see Fig. 4). Projection of oil consumption in the NEB reference scenario compared to our reference scenario is 0.35 mbd higher in 2030 and 0.4 mbd higher in 2040. Federal carbon tax impact on oil demand is more pronounced in our model compared to the NEB scenario. NEB projects that by 2030 demand for oil in the Canadian economy in the high carbon price scenario will drop only by 1% relative to 2015 level and by 6% in 2040.

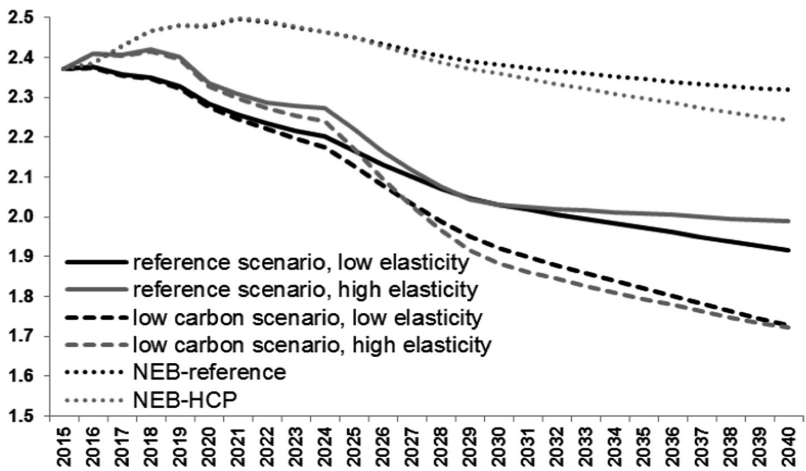


Fig. 4. Projections of oil demand in Canada until 2040, mbd.

Until 2021 our projections of oil production dynamics are close to the NEB scenarios (see Fig. 5). After 2021 the NEB scenarios become more optimistic. In relative terms NEB projections assume much stronger constraining impact of the federal carbon tax on oil production dynamics than our scenarios. As we assume that oil producers fully pass costs of carbon tax onto consumers of petroleum products, that is an expected modelling outcome. NEB forecasts of oil production are significantly higher compared to projections in all our scenarios. By 2030 the gap in the reference scenarios reaches 1.4 mbd. Such a large difference in modelled results is partially explained by the gap in production volume in the forecasts base year. We rely on the International Energy Agency data, while NEB uses its own estimates. However, the main explanatory factor behind such wide difference in output projections is oil export assumptions. NEB does not provide projections of crude oil export from Canada, but implicitly it is very optimistic about future export growth in its both scenarios. Our assumptions about export potential of Canadian oil are more modest.

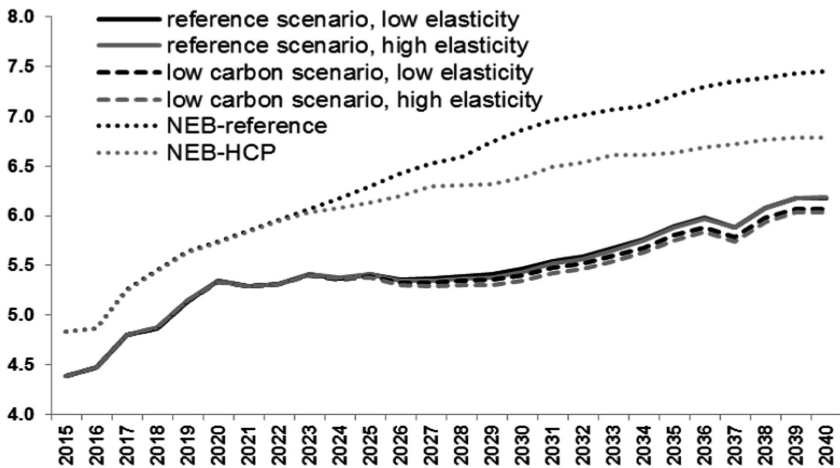


Fig. 5. Projections of crude oil and NGLs production in Canada until 2040, mbd.

4 Increasing Export Orientation of Canadian Oil Production

Shale revolution in the US led to unprecedented growth of U.S. light sweet crude oil production and at the same time created a strong demand for Canadian oil, as U.S. refineries have been modernized to process heavy crudes. The mix of light tight oil with relatively cheap heavy crudes strongly increases margins for American refineries. Because of this complementarity the demand for Canadian crude oil exports to the U.S. increased in parallel with rising U.S. tight oil production. Share of Canada in the U.S. crude oil imports went up from 20% in 2008 to 43% in 2017, squeezing out Venezuela's and Mexico's heavy crudes. Canada could continue to increase crude oil exports to the U.S. on the one hand by further squeezing out Venezuela's and Mexico's crudes, on the other hand by meeting growing appetite for heavy feedstock from the U.S. oil refineries.

We estimate that in absolute terms Canada's crude oil exports will grow by 0.7 mbd to 4 mbd in 2020 and reach 4.9 mbd in 2040. It is worth noting that pipeline and railway exports infrastructure is capable to transport these volumes of Canadian crude. IEA estimates reveal that in 2018–2020 due to the lack of sufficient pipeline infrastructure oil producers in Canada will switch to the alternative railway transport, which is capable to transport up to 1 mbd of crude oil per year [9]. By the end of 2019 pipeline takeaway capacity will expand by 0.5 mbd due to Enbridge Line 3 optimization and replacement. Also, Trans Mountain pipeline is probably to be expanded by 0.59 mbd by 2021, and the most controversial Keystone XL project, if implemented, could add 0.83 mbd of takeaway capacity [9]. Nationalization of Kinder Morgan oil pipeline system by Canadian government [2] with plans to extend the pipeline to the Pacific coast with the goal to increase oil exports to the Asia Pacific show that there are intentions to expand the country's oil exports capacity and diversify oil exports beyond North America after 2020.

5 Conclusions and Discussions

The major conclusions from the modelling of the Canadian oil demand and production until 2040 are the following. First, in the projection period carbon tax will minimally constrain future oil production growth in Canada. Such a conclusion is of a particular importance given the high dependence of economic growth in Canada on oil revenues. Second, under the assumption that producers fully pass costs of carbon tax onto consumers of petroleum products demand for petroleum products will contract more substantially compared to crude oil production. Third, the continuously increasing export orientation of the Canadian oil sector to the US market with limited pricing of carbon will partially shield the former from the impact of the carbon tax.

The assumption that oil producers fully pass costs of carbon tax onto consumers of petroleum products is a strong one. More detailed research modelling the sharing of carbon price among oil producers and consumers is required. Also, oil companies in Canada's oil sector, reacting to the introduction and increase of carbon tax, could follow heterogeneous strategies. In 2016–2017 some international oil companies sold oil exploration and production projects in Canada to local companies, possibly reacting to the risks associated with the federal carbon tax introduction. If this tendency continues it would be difficult to attract capital investment into the Canadian oil sector, sufficient to ensure oil output growth in the long run.

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Methodical Approach to Extraction Results Diagnostics of Innovation and Resource Potential in the Russian Federation Territories

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Abstract. The article reveals scientific trends in the study of high-tech processes in the territories. It substantiates the advantages and disadvantages of existing approaches. The author proposes and tests the methodology for diagnosing the level of innovative resource potential of the Russian territories. On the basis of official statistics, there are made calculations of current, average and dynamic results of developing regions and federal district. There is constructed the model of distributing the Russian Federation territories in the main components space on a complex of innovation-resource indicators. There is given the values dispersion estimation of the most important indicators for a long period of time. There is revealed the interrelation between economic and infrastructural factors. There are investigated the threats of the state strong interregional imbalances. There are grounded the priority directions of developing depressed areas in the Russian Federation. There are defined the possibilities of applying the developed methodical approach for scientific, educational and power structures.

Keywords: Regions and federal districts · Innovation and resource potential · Performance indicators · Interregional imbalances · Dynamics · Interrelation of factors

1 Introduction

The impressive geographical extent of the Russian Federation, the uneven concentration of various resources reserves by regions, as well as the varying degree of their use, exacerbate the crisis of spatial heterogeneity and create significant obstacles to the rational development of the country economic potential. At the same time, understanding the essence of the existing problems and identifying inefficient processes in the subjects of the Federation, lead to the need to find new scientific mechanisms to analyze the territorial development, the causes of strong polarization and ways to correct the unfavorable situation.

2 Relevance

High-quality diagnostics of socio-economic, reproductive and innovative resource of the Russian Federation region development requires reasonable selection of factors, as well as the most adapted tools, allowing tracking both the current operation results and the process dynamics. It is the speed and vector of territorial transformations that significantly determine the prospects of subjects (or lack thereof) in achieving the benchmark levels of efficiency and their increase. At the same time, when conducting the study, it is proposed to operate with exceptional criteria that allow minimizing the manifestation of the territories “anomaly” (for example, the Moscow agglomeration) and to observe the objectivity of the evaluation procedures performed.

3 Formulation of the Problem

The problems of researching innovative regional socio-economic systems potential, as well as the efficiency of its use, have recently received close attention in the Russian and foreign scientific environment [7–16]. At the same time, the multiplicity of approaches, their multifaceted nature, paradoxically, do not allow to uniquely select a specific set of factors from which to start the analysis, and, moreover, to determine the calculation algorithm. In this regard, there looks very natural the fact of obtaining different, and often opposite results in implementing calculations using various methods and different parameters.

4 Theoretical Part

It should be noted that an impressive part of the scientific work on this theme has recently been based on the use and processing of official statistics, which is undoubtedly an encouraging trend and a significant counterbalance to expert methods that do not provide accurate, verified results regarding the current efficiency of using innovative and resource-based socio-economic systems.

So, for example, in the work of Russian researchers from Mordovia State University named after N.P. Ogareva there are proposed four functional blocks of indicators to assess the regional innovation system effectiveness: financial and economic, scientific and innovative, informative-communicative and educational [1]. In turn, there is calculated a dimensionless indicator I_i for each factor i in a particular block on the basis of Rosstat official data according to the linear scaling formula (which has recently been extremely widespread).

$$I_i = \frac{x_i - x_{\min i}}{x_{\max i} - x_{\min i}}, \quad (1)$$

where x_i is the actual value of indicator i ;

$x_{\min i}$ and $x_{\max i}$ are minimum and maximum values of indicators in the analyzed sample (of the regions).

The resulting index characterizing the efficiency of the processes within each of the four blocks is proposed to be determined by means of an arithmetic mean. According to the authors of the methodology, there can also be evaluated the effectiveness of the innovation system of the region as a whole – the index of “knowledge economy” (KSI) – on the basis of the arithmetic mean of the resulting indicators of functional blocks. Naturally, the higher the total score is, the more innovative processes are developing in the region, and Vice versa.

A significant advantage of the method is obtaining relative indicators, which are always in the range from 0 to 1. In addition, the developed algorithm of actions does not provide the possibility of analyzing the indices of the “knowledge economy” both for different periods of time and in the context of the selected regions for their comparison with each other, which was demonstrated by the authors. Attention is drawn to a very representative set of 26 factors, on which the study is carried out.

At the same time, there is no justification for applying the arithmetic mean to find the “knowledge economy” index in this methodology. This approach, in fact, means that all indicators and processes for all functional blocks have equal weighting factors and play an equal role in forming the ownership innovation system. But this assumption is highly debatable. In addition, ranking the Federation subjects by clusters based on KSI values refers exclusively to the selected period of time (year) and does not take into account the dynamic component, that is, the possible transformation of regions from one classification group to another when changing their final indices.

Nevertheless, the considered approach is rather urgent and makes a certain contribution to the assessment methodology of using innovative potential of territories.

It is proposed to carry out diagnostics and reasoning of conclusions within the framework of the author’s method at the first stage due to the aggregated monitoring of all the considered territories (selected Federal districts and the Russian Federation as a whole) and blocks of factors, and in the subsequent phases of the study it is necessary to perform a detailed analysis of the identified deviation causes and to determine the possible directions of their optimization.

To assess the level of using innovative resource potential of regional systems, there were selected eight of the most representative factors classified into 4 blocks (see Table 1): (1) infrastructure (reflecting the level of developing road infrastructure and health); (2) resource (characterizing the investment volume and the human capital quality); (3) reproductive and import substitution (including performance indicators of small business and labor productivity in manufacturing); (4) innovation (represented by the organization innovation activity and the level of using advanced production technologies). The study is based on official Russian statistics (publications “Regions of Russia. Socio-economic indicators” and “Small and medium-sized business in Russia” [2]) and covers the 16-year time period from 2000 to 2015.

The first group of infrastructural factors is the most important investment for the full-fledged life of modern society and human capital development. The presence (or absence) of road communication and health care system determines the level of the population motivation to conduct business processes in a particular area in the long term.

The second set of factors reflects the degree of investment and staffing in the regions of the Federal district with the necessary resources for the economy modernization and accelerated innovation reproduction. Low rates of industrialization resource

Table 1. Performance indicator classification of using territory innovation-resource potential.

No.	Unit	Indicators	Determination procedure according to Rosstat	Unit of measurement
1.	Infrastructural	1.1 Level of developing road infrastructure.	Density of paved roads	km of line/1,000 km ²
		1.2 Healthcare development level	Number of doctors per 10,000 persons	persons/10,000 persons
2.	Resource	2.1 Specific investments in the fixed capital	Investments in the fixed capital per capita	RUB/person
		2.2 Degree of involving human capital in the reproduction processes	Participation level in the labor force (until 2015 – economic activity level of the population)	%
3.	Reproductive import-substituting-	3.1 Turnover proportion of small businesses per capita	Turnover of small enterprises/population	thousand RUB/per person
		3.2 Labor productivity in the manufacturing sector	Turnover of the manufacturing industries/the number of people employed in manufacturing	thousand RUB/per person
4.	Innovation	4.1 Level of organizations innovation activity	Organizations innovation activity	%
		4.2 Level of using advanced production technology	Used advanced production technology/number of enterprises and organizations	units/1000 enterprises

support, as evidenced by world experience, do not provide the proper dynamics of industrial renewal and provoke protracted crises in the most important economic sectors.

The third block presents the factors characterizing business and industrial activity in the territories. Small businesses involved in intense competition and implementing innovative solutions provide employment and replenishment of the territorial budget. Labor productivity in the processing sector of the economy is an important indicator of using fixed assets and their equipment in the regions and to some extent indicates the level of independence from imported products. Calculating these indicators over a long period of time allows forming conclusions about the effectiveness of the innovative transformations implementation.

Calculating current and dynamic indicators for the fourth block gives an idea of the power of transforming the received and registered new knowledge in the innovation and production processes of the Federal districts.

The current values of the key indicators (only the last period of time), of course, cannot adequately reflect the territory development. Therefore, for each of the selected indicators in the blocks it seems appropriate to assess: (a) the current performance (hereinafter referred to as “P”), (b) the average performance in the form of an arithmetic mean value for the analyzed period – « »; (c) the dynamics of the processes for the covered time interval-“D”.

The last of the levels indicated above can be calculated by the ratio of the average absolute difference of the achieved results to the arithmetic mean of the analyzed sample of data on the j -th territory for a certain period of time: (2a):

$$\Delta_j = \frac{\overline{\delta_j}}{P_j} 100 \%, \quad (2a)$$

where $\overline{P_j}$ is the average arithmetic value of a particular coefficient of the territory performance.

The logic of “D” dynamics index estimation is to calculate the result change degree against the background of its average value in a certain regional socio-economic system. At the same time, the positive and relatively high value of the specified indicator signals about successfully developing certain processes in the concrete territory.

In turn, the average absolute difference of performance indicators $\overline{\delta}$ is proposed to be calculated as follows [3, p. 23] (2b):

$$\overline{\delta_j} = \sum_{i=1}^{n-1} \frac{P_{j,i} - P_{j,i-1}}{n-1}, \quad (2b)$$

where $i = 1 \dots n$ is the analyzed time intervals (years).

The application of the above formula allows us to assess the presence of a positive or negative trend in the change of the performance coefficient for a particular development factor of i -th territory system. In the absence of a clear trend in this parameter there is a sign of compensation, and the average absolute differences tend to zero.

The objects of the study were the regional systems of the Central (CFD), Volga (VFD), Siberian (SFD) and far Eastern (FEFD) Federal districts. This choice is due to the complex study necessity of real effectiveness involved in the reproductive processes of resources in both economically strong and in remote, depressed areas to prove (or disprove) the convictions formed in scientific circles, about the dominating some regions and lagging behind others (for example, according to the criterion of the gross regional product size).

As the study result of four selected Federal districts and the average Russian indicators on a set of 24 factors (two indicators at three measurement levels in the context of four blocks) and processing the information array of data, there was obtained the projection of variables on the factor plane (Fig. 1).

The performed diagnostics made it possible to classify the leased territories in the space of the main components and to define factor 1 as “dynamics of innovation processes”, and factor 2 as “current investment and infrastructure positions”.

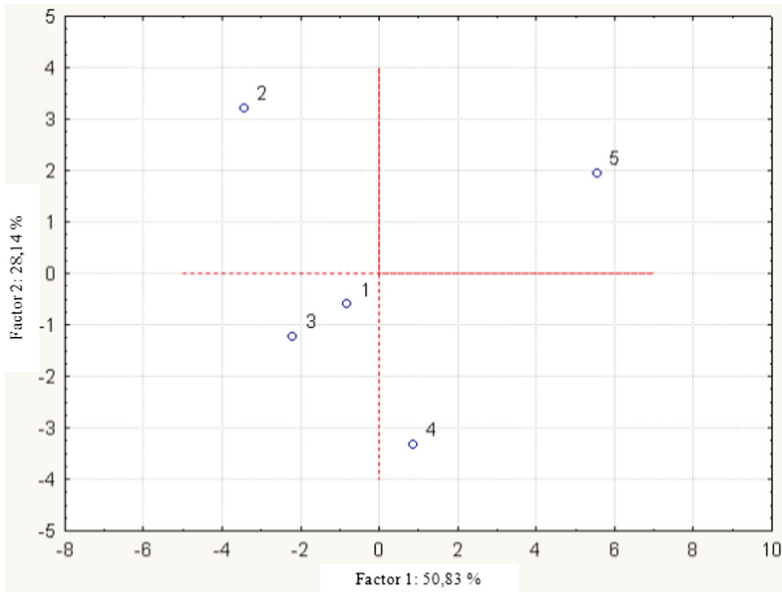


Fig. 1. Distributing the Russian Federation territory in the main components range on the complex of innovative resource indicators (1-RF, 2-VFD, 3-CFD, 4-SFD, 5-FEFD).

Judging by the calculations made, the current level of organization innovative activity ($\langle P_{4.1} \rangle$) in CFD and VFD, as well as in Russia in general, is 20–50% above the corresponding figures for the SFD and FEFD. However, the dynamics of this indicator ($\langle D_{4.1} \rangle$), for example, in SFO is 4.7 times higher than the average values, 2.7 times higher than this indicator at CFD, and 5.6-fold than in VFD.

Comparing the levels of using advanced production technologies (4.2) on the territories of the Russian Federation, the fragment of which is presented in Table 2, gives grounds to assert that all considered social and economic systems, with the exception of VFD, demonstrate approximate one-way current ($\langle 4.2 \rangle$) and average ($\langle 4.2 \rangle$) results. At the same time, the dynamics of this indicator ($\langle D_{4.2} \rangle$), for example in FEFD (7.98), is almost 2 times higher than the values for the Central Federal District and the average level in Russia, and almost 3 times higher than the indicator for VFD.

Turning to the analysis of infrastructure and investment modalities of districts, one can state that at the background of the Central Federal district, Volga Federal district and national values, there is quite a favorable situation in the SFD and FEFD in the field of healthcare (indicator 1.2 is almost at all levels). Investments in the fixed capital per capita (indicator 2.1) for the Far Eastern Federal district are almost 1.5 times higher than the current results for the Central Federal district and the Russian Federation and 2 times higher than the achieved value for SFD.

At the background of separate impressive achievements of socio-economic and investment development, Siberian and far-Eastern territories look clearly “failed” judging by the labor productivity indicators in manufacturing industries and, especially, by the level of road infrastructure development, which is a vital artery for the economic

Table 2. Performance analysis of using advanced production technology for 1,000 enterprises in the Russian Federation.

Territories	Current performance « $P_{4,2}$ »	Average performance « $\langle 4,2 \rangle$ »	Dynamics « $D_{4,2}$ »
RF	43,23	34,46	4,31
Central Federal District	36,04	29,36	4,03
Volga Federal District	78,80	72,27	2,80
Siberian Federal District	35,64	24,64	5,12
Far Eastern Federal District	36,70	26,12	7,98

resources uninterrupted supply. In 2015 the minimum value of the roads density in the Central Federal district, characteristic of the Kostroma region (133 km/1000 sq. km) was covered in only two geographic regions of the Siberian Federal District: the Altai region (221 km/1000 sq km) and Kemerovo region (174 km/1000 sq km) and it isn't achieved in any of the FEFD subjects.

Figure 2 shows the magnitude of road density values for the far Eastern Federal district regions.

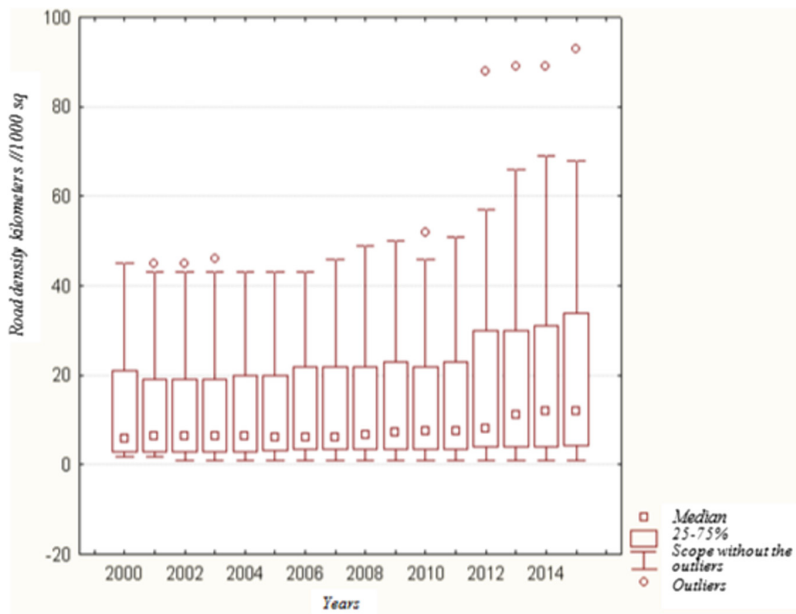


Fig. 2. Graph of the road density values for the far Eastern Federal district (designations: “Median” means the average road density; “25%–75%” means a rectangle corresponding to 25% and 75% quarters; “Scope without outliers” is the range of roads density values without taking into account outliers in observations; “Outliers” are points corresponding to the emissions).

The median values of the presented graph show that for the 16-year period under review in the “lower” half of the far Eastern Federal district, the density of roads is within 10 km/1000 sq. km of the territory and has been increasing intensely, which is a serious obstacle to developing neo-industrial conditions of managing the subjects remote from the Federal centre. At the same time, as it can be seen from the chart, the spread of values between the minimum road density and the maximum indicator in the far Eastern Federal district has grown sharply since 2012, and as of 2015 it exceeds a hundredfold level (Chukotka AD – 0.9/Primorsky Krai – 93.00), and, of course, acts as a threatening aspect of strengthening interregional imbalances. For comparison, in the Central Federal district the ratio in 2015 is 18.4 times (between indicators in Moscow (2453 km/1000 sq km) and Kostroma region (133 km/1000 sq km)); in the Volga Federal district the ratio is 3.7 times (Republic of Tatarstan (423 km/1000 sq km)/Kirov region (113 km/1000 sq km)); in the Siberian Federal district the ratio is 18.4 times (Altai Krai (221 km/1000 sq km)/Krasnoyarsk Krai (12 km/1000 sq km). Although the average roads density in the SFD exceeds the corresponding value in the far Eastern Federal district by 3.7 times, it is almost 10 times lower than in the far Eastern Federal district.

It should be noted that the facts and consequences of significant inter-regional imbalances are analyzed by many experts not only in the economic field, but also sociologists, political scientists, geo-graphs, etc. [17–21].

S.G. Arbuzov clearly identifies the problems of these differences. According to him, the issue of the permissible level of regional development imbalances is very relevant for all the states, including the most developed countries. Territorial differentiation and the economic contradictions existing on this basis may provoke protracted regional conflicts, which have a direct impact on the functioning stability not only of the state, but also of the world community [4, p. 137].

Therefore, for specialists studying socio-economic systems, it is fundamentally important to identify and justify the causes of significant interregional imbalances by specific indicators, the optimal boundaries of the discrepancy (based on the practice of the most successful territories), as well as the prospects for smoothing differences through targeted support for the lagging regions.

According to E.S. Gubanova’s fair statement, under the conditions of significant regional differences, accumulating advantages in specific territories occurs due to the limitation of the possibilities of others, which increases the likelihood of the crisis phenomena threat, leads to violating the socio-economic space homogeneity. The unequal development of regions initiates the economic growth slowdown, human capital depletion, technological backwardness, decrease in public confidence in government, weakening economic and social ties [5, p. 68].

There can be the affirmative answer to the question of, for example, infrastructure indicators impact (road density – X) on the level of labour productivity (Y) in the far Eastern Federal district. The performed correlation and regression analysis allowed determining the dependence between two factors with a high reliability degree (Fig. 3).

The adequacy of the obtained model is proved by a high correlation coefficient (r) close to 1, as well as a low level of Fisher statistics ($p \approx 0$). In this case, most of the observations fall within the 95% confidence interval of the obtained function: $Y(X)$.

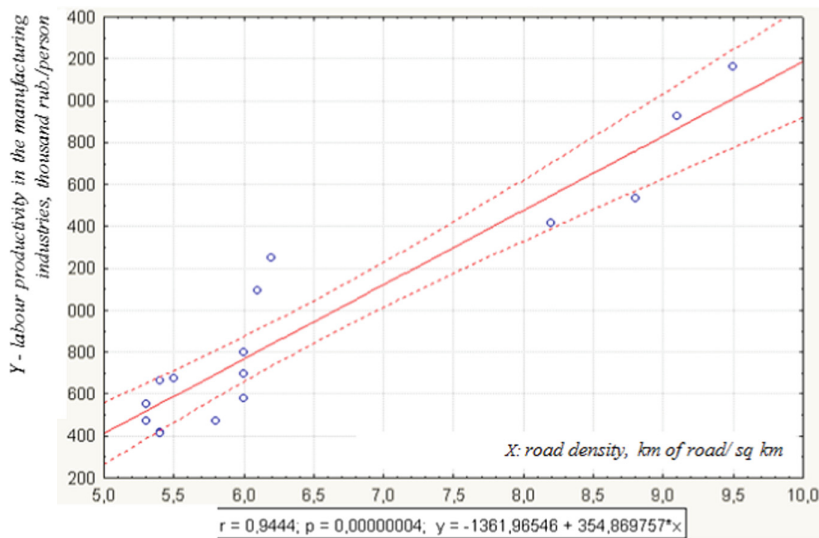


Fig. 3. The scatterplot of the labour productivity values in the manufacturing industries depending on roads density in FEFD for 2000–2015.

In the context of the market conditions and transiting the majority of domestic industrial enterprises to work “on demand”, the priority is given to the time during which organizations receive the necessary resources, often from different suppliers, and the speed of technological operations, which directly transforms into the level of local and industrial productivity. It may be noted that the infrastructural content and, especially, the saturation of transport interchanges in the region, ultimately determines the production volume per one employed in the relevant sector of the economy.

Recognizing the significant state support of the removed regions of Siberia and the Far East, and in this regard fulfilling in these areas Federal target programs on developing road infrastructure, we have to admit it that in FEFD the relatively low dynamic of road density increase («D_{1,1}») and sluggish growth in average labor productivity («D_{3,2}»).

It is obvious that in order to get out of the current protracted and unfavorable situation, it is necessary to have tighter control over the investment resources use, directed in particular to improving the high-cost infrastructure in remote regions of the Russian Federation, as well as to regular monitoring of the achieved result dynamics in terms of their comparison with the reference values for other territories.

Highly reasoned conclusions of the Institute of economic forecasting of RAS formulate highly grounded conclusions of the non-structural and technological non-equilibrium of the Russian economy characterized by non-proportional distribution of production factors and financial resources. In their opinion, specialized structural and investment policy is necessary to overcome the existing significant differences – a set of measures aimed at smoothing the imbalances of sectoral, technological and spatial nature, which complicate the interaction between sectors of the economy and are not eliminated by traditional market mechanisms [6, p. 8].

5 Conclusions

As a result, the selected set of indicators can be changed and supplemented with other characteristics in accordance with the tasks solved in a particular study.

The proposed methodological approach to diagnosing innovation and resource potential and the territories differentiation degree can be applied in the practical activities of the authorities of different levels in forming, implementing and controlling socio-economic development programs, as well as in the scientific work of specialists engaged in fundamental research and substantiating the perspective extraction of unused infrastructure, reproduction and innovation reserves in the regions and Federal districts.

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Actual Problems of Business in Russia

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Abstract. In the face of Western sanctions, a sharp drop in prices for oil and other commodities, Russia has found itself in a difficult political and economic situation. President Putin, addressing the Federal Assembly on March 1, 2018, paid special attention to the importance of the economic development of our country, pointing out not only the shortcomings that existed, but also defining the main directions of work for the next six-year term in this field. To this end, V. Putin offered to “support high-tech companies in every possible way, build a favorable environment for start-ups, for the rapid introduction of new developments into production,” and create a convenient infrastructure, comfortable tax regimes, and protect intellectual property. “These and other measures, according to the president, will help accelerate the processes of re-industrialization in our country, will stimulate economic growth.

To ensure sustainable economic growth, the president proposed to increase investments to 25 percent of GDP and direct them, first of all, to modernization and technological re-equipment of industries, renewal of industry. “We need to ensure the highest dynamics here, to reach a level where on average every second enterprise carries out technological changes during the year,” the head of state said. “That’s when the economy and industry will be renewed [1].

To fulfill these and other tasks which the head of state set out in a message to the Federal Assembly in March 2018 to increase the pace of Russia’s socio-economic development joint efforts of the authorities and business will be required. It is known that business is able to develop its production, build new plants only where favorable conditions are created. However, the practice shows that the necessary conditions for business have not yet been created in Russia. This research is devoted to unresolved problems in this sphere.

Keywords: State policy of reindustrialization · Western sanctions · Raw materials economy · Import substitution

1 Introduction

President of the Russian Federation V.V. Putin, speaking with the next message to the Federal Assembly on March 1, 2018, paid much attention to the problems of business, its relationship with the authorities, law enforcement structures. “In order for the economy to work in full force, we need to radically improve the business climate, ensure the highest level of entrepreneurial freedom and competition ... We should remove everything that allows unscrupulous, corrupt officials and law enforcement agencies to exert pressure on the business. The Criminal Code should cease to be an instrument for resolving economic conflicts between legal entities” [1].

On March 18, 2018, presidential elections took place in Russia, in which Vladimir Putin won a big victory. The Russian people, having handed the next *carte blanche* to the head of state, expect changes for the next six years for the better. However, many independent experts instead expect the continuation of stagnation in the economy and failure to implement a number of election promises. For example, Sergei Zhavoronkov, senior researcher at the E. Gaidar Institute for Economic Policy, explicitly stated: “Vladimir Putin is not in a position to change his economic policy because of the interests of state corporations headed by his friends. However, in his message to the Federal Assembly, he said a lot of the right things, but he says these correct things throughout the 18 years of government. This is not even populism, but a complete divergence of words and actions. He said that the state will reduce the share in the economy, but it increases. He said that the burden on the business will decrease, but it only increases due to customs, trade and other payments [2].

The head of state publicly stated that “the relations between business and the state should be built on the philosophy of the common cause, on partnership and equal dialogue” [3].

However, it is incorrect to believe that after such public speeches of the head of state, all the main problems of mutual relations were completely solved. For example, there are still no clear and unchanging “rules of the game”, the investment climate is far from favorable, and the legal framework does not guarantee the inviolability of private property. After the well-known authorities destroyed one of the most successful oil companies with an annual income of tens of billions of dollars, and its owners were sent to jail, the overwhelming majority of large Russian entrepreneurs began to register their companies abroad - in Cyprus, the Bahamas, the Maldives, in Switzerland and other offshore zones, thereby expressing a sign of mistrust of Russian jurisdiction.

Registration of companies in offshore zones is beneficial for entrepreneurs for many reasons. Having registered in the Seychelles, Cyprus, Monaco, the Bahamas and other offshore companies, Russian companies minimize their costs. Offshore schemes allow you to evade many Russian taxes: (value-added, income of individuals, payment of various excises and duties, as well as from social payments to budgets of different levels.

According to SM Mironov, the former head of the Federation Council, 70% of the Russian economy today is managed from offshore companies, which is confirmed by many facts. Thus, a controlling stake in the largest domestic steel company Novolipetsk Steel (worth \$ 13.3 billion) belongs to Fletcher Group Holdings Limited, based in

Cyprus. The main owner of NLMK V. Lisin, who owns 82% of the combine, is at the top of the list of the richest businessmen in Russia. Its condition in 2018 is estimated at \$ 19 billion. Another well-known Russian businessman O. Deripaska also keeps his assets away from his homeland. His United Company "Russian Aluminum" (UC RUSAL, United Company RUSAL, UC Rusal), the world's second largest producer of aluminum and alumina, is registered on the British island of Jersey. And the assets of R. Abramovich, whose personal fortune exceeded \$ 19 billion in 2017, are also placed abroad, mainly in off-shores [4]. According to our calculations, over the past 10 years, Russian businessmen have been exported abroad, including offshore companies for more than \$ 680 billion or almost three annual Russian Federation's budgets.

As a result of mass withdrawal of large Russian business to offshore, the Russian budget is not receiving hundreds of billions of rubles in taxes and fees.

With the help of offshore companies, Russian businessmen not only evade taxes, but also protect property from raider seizures, and from illegal criminal prosecution. On illegal criminal prosecution of entrepreneurs in modern Russia say for a long time, but radically to break the trend is not possible, the chances of facing a criminal case with Russian businessmen are quite large. In Russia, the institution of a criminal case against a businessman often ends in a reputational loss or loss of business. Businessmen are in danger of losing control of their case in the SIZO, where they can be kept for months without a verdict and great progress in the investigation.

Thus, the current practice of unlawfully instituting criminal proceedings against Russian businessmen is an integral part of the negative process - raiding, that is, the illegal seizure of profitable business.

With the pressure of the law enforcement agencies, the authorities have been struggling for more than ten years, during which the head of state issued tough instructions on this issue. Thus, Dmitry Medvedev, being the president of Russia, in the summer of 2008, at a meeting with representatives of small businesses, directly stated: "In general, it is necessary that both our law enforcement bodies and the authorities cease to be a nightmare of business" [5]. Vladimir Putin also called on the supervisory and supervisory bodies to stop the nightmare of business, to reduce the number of unscheduled inspections of entrepreneurs.

Fulfilling V. Putin's instructions to stop the "nightmarish business", the Ministry of Economic Development in October 2012 drafted a bill proposing a fine of 200 thousand rubles and even imprisonment for up to 5 years of police for illegal criminal prosecution of entrepreneurs. The document caused widespread approval in the expert environment. After all, it was also proposed to include a number of articles of the Criminal Code, according to which policemen often set up businesses for businessmen, to the sphere of private-public accusation, where cases can only be initiated upon the application of the victim or his legal representative.

Despite the wide support among lawyers and businessmen, this project has been forgotten. Just as the proposals of the head of the Investigation. "The practice of investigating criminal cases of raiding shows that in almost all cases, officials of the government and local government provide assistance to raiders," said the head of the Investigation Committee, Alexander Bastrykin. According to him, the elected authorities initiate deputy requests, distort the coverage of events in the media, and fulfill other orders of the raiders. According to A. Bastrykin, law enforcement officers also

assist raiders: they initiate custom criminal cases, seize media with shareholders registers, and then make changes to them [6].

The fight against raiding in Russia is hampered not so much by legislative problems as by crime and corruption by state bodies. Practice shows that almost no seizure occurs without the participation of corrupt individuals in courts, notary offices, law enforcement agencies. Many entrepreneurs have to pay officials to protect themselves from raider attacks, in which corrupt individuals in power structures are involved in varying degrees.

In fairness, it should be noted that the number of raider seizures of the profit-making enterprises of registered crimes on “economic” items has declined over the past five years, but at a slow pace. If in 2010 - 281.3 thousand “economic” crimes were recorded, then in 2011 - 240.2 thousand, in 2012 - 235 thousand, in 2013 - 225.2 thousand, in 2014 - 212.3 thousand [7]. However, in the last two years, a negative trend has again appeared. In 2016, according to the business ombudsman Boris Titov, 240,000 criminal cases on economic crimes were instituted.

President Vladimir Putin was aware of the wrong policies of the authorities and law enforcement agencies in relation to business. At the meeting-seminar with the chairmen of the courts, he stated the following facts: “In 2014, investigative authorities instituted nearly 200,000 criminal cases on so-called economic composition. Only 15% of the cases ended in a verdict. At the same time, an absolute majority, 83% of entrepreneurs, where criminal cases were opened, completely or partially lost business. That is, they were pressed, robbed and released. “And this, of course, is not what we need from the point of view of the business climate” [8].

This situation can hardly be considered acceptable for the domestic economy. That is why in December 2016 the head of state signed a law that tightens the punishment for initiating a criminal case against a knowingly innocent businessman if the goal was to interfere with business or he eventually stopped working. And for the safe enrichment of the 1990s and the 2000s, support was required from the power structures, which legally and politically protected from competitors and the “punishing sword of justice”. This officially - under oath and under the protocol - told the High Court of London in October 2011, the dollar billionaire Roman Abramovich, received such support from the Russian government. According to the version voiced by Roman Abramovich in the course of the London court, he gave Boris Berezovsky a large sum - more than 2 billion 500 million dollars - for supporting his business at the political level [9].

In the conditions of constant pressure on the business, which are far from the normal investment climate, the empowered entrepreneurs should receive additional powers to resolve conflicts between businessmen and authorities. Otherwise, more and more businessmen will withdraw their business from Russia’s jurisdiction to offshore, and offshorization of the Russian economy will become irreversible.

Today offshores become a real obstacle to the formation of a normal business climate in the country, reducing the level of confidence in its economy from foreign partners and investors. Therefore, President V. Putin repeatedly stated that the state needs to support domestic business, create such conditions that it is profitable to invest in the domestic economy and industry.

According to Vladimir Putin, nine of the ten significant transactions concluded by major Russian companies, including those with state participation, are still not regulated by Russian laws [10]. To do this, it is necessary to create comfortable conditions for doing business in Russia, to reduce corruption in public authorities, etc.

Corruption in the Russian Federation complicates not only normal business conduct, but also distorts the functioning of all political and economic mechanisms, including competition, hinders social reforms and modernization of the national economy, causes serious anxiety and distrust in state institutions in Russian society. Corruption in Russia has become a way to enrich the powers that be. Granting exclusive rights and benefits to business (for export and import, taxes, licensing, etc.) is a breeding ground for corruption. New political and socio-economic conditions have become fertile soil for illegal enrichment of those who, by virtue of their official powers, distribute various kinds of quotas, issue licenses, conduct tenders for government purchases, etc.

The main incentive for corruption and its main reason is the possibility of obtaining benefits related to the use of power. The annual aggregate income of Russian corrupt officials is constantly growing and has already reached, according to some estimates, \$ 300 billion [11]. Thus, the corruption component in Russia has become a critically dangerous problem. According to opinion polls, 90% of Russian businessmen do not believe that their business in our country can be successfully managed without corruption links. This fact was confirmed at a meeting in the Administration of the President of Russia [12]. With the close interaction of government and business in Russia, so-called business corruption has increased.

The multiple growth of bureaucracy in Russia, the great number of necessary, few necessary and useless instructions, rules, instructions, regulations, orders, regulations and other products of creativity of inventive bureaucrats make it very difficult to conduct business in our country. Under the terms of doing business, Russia is on the 120th place in the world. “When there are too many such regulations and restrictions,” the researcher M. Olson notes, “sooner or later the private sector (since all or almost all of its representatives have incentives to violate anti-market facilities or bribe officials) makes the government corrupt and ineffective” [13].

Practice shows that Russian businessmen, in order to create favorable conditions for their company, are looking for workarounds and strive to use bribes to create acceptable conditions for themselves and their business. Thus, one of the good reasons why Russian authorities are seriously affected by corruption is that almost all private entrepreneurs have incentives to violate numerous laws, regulations, restrictions, trying (and quite successfully) to overcome illegal ways bureaucratic obstacles on the path to profit.

In 2017, according to the world’s corruptness rating, Russia occupies an odd 135th place out of 182 states and is among the most corrupt states in the so-called “zone of national shame” [14].

The most affected by corruption are such spheres and activities as export of non-ferrous and rare-earth metals, timber, other export goods, imports of alcohol and some food products, and other foreign economic activities; privatization, licensing and registration of business and commercial structures; bank crediting; land relations; auto business and vehicle operation; financial, sanitary-epidemiological, fire-prevention and

other control of the activities of business and commercial structures. Today, there is practically no government body whose corruption services would not be in demand in business. A feature of modern corruption in Russia is that it is consistently expanding its zones of influence, at the expense of new, previously sufficiently protected from it spheres, in particular, law enforcement and higher echelons of power, which makes it particularly dangerous.

In order to combat corruption the specialists suggest minimizing the contacts of the official with the customer of the state service, applying a widely advertised “electronic government” that is not yet fully operational. It was proposed to ensure a broader representation of state and public structures in the President’s Council for Combating Corruption. A number of recommendations concern the improvement of the system for investigating cases of corruption, the development of a legal institution for the confiscation of corrupt incomes, and the tightening of the liability of legal persons for corruption offenses [15].

So far, in this regard, Russia has a serious lag from the Western counterparts. Moreover, having signed the UN Convention against Corruption in 2003, Russia refused to ratify five of its basic articles, including Art. 20, which provides for confiscation of property of corrupt officials for illegal enrichment. Corruption - is a national problem, the rate of effectiveness of the state, but the fight against it is conducted haphazardly and more in words, without the use of positive counter lessons learned and successfully applied in the developed world.

Thus, the lack of political will, the non-use of political mechanisms that have proven themselves in other countries, in the presence of corruption niches created in huge numbers in the current Russian legislation (according to some estimates, more than 10,000), allow officials to extract unprecedented income from their own posts. Corruption today has become the main source of income for a certain part of federal, regional and municipal leaders, representatives of legislative bodies and political parties, has become the main motive for making managerial decisions.

Thus, in relations of power and business in Russia, quite a lot of acute problems have accumulated, which President V. Putin must solve in the new six-year term if he intends to realize his election promises and tasks formulated in his next letter to the political and economic elite with whom he spoke on March 1, 2018.

2 Problem Statement

One of the main issues of this research was the issue of topical issues of the relationship between business and government in Russia. The authors made an attempt to analyze the shortcomings in this area relating to corruption, lobbyism, criminal prosecution of businessmen, etc. To remedy this situation, it is necessary, in our opinion, to change the forms and methods of state management of the economy.

Specific directions, forms and methods of public administration, including such an important sphere as state regulation of the economy are determined by the nature of the relationship between government and business in this particular period.

Economic forums are one of the forms of effective interaction between government and business. The fact that there have been a lot of different subjects in the subjects of

the Russian Federation over the past few years, both in terms of objectives and composition of participants in economic forums, shows that the dialogue between the authorities and business is happening more and more often. Leaders of the largest domestic companies and regional leaders, heads of regional government bodies can openly discuss issues of stimulating innovation activity in the framework of forums to upgrade the regional economy, to talk freely about taxes, labor resources and investments. All this can not but contribute to mutual understanding, development of common views and common approaches to solving urgent problems of social and economic development of regions and the country as a whole.

As international experience shows, this form of interaction between government and business, such as public-private partnership (PPP), can become an effective means of establishing close mutually beneficial relations in the economy and social sphere. Public-private partnership (in foreign public and political literature - public-private) implies cooperation between business and government structures, regional corporations and state enterprises aimed at achieving common social and political goals, solving pressing social and economic problems through agreements, contracts, concession agreements on interaction. Public-private partnerships are widely spread abroad, and, above all, in Western Europe.

The goal of PPP is to combine public and private resources to use them most effectively and to maximize the benefits of joint activities for all parties to the partnership, as well as to address some of the tasks set for the state and the private sector, respectively.

The need for the formation of public-private partnership in our country is quite clearly indicated by Presidents D. Medvedev and V. Putin in a number of their public speeches. Thus, in the Message of the President of Russia Dmitry Medvedev to the Federal Assembly of the Russian Federation on November 30, 2010, it was stressed: "We need to encourage and make maximum use of the mechanism of public-private partnership" [16]. In June 2017, President Vladimir Putin instructed the government "to work out a mechanism for public-private partnership for infrastructure" [17].

For each party, the benefits of PPP can be its own. So, for the state, PPP can be a tool for attracting extrabudgetary funds that will enable it to fulfill its obligations. One example of the state's obligations can be the effective implementation in various sectors of projects that are of significant importance for society: reducing unemployment, improving the level of economic indicators that confirm the effectiveness of investing in projects implemented in Russia. The private sector can solve such tasks as profit from joint activities with the state, access to objects owned by the state, or other benefits, such as benefits, budget funds for business development, stability, overcoming barriers to access to markets for services (works) and other. Also, for business, one of the main incentives is return on invested capital or return on investment, as well as guarantees of return on invested capital.

Thus, public-private partnership as a form of interaction between government and business in Russia is gaining momentum and in the long term it should become an organizational and institutional combination of efforts and resources of the state and private business with a view to implementing socially significant projects.

3 Research Questions

In this study, the authors consider the following questions.

1. Identify shortcomings in the relationship between government and business and outline ways to overcome them.
2. Analyze the reasons for the flight of domestic businessmen and their capitals to offshore and other countries of the world.
3. Analyze some forms and methods of effective interaction between business and government in the face of Western sanctions.

4 Purpose of the Study

The aim of the study is to study the problems that Russian businessmen face when doing business in their country, including when they enter into relations with the authorities of the Russian government.

5 Research Methods

In this study, the following methods are used: (1) a comparative method that compares the relationship of power and business in Russia and China, some other developed countries; (2) systemic and structural-functional approaches make it possible to form a holistic and objective view of the state of relations between government and business in Russia, highlighting both the positive aspects and the existing shortcomings; (3) The institutional approach allows us to analyze the role of the president, the government, law enforcement and other authorities in the implementation of state policy regarding business representatives in Russia.

6 Findings

1. In the new economic conditions at the state level, recognition of business as an active creative force of the society is necessary, and entrepreneurship is an important part of the country's economic growth, welfare, quality of life and national security. The state should give an open, clear and long-lasting signal to society that entrepreneurship is a benefit for both the Russian economy and citizens.
2. The federal and regional authorities should finally understand that the entrepreneurial potential can be realized only in the case of guaranteed inviolability of private property, stability of tax policy, fiscal and regulatory conditions, and also with the interest of regional and local authorities in the development of entrepreneurship, mutual understanding and cooperation of the authorities and business, their common responsibility for social and economic development of the country.

3. Despite the less favorable conditions for doing business in Russia than the developed countries of the world, domestic businessmen, acting within the limits of the anti-Russian sanctions, with the support of the power institutions, are achieving significant results in modernizing production and introducing the latest achievements of science and technology in their enterprises. This is evidenced, among other things, by the successes in the production of precision weapons, aircraft and shipbuilding, and other branches of the economy.
4. Thanks to the achieved mutual understanding between the authorities and the business community, attempts by the US and its allies to drive a wedge between the authorities and big business, including those who were included in the so-called “Kremlin list” failed, experts predict that Americans can seize property and business accounts from a blacklist to quarrel with the power of a large business or that oligarchs close to the Kremlin, influenced the change in Russia’s foreign policy, including on issues related to Ukraine.
5. However, it would be a mistake to believe that in the relations of power and business in Russia all problems are solved. The level of corruption is still high, there is no guarantee of inviolability of private property, as evidenced by raider seizures of lucrative enterprises involving law enforcement agencies, Russian courts and other authorities, and the number of arrests of businessmen in economic crimes exceeds two hundred thousand a year.

7 Conclusion

Thus, the study showed that Russia has not yet created favorable conditions for doing business. In terms of doing business in the world ranking Doing Business, Russia in 2017 ranked 35th, although it rose by 5 positions [18]. The difficulties of doing business in Russia are exacerbated by the tightening of Western sanctions. This was especially reflected in the business owned by O. Deripaska, which in 2018 was included in the list of new US sanctions. After the publication of new orders of President Trump in April, UC Rusal shares on the Hong Kong Stock Exchange fell by 50%. Investors refused to support the company’s money, which fell under new US sanctions [19].

To the political leadership of Russia to improve the business environment, it is advisable to turn to the experience of Japan, China, Singapore, and other developed countries of the world in order to creatively use it in their country. Both China’s experience, and the Japanese and Singaporean “economic miracle” have convincingly shown that by creating a favorable investment climate, caring for comfortable conditions for entrepreneurs, providing them with all possible support, the state not only achieves impressive results in the economy, but also significantly improves political stability in society, the level and quality of life of its citizens.

Alexei Kudrin, the ex-Minister of Finance of Russia and the head of the Center for Strategic Research (CSR), called the “immediate launch of public administration reform” the main task of the newly victorious President V. Putin and the future

government, since the current system of state administration “is not capable of solving problems, facing the country” [20].

The authors of the article express the hope that President Vladimir Putin will use his new six-year term as head of state to change the relationship of power to business for the better, to reduce corruption and raiding, to reduce the outflow of capital to offshore so that by joint efforts of the authorities and business, creatively using international experience, to bring Russia to a number of prosperous countries in the world.

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An Optimal and Quasi-optimal Alternatives Determination in the Multicriteria Marketing Researches

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Abstract. The problem of multicriteria choice is considered at the example of marketing researches. The problem is solved in two stages. At the first stage it is necessary to find the alternative which is optimal to the all used criteria. The intermediate stage is the ranging of other alternatives compares to the optimal which has gained the majority of conditional points. The second stage is concerned with the actions of the decision-making person (DMP) for the most objectifying choice of quasioptimum alternatives. Then with the considerable size of the alternatives set the optimum alternative is complemented with the quasioptimal list solutions by the decision-making person in two stages. On the first stage the decision-maker determines the size of some threshold value in the interactive mode. Next, on the second stage after the clustering with the author's method of randomized ranks elements of the studied set and displaying the range to the chart of alternatives corrects the initial choice. This correction depends on the revealed clusters elements coloring as injective prototypes mapping i.e. the elements of color of the standardized colors range for the images which are the investigated areas of the explored region. The display of a prototype (as color) to the areas image generally could have the surjective character when the remained classes and their elements are painted by the last range color which obviously marks not the quasioptimum alternatives areas of the explored region.

Keywords: Decision-making problems · Optimization · Fuzzy sets · Clustering · Mappings · Color

1 Introduction

The need for the decision-making (which are multicriterial usually) is the obvious part of any managerial activity process. There is no exception for the using the multicriteria decision-making tasks apparatus in the optimal solution selection in marketing research concerned with the purchasing a particular product or the finished products promotion

in the selected market segment. In such cases the MC DMT could be described in the next reduced tuple like [17]:

$$\langle t, X, R \rangle \quad (1)$$

where t is the formulated control problem; X - the set of possible management decisions, and R is the set of values/ requirements (criteria) taken into consideration.

As it is known for example from the researches of prof. A.S. Orlovsky the couple variants of X solutions could be represented as the alternatives set belonging to the agreement region X_s which in either case satisfy the requirements in the selection process, formulated as a list in the name scale R , and the compromise area X^0 satisfies the almost all requirements of R , except the least one. The both theoretical subsets X_s and X^0 from the general list of alternatives X must satisfy the following obvious conditions:

$$X_s \cup X^0 = X \quad (2)$$

$$X_s \cap X^0 = \emptyset \quad (3)$$

Due to the (2) and (3), the optimal solution x_{opt} should be sought especially in the compromise field: $x_{opt} \in X^0$. However, the task will be much simpler if as a result of the preliminary data analysis as a mapping of the X array onto the R array the obviously winning alternatives which simultaneously satisfy all the criteria (hypothetical X_s) are derived from the following discussion (if there are any of them in the formation of the problem t from expression (1)). Then, according to (2), we could use the identity of the sets $X^0 = X$. After that the problem of optimal choice is reduced to an analysis of the management variants (alternatives) of the X set concern to the list of criteria R .

The presented author's approach is based on the solution of a multicriteria task decision making (MC TDM). This method as the famous scientists in [1–3] note is one of the most reliable mathematical tools of the multicriteria choice. In the [4–8] authors note that this method is demanded for the solution of a wide range of administrative tasks based on the principles of validity and accounting of compromises between various parties which are interested in a decision making. Especially it should be marked that from the researches presented in publications [9–16] when determining the locations of the industrial and social facilities it is necessary to use not only the geoinformational technologies for processing and submission of space data, but also the multicriteria decisions analysis methods for the multifold assessment of the alternatives set.

2 Materials and Methods (Model)

The formulation of the MC DMT as a tuple (1) taking into account constraints (2) and (3) has a simple solution in the form of a nonstrict (usually) preference, in which the optimal alternative $x_{opt} \in X$ has the first place if the investigated set X has low power: $|X|$ include several units. In the [18] it is noted that one-time perception is measured as 7 ± 2 units. Then the choice priority could be limited to the only one alternative the x_{opt} which obtained in most methods of solving the MCDT as a result of sequential search for the vector of local and subsequent global variables obtained as a result of the

additive convolution application taking into account the weights of the accepted criteria and the current values of the local priority vector. In other words, MK TDM allows creating a one-dimensional complex integrating index according to which it is possible the ranking of the investigated alternatives from their set X .

However, the formulation of the multicriteria choice problem becomes more complicated if the number of elements of the ranked set X is much larger than the quantity of the previously specified units 7 ± 2 , for example, dozens of units. As an example it is possible to note the customer's interest positions list in one of the market products segments (for the purchase), and a possible list of supplies for the same market segment. In such cases the special urgency has the task of finding not only the optimal alternative (management solution) x_{opt} , but also the quasi-optimal alternatives of x_{kwopt} close to it by the complex rating. It is obvious that the set of quasioptimal alternatives is a subset of the original working array when it is modified (by the identifying and excluding from the process of solving the possible presence in the expressions (2) and (3) the agreement area $(X_S) X^0 = X: x_{\text{kwopt}} \in X$.

It is obvious that in the randomized decreasing series obtained as a result of the MC TDM decision by any known method the first position will rightfully be occupied by the optimal alternative x_{opt} . Then the alternative variants decreasing by the magnitude of global priorities vector (GPV) should be referred to the quasioptimal, i.e. which belong to the alternatives area $x_{\text{kwopt}} \in X$. And if the amount of optimal alternative in the case of obtaining a nonstrict preference relation is already to the leading elements the number of which could be generally from one to more we denote by k_1 , then the required number of the most promising (leading) elements could be estimated as the sum of the concrete optimal solutions and the part of the following quasi-optimal alternatives:

$$|X^{\text{lider}}| = |X_{\text{opt}}| + |X_{\text{kwopt}}| = k_1 + k_2 \quad (4)$$

And if in a tabular or graphical representation of the results of the MCTDM decision the amount of alternatives belonging to the set X_{opt} is easily determined at the visual level (usually in practice $k_1 = 1$) the definition of the quasi-optimal alternatives number k_2 belonging to the set X_{kwopt} is both practical and theoretical problem (task).

2.1 The Proposed Solution

As an example of the such problem solution we propose to use the results of solving the logistic problem i.e. identifying the most promising areas of the Republic of Tatarstan (RT) for the most optimal (rational) placement in the areas of the RT the logistics facilities (objects) on multi-purpose requirements with the estimation the sought value $|X^{\text{lider}}|$ from the expression (4). Then the notation (1) foresees among the 43 districts of the RT (the set X with the number of elements $n = 43$), taking into account the requirements of the 24 criteria (set R with the number of elements $m = 24$) accepted, the decision of the problem $t =$ "Identify the most promising areas for locating LO" [19]. As a model for the MC TDM solution was chosen the method given in [20].

Like the all other methods of solving the MC TDM the chosen method [4] provided the all classical steps: (1) the mapping τ_1 of the alternatives set X in the naming scale to

the set of R criteria (also in the naming scale) in the form of statistical data in the interval and in linguistic binary scales (such as “yes-no”, “far-close”, “there is – there isn’t”, etc.). Totally is estimated 15 indicators for each district of RT presented in the interval scale and 9 are in binary linguistic scale [3]; (2) the mapping of linguistic scales τ_2 into the interval scale according to the correct rules for the chosen method; (3) the division of the criteria list R into two groups, one of which defines the criteria r_j , $j = 1, m$, for which the quality of their accounting increases with the growth of its quantitative indicator (there were 23 such cases in the example), in the other group are the criteria for which the growth of quantitative indicators lead to the overall quality reduction (was just 1 criterion); (4) the structuring of the criteria set in the form of a multilevel (in the example there is two-level case) hierarchical goal tree (GT) in the form of prof. Ishikawa’s “Fishbone diagram”; (5) weighing the criteria ω_{qz} ($q = 1, 6$ - is the number of groups of criteria, $z =$ from 1 to 3 - 6 criteria on each branch of the first level) as the branches of a two-level GT in which the each level of “tree branches” is a complete group of events; the preferences of the decision-maker (DM) are expressed in the rank (ordinal) scale with the subsequent mapping of τ_3 to the interval scale in the form of weights according to the famous Fishburn transformation; (6) the definition of dimensionless elements of the local priorities vector of (LPV) $U = \{u_{ij}\}$; (7) the global priorities vector (GPV) calculation with the additive convolution

$$v_i = \sum_{j=1}^m u_{ij} \cdot \omega_{qz}, \quad (5)$$

where ω_{qz} are the criteria weights on the hierarchical two-level GT; (8) finding the optimal alternative i number from the expression

$$v_{\text{opt}} = \max(v_i) \quad (6)$$

(9) the construction of a randomized decreasing alternatives sets series of $X = X^0$, beginning with x_{opt} (as a result of the decision of the MC TDM three lists of alternatives are formed as listing of the investigated set X in the integral rating points, in membership degrees and by the normalizing the initial scores in scales whose sum is strictly equal to 1 (see the columns 3–5 of Table 1)), (10) the determination of the k_1 and k_2 from the expression (4); (11) the interpretation of the obtained results and the creation of practical recommendations to the state administration bodies (SAB), in this example about the districts of RT which are preferable from the position of placing in them the logistic objects.

Next, if with the definition of the k_1 value the part of claimed problem is removed by observing the tabular or graphical results then with the domain set of quasi-optimal alternatives to k_2 finding there are certain difficulties. First, in the nature there could hardly be find an abstract formalized selection rule without predefined constraints (which due to their essence) could have a purely contextual meaning in accordance with the solved problem t from the tuple (1), and secondly, finding the value of k_2 in a simple expert implementation could hardly be estimated as the sufficiently objective. In the case of group peer review with the using of the full statistical analysis under the guidance of a decision maker (as the instrument of initial expert assessments

verification), a certain degree of objectification of the k_2 from expression (4) definition could be ensuring in a some extent, however, the degree of a result obtaining promptness with this way could create justifiable doubts. Due to this issue the following two-level expert approach is proposed in determining the k_2 value immediately after the completion of stage 8 above.

First, the randomized descending series of elements x_i , $i = 1, n$ of the studied set X as the alternatives with integral values in the form of rating points (see column 3 of Table 1) for the next necessary formalization is represented in the form of a normalized fuzzy set with the membership degrees $\mu(x_i)/(x_i)$, see the column 4 of Table 1, where the set X itself acts as the carrier of the fuzzy set S_X . Next, the whole alternatives are X is clustered on to the author's algorithm [21] on the basis of normalized four-field tables using in a linguistic variable terms. As a result are formed the clusters (classes, taxa) elements of which are more "similar" to each other than each of them with the other clusters elements (i.e. are created the transitive equivalence relations) by using the properties of fuzzy level sets. As the significance level of the α linguistic variable could be any linguistic term assigned by the DM with respect to the difference degree between the two following levels of values $\mu(x_i)/(x_i) \in X_A$ in accordance with the double tetra scale of T. Saati [18]:

$$\alpha = \{ \text{"there are no differences," "weak," "significant," "strong," "absolute"} \} \quad (7)$$

In this research as a set of the DM was chosen level $\alpha = \text{"significant differences"}$. As results were formed clusters which numbers are placed in column 6 of Table 1. The number of elements entered in clusters is given in column 7 of the same table. Further the creators of this methodology presented in the FoxPro 2.6 programming environment (with MS Windows) offer to the DM to arbitrarily assign the size of the boundary value of belonging degree for every region $\mu^{\text{gr.opt}}(x_k)/(x_k)$, where k is the current variable index, corresponds to the definition "a list of optimal alternatives" (as the management strategies here). Supposing that the DM formulated the value of $\mu^{\text{gr.opt}}(x_k)/(x_k) = 0.90$ as the boundary belonging degree of alternatives to the term "optimal" (which could be perceived by them and simply as 90% confidence that does not change the matter of the sense). In the Table 1 (see column 4) the amount of optimal alternatives with a membership degree of 1,000 (or 68,99 points) is concerned with only one Tukaevsky district, i.e. it has been selected the small number of the optimal (and quasi-optimal) regions, which are the most attractive for locating LO. Then the decision maker for example assigns the level $\mu^{\text{gr.opt}}(x_k)/(x_k) = 0.50$. The computer program will indicate to him 12 districts which are budding from the position of placing LC there. It is possible to propose that 12 districts are a lot here. Then the decision maker assign for example $\mu^{\text{gr.opt}}(x_k)/(x_k) = 0.60$. As a result, this method provides to him only 8 prospective districts of the Republic of Tatarstan for locating there LO from 43. Suppose that a DM finds such number of budding districts as an acceptable variant. Thus, at the first stage of expert evaluation by the decision maker as a result of the iterative process was chosen a list of districts in the names scale which could be perspective for the design and construction of certain LO. Since according to psychologists the 90% of the information the observer perceives through the visual channel this position also could be taken into account in the multi-criterion choice task. Let's

propose that the decision maker again need to intervene/not intervene to the earlier obtained result which is achieved by coloring in the two next mappings: surjective (τ_4), when the clusters of regions correspond to one of the linguistic variable C colors and the injective (τ_5) when the elements appearing in clusters as preimages are assigned the same image and here is the same color of the spectrum C (if there are more clusters than $|C|$, then the last clusters color to last colour “by default”): $C = \{\text{“red”, “orange”, “yellow”, “green”, “azure”, “blue”, “purple”}\}$. Totally as a result of the author’s clustering method [5] of decreasing randomized series from 43 elements (districts of RT) were formed 18 clusters. Moreover, the coloring in the colors of the C color is especially interested for the leading alternatives. It is clear that by ordering, for example, a set of levels among the set expressed in membership degrees $\mu^{\text{gr.opt}}(x_k)/(x_k) = 0,50$, the DM will receive as the set of optimal and quasi-optimal alternatives the 12 RT districts (from Tukaevsky to Bavlinsky) the accumulated rating weight of which will be about 45,98% (see columns 4 and 5 of the Table 1). If the decision maker assigns the value $\mu^{\text{gr.opt}}(x_k)/(x_k) = 0,60$ (see columns 4 of the Table 1), then the number of optimal and quasi-optimal alternatives is 8. Since the set of optimal alternatives in this example is a one-point set ($k_1 = 1$), then the required k_2 will have $8 - 1 = 7$ quasi-optimal alternatives, which will take 33,65% from the total amount of set X regions, as it is easily seen from column 5 of Table 1. This concludes the first stage of the participation of the decision maker in the proposed iterative process. For the organization of the second stage of such expertise the DM observes the already colored diagrams which are constructed on the basis of Table 1 (see column 8) and visually assesses that the Bugulminsky district of the Republic of Tatarstan, painted with a azure color from the list C even entered the ordered $\mu^{\text{gr.opt}}(x_k)/(x_k) = 0,60$, but this area belongs to another cluster, neighboring in its limits with four other districts of the Republic of Tatarstan (also according to the injective mapping τ_5 are colored azure). Then the decision maker makes a natural decision on the withdrawal of the given area from the previously declared list according to the level of $\mu^{\text{gr.opt}}(x_k)/(x_k) = 0,60$. Thus, only 7 regions remain as leaders (the total weight load on them decreases from 33,65% to 30,41%): from Tukaevsky district as the optimum from the MC TDM position ($k_1 = 1$) to Arsky. Then the desired $|X^{\text{lider}}|$ with the found value $k_2 = 6$ from the expression (4) look like:

$$|X^{\text{lider}}| = |X^{\text{opt}}| + |X^{\text{kwopt}}| = k_1 + k_2 = 1 + 6 = 7 \quad (8)$$

The task of the most perspective areas list for LO placement definition is solved and presented in the form of expression (8) as a result of expeditious two-stage expert estimation of the decision-maker in the iterative mode. For the illustration of the input data for finding the k_1 , k_2 and $|X^{\text{lider}}|$ is provided in the following Table 1.

3 Results and Discussion

Thus, with the using of the fuzzy sets instruments decision-maker receive the opportunity of the most objectified choice in the interactive mode in two stages. The decision-maker at the first stage reveals the leaders randomly appointing the size of

threshold value, for example, equal to 0,60, then are selected the alternatives x_1-x_8 (column 2 of the Table 1). However h_8 belongs to a 5th cluster to which another four more elements enter. Due to the definition of transitivity the elements of this 5th class are more similar among themselves than to other classes elements. Therefore the decision-maker receive the objective reason for the exclusion of this (the 8th) alternative from the next analysis as quasioptimum (the second stage). Then the expression (2) makes $1 + 6 = 7$ of optimum and conditionally optimum districts (alternatives), i.e. that k_2 is 6. Proposed task is solved.

Table 1. The results of the iterations from decision-makers during the selection of budding alternatives.

No.	District name	Scores	Degree of belonging	Weight, %	No. cluster	No. clust. element	Color C
1	Tukaevsky	68,99	1,000	5,40	1	1	red
2	Nizhnekamsky	61,22	0,887	4,78	2	1	orange
3	Almetyevsky	59,97	0,869	4,69	2	2	orange
4	Vysokogorsky	54,54	0,791	4,27	3	1	yellow
5	Laishevsky	52,56	0,762	4,11	3	2	yellow
6	Mendeleevsky	48,53	0,703	3,64	4	1	green
7	Arsky	44,86	0,650	3,51	4	2	green
8	Bugulminsky	41,41	0,600	3,24	5	1	azure
9	Mamadyshsky	41,03	0,595	3,21	5	2	azure
10	Zelenodolsky	40,52	0,587	3,17	5	3	azure
11	Yelabugshsky	38,99	0,565	3,05	5	4	azure
12	Bavlinsky	37,04	0,536	2,90	5	5	azure
13	Apastovsky	32,94	0,477	2,58	6	1	blue
.....

4 Conclusion

Such operational expert work algorithm of the decision maker in the form of the proposed two-stage iterative procedure could also significantly increase the degree of objectivity in the process of selecting the types of product-leaders, etc., i.e. could be extended to the similar managerial situations, when the number of alternatives is sufficiently large.

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Prognostic Competence and Socialization of Junior Schoolchildren with Health Limitations

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Abstract. The study concerns the problem of prognostic competence of children with health limitations, relevant for understanding the psychological content of difficulties of socialization in dysontogenesis and the emergence of deviant behavior. The aim of the article is to determine the contour of prognostic competence, relevant to the socialization space of a junior schoolchild with health limitations. We have used the comparative analysis of literary sources, represented by the unity of comparative, bibliographic, logical methods of research. We actualized A.A. Rean approach to socialization; we realized competence approach in the interpretation of Yu.V. Gromyko. We expanded and clarified the idea of socialization space of a junior schoolchild in normogenesis and dysontogenesis. The term “prognostic competence of a junior schoolchild with disabilities” is defined as a developed ability to forecast in learning, in relationship with teacher, with peers, in the family, with “alien” adults, in virtual relationship, in attitude to health. Prognostic competence is interpreted as a developed forecasting, covering significant areas of the relationship of a child with health limitations and contributing to successful socialization. The proposed understanding of socialization space, including attitude toward learning, to teacher, peers, family, “alien” adults, health and virtual relationships, clarifies the idea of the social development situation of today’s junior schoolchild. It serves as a basis for developing diagnostic tools for prognostic competence, broadens the understanding of psychological and pedagogical of support children with health limitations. The proposed understanding can be used by teachers, psychologists, social workers, parents in promotion of socialization and prevention of deviations.

Keywords: Socialization · Socialization space of junior schoolchildren · Prognostic competence · Children with health limitations

1 Introduction

The relevance of predictive competence issue is determined by the need for a psychological study of the difficulties which children with limited possibilities of health face during the process of their socialization. The issue of poor socialization of children with limited possibilities of health became especially significant due to the development of social and educational inclusion in our country. Sociology, psychology,

pedagogy, biology, medicine seek to find the essence of deviations, as well as natural, macro- and microsocial conditions which cause them, methods of prevention and correction. In domestic defectology, behavioral disorders are being studied as a separate type of deviant development. In other forms of dysontogenesis, the problem of the development of deviations is more likely to be outlined than analyzed. The lack of empirical data and conceptual approaches is particularly noticeable in relation to early detection of the prerequisites of deviations and their prevention in children with limited possibilities of health.

Among the conditions for successful socialization, the researchers adhering to various psychological approaches call advanced foreseeing – the ability to reflect the patterns of the environment in the structure of past experience, to formulate behavioral strategies, anticipating the course of events [1, 2]. According to Mendelevich [3], Sergienko [4], Regush [5], the increased interest of modern psychology in anticipation is determined by the variety of functions it performs in various spheres of life activity at each age stage. The study of prognostic competence (anticipatory consistency) in the structure of deviant adolescents' personalities and mechanisms of genesis of neurosis in normal and impaired development showed: the shortcomings of prediction are directly related to various forms of psychosocial maladjustment [3, 6]. In contrast, developed forecasting is considered as an important condition for successful socialization [7].

Difficulties and impairments in socialization, including the formation of deviations, are studied mainly in adolescence [1–3, 8, 9], when various deviations in behavior, as Mendelevich [3], Zmanovskaya [10], Belichev [11], Lubovsky, Korobeinikov, Valyavko [12], McDougall, Vallincourt [13] and others emphasize, have a distinct nature. Meanwhile, more and more researchers consider younger school age as the most important stage of socialization (Vlasova [14], Kirillova [15], Larin [16]). This period is especially important for children with limited possibilities of health: the increased demands of society for the position of a schoolchild explicate previously formed shortcomings and deviations, which, in turn, is extremely important for socialization in the run-up to the teenage crisis.

In relation to the younger school age, the content of socialization processes and the role of various socialization institutions [14–16] are discussed. However, in scientific literature there is still no complete image of the space of activity that determines the socialization of a modern junior schoolboy, especially a junior schoolchild with limited possibilities of health, [14] which creates serious difficulties for an integral assessment of socialization success.

The younger school age also plays a special role in the development of forecasting. Achievements in education, social responsibility associated with the position of the student, the expansion and complication of meaningful relationships with people increase the requirements for anticipating the consequences of child's behavior and at the same time contribute to the development of predictive competence. However, it is precisely this period that has been least studied in terms of the content of forecasting and its role in the process of socialization; this is particularly true for children with limited possibilities of health.

These contradictions define the main problem of the research, related to the lack of a holistic view of a modern junior schoolchild's socialization space in dysontogenesis, which determines the content of prognostic competence as an important condition for

successful socialization. Theoretical and practical significance of the work is related to the need to determine the characteristics of forecasting, which – already at the younger school age – can be used to monitor the progress of socialization, an integral assessment of its well-being, identify predictors of the risk of deviations and create new methods of prevention.

These points determined the objective of the research: to detect the main areas of socialization of a junior schoolchild with limited possibilities of health and corresponding structure of prognostic competence on the basis of a comparative analysis of the psychological factors of successful socialization and its violations. The main feature of the author's position is creating the representations about prognostic competence as an integral education with the structure reflecting the main spheres of the socialization space for children with limited possibilities of health in primary school age.

1.1 Literature Review

The start of researches in the field of socialization, which is now the subject of a number of sciences, was set by E. Durkheim, T. Parsons, I. Tallman, and other sociologists. Socialization was considered as assimilation of social experience by individuals as they become more and more actively involved in social relations and relations with the outside world. The specificity of psychological approach lies in the study of the mechanisms and driving forces of socialization. Different sections of science formed their own focuses of studying the problem: for pedagogical psychology, socialization is a purposeful process of the society's educational efforts to form a personality; differential and general psychology distinguish individual and personal factors of socialization; social psychology considers the direct interaction of a person with the social environment. Clinical-psychological approach is characterized by the integrative nature of the problem review; as V.D. Mendelevich points out, the internal psychic characteristics of socialization represent not only a factor of person's adaptation in the social environment and behavior that meets the norms accepted in society, but it is also the condition of mental health, personal self-actualization [3]. Unsuccessful socialization is the opposite of successful one. It might be represented by conformism and deviance; desocialization in the form of deviant behavior, deformation of the internal regulation system, distorted value-normative representations and anti-social orientation [11].

The literature offers extremely diverse criteria for the success of socialization - from value orientations and attitudes approved by the social community, to the ability to partner with different people [14]. Developing his clinical-psychological approach, V. D. Mendelevich points out the criteria for the failure of social adaptation and deviations: social danger of human behavior, the violation of self-actualization, the lack of moral and aesthetic control over person's behavior [3]. According to Zmanovskaya, the propensity to various forms of deviation is the result of a complex interaction of social, socio-psychological and individual psychological factors [10]. Age-oriented models focus on biosocial [17] and neuropsychological [18, 19] mechanisms of child maladjustment; they study early behavioral predictors of the development of aggressive forms of antisocial behavior (Wallinius, Delfin [17]). The complexity of differentiating pathological forms of behavior and addictions from "normal" extremely complicates

the task of timely identifying indicators that indicate the success of socialization or its problems [20–22]).

The Features of Socialization in Early School Age. At each age stage, the process of socialization is filled with specific content; the degree of its awareness changes, as well as the structure of its mechanisms, and its main agents. In the early school age the most significant factor of child development is a change in the leading type of activity. The birth of a social “Me”, the formation of a schoolchild’s social position, the development of educational skills, the interpersonal relationships that develop in the school make this period sensitive to the process of socialization [12, 23]. The age-related tasks of socialization are usually defined as the formation of the subject of educational activity, the development of skills and independence in everyday life and creative work, the acquisition of business communication skills in the “child-teacher” and “child-other pupils” systems, the development of arbitrariness and awareness of mental processes, understanding of self-changes in during education [24]. However, such understanding limits the spheres of junior schoolchild’s life which are important for socialization to educational and extracurricular activities, business communication and self-awareness. It does not include Internet communication, which plays a *significant* role in the life of modern children as it compensates for the lack of communication and dissatisfaction with relations with peers [25]. The illusion of freedom from norms and requirements of family and school in the virtual space makes information and pedagogical technologies very valuable in order to protect children from negative content and to avoid diminishing live communication [25, 26]. In the modern world the role of the family as an agent of socialization is changing; contacts with “stranger” adults representing broad social environment, play an increasingly important role in the Internet space and in real communication in early school age. It must be admitted that transformation of traditional spheres of socialization and the emergence of new ones are not yet reflected in the holistic concepts which are built up on unified theoretical grounds and cover the entire space of socialization of a junior schoolboy.

The Features of Socialization of Younger Schoolchildren with Limited Possibilities of Health. In recent years, the socialization of children and adolescents with dysontogenesis (basic principles developed by L.S. Vygotsky) has become a special subject of research in domestic defectology and special psychology. Forms of integration in society, features of the development of social situation, content and age patterns of the socialization process, social and psychological adaptation and disadaptation of children with limited possibilities of health are being studied [12, 15, 27–30]. The determinants of socialization, external (relationships with parents, peers, teachers) and internal (personality traits of adolescents) are being analyzed; socialization indicators are proposed – socio-psychological adaptation, reflexivity, value orientations [29].

Talking about dysontogenesis, the problem of unfavorable socialization options – especially deviant behavior – is extremely acute [10]. Adolescents with limited possibilities of health are particularly unprotected from the complexities of economic, political, spiritual life [27]; family relationships require special attention, as well as the formation of communication skills, and sex-role behavior [31]. Zmanovskaya characterizes the individual-typological vulnerability, violation of self-regulation, lack of personal resources as the factors causing deviations [10]; for these indicators, children

with limited possibilities of health are at risk. Among the conditions that contribute to deviant behavior are the psychophysiological or anatomical disorders that hinder social adaptation; psychological features (increased impulsiveness, the desire to seek something new, attention deficit hyperactivity disorder, etc.); socio-pedagogical (shortcomings in family and public education, lack of the knowledge about the most important social roles, violation of interpersonal relations) [27, 28].

The younger school age is a critical period for a child with limited possibilities of health: the beginning of regular education, the increase in the social significance of interpersonal relations with teachers and peers becomes a kind of a “quality test” for the results of previous development, which act as resources for socialization. At the same time, there are no integral concepts that enable to evaluate the process of socialization in terms of its progress or the presence of early predictors of deviations. Among the few developments where socialization is one of the main goals are the programs of psychological and pedagogical support for children with speech disorders. Here, socialization is defined as the formation of a positive attitude of students to various types of activities (educational, playful, communicating) and the optimization of relations (with the teacher, other students, intra-family relations); the indicators of socialization involve such heterogeneous phenomena as interaction skills, creative abilities, improving the regulation of emotional states, increasing self-esteem [15].

It is not correct to reduce the specificity of socialization processes in children with limited possibilities of health to special *conditions* of socialization, determined by the complex structure of the defect. The social situation of the development of a child with disabilities is characterized by a large involvement in the treatment and rehabilitation process. Frequent hospitalizations, medical procedures in hospitals and at home, the need to adhere to doctor prescriptions early make the children subjects of recovery and maintenance of their own health. Talking about this category of children, it is possible to consider relations related to health protection and medical rehabilitation as a separate sphere in which the processes of socialization also take place.

Prognostic Competence as a Factor of Successful Socialization. The problems of forecasting, anticipation, prognostic abilities, prognostic activity has an important place among psychological studies of recent decades. The importance of forecasting issues is emphasized by the age range in which anticipation processes are studied: in infancy [4], in preschool period [32], in adolescent age [33], in senior schoolchildren [1, 2], in students [34], in professional activity [35]; A.P. Prisyazhnaya characterizes prognostic competence as a significant result at all levels of training. [35] Phenomenology, content, forecasting functions, its place in general structure of the psychic are studied on diverse theoretical basis. Thus, Nichiporenko, Mendelevich identify structural, psychophysiological, cognitive-behavioral, genetic, clinical, action-related, situational, acmeological approaches to prediction [36]. The study of forecasting as a phenomenon of cognitive nature has a long tradition and a large number of supporters (Lomov, Surkov [37], Regush [5], Nichiporenko, Mendelevich [36]). Modern studies increasingly emphasize the regulatory component of forecasting [1, 38]. Metacognitive approach for which meta-cognition performs a regulative function in relation to cognitive processes of the “first level” became some kind of solution to the issue of the relationship between cognitive and regulative [38]. Continuing this line, forecasting is

studied as a metacognitive component in the structure of professional-pedagogical thinking [33].

A detailed analysis of different approaches to the content and structure of prognostic competence is not the objective of this research. In the context of our work, it is the issue of the relationship between forecasting and the processes of socialization which is fundamental. As shown by Larin, the ability to predict already at the younger school age is among the priority qualities for successful socialization [16]. Andronov showed the importance of prognostic abilities for professional self-determination of senior [1], Ionova – for adaptation in the high school [34]. Experimental data on significant shortcomings in the prediction in various forms of deviant behavior and adolescents at risk has high importance (2, 3, 40, 41). In relation to dysontogenesis, the features of prognostic processes have only recently become the subject of researchers' attention. There is a small number of works (Tvardovskaya, Kurbanova [7]; Akhmetzyanova [41, 42]; Akhmetzyanova, Nigmatullin [43]), devoted to the study of particular aspects of prediction in children with development disorders.

Within the topic of this research the most significant characteristics of forecasting are the ones which can serve as indicators of the success/failure of socialization processes in a certain age period. In accordance with the objectives set, forecasting is considered as a meta-process that performs both cognitive and regulative function, not only with respect to cognition, but also with respect to behavior. A working definition of the prognostic competence of a junior schoolchild with normotypic development and with limited health possibilities will be offered below.

2 Materials and Methods

The study was based on a public domain works of domestic and foreign scientists dedicated to the problems of successful socialization and deviations in children and adolescents, including those having a dysontogenesis, to forecasting problems and its peculiarities in children with limited possibilities of health.

Determining the role of forecasting in preventing and overcoming the difficulties of socialization required a holistic view of the space of socialization of a child with deficient dysontogenesis which is absent in modern science. At the younger school age, the content of the socialization process, the criteria for its success in domestic science are studied primarily within the theory of educational activity, which does not cover all the activities of the child. In our opinion, the activity approach has to be supplemented by the principles of psychology of relations, which has shown its effectiveness in the study of successful socialization and deviations. The methodological basis for the analysis of literary data and the synthesis of author's notions of the socialization of a younger schoolchild with limited possibilities of health was the theory of relations created by V.N. Myasishchev. Based on this theory, Rean [44] defines socialization as the formation of a system of personal relations, deviation – as a deformation of this system of relations and examines violations of family relations as a source of deviant behavior of adolescents.

Taking into account the principle of unity and peculiarities of dysontogenesis and normogenesis (G.Y. Troshin, L.S. Vygotsky, V.I. Lubovsky) in the space of

socialization of junior schoolchildren with limited possibilities of health, we consider it necessary to single out both areas of relations common to all children of this age and the additional sphere of socialization associated with health restrictions.

Studying the forecasting in the context of socialization processes involved a competence approach in the interpretation of Gromyko [45], where competence is understood as the social aspect of abilities. The correspondence of the structure of predictive competence to the structure of the socialization space forms the basis of the author's approach to constructing the model of prognostic competence of the younger schoolboy in normogenesis and in dysontogenesis.

The development of the predictive competence model as a predictor of successful socialization or the risks of deviations with relation to the space of socialization of a junior schoolchild with limited possibilities of health was the first theoretically-analytical stage of a practice-oriented research project. The content of the second stage is the development of a technique for diagnosing the prognostic competence of a junior schoolchildren, an empirical study of its features in normogenesis and one of the forms of dysontogenesis – deficitary dysontogenesis, as well as clarification of the structural and functional model of prognostic competence. Based on this model and the results of empirical research, it is proposed to develop and approbate the method of development and correction of forecasting of younger schoolchildren with normotypic development and with visual, hearing, musculoskeletal disorders, severe speech disorders in the context of socialization support and prevention of deviation.

3 The Results of the Study

The results of the analysis let us make the conclusion that the study of the role of forecasting in socialization is possible based on our approach to predictive competence as a psychological phenomenon which structure reflects the structure of the socialization space of a junior schoolchild with limited possibilities of health.

The absence of holistic concept of the socialization of the younger schoolboy in normogenesis and dysontogenesis required the development of new ideas about the space of socialization for a given age period.

School, along with the family, acts as the main institute of socialization in the younger school age; educational activity as the leading one determines the development of all aspects of the child's psyche. However, the space of socialization of a junior schoolchild is wrongfully limited to educational activities and educational communication. Specifying the position of Rean on socialization as a process of formation and purposeful creation of the system of personal relations [44], we can distinguish the following areas of relations of a junior schoolchild with limited possibilities of health.

At the younger school age, the main form of a child's relationship with society is the relationship with the school; social position of the schoolchild determines the other areas of his relationships. Teacher becomes the leading figure in the life of a junior schoolchild; attitudes toward the teacher mediate attitudes toward learning, relationships with peers within the school and even beyond its borders; teacher's assessment of educational success is a significant factor in the child's relationships in the family. The expanding social contacts include the schoolchildren, in addition to teachers and family

members, other adults, whose interaction with them is less and less controlled by the parents or the teacher. Building an adequate attitude of a junior schoolchildren to other adults, who represent a broad social environment, can also be considered a significant sphere of socialization, especially important in the run-up to adolescence.

Internet communication is considered as one of the factors of socialization success or violations of today's child (Mendelevich [3], Eremin [26]). This point is confirmed by a considerable time that children spend in social networks and playing computer games, and by enormous opportunities for development and risks related to Internet technologies. We study relations in the Internet space as a separate sphere of socialization for today's junior schoolchildren; this approach corresponds to the understanding of childhood as a specific time category.

In dysontogenesis, the features of socialization are studied primarily through the prism of difficulties, specific tasks, conditions, methods of promoting socialization. Talking about children with limited possibilities of health, we consider it advisable to study their attitudes towards their own health, its protection and strengthening as a special sphere of socialization.

Summarizing all the above, it is possible to characterize the space of socialization of the younger schoolchildren with dysontogenesis as follows. It is made up of an attitude toward learning; attitudes toward the teacher; relations to peers; family relations; relations to "stranger" adults who represent a broad social environment; virtual relationships based on Internet technologies; attitude towards one's own health. The success in these spheres of relations can serve as a criterion for the successful socialization of junior schoolchildren; problems in any of them can be regarded as a risk of deviant behavior.

The existing data on the relation of socialization processes with indicators of forecasting make it possible to consider prognostic competence as an integral indicator of successful socialization and various deviations, such as deviant behavior. In order to create a working concept, we rely on the understanding of the anticipatory consistency (prognostic competence) of Nichiporenko, Mendelevich [36] as a certain level of development of the personal ability of forecasting; at the same time, using the studies of Y.V. Gromyko, we consider it necessary to distinguish between ability and competence, where competence is a socially demanded capability of the individual [45].

The comparative analysis made it possible to clarify the content of the concept of "prognostic competence of a junior schoolchild with limited possibilities of health", which consists of the ability to predict in teaching, in relations with the teacher, with peers, in relationships in the family, with "stranger" adults, in relationships in the Internet space, as well as in relation to one's own health. Each of these spheres of relations is a necessary part of the socialization space; each of them makes special requirements for anticipating the future, for predicting the consequences of one's own behavior and actions of other people, and also provides special conditions for the implementation and formation of prognostic abilities. The success of forecasting in each of these areas and predictive competence in general can act as an indicator of the socialization success while shortcomings can serve as a possible risk factor for the development of deviations.

4 Discussion and Conclusions

The absence in the psycho-pedagogical science of the integral concept of socialization in younger school age and the lack of research concerning the factors of its successes, including forecasting, is particularly noticeable in regard to dysontogenesis

The suggested idea of the structural correspondence of predictive competence to the socialization space can serve as a basis for further theoretical and empirical study of forecasting in younger schoolchildren with limited possibilities of health in comparison with normogenesis. The complex interrelation of the features of each form of dysontogenesis with age patterns prompts us to talk about the specifics of the socialization of children with various developmental disorders [12, 29]; thus, the symptoms of mental dysontogenesis do not just appear as a background on which deviant behavior arises, but closely interact with it [27]. For the immediate future, the study of such type of dysontogenesis as a deficitary dysontogenesis seems the most reasonable option. This suggestion is confirmed by a very small number of theoretical and empirical studies of forecasting as a factor of socialization of younger schoolchildren with visual, hearing, and musculoskeletal disorders.

The proposed presentations enable to determine the content of the methodological tools necessary for diagnosing the prognostic competence of junior schoolchildren. Our methodology implies the study of forecasting in kid's real and potential violation of the social norm in situations that present significant areas of the relationship of a junior schoolchild with limited possibilities of health. It is assumed that the characteristics of prognostic competence revealed with its help can be useful for assessing the success of socialization of younger schoolchildren with normogenesis and dysontogenesis, as well as the timely detection of predictors of various forms of deviant behavior. The obtained data determine new lines of psychological and pedagogical support for children with developmental disorders, where the improvement of prognostic abilities in all spheres of relations becomes an important target of the corrective work of educators, psychologists, defectologists, parents. All of these ideas confirm the need for further theoretical and experimental study of prognostic abilities as a resource for overcoming the difficulties that arise in younger schoolchildren with developmental disabilities in the process of socialization.

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The Impact of Changes in Working Capital on Firm Value in Bursa Malaysia

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Abstract. The ability of firm to sustain and accelerate in current rapid changing world economic is determined by firm performance. Several previous researchers suggest that an optimal working capital management is expected to contribute positively to firm performance, and indirectly to the creation of firm value. This research will analyze the impact between changes of monetary in working capital towards firm value in view of shareholder perspective. Panel data analysis using Malaysian firm financial statement data of various industry typologies from 2009 till 2017; indicate additional investment in working capital worth less than perceive value of additional investment in cash, apart increase of financial aid for working capital will reduce firm value in the same fiscal year.

Keywords: Working capital · Firm value · Panel analysis

1 Introduction

Firm value and profitability are main instrumental of firm continuity growth as well survival in this rivalry economic age. Firm with sustainable profit able to use internal capital to lower debt subsequently decrease earning volatility or protect positive net present value investment. Internal capital also important to finance the investment of firms in working capital since the cost is cheaper than external capital. The efficiency of firm's working capital can be measured by cash conversion cycle (CCC). Good management of CCC is crucial in ensuring firm profitability, risk management, ultimately to improve firm value and maximizing shareholder's value. Continuous operational as well as structural improvement of top tier working capital not only improve return on capital, it will also deliver higher cash return to shareholders and substantially able to display positive signal to the capital market making firm being evaluate higher along with their peers (Ernst and Young 2014).

Efficient working capital management resulted firm to be less dependent towards external funds in managing operation expenses. Firm with efficient working capital would normally tend to react fast towards economic changes. One of most recent studies by Julius et al. (2014) had shown that efficient working capital management had significant impact onto profitability during economic downturn rather during economic booms. Furthermore, when inefficient firm face cash flow constraint; stakeholder may perceive that high possibility of firm to abandon any value-creating investment thus worsen firm value (Juliano and William 2014). Apart, efficient working capitals are

exceptionally important for smaller firm, as they are normally associated with higher liquidity and rather unstable cash flow. In the study of Gerhard et al. (2014), UK firm total assets had shown an increase of 5.8% from 1980 to 2006. Rationale behind increase of asset is that by doing so it will help them to protect from unexpected liquidity.

With movement of unification trade in global market, Malaysian economic growth in specific was boosted in the last three decade; revolutionize it becoming more export-oriented. In year 2008, global financial crisis strike world financial market, had tremendous affect towards local economic growth resulting drop of 13% GDP mainly due to decrease amount of export (Hussain and Tahira 2014). A survey conducted by Bank Negara Malaysia (BNM), point out around 67% of their sample study onto local manufacturing firm are highly rely on bank loan to finance working capital. During financial crisis, uncertainty of market influence bank lending decision. Allocation of bank loans determine by firm expected return of investment, hence instability of local financial market in year 2008, signaling for banks to relocate their asset away from risky loan (Ibrahim and Shah 2012). Many firms whom had survived recent financial crisis that's strike in year 1997–1998 and 2007–2008, are forced to tighten their internal financial flow (Julius et al. 2014). Study done by Enst and Young (2014) which survey 4,000 firms in several countries, they found that working capital of Malaysia firms declined in 2013 and result to increased 7% of cash cycle in comparison to 2012. Management of working capital is an important role to ensure firm have the ability to continue sustain in market, create profitability, increased firm and shareholder value. Thus, firm value will affected if firms change their management or composition of financing and investment in working capital. Hence, the purpose of this study is to inspect the impact of changes in working capital on firm value in Bursa Malaysia.

2 Literature Review

Working capital management are prime tools for firm in managing liabilities and short term asset. Furthermore, firm able to strategically mobilize it in lowering firm financial cost, or used as strategic objective to deliver firm profitability (Lotta et al. 2012). In research of James and Andrew, 2014, affirm capital management is vital towards firm strategies and widely used as area of continuous improvement in financial performance. Efficient working capital help firm to reduce their dependency from external fund conjointly will reduce firm's financing cost, or having the ability of taking positive net present value project to their benefit (Juliano and William 2014).

Objective of working capital management is to ensure firm ability to meet operating expenses and having sufficient capacity to pay short-term obligation when they fall due. Attuning amount invested in current asset mainly to those that are not in optimum level, allowed firm to use the available resources for expansion projects. Generally, WCM is classify to three different approach, (1) Aggressive – investment of capital is characterized of high risk and high return, (2) Moderate – with lower rate of risk and return, whereas (3) Conservative – is the lowest investment risk and return. Many former noticeable empirical studies conducted to demonstrate importance of decision making towards investment of working capital and their effect towards firm profitability. Deelof (2003),

verifies efficient working capital management peculiarly in reducing excess inventory and outstanding period of account receivable able to increase profitability. Sustainable profits are generally accepted as foundation or basis for investor to continue invest of desired firm, hence active working capital management matter to secure profit in time of both downfall and boom of market. Julius et al. (2014), investigates impact of downturn economic towards business cycle at Finland in year 2007–2009, the result indicate Finland business cycle became more pronounced during economic downturn in relative to period of economic boom. Notable increase of efficiencies in inventory as well as account receivable is seen during their economic downturn.

Sonia et al. (2014), whom suggest a concave correlation between working capital management and corporate performance. This relation explain that when firm working capital below optimum level, where account receivable are excellent and in the same time firm received good credit terms between supplier, firm will tends to show positive performance. This implied that firm required an optimum level of investment onto working capital that is needed to ensure Firm value is maximized. Sai et al. (2014), investigate uniqueness of China firm with their ability to adjust working capital to alleviate constraint cash flow effect. Similar to Brazil, Chinese firm as well face limited access of financial source, nevertheless China economic show a phenomenal growth rate. Global economy face most challenging time, yet China continuously grow with their investment plan (KMPG, 2013). Analyzing of regress sampled data indicate that constraint local Chinese firms regulate their working capital to alleviate the effect of firm financial constraint, so keeping fixed investment high. This was also explain in researched of Marco and Javier (2012), of smaller Italian firm that is younger, riskier and financially constrained will hold significantly higher level of cash, and this cash rich firm appear to be considerably more profitable.

Firm cash indicate internal governance where firms with weak corporate governance structure hold smaller cash (Harford et al. 2008). Bates et al. (2006), finds that's there's an increase of 13.55% average cash ratio for industrial firms that imply excess cash is serve as firms diversification purpose to increase profitability likewise to affect firm value at a future time. Internal cash holding can be used to finance firm investment without raising external funds, moreover during financial distress an excess of cash holding would ensure firm to survive for a period of time. Evidence from China, despite constant cash constraint, Chinese economy persistently shows high fixed investment rate and phenomenal growth. It is their firm ability to adjust working capital during cash flow shock ensuring continuity of firm profitability (Sai et al. 2014).

Recent study by Juliano and William (2014), carry out study in relation of working capital management and firm value in context of Brazilian firm. Sample data was obtained from BM&FBOVESPA (listed Brazilian public firm) ranging from year 1995 till 2009. They analyzed the effect of working capital towards Brazilian firm value essentially to those financially constraint. Brazil are middle-income country but are in fast pace of development, making sustainability of firm growth important (Micheline and Reinilde 2012). Earlier similar study was also done by Autukaite and Molay (2011), towards firm French firm in period of 2003 to 2009. Result is shown differ from Brazilian whereas French firm are highly concerned with working capital management, but an extra valued perceive by shareholder are less than on euro. Their explanation on the results was mainly due to financial structure of company in Europe differ.

3 Methodology

This research use DataStream to extract needed financial report, composing 924 firms and 23 different typologies of industry as classify by the source. To ensure data integrity and best result achieve, all downloaded report are refine whereby financial firm is excluded from study. Also, only firm with complete information required to formulate the variable is used which bring down total of firm to be used to a total of 219, compromise of 21 industry typologies and 1095 firm-years observations.

This study aim is to investigate impact of changes in working capital towards firm value. The ways markets perceive towards firm value are define thorough movement of their excess stock return. In the same fiscal year, changes of working capital and other variable that may influence working capital movement is analyzed together with excess stock return. Through statistical correlation analysis of mentioned variable, expected results of the study are:

H1: There is negative correlation of working capital management and firm profitability.

H2: In view of shareholder, additional investment in working capital worth less than additional investment in cash.

H3: Additional investment in working capital will reduce firm value of the same fiscal year.

H4: With an increase of financial aid to finance working capital will reduce firm value of the same fiscal year.

Four models construct to test hypothesis of this study. All the model will analyze by using panel data analysis. Model applied are based on methodology develop by Faulkender and Wang (2006), which then being refine by Kieschnick et al. (2009) and Juliano and William (2014) accordance to their study needs. Approach of this model is to generate estimated value perceived by shareholder represent by stock access return (ER) against changes within working capital. Other factor that would have a direct implication towards management of working capital such cash level, interest expenses and investment of external funds are also part of independent variable of this study. Detail of all four models is described next.

First model are the basic frame of balance three models, comprise seven main independent variable CASH, Δ CASH, Δ EBIT, Δ N.ASSET, Δ INTER, Δ DIVID and LEVER. This model is to test average cross-section regression slope of excess stock return for all mentioned variable. Working variable is not introduced in first model (formula 1).

$$ER_{i,t} = \beta_0 + \beta_1 \frac{\Delta CASH_{i,t}}{M_{i,t}} + \beta_2 \frac{CASH_{i,t}}{M_{i,t}} + \beta_3 \frac{\Delta EBIT_{i,t}}{M_{i,t}} + \beta_4 \frac{\Delta N.ASSET_{i,t}}{M_{i,t}} + \beta_5 \frac{\Delta INTER_{i,t}}{M_{i,t}} + \beta_6 \frac{\Delta DIVID_{i,t}}{M_{i,t}} + \beta_7 LEVER_{i,t} + \varepsilon_{i,t}$$

Model 2 have 7 similar independent variables, but $\Delta N.ASSET$ is substitute with $\Delta NN.ASSET$, and ΔNWC is introduce to show correlation of changes investment in working capital and perceive market towards firm value. Similar to earlier model all independent variable except LEVER is divided by market value.

$$ER_{i,t} = \beta_0 + \beta_1 \frac{\Delta CASH_{i,t}}{M_{i,t}} + \beta_2 \frac{CASH_{i,t}}{M_{i,t}} + \beta_3 \frac{\Delta EBIT_{i,t}}{M_{i,t}} + \beta_4 \frac{\Delta NN.ASSET_{i,t}}{M_{i,t}} \\ + \beta_5 \frac{\Delta INTER_{i,t}}{M_{i,t}} + \beta_6 \frac{\Delta DIVID_{i,t}}{M_{i,t}} + \beta_7 LEVER_{i,t} \\ + \beta_8 \frac{NWC_{i,t}}{M_{i,t}} + \beta_9 \frac{\Delta NWC_{i,t}}{M_{i,t}} + \varepsilon_{i,t}$$

Model 3 identical to Model 2 and keep to same principal of dividing with market value, though new variable is introduce: $(NWC_{i,t-1} \times \Delta NWC_{i,t-1})$, to investigate effect of firm value correlation between current working capital with the changes of working capital.

$$ER_{i,t} = \beta_0 + \beta_1 \frac{\Delta CASH_{i,t}}{M_{i,t}} + \beta_2 \frac{CASH_{i,t}}{M_{i,t}} + \beta_3 \frac{\Delta EBIT_{i,t}}{M_{i,t}} + \beta_4 \frac{\Delta NN.ASSET_{i,t}}{M_{i,t}} \\ + \beta_5 \frac{\Delta INTER_{i,t}}{M_{i,t}} + \beta_6 \frac{\Delta DIVID_{i,t}}{M_{i,t}} + \beta_7 LEVER_{i,t} \\ + \beta_8 \frac{NWC_{i,t}}{M_{i,t}} + \beta_9 \frac{\Delta NWC_{i,t}}{M_{i,t}} + \beta_{10} \frac{NWC_{i,t}}{M_{i,t}} \times \beta_{11} \frac{\Delta NWC_{i,t}}{M_{i,t}} + \varepsilon_{i,t}$$

Model 4 is identical to model 3 and follow same principal, the only change made is that, instead of using NWC for the new variable, Model 4 use: $(LEVER \times \Delta NWC_{i,t-1})$, with intention to investigate effect firm value correlation between leverage ratio with changes of working capital.

$$ER_{i,t} = \beta_0 + \beta_1 \frac{\Delta CASH_{i,t}}{M_{i,t}} + \beta_2 \frac{CASH_{i,t}}{M_{i,t}} + \beta_3 \frac{\Delta EBIT_{i,t}}{M_{i,t}} + \beta_4 \frac{\Delta NN.ASSET_{i,t}}{M_{i,t}} \\ + \beta_5 \frac{\Delta INTER_{i,t}}{M_{i,t}} + \beta_6 \frac{\Delta DIVID_{i,t}}{M_{i,t}} + \beta_7 LEVER_{i,t} \\ + \beta_8 \frac{NWC_{i,t}}{M_{i,t}} + \beta_9 \frac{\Delta NWC_{i,t}}{M_{i,t}} + \beta_{10} LEVER_{i,t} \times \beta_{11} \frac{\Delta NWC_{i,t}}{M_{i,t}} + \varepsilon_{i,t}$$

There are 9 independent variables, namely CASH and $\Delta CASH$, $\Delta EBIT$, $\Delta N.ASSET$, $\Delta NN.ASSET$, $\Delta INTER$, $\Delta DIVID$, $\Delta LEVER$ and ΔNWC . All variable except LEVER are divided over market value to ensure all variable are standardized. Stock excess returns (ER) are dependent variable for the study. Stock return or excess stock return defines as return on stock i during fiscal year t, minus benchmark return of stock i during the same fiscal year. Benchmark returns of stock are calculated from mean of daily closing price of each firm fiscal year, whereas stock return refers to closing price at the end fiscal year. Stock return are the dependent variable this study.

Cash represents money available for use in the normal operation of the firms. It is part of Firm current asset and is most liquid of all. It includes money and any other instrument that is normally accepted by banks or immediate creditor to customer account. It can be extracted directly from firm annual balance sheet report. Cash (CASH) and changes cash (Δ CASH) are divided by market value (MV) before apply into the equation, as independent variable.

Earnings before interest and tax (EBIT) represent earning of a firm i before interest expenses and income taxes in fiscal year t . It is calculated by taking the pretax income and adding back interest expenses on debt and subtracting interest capitalized. It can be extracted directly from firm financial summary annual report. In all model, changes EBIT (Δ EBIT) divided with market value (MV) and part of independent variable.

Net Asset (N.ASSET) equal to total asset minus value of cash of firm i the same fiscal year t . Net asset is used in the assessment of profitability, creditworthiness and solvency. Total asset represent the sum of total current asset, long term receivable, investment in unconsolidated subsidiaries, other investments, net property plant and equipment and other assets. Changes net asset (Δ N.ASSET) is used in Model 1, after divided with market value (MV) data. Net asset equation as below:

Model 1 equation does not incorporate working capital variable, hence total net asset can be used. However in following model 2, 3 and 4, working capital is tested as part of variable, thus it is needed to exclude from net asset variable. Working capital can be calculated from balance sheet item of current asset (CA) minus current liabilities (CL). It is the funds available for firm to operate their day-to-day operation. Accordingly to formulate required variable, changes net asset less working capital (Δ NN.ASSET) over market value (MV) is applied to model, 2, 3 and 4.

Interest Expenses on Debt (INTER) represent the service charge for the use of capital before reduction for interest capitalized. For the study, it is used in form of changes (Δ INTER), after divide over market value (MV). From the equation, it is included to show correlation of firm value with the changes of interest expenses on long debt as well as interest capitalized. It can be attain from firm annual income statement.

Total cash dividend paid (DIVID), represent total common and preferred dividend paid to shareholder of the firm, but exclude dividend paid to minority shareholders. Items include are, cash in lieu of fraction shares, arrearages of prior year paid in current year, partnership distribution, and liquidating dividend or distributions. In cash flow statement, it represent in combine figure. DIVID is used in all models, in form of Changes (Δ DIVID) divided with market value (MV).

Leverage Ratio (LEVER) represents in this study is calculated from dividing long-term liabilities (LL) with market value (MV). From firm annual balance sheets, long term liabilities is calculated from total liabilities (TL) is minus out from current liabilities (CL). As LEVER formula is readily divided by MV, thus wouldn't need to repeat as per other variable. LEVER is dependent variable and used in all model.

Net Working Capital (NWC) is calculated by differences between current asset (CA) and current liabilities (CL) followed by less cash (CASH). NWC represents the investment needed to maintain the cash, credit and inventories for operation that constantly varies over time. Δ NWC is introduced in Model 2, to show correlation with firm value, whereas in model 3 and 4, additional variable of interaction NWC and

Δ NWC, followed by LEVER and Δ NWC. All are independent variable and divided by market value (MV).

Model 3; introduce independent variable, $[(NWC)]_{(i,t)} \times [(\Delta NWC)]_{(i,t)}$ to investigate effect of firm value correlation between current working capital with the changes of working capital.

Model 4; introduce independent variable, $[(LEVER)]_{(i,t)} \times [(\Delta NWC)]_{(i,t)}$ investigate effect firm value correlation between leverage ratios with changes of working capital.

4 Findings

First, we'll consider Descriptive Statistic.

Using Stata 12, analysis result of descriptive statistic for variables, independent and dependent are illustrate in Table 1. Tabulation of result indicates most of variable are having relatively balance minimum and maximum range, though variable net asset (Δ N.ASSET & Δ NN.ASSET) showing wider range of data. Yet most variable show relatively low standard deviation, meaning distribution data of all variable are concentrated including net asset variable (Δ N.ASSET & Δ NN.ASSET). Hence, higher range of maximum value in net asset may due to minor amount of outlier data.

Table 1. Descriptive statistic of variables.

Variable	Mean	Std. dev.	Min	Max	No. observation		
					N	n	t
ER	0.2413	0.5307	-0.52	5.95	1095	219	5
Δ CASH	0.0090	0.1117	-0.96	1.00	1095	219	5
CASH	0.1379	0.1922	0.00	2.69	1095	219	5
Δ EBIT	0.0135	0.1411	-0.91	2.33	1095	219	5
Δ N.ASSET	0.1362	0.6075	-4.35	15.39	1095	219	5
Δ NN.ASSET	0.1170	0.8677	-3.94	24.71	1095	219	5
Δ INTER	0.0013	0.0412	-0.16	1.30	1095	219	5
Δ DIVID	0.0026	0.0674	-0.47	1.35	1095	219	5
LEVER	0.2877	0.4655	-0.02	6.19	1095	219	5
NWC	0.2548	0.7389	-10.87	4.04	1095	219	5
Δ NWC	0.0099	0.3869	-9.23	1.63	1095	219	5

N = number of observation, n = number of variable, t = Year.

Key highlight for descriptive study, Malaysian firm hold cash with an average of 0.13, leverage ratio is at 0.29, excess return are positive value with an average of 0.24, lastly working capital is at 0.26.

Second, we'll consider multicollinearity analysis.

To access correlation between variable towards each other, multicollinearity test was used. Variable tested and how it correlates towards other variable are listed in

Table 2. Variable Δ CASH is strong positive correlated with CASH (0.35) and LEVER (0.24). Δ EBIT show positive relation with Δ DIVID (0.25), but has a strong negative correlation with NWC (-0.20). Both variables Δ NN.ASSET and Δ INTER show dis-

Table 2. Variables correlation matrix.

Variable	Δ CASH	CASH	Δ EBIT	Δ NN.ASSET	Δ INTER
Δ CASH	1.0000				
CASH	0.3460	1.0000			
Δ EBIT	0.0790	0.1013	1.0000		
Δ NN.ASSET	0.0834	-0.1107	-0.0422	1.0000	
Δ INTER	0.0573	-0.0206	-0.0570	0.8739	1.0000
Δ DIVID	0.0460	0.0680	0.2517	-0.0738	-0.0093
LEVER	0.2369	0.0138	0.1617	0.4007	0.3783
NWC	-0.2455	-0.1199	-0.1966	-0.4281	-0.3889
Δ NWC	-0.2087	-0.2574	-0.0610	-0.7479	-0.6902
Variable	Δ DIVID	LEVER	NWC	Δ NWC	
Δ DIVID	1.0000				
LEVER	-0.0125	1.0000			
NWC	0.0053	-0.3825	1.0000		
Δ NWC	0.0288	-0.2903	0.5754	1.0000	

tinct strong negative correlation towards Δ NWC, with result indicate -0.75 and -0.69 respectively.

Third, we'll consider effect of working capital on firm value.

As stated in earlier chapter of methodology, to evaluate effect of changes in working capital towards firm value, four regression models were constructed using Faulkender and Wang (2006) methodology. Prior of analyzing result, Hausman test is done towards two types of regression methods, fixed effect (FE) and random effect (RE). Purpose of this test is to evaluate whether unique error are correlated with regression, the null hypothesis will indicate there are not. Using Stata to run Hausman test onto both fixed and random data, result of both technique is 28.20 ($p = 0.0002$), that is less than ($p = 0.01$) which rejected the null hypothesis. Therefore, fixed effect is most applicable for our regression model.

Table 3 lay out result of all four regression model. Each model has specific function towards main objective of finding correlation on how investor perceived changes in working capital and firm value. Noteworthy to reiterate, all model are forefront with dependent variable of excess stock return, denote how firm value perceive by market. Rest of model is independent variables, where in this study working capital and other cash components that have implication towards changes of working capital is applied. Hence, all four model equation will able to show how changes within independent variable correlate towards changes in dependent variable.

In the first model, working capital variable is not included into the formula. This model is tested to show estimate regression of an average slope stock return, against

Table 3. Regression correlation.

Variable	Model 1	Model 2	Model 3	Model 4
Intercept	0.3859	0.495	0.5005	0.4877
Δ CASH	0.6184	1.0065	1.0368	1.0735
CASH	-0.6667	-0.8664	-0.9622	-0.9041
Δ EBIT	0.4813	0.3389	0.3425	0.3442
Δ N.ASSET	0.0946			
Δ NN.ASSET		0.1323	0.1062	0.1075
Δ INTER	-0.2744	-0.0367	-2.1036	-2.3211
Δ DIVID	-0.7627	-0.7149	-0.7318	-0.7655
LEVER	-0.2617	-0.3675	-0.3832	-0.3774
NWC		-0.2336	-0.1891	-0.1725
Δ NWC		0.3817	0.3497	0.4445
NWC X Δ NWC			0.0394	
NWC X LEVER				-0.0901
Adjust R	0.0497	0.0706	0.0747	0.0761

independent variable namely, CASH, Δ CASH, Δ EBIT, Δ N.ASSET, Δ INTER, Δ DIVID, and LEVER. Noticeable, Δ CASH has the highest value perceived by shareholder, and positively correlate. Regression Δ CASH are also statistical significantly at 1%. Malaysian investor perceived, for every ringgit increase in Δ CASH is valued at MYR0.62 by shareholders.

Apart, worth mentioning is correlation variable Δ INTER and Δ LEVER towards stock excess return are negatively correlate. Though variable Δ INTER, we can't validate result as it is not statistically significance, per contra variable Δ LEVER is highly correlated at 1% statistical significance. Variable Δ LEVER is define as leverage ratio, and from result indicate Malaysian shareholder perceived for every ringgit increase in Δ LEVER is valued at -MYR0.26 by shareholders. From model one, we can infer shareholder perceives higher value and positively on every increase of CASH, but vice versa for variable associate with increase of working capital. Nonetheless, model 2, 3 and 4 will further validate this research hypothesis.

In second model of the study, variable working capital is added thus correlation between working capital and value perceived by shareholder can be identified. By regressing model 2, denote value perceived by shareholder towards additional investment in working capital (Δ NWC) is valued at MYR 0.38, whereas valued perceived of investment in cash (Δ CASH) are significantly higher, valued at MYR 1.01. Result suggest, from view point of shareholder additional ringgit invest in working capital is worth less then additional investment in cash, which favor hypothesis 2 (H2). Noteworthy to highlight, variable Δ INTER (-0.036), Δ DIVID (-0.7149), LEVER (-0.3675) and Δ NWC (-0.2336) that is expected to be negatively correlate to Δ CASH as per past literature studies.

In Model 3, new variable on interaction between working capital ($NWC \times NWC$) was added on top of equation model 2; this to allow correlation excess stock return and changes of working capital is studied. Hypothesis 3 (H3) suggests with an

increase of investment in working capital, will reduce firm value of the same fiscal year. Unfavorably, model 3 results as describe in Table 3, imply there's a positive correlation of excess stock return and working capital that also suggest each ringgit increase in working capital will increase firm value by MYR 0.03. Albeit mentioned results, correlation of the variable are not statistically significance and so it is not possible to confirm changes in working capital discordantly gave positive return to firm value.

Lastly model 4, is aim to seek interactive effect of firm leverage ratio towards firm value, by introducing new variable ($LEVER \times \Delta NWC$). Hypotheses 4 (H4) assume that additional investment in working capital will reduce firm value. To instigate mentioned assumption, changes of leverage ratio towards working capital was applied whereby leverage ratio signify valuation of firm long term liabilities, subsume of long term debt such loans and debenture. Incorporating hypothesis into model 4, it is anticipated that new variable $LEVER \times NWC$ will correlate negatively towards excess stock return. Model 4 results certify the assumption; demonstrate strong negative correlation towards firm value and suggest that each ringgit increase in financial leverage to funds additional investment in working capital will reduce approximately MYR 0.03 of firm value. Other observable result in model 4 to support hypothesis of this study was variable cash ($\Delta CASH$) has higher valuation (1.07) in contrast to changes in leverage ratio (0.03). Mismanage financial leverage may damage firm valuation by market that's is akin to many earlier researches namely Moss and Stine (1993), Deelof (2003), Raheman and Nasr (2007) and Gill et al. (2010) acknowledge the effect of inefficient working capital management will reduce firm profitability, henceforth signify negative relationship of working capital management towards firm profitability (hypothesis 1, H1).

5 Conclusion

Managing working capital is an important role to ensure firms have the ability to sustain in market, create profitability, increased firm and shareholder value. Thus, firm value will affected if firms change their management or composition of financing and investment in working capital. Foremost proposition of this study was to investigate analogue between additional investments of funds in working capital towards firm value. Ours study found that changes in working capital of Malaysian firms will reduce firm value. Nonetheless, all regression are consistently highlighting higher value perceive when additional investment is made onto net asset, cash. Result highlights leverage ratio negatively related towards working capital management. It implies firm with efficient working capital required less external funding to finance their routines cash flow. Financial leverage can be allocated to seize investment opportunities and most importantly firm able to survive during financial crisis. Investor perceive negative returns when additional funds being allocated to working capital, hence this would give better indication for firms to improve working capital management in creating stronger shareholder value and ultimately growth of the firm. To achieve optimum level of working capital management, is essential for firms to view end to end of cash flow cycle, from point of credit term with supplier as well as customer while also managing.

Firm with efficient cash management, able to release investment in working capital for strategic objective, reduce financial cost, less dependent to banks, increase profitability and ultimately shareholder value maximization.

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Evaluation of the Innovative Activity Efficiency While Developing the Sectoral Technology Policy in the Region

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Abstract. The article deals with the development of methodological approaches to assessment of various strategies developed for the regional industrial technical and technological policy. The object of the analysis is the existing modern system used for assessment of the innovative activities.

The study hypothesis is the assertion that simulation modeling facilitates elaboration of a systematic approach to assessment of various strategies of the regional sectoral technical and technological policies based on innovation activity. Simulation modeling allows obtaining a realistic view of the financial resources, which are needed to implement modern scientific achievements and best practices. It also helps to develop an objective organizational-economic mechanism for their implementation, creates opportunities for reducing the administrative barriers to innovation investments, studies the capacity to self-finance innovative activities, and exposes the institutional mechanisms, which may stimulate their development.

The article considers the algorithm and mechanisms used to evaluate the results of innovative activities. The assessment is made using a balance simulation model at the stage of introduction of scientific achievements and best practices during the forecast period.

The paper discusses a possibility to use simulation modeling for the anticipatory evaluation of various options of the innovative activities, which may be conducted in the region. This will make it possible to identify the necessary resources and their location while developing the concept and the long-term strategy of the industrial technical and technological policy in the region.

Keywords: Innovation · Assessment methods · Region · Subsidizing · Modeling · Investment · Evaluation · Technological policy

1 Introduction

In our view, it is important to note that one of the reasons for slow innovative development of the modern agro-industrial complex in Russia is lack of its scientific component. At first glance it may seem that the theoretical basis for the innovative state

policy in the field of agriculture is indisputable. However, the effectiveness of its practical implementation remains fairly low. It is becoming more and more evident that the implementation of the state innovative technical and technological policy is based on an antiscientific approach. In our opinion, the main components of this approach are as follows:

1. In most cases, the land does not belong to those who work on it. It is either a shared ownership, or it is rented. Therefore, nobody is interested in maintaining soil fertility of cultivated land areas. Arable soils are inefficiently used. Soil fertility is not restored and not regenerated. As a rule, high-cost innovative activities are not motivated.
2. Innovative agrarian processes are funded residually. Thus, in Sverdlovsk Oblast (Region) during the last 10–15 years the average state subsidies, which were primarily used for restoration and development of the technical potential in agriculture, amounted to 2–3 billion rubles. At the same time, calculations show that at least 7–12 billion rubles are required for simple reproduction in the region. [7–9].
3. The standards set by the state for agro-industrial production have practically ceased to exist. Standardization requires development of objective technical and technological procedures and is one of the main instruments of the state economic regulatory policy. Besides, standard-setting is a kind of a diagnostic tool: it helps to assess the effectiveness of comprehensive technological processes in the agrarian field. It is also the basis for technical and technological policy. If there are no standards - there is no innovation policy.
4. The regional authorities may leave without funding such target programs as “Technical and Technological Modernization, Innovative Development”, “Preservation and Restoration of Agricultural Soil Fertility and Agricultural Landscapes as the National Asset of Russia in 2006–2010 and to 2013”, “Developing Agricultural Land Amelioration in Russia in 2014–2020.”
5. The state does not create conditions for expanded reproduction of the manufacturing and resource potential of agricultural companies. The sales margins of the main agricultural products in the Middle Urals should be above 50% [9]. Taking into account state subsidies, in 2015–2016 it was 10.9–20.5% in the crop production sector, in the livestock breeding on average it amounted to 14.7–17.4%, including 33% in dairy cattle breeding, while large-scale raising and sales of beef cattle has always been and still remains unprofitable.
6. The criteria, which are used to judge about the innovativeness of the regional agrarian complexes are mainly the achievements of specific “pilot” companies. Popularization of highly intensive farms working in the regions is brought to the forefront. However, it does not help to booster production. In general, high performance enterprises produce only about 10–15% of the regional demand for milk. Moreover, the efficiency of dairy production does not always correspond to the volumes produced. For example, in Kilachevsky Agricultural Production Cooperative in Sverdlovsk Region the average sales price is 23–25 rubles per 1 L of milk, while the cost of its production in the first half of 2016 was 20–22 rubles. Therefore, in order to ensure expanded reproduction, the enterprises of this type need constant state support. Every year the federal and the regional budgets allocate to these

enterprises up to 20–25% of the total amount of funds planned for this purpose. It means that about 3% of the regional enterprises with the total volume of production equal to 10–15% receive about a quarter of the total amount of state subsidies, or, on average, 60–70 million rubles, while the rest of more than 300 farms get on average 3–5 million rubles per year.

7. Unfortunately, it must be admitted that the decay of agrarian science and agrarian education is becoming more and more evident. As a result, an objective view of the technical and technological components of the agrarian economy is being lost. Science claims that one of the most important components of the effective state support is how often and how quickly it is provided. The growth rate of state support should correspond to the rates necessary for the development of food security. During the last 10–15 years despite the inflationary tendencies observed in the economy, the agricultural subsidies paid in the Middle Urals amounted to 2–3 billion rubles. Does this really mean substantial government support aimed at strengthening regional agricultural innovation platform?

At the same time, innovative activity is one of the main arrears of focus, which provides rise in the efficiency of agricultural production. The term ‘innovation’ as an economic category was introduced at the beginning of the 20th century. Innovation is understood as ‘introduction of change via something new’, ‘a creative process whereby some improvements or novelties are used’ [1, 3, 5, 13]. In agrarian production, innovation is increasingly recognized as a radical way to solve many of its intrinsic problems. So, for example, I.G. Ushachev in his article ‘Problems of the Formation of Management Systems for Innovative Activity in the Agro-Industrial Complex’ indicates that an innovation is the final result of any novelty implemented in order to change the object of management and to obtain economic, social, scientific, technical, ecological or any other effects. An innovation is a formalized result of fundamental, applied research, development or experimental work in any field of activity to improve its effectiveness [12]. In our opinion, the most precise and complete definition of an innovation is given in the works of I.G. Usachev, I.T. Trubilin, E.S. Ogloblin, I.S. Sandu, L.M. Gokhberg, I. Kuznetsov, L.N. Vasilyev, and E.A. Muravyova, who adhere to the international standards, according to which an innovation is defined as a process of making improvements by introducing something new, embodied in the form of a new or improved product, or technological process used in practice [4, 11, 12].

At the local level, an innovative activity in the agricultural sector is materialized via a system of rational farming developed by the regional research centers [8]. By its purpose it is a comprehensive document. It contains a sophisticated system of agricultural production, taking into account scientific achievements and regional peculiarities specific to all branches of the local agrarian-food complex both at the present moment and in a long-term perspective. In the Middle Urals, however, this is a time-independent document, which means that it has not been revised for about 20 years, whereas during the last 5–10 years there have been great changes in the agrarian sector connected with the introduction of new equipment, machinery, varieties of crops, the renewal or reconstitution of the herd or flock, the development of new technologies, etc. Consequently innovative processes require additional state support.

For the past fifty years, both domestic but foreign experts and scientists have been discussing the problems connected with the evaluation of the innovative activity efficiency as a central catalyst of steady economic performance [1–3, 5, 10, 14, 15]. In Russia, for example, the methods used for efficiency assessment, may be subdivided into three groups: methods based on a technocratic approach; methods based on the economic approach; and integrated methods. Global experience shows, that the methods based on discounted valuation are probably the most widely applied for assessment of the project effectiveness, since they are more accurate, and take into account different types of inflation, interest rate changes, expected rates of return, etc. Using the discounting methods, which actually mean comparison of the time-dependent correlation between incomes and expenditures it is possible to choose a specific option of innovation investments, if there are not enough funds.

Under market conditions, all investment activities are associated with significant risks. The longer it takes an investment to recoup its original cost, the more risky the investment. Usually, this refers to knowledge-based industries, where the pace of scientific and technological progress is the highest, since the emergence of new technologies quickly depreciates the initially invested amounts. Therefore, based on the opinion of the majority of authors, all calculations aimed at assessing the economic efficiency of an innovative activity should also be carried out taking into account the time factor.

Researches have shown that when innovative solutions in the agro-industrial complex are introduced, new types of equipment and technologies, acquisition of rights to them, marketing and promotion activities require significant financial investments. Since agricultural enterprises do not have enough funds for these purposes, it is necessary to create conditions and tools for financial support of this innovative sector of economy. Therefore, preliminary forecasts of the innovative activity efficiency should be based on the extensive use of mathematical models.

In our view, the use of mathematical modeling and simulation is perfect for the development of a viable and efficient integrated farming system, the long-term concept of which may be elaborated and updated in the course of time, for dynamic evaluation of its economic efficiency using all or the most accurate methods for assessing the economic efficiency of innovation activities, for shaping the structure of technological processes and for ensuring their development on the basis of state support. Elaboration of the region's economic model is necessary, since it helps:

- To develop an automated system of transitional investment programs and innovative projects, which will allow utilizing the results of innovative activities related to the technological processes existing in various areas and sectors;
- To ensure automated short-, medium- and long-term planning and analysis of agricultural production, based on the elements of innovative activities in the region;
- To draft economically balanced indicative state orders to economic entities, which are involved in innovative activities;
- To elaborate the strategy and strategic plans for the implementation of innovative agricultural practices for a period of 10 years or more; to facilitate the adoption of objective management solutions based on multivariate calculations; to ensure

optimal distribution of cash flows in all sectors and to improve the efficiency of innovation activities.

Besides, the concept of innovative agricultural practices in different regions (or business entities) should be developed taking into account the diverse peculiarities of the agricultural production systems at each enterprise of the region. To guarantee continuity and information exchange within a single system of strategic planning, it is very important to make sure that all these strategies are being developed within a comparable information field.

In fact, simulation models are computational arrays, which help to consider possible results taking into account different combinations of variables. Therefore, these models provide a decision maker with the information necessary to make the best decision in a particular situation.

We have developed a simulation model, which may be used in economic analysis for strategic planning of innovative activity related to agriculture and food production at the regional level (see Fig. 1). It is a multi-purpose system allowing to adequately reflect the processes of gradual development of innovative achievements both at the level of the region and at the level of an agricultural enterprise [6, 7].

Incorporation of the innovation concept into a system of comprehensive target programs (using a single database) will allow developing a unified system of strategic planning within the framework of any target program, including the program aimed at stimulation of innovative activities in the region (see Fig. 2).

The main elements of the model structure at the regional level are the following:

1. Development and upgrading of the strategic plan for the transformation of agricultural production.
2. Global algorithmically linked computer database of all the main and auxiliary branches of agriculture (the database is compiled in a discrete-dynamic form and includes monthly calculations of costs of production, expenses borne in connection with storage and processing of crops and livestock products; prices for resources and services of all kinds, etc.).
3. Regulatory and technological environment for strategic variant planning and analytical calculations (legislative instruments, standards and innovative technologies for cultivating agricultural crops and livestock keeping, reference information on technologies of manufacturing and feeding of the farm animals with ready-made feeds, standardized animal feed diets, standards for planning in all branches of main and auxiliary production based on the best farming practices).
4. Subsystems for calculation of all types of costs related to crop production and animal husbandry taking into account the time aspect.
5. An integrated system reflecting production volumes, all kinds of required resources and a complete list of monetary and material expenditures with specific details about each cultivated crop and each type of farm animals, including all main and auxiliary industries, complemented with an automated overhead cost allocation system used at the level of all main and auxiliary production units.
6. A system of balances of agricultural products, feeds, seeds, fertilizers, labor, marketable products (own production, sales, purchase), movement of goods in natural and value terms.

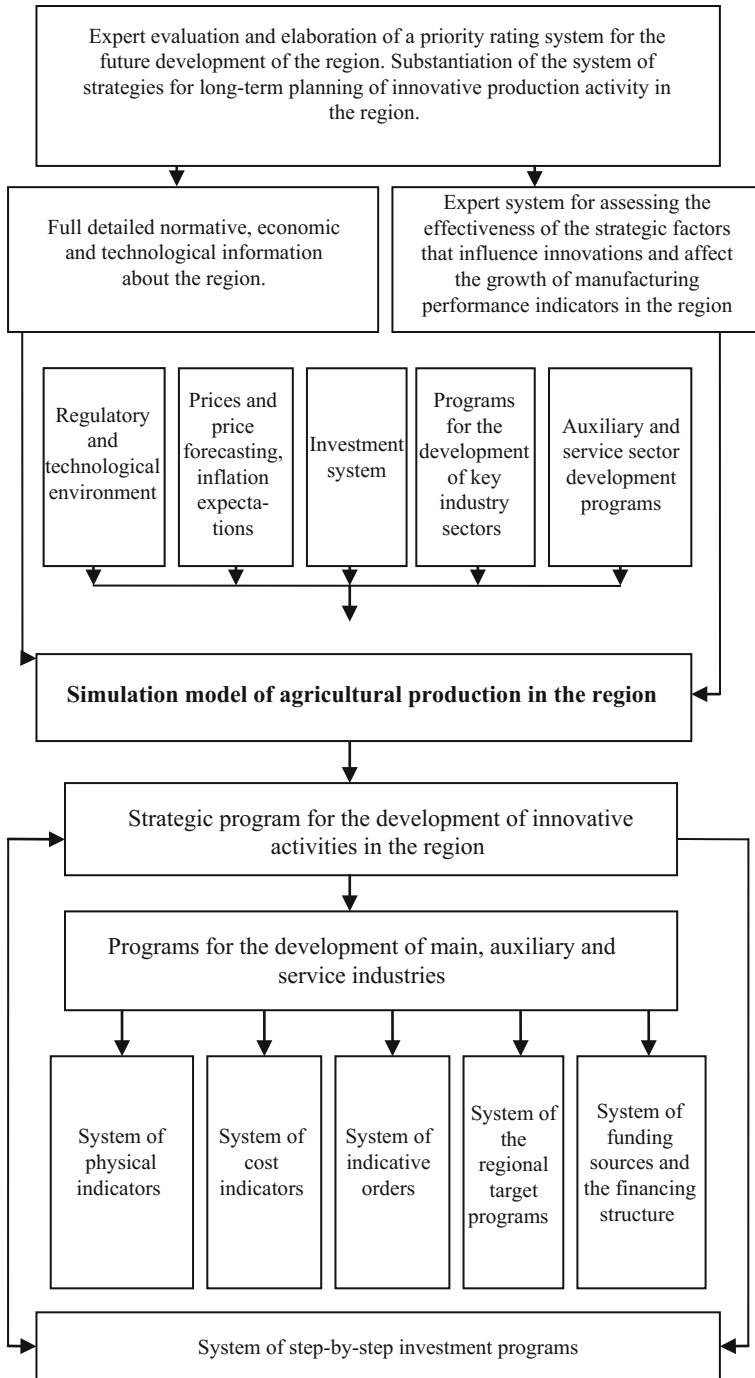


Fig. 1. Information diagram showing the economic model of innovative strategic planning in the field of agricultural production at the regional level.

7.

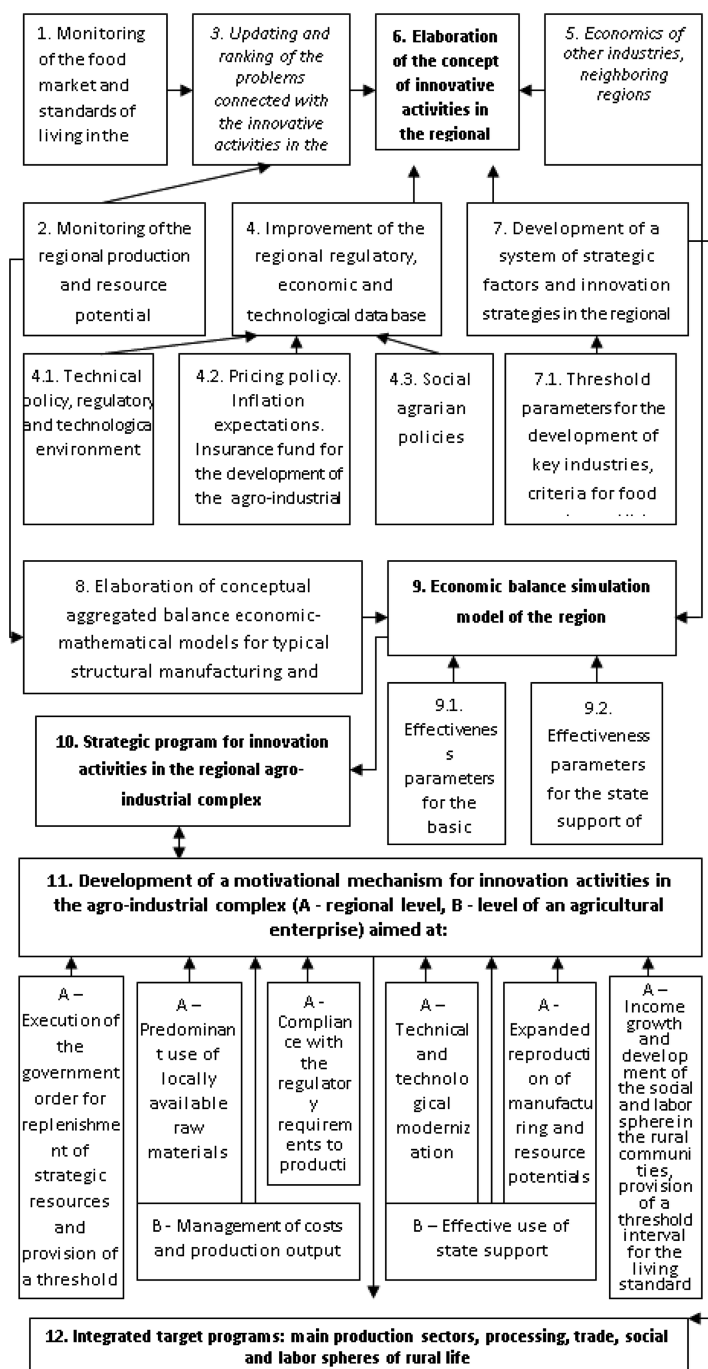


Fig. 2. Order for the development of the target program for innovative activities in the regional agro-industrial complex.

Table 1. Algorithm for calculating the state support for innovative activities.

No	Ways to overcome the existing barriers for innovations	Implementation mechanisms
1	2	3
1.	To develop reliable practical nutritional guidelines based on medical recommendations (Q - nutritional requirements, ni - consumption rate)	To adopt an approved methodology for determination of the nutritional standards set by the responsible medical authorities
2.	To determine food consumption volumes in compliance with No 1	$Q \cdot ni$ To approve in compliance with the regional legislation
3.	To establish regional production volume thresholds (kiz)	$Q \cdot ni \cdot kiz$ To approve in compliance with the regional legislation
4.	To develop innovative regulatory process flow diagrams reflecting production conditions within the regional areas with sustainable development	To determine the standard cost of production (Chj)
5.	To develop innovative standard technological and technical policies based on import substitution of manufacturing technologies	To determine the standard annual capital investments (K _{hj})
6.	To develop the standards for expanded reproduction of innovative activities under the existing manufacturing conditions in all intra-regional areas with sustainable development (N _{ij} , K _{Ij})	$N_{ij} = 10, 15, 20, 25, 30, \dots \%$ $K_{ij} = 10, 15, 20, 25, 30, \dots \%$ To approve the standards in compliance with the regional legislation
7.	To determine the standard volume of state support for agricultural producers, taking into account the environmental conditions in the regional areas with sustainable development	$N_{ij} \cdot (Chj) + K_{hj} \cdot K_{Ij}$
8.	To develop the requirements and to arrange a competitive tender for execution of an indicative government order	To announce a competitive tender for supply of agricultural products in compliance with the indicative government order $Q \cdot ni \cdot kiz$
9.	To develop the requirements to the structure of a business plan, which describes innovative activities	To determine the amount of direct state support for innovative activities $Q_i \cdot ni \cdot kiz \cdot [N_{ij} \cdot (Chj) / Q_i \cdot ni \cdot kiz + K_{hj} \cdot K_{Ij} / Q_i \cdot ni \cdot kiz]$
10.	To determine a standard amount of state support necessary for the implementation of target innovation programs	Π_j
11.	To develop the integrated state support of innovative activities in the region ($\Gamma\Pi$ – state support)	$\Gamma\Pi = Q_i \cdot ni \cdot kiz \cdot [N_{ij} \cdot (Chj) / Q_i \cdot ni \cdot kiz + K_{hj} \cdot K_{Ij} / Q_i \cdot ni \cdot kiz] + \Pi_j$

Cost budgets and physical units budgets compiled for all main and auxiliary industries, consolidated budgets of enterprises (calculation of financial indicators for each enterprise, monthly cash flows, budget deficit and surplus, etc.).

8. Programs for the development of all industries.
9. Composition and use of machine-tractor fleet. A possibility to assess the need for equipment in the region at any time of agricultural operations.
10. System of interrelated production programs for all industries.
11. System for assessing the performance indicators of the regional production and financial program (a set of analytical statistical tables and graphs).
12. System of investment programs aimed at the development of agricultural production in the region.

System features and capabilities.

1. Individual approach to the formulation and development of an innovative system for arranging the regional agricultural production combined with the regulatory requirements to accounting, reporting and report forms of plans and systematic analysis of data or statistics.
2. Database storage and updating in any time period.
3. Automated development of a regional production and financial program:
 - Formulation and evaluation of various versions of concepts and strategic options;
 - Updating the strategies in connection with the change of various factors (innovative components of technological processes, prices for resources, products, etc.).
4. Easy access to any data unit and, if the core of the system is already well-developed, a possibility for the user to independently build a wide range of additional interconnected tables and graphs.

Thus, using an iterative process for the strategic plan development, it is possible to determine the amount of the necessary state support to agriculture and to distribute it in such a way as to ensure the required regulatory level of production profitability, which will provide the extended reproduction and equalize the economic conditions for production at different regional enterprises. Available information should become an integral part of the development of the agricultural state support strategy.

The simulation model of the regional economic development should become the most important unifying subsystem of the whole package of target programs. In addition to regulatory information and reference data, the simulation model contains technological information and, most importantly, the information about the changes of the indices connected with the development of different branched of the agro-industrial complex under various options of effective utilization of the potential reserves available in the region. This will create an innovation decision-making toolset, which will be absolutely objective. Besides, it will reduce the likelihood of subjective approach to problem solving and will become a weighty argument preventing administrative interference into the economic and social constituent component of the food security problem in the region.

In our opinion, the concept of innovative activity should be introduced on a gradual, step-by-step basis: the first step is to create attractive socio-economic conditions for the development of agricultural production in the region (2018–2020, the goal is to ensure stabilization and gradual growth of agricultural production in the region); the second step is to provide conditions for competitive agro-industrial production (2021–2030, the goal is to ensure sustainable food security in the region). To supervise the process, a Coordination Center should be created, which should become a representative body incorporating the regional branch unions, scientific research institutes, agrarian education institutions and authorities. The creation of such a center will allow developing a system of objective management of innovative activities.

An important component of the regional simulation model should be a subsystem used for calculating the necessary innovation state support. The amount of such support, in our opinion, should be determined on a regulatory basis (see Table 1).

When distributing the overall amount of funding allocated to support innovation activities, the main principle should be an objective assessment of the fiscal health of each enterprise to which the state support will be provided. It is necessary to review the procedure of expert examination of business plans presented by the enterprises, which are applying for state subsidies required for equipment modernization. Before making a decision on investment program implementation, the enterprises or credit institutions, which will invest in the new project, should analyze the financial status of the company, to which the subsidies will be granted.

The conducted research shows that there are some important factors influencing the evaluation of the innovative activity results:

- At the present level of economic development, innovative activity is important not only as a scientific phenomenon, but also as a category that determines the criteria for the analysis of the current state of the national economy;
- Since the level of development of all market participants is different, innovative activities should be supported by the state;
- To justify the necessity of state support, all enterprises should submit a long-term comprehensive and well-reasoned plan of innovation implementation;
- To economically justify the policy and strategy of technical and technological development in the regional production sector, it is expedient to elaborate a discrete dynamic simulation model, which may be used for formal description of the practical application of technological advances in order to assess the economic efficiency of the chosen strategy and to plan state support for each branch of production;
- To justify the investment efficiency (including state support), it is advisable to use simulation models as a mechanism for systematic evaluation of the innovative activity results achieved by a certain company or region;
- The research institutes and research centers should develop simulation models for assessing innovation activities; the research results should form the basis for an advanced system of agricultural production in the region and the basis for elaboration of the regional scientifically justified technical and technological policy, which may be dynamically upgraded and supported by the state.

The balance simulation model was tested during the introduction of the new agricultural production systems in subsidiary farms of industrial enterprises in Sverdlovsk, Orenburg and Perm Regions and the Republic of Bashkortostan.

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Up-to-Date English Language Course as a Means of Developing the Communicative and Professional Skills of IT Students

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Abstract. Much of the academic literature concerning studying IT English tends to become outdated. The article focuses on problems associated with the rapid development of Information Technology, which can lead to obsolescence of training aids for IT students. The authors underline the importance of updating English language courses and creating modern teaching aids for IT language study. The article describes the educational and methodological materials for the English language course for IT undergraduates including a syllabus, a set of evaluation tools, guidelines for students, and training and methodological aids for practical classes. The research illustrates how up-to-date educational materials and exercises based on interactive teaching methods are implemented to develop students' communicative and professional skills.

Keywords: Information Technology · English language course ·
Language study · Training and methodological aids ·
Interactive teaching methods

1 Introduction

Information Technology (IT) is one of the most dynamically developing fields all over the world. Many Science, Technology, Engineering and Mathematics disciplines increased their efforts to produce more graduates in computer science, including those that are capable of proceeding to acquire professional and graduate degrees, as well as take a career in computer science related fields [1]. In Russia, the educational program in Information Systems and Technologies is being implemented in more than 30 universities [2]. According to the research of the Ministry of Labor of the Russian Federation, professions related to the IT industry are among the most popular and high demanded in Russia [3].

The professional activity of graduates with a Bachelor's degree in Information Systems and Technologies includes research, development, introduction and support of Information Technologies and Systems. Main objects of professional activity of graduates are information processes, technologies, systems and networks, their

instrumental (software, technical, organizational) support, techniques and methods of designing, debugging, production and operation of Information Technologies and Systems in various fields, including geology, oil and gas industry, geodesy and cartography, geoinformation systems and all kinds of activities in the context of the information society economy [4].

The study of a foreign language at a technical university is an important component of professional higher education. The State Educational Standard of Higher Education requires the consideration of professional specifics in the study of a foreign language, the implementation of the tasks related to the future professional activity of university graduates [4]. As a result, a professionally oriented approach to teaching a foreign language in technical universities is applied, with the aim for students to communicate in professional, business and scientific spheres and situations.

The quality of education for IT professionals directly depends on the proficiency in English, in particular, specific vocabulary and terminology, since most terms related to Information Technology are English-speaking in origin. The professional language of IT specialists, probably like no other, abounds in English borrowings [5, 6]. According to [7], English is the language of computers and the Internet.

An IT specialist with professional communication skills in English is less dependent on translated professional literature. He/she can be a direct participant of international professional communities in social networks and special IT forums. Such specialist has more opportunities for self-education, and therefore, can remain competitive in the field of a super-profitable and dynamic IT industry [8].

2 Problem Statement

The dynamism of IT industry development imposes its specificity on educational and reference materials, which is expressed in their rapid “obsolescence” and “lagging behind” new technological trends. This feature of Information Technology puts strict requirements on the relevance and updating of educational, methodological and reference literature in a foreign language, as well as to the authors and compilers, who have to make constant efforts to maintain their level of awareness and competence in the core field.

The problem of up-to-date English textbooks and language courses for IT students is a major concern today [9]. After analyzing the available training materials while teaching the English language course for IT students, the following problems can be highlighted.

2.1 Outdated Information

The textbooks for studying IT English contain outdated information when describing the types of computers, external and internal hardware, peripherals, storage devices, technical characteristics of personal computers, programming languages.

For example, the technical specifications for the personal computers that are no up-to-date (processor types, RAM, and hard disk space) are described in the exercises (Unit Inside the System):

Dell desktop PC, AMD Athlon at 2.4 GHz, 1 GB RAM expandable to 4 GB, 320 GB hard drive, DVD+/-RW drive [10].

Sony Vaio AR laptop, Intel Core 2 Duo Processor at 2 GHz, 2 GB DDR2 SDRAM, 200 GB hard drive, DVD+/-RW optical drive, 17" WXGA high-definition LCD screen, Memory Stick slot, three USB 2.0 ports [10].

In some tutorials, you can find a description of operating systems for personal computers that are no longer in use:

Windows 95 & 98 are still the most popular user-oriented operating systems with a friendly interface and multitasking capabilities [11]; Some newer operating systems such as Windows XP require 256 MB of RAM to run comfortably. Many people now have 512 MB or more for better performance. Users of modern games and graphics software, or people who may wish to host Internet services such as a web site, may want 1 GB or more [12].

The outdated information about storage devices is given:

The most common ways of storing data are Hard disk (HDD), floppy disk and CD-ROM [11].

The installation of a special program (chat client) for online chatting on the Internet in real time (chat) is described: *To participate you need to install a chat client, a special type of software, on your computer to connect to the chat server, the computer where the meeting takes place* (Unit Chatting and video conference) [7]. Currently, this information is outdated, since the user does not need to install a special program for text messaging, for which the World Wide Web is used.

2.2 Outdated Terminology

The problem of outdated terminology in the training aids for IT students is connected with the problem mentioned above. We can find the following outdated terms in various tutorials:

- (a) Vocabulary denoting various devices that have become out-of-date, or are used extremely rarely (as a rule, devices for data storage, types of monitors and other peripherals): *tape drive [10]; floppy disc [7, 10, 11, 13]; Zip drive [13]; CRT (Cathode Ray Tube) monitor [7, 10, 12]; dot-matrix printer [7, 10].*
- (b) Special terminology describing hardware, software, operating systems, programming languages, and other terms: *SIMM (Single In-line Memory Module)* (type of memory module with one-sided arrangement of microcircuits): *First, determine whether your computer uses SIMMs or DIMMs [13].* SIMM were standard memory modules in the late 1990s and early 2000s, later replaced by DIMMs (Dual In-Line Memory Module) (dynamic random-access memory integrated circuits).
- (c) Terms with expanded semantic scope. For example, the word *workstation* originally meant a powerful computer with a large monitor, having been used for computer graphics/animation, scientific calculations, etc. Such workstations were first developed in the early 1980s by Apollo, and then developed by Sun Microsystems and others. At present, personal computers have technical characteristics sufficient for any purpose. The term *workstation* is now used in a broader

sense, referring to the computer that is used in the workplace. However, the textbook gives the following description: *First, all employees receive PDAs and desktop computers. But we only use those for word processing and spreadsheets. Of course, some programs are too powerful for desktops. So many employees use the faster workstations* [13].

2.3 Lack of Relevant Information and Terminology

The third problem can be formulated as the lack of relevant up-to-date information and terminology on some topics, as well as insufficiently comprehensive coverage of topics necessary for study.

The topic of computer networks requires more attention, since the activities of IT professionals are largely related to the installation, setup and maintenance of network equipment and services. The tutorials reveal the concepts of local and global networks, including wireless ones, a network protocol, the typology and architecture of networks [7, 10, 14], but the concept of a server as the main component of the network, its hardware and software, such concepts as the protocol stack, the network layer, the types of network equipment, the criteria that the network must meet are not considered.

In some topics only certain aspects of this or that IT phenomenon are considered. For example, in the topic Operating system [14], attention is given only to the theme of installing/reinstalling the operating system.

IT students need relevant, up-to-date and more detailed information on different IT topics such as storage devices, programming languages, operating systems (for mobile devices and servers), network technology, cloud storage, information security [9]. Up-to-date terminology (e.g. *smartphone*, *SSD (Solid-State Disk)*, *Unified Extensible Firmware Interface (UEFI)* (used on new motherboards instead of BIOS), *multicore CPU*, *SQL (Structured Query Language)*, *VHLL (Very high-level programming language)*) can also be included into the training materials.

3 The Course Structure

For the successful implementation of the English language course of the Bachelor's program in Information Systems and Technologies, we have developed educational and methodological materials in English, which include:

- Syllabus
- Set of evaluation tools
- Methodological guidelines for students
- Training aids for practical classes relevant to the syllabus.

The aim of the course is updating and enhancing the content of the syllabus and training materials in accordance with the modern requirements, the integration of the course into the curriculum, cooperation with the faculty members of the specialized department for the further enhancement of the course.

3.1 Syllabus

The syllabus defines the goals and objectives of the discipline, the requirements for the results of its development. In accordance with the State Educational Standards in Russia, a graduate must have the necessary knowledge of a foreign language, namely:

- To know the phonetic features of a foreign language; lexical minimum of general and special character; grammatical phenomena and rules that ensure correct communication in everyday and professional communication; culture and traditions of the countries of the studied language; rules of speech etiquette
- To be able to read and translate texts in a foreign language according to the specialty profile; extract necessary information from original foreign language texts; understand a foreign speech in everyday and professional communication
- To be able to speak a foreign language using the most common lexical and grammatical means in communicative situations of everyday and professional communication
- To speak Russian and a foreign language at the level necessary to solve professional problems [4].

The educational program is aimed at improving the skills of English grammar, studying the cultural characteristics of the countries of the studied language, developing communication skills in the professional sphere and professional competencies.

The syllabus contains the following professional topics:

- Information Technology in the world;
- IT jobs;
- Computer system (Computer system components; External and Internal hardware; Operating system; Application software);
- Programming languages (History of Programming languages; Low-level Programming languages; High-level Programming languages);
- Databases (Database structure; Relational databases; Database management system);
- Computer Networks (Networks; Internet; E-mail; Cloud computing);
- Information security (Computer viruses and malware; Internet security).

The program provides educational applications software, multimedia tools, electronic resources (databases, information and reference systems, and search systems).

3.2 Assessment

A periodic and final assessment of knowledge and practical skills in English is essential for improving students' communication skills.

The assessment is carried out with the help of a set of evaluation tools, which includes various questions and tasks on topics, and lexical and grammatical tests.

Tests can be conducted in a traditional form or with the use of an electronic system that has been successfully implemented at the university.

3.3 Guidelines for Students

Guidelines for students contain a thematic plan of the discipline, the number of hours for each topic and the number of hours for students independent work, lesson plans, brief materials on topics, the terminological glossary, exercises for the revision of the studied material, tasks for independent work, a list of basic and additional literature [15, 16].

Guidelines give students an idea of the content of the English course, the sequence of the study of topics and can help organize independent work effectively.

3.4 Training Aids for Practical Classes

Training aids for practical English classes consist of lessons, the topics and content of which correspond to the syllabus, and are aimed at developing and improving the oral and written skills of students in their professional activity. The main objectives are:

- Development of the skills of reading professional literature from international newspapers and journals in order to obtain necessary information
- Development of oral and written communication skills in English within the framework of a professional subject defined by the syllabus.

4 Approach and Development

While developing the training aids for practical classes, the challenges faced by the English language instructors have been taken into account [9, 17]. The following approach has been applied and the following objectives have been achieved.

4.1 Systematic Approach

A systematic approach to the selection of topics for study has been used. Lessons have been developed on the themes connected with the basic professional directions of the future IT experts. The material is logically structured and presented in order of increasing complexity: at the beginning of the course students get acquainted with the concept of 'Information Technology', discuss the role of IT in modern society, its advantages and disadvantages; consider the main professions in the field of IT, study the basic concepts of hardware and software, and then move on to the study of more complex and specialized topics such as programming languages, databases, computer network technology, information security and other topics included in the syllabus [18].

4.2 Language Skills Development

Lessons are aimed at developing students language skills and consist of the Introduction (Lead-in) and three sections: Reading, Speaking and Writing.

The Introduction includes several questions that introduce the topic of the lesson to the student and facilitate the revision of the material studied.

The Reading section contains the English-Russian vocabulary on the topic, a text for reading and translation, questions on reading comprehension, and a number of various exercises aimed at enhancing vocabulary on the topic. For example:

- Find English equivalents in the text. Use them in sentences of your own.
- Match the words and word combinations with their definitions.
- Guess what these abbreviations stand for.
- Fill in the blanks with the correct word.
- Complete the table with the words of the same root.
- Choose the correct part of speech.
- Find the synonyms to the following terms.
- Explain the difference between the following terms.
- Explain what these terms mean.
- Make up sentences according to the model, etc. [18]

For each lesson, exercises are also developed for translating sentences from Russian into English, which are useful as homework assignments.

In the section Speaking, there are questions for discussion, touching the actual problems existing in the field of information technology, in accordance with the topic of the lesson; exercises for working in pairs; tasks for conducting role games.

The Writing section is aimed at improving students' writing skills, developing creative abilities, and skills of independent work.

4.3 Up-to-Date Information

All materials contain only up-to-date information and terminology. The texts for reading and discussion are based on authentic articles from different original sources. The topics for study are fully covered, definitions of the main terms are given. Each lesson contains the glossary of the most important terms on the topic. For all the questions concerning the relevance of information and terminology, we have consulted experts in the field of IT.

The topic Programming Languages contains logically structured information about languages of different levels, describes their characteristics and applications, introduces the terms Fourth Generation languages (4GL), Visual programming languages (5GL), Very high-level programming language (VHLL), SQL (Structured Query Language).

The Database topic provides an understanding of a database, describes in detail the components of a database and the principle of its organization, explains the advantages of relational databases, introduces the concept of a DBMS (Database Management System), in particular, RDBMS (Relational Database Management System), a query and a special query language SQL (Structured Query Language).

The Operating System unit is supplemented with the up-to-date information about OS Windows, Mac OS X and Linux, operating systems for mobile devices and servers, and also some facts from the history of these OSs. Information about proprietary and open-source operating systems is included.

It should be noted that the activities of IT professionals are connected in many ways with the installation, setup and maintenance of networks. Therefore, much attention in the training materials is given to the topic Computer Networks and related topics.

The Computer Networks topic details not only geographic layout (LAN, MAN, WAN) and network topology (bus, ring, star, tree, mesh, hybrid), but other important components, such as network architecture (peer-to-peer and client-server), communications protocol, protocol stack, connecting devices (repeaters, hubs, bridges, routers, and gateways). The notions of performance, reliability, scalability and security (criteria a network must be able to meet) are considered.

The Internet theme tells about the history of its occurrence, defines the concept of the Internet, describes the ways of Internet access, components of the Internet, discloses the terms TCP/IP, IP, service provider, domain name, Domain Name System, World Wide Web, HTTP.

4.4 Interactive Teaching Methods

To develop the skills of oral communication, various tasks and exercises have been developed using interactive teaching methods (role games, discussions, project method) [19, 20].

For example, the topic Information Technology in the World provides discussion on the following issues:

What advantages of information technology do you consider to be the most important for society?

Has information technology influenced the quality of education? In what way? Is it positive or negative influence?

English has slowly become the primary mode of communication for business and other communication areas. What do you think about it?

How do you see the future of IT?, etc.

In the Cloud Computing unit the following role-playing game is proposed:

Student A: You are talking to an employee about cloud computing. Ask student B about: (a) A possible problem; (b) Benefits; (c) Setting it up.

Student B: You work with Student A. Answer his or her questions.

4.5 Specifics of the University

The specifics of the university, the content of curricula on special subjects were taken into account. For example, in the topics Networks and E-mail the following project tasks are proposed:

Find out what computer network(s) (geographical layout, topology, architecture, transmission media, network protocol) your university provides. Think about their performance, reliability, security. Express your opinion.

You are going to design an e-mail policy for your University. Write a letter to your University authorities with your ideas.

The Databases unit contains the following role-playing game:

Role-play the following situation:

Student A: You are a database administrator working in an oil and gas company. You are explaining the basic principles your company's databases are organized.

Student B: You are a trainee. You are asking questions about company's database structure.

4.6 Students Independent Work

The tasks for students independent work have been developed:

- Searching for additional material
- Preparing presentations
- Preparing for role-playing games
- Writing essays
- Developing projects.

Examples of the tasks are as follows:

- Computer networks operate according to a network model. Search for information about a network model. Then answer the questions.
- Work in groups. Think what advantages and disadvantages the following network topologies have (Bus topology, ring topology, star topology, tree topology). Then discuss it.
- You are taking part in a students' scientific conference. Make a research about a particular operating system.
- You are a vendor offering specialized software for some organization. Present this software. Speak about its features, capabilities and advantages.
- Write a composition about what IT area you would like to work in. Describe what responsibilities this job involves, what professional and personal skills it requires, what your career plans are.

The English language course is implemented through various training facilities. Computer classes, multimedia classrooms, smart boards, electronic resources of the university (e-learning aids, catalogs, tests), Internet access, access to electronic resources of other educational institutions are at the disposal of students.

5 Conclusion

The study of English as a foreign language by IT students in higher educational institutions is an integral part of the educational process. The quality of education of IT professionals directly depends on their proficiency in IT English. The rapid development of Information Technology causes obsolescence of teaching aids and other teaching materials, which requires their constant updating. The developed English language course for IT students meets modern requirements and includes all the materials necessary for the successful implementation of the course: (1) a syllabus; (2) a set of evaluation tools; (3) methodological guidelines for students; (4) training aids for practical classes; (5) electronic facilities. The course is based on modern interactive teaching methods (discussion, role game, or project method) which contribute to the development of professional and communicative skills of students.



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Determinacy vs Randomnicity in Socio-Economic Processes: Epistemological Concept

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Abstract. Randomnicity in socio-economic systems are investigated in the article, from a conceptual point of view. It is shown that the impact of economic agents on the system is the main generator of the emergence of randomnicity in socio-economic processes. It is proposed an epistemological concept, according to which the anthropogenic nature of economic agents' expectations and preferences, as well as the heterogeneity and heteromorphicity of their subsequent impacts on the socio-economic processes, is the main factor of impacts to the socio-economic system. Ontological aspects of formalization of economic agents' expectations and preferences in socio-economic processes are considered.

Keywords: Socio-economic systems · Socio-economic processes · Determinacy · Randomnicity · Financial markets · Economic agents · Expectations and preferences of economic agents · Heterogeneity · Heteromorphicity

1 Introduction

Modern socio-economic processes are characterized by increased turbulence, determined, in particular, by changes in the transformational nature of geopolitics and, as a consequence, in the world economy. In such conditions, the interests of researchers are aimed at analyzing characteristics of dynamics of processes occurring in socio-economic systems.

The socio-economic system (SES) is a finite set of elements (subjects and objects of the system) and relations between them, which is determined by a specific structure and can be ascertained from the environment in accordance with the system purpose (or several purposes) within a certain time interval, called the life cycle of the system, during which the system maintains the integrity of its structure and goal-setting, and is characterized by specific functions related to the processes of production, exchange, distribution and consumption of labor results.

System characteristics of SES, which are of great interest on the part of researchers, are determinacy and randomnicity in socio-economic processes (SEP).

The research objective is to form a concept to identify the main reason of randomnicity' occurrence in socio-economic processes.

Since SEPs are quite diverse in nature, and no universal laws of their development have been revealed yet, within the framework of the proposed study - to specify the type of SES - we will use pricing processes taking place in financial markets that reflect the essence of the problematic of randomness and determinacy in SEP as an empirical material illustrating the provisions of the article. Although most of the statements and conclusions made in the course of the work can be applied to SEP of an arbitrary nature.

2 About Randomicity and Determinacy in Socio-Economic Processes

In scientific works you can find various (sometimes directly opposite) views on the place and role of randomness and determinacy in the evolution of SES. Thus, some researchers speak for the primacy of randomness in evolution of complex systems, and the SES are certainly a part of them (see, for example, [12, 31]).

Another part of researchers insist on universal determinism in evolution (see, for example, [1, 24]). Thus, in their work the authors [19], arguing with Ilya Prigogin, write about randomness and determinacy in SES: “if it is referred to randomness, then there are wanderings, and not just any, but within a pretty defined, deterministic field of opportunity”, where they claim that randomness in real systems has a limited impact on processes.

At the same time, there are more restrained opinions (and there are most of them) that in real life there is a place for both randomness and determinacy (see, for example, [6, 26, 28, 33, 35]).

In fact: even for such outwardly chaotic SES as, for example, financial markets - in the retrospective analysis of SEP existing therein, it is almost always possible to identify the cause and effect relationships that determine the particular character of the dynamics of the pricing processes taking place in such systems. Simply at the stage of cause and effect relationships formation it is not yet clear what (quantitative and vector) impact they will have even in the nearest future on the dynamics in SES.

The reasons for this uncertainty were revealed by Leonard Mlodinow [28], who identified three conditions required for using Laplace’s hypothesis of universal determinism [8] in the practice of predicting the evolution of SES:

- (1) the laws of nature that determine the future must be known. But so far the economic theory cannot offer us such laws;
- (2) access to all data fully describing the system under investigation and not subject to unforeseen (including subjective) influences is necessary. But, first of all, the situation with the full amount of data on SES in practice is an unattainable ideal, and secondly, in the title of the term “socio-economic systems” there is already the implied possibility of the influence of society on the subjective interpretation of data (let’s recall at least the diversity in the interpretation of events taking place in Syria and Iraq by various mass media);
- (3) a fairly large mind or sufficient computing power is needed to understand what future awaits us at the specified parameters of the present according to these laws.

But even if such a condition were fulfilled (which is unlikely for a modern economy characterized by multi-vector nature and a large number of factors influencing the evolution of SES), failure to fulfill the two previous conditions makes the realization of Laplace's hypothesis in SES a task that does not yet have a solution.

Therefore, the questions - how much the randomness influences the current state of the SES, and how accurately we can predict its future development trajectory - do not in fact have plausible unambiguous answers in practice.

Simply determinism in SEP coexists with randomness and interacts with them, making the process of SES analysis and forecasting a non-trivial matter that accompanies additional difficulties noted below.

As for the randomness in SEP, Mandelbrot and Hudson [26] identified three forms of randomness inherent to financial markets:

- (1) a "soft" randomness, determined by regular distribution of probabilities, and which, in B. Mandelbrot's opinion, is similar to a solid state of matter with a minimal system mobility;
- (2) "violent" randomness, in which the amplitude of fluctuations in the quantitative characteristics of the system increases substantially, and which is similar to the gaseous state of matter with maximum system mobility;
- (3) "slow" randomness, the characteristics of which are between two previous forms of randomness. This form of casualty is similar to the liquid state of matter, in which system mobility can be quite diverse.

At that, Mandelbrot and Hudson [26] state that in reality, financial markets are characterized by "slow" and "violent" types of randomness, which are not described by the normal distribution of probabilities. But unpopularity of these types of researches' randomness is explained by the authors as follows: "violent" randomness is inconvenient, since not all are familiar with its complex mathematical apparatus, and in many cases it has yet to be developed.

In [26] it is noted that much in the economy is best described by this "violent", unpleasant form of randomness. Apparently because the economy includes not only physical objects and phenomena (for example, wheat harvest, weather), which can be described with the help of existing mathematical toolkit: SES is also characterized by changeable moods and unreliable expectations of economic agents.

In [25] the most significant postulates of the classical approach to the emergence of randomness in the pricing processes in financial markets are characterized as follows:

- (1) current price is the best source of the of the future price forecast (that is, the stochastic nature of the price change is initially assumed);
- (2) future price does not depend on the price dynamics for the last period (again it is assumed that there is no determinism in the price dynamics);
- (3) the normality of Gaussian distribution.

However, only the first provision - in the opinion of B. Mandelbrot - does not contradict the actual data. At least, it helps to explain why we are so often mistaken in our forecasts about the movement of prices in financial markets. The second and the

third provisions are simply rejected as methodologically unjustified, since the evidence clearly shows that price volatility depends on its changes in the past, and the Gauss curve is generally an abstraction invented by mathematicians, which has nothing to do with real life.

That is, in the processes that take place on financial markets, there is a determinism that is not always obvious.

This methodological result allowed Mandelbrot in [25] to argue for the inconsistency of the VaR model [27], and in [26] to criticize the accuracy of autoregressive heteroscedastic models [3, 15], used for the analysis and forecast of price dynamics in financial markets, since these models are based on the assumption of a normal distribution of the probability of occurrence of a particular value in the financial market.

3 Economic Agents are Randomicity' Generators in Socio-Economic Processes

Economic agent (EA) is any subject of socio-economic relations determined by the current processes of a specific SES development that implements specific socio-economic functions (in the process of a specific SES functioning) within the framework of its individual set of objectives (in relation to a particular SES) and existing restrictions, which by its actions (or inaction) can affect the processes of adoption and implementation of socio-economic decisions in a single SES.

The term "economic agent" includes not only a specific individual participating in the SEP, but also a set of subjects (from the state and intergovernmental organizations to a group of individuals) united by a single set of social and economic goals that do not contradict the individual sets of goals of each economic agent, included in this set.

Moreover, SES can act as economic agents.

In this definition, the word "current" is important, since the expectations and preferences of each economic agent can be dynamically changed. In addition, it is important that economic agents, interacting with each other, enter into socio-economic (intersubject) relations, which are quite diverse and, as a rule, are not unambiguous in nature.

At the interdisciplinary level, a significant number of researchers (see, for example, [7, 11, 13, 18, 34]) for decades have been pointing out the relationship between social and economic problems of humanity. This relationship led to the necessity to form a new field of knowledge - behavioral finances - in the 20th century. Thus, Nobel Prize winners in economics for their studies in behavioral finance became Gary S. Becker (1992), Robert Lucas (1995), Daniel Kahneman and Vernon Smith (2002), Elinor Ostrom and Oliver Williamson (2009), Richard H. Thaler (2017).

Therefore, an adequate investigation of SES is impossible without taking into account the behavioral aspect inherent in such systems.

Behavior of an economic agent in relation to SES is determined by its current expectations: individual understanding by a particular economic agent of alternative possibilities for the future evolution of the analyzed SES as a result of various endogenous and exogenous impacts on the system; including - on the part of the economic agent. Also, each economic agent has his current preferences: individual

views on the desired direction - from the perspective of a particular economic agent - the future evolution of a particular SES.

Analyzing the works of the Nobel Prize laureate in economics of 1988 Maurice F. C. Allais [1], the authors came to the conclusion that the overwhelming majority of seemingly random events taking place in SES is of anthropogenic nature: “random” event in SES seems as random only at first glance: as a rule, at a detailed retrospective study, the cause and effect relationships of impact on the appearance of this “random” of anthropogenic factors are revealed. Similar opinions about the anthropogenic nature of randomness in SEP are expressed in [5].

Therefore, according to the authors, the main source of randomness in SEP is the human factor. It can be affirmed that the SEP trajectory is, for the most part, the dynamic aggregate result of interactions of current heteromorphic and heterogeneous expectations and preferences of economic agents and their combined effect on the SES under consideration, with due regard to the reflexive nature of such processes.

The concept of reflexivity in SEP is described in details in [9, 36].

This hypothesis of anthropogenic nature of randomness in SEP was confirmed in [30]: “When studying the category of randomness within the framework of the philosophy of history and social philosophy, it will be fair to say that the subject can independently act as a specific type of randomness and such a situation will be a good demonstration that a social subject is sufficiently effective to influence both its internal development from the point of view of its perspectives, and on the totality of various processes, including economic, historical and social ones”.

Some arguments about the heteromorphism in the behavior of economic agents can be found in [14]. Heterogeneity in the behavior of economic agents, with due regard to the diversity of their preferences, is noted in [2, 32].

Thus, in support of the hypothesis expressed by the authors about anthropogenic nature of randomness’ generation in SES - in [19] we find the following understanding of the role of economic agents in random and deterministic SEP: “... here we have a kind of a higher type of determinism - determinism with an understanding of the ambiguity of the future and the possibility of reaching the desired future. This is determinism, which strengthens the role of a human being”.

Modern economy, including almost all processes in it, is the result of multidirectionality and differences in the strength of the impact of (hereinafter - heteromorphicity) expectations and preferences of economic agents having a diverse nature of origin (hereinafter - heterogeneity) on SEP.

It is heteromorphicity and heterogeneity of current expectations and current preferences of economic agents, which, according to the authors, is the generator of emergence of randomness in SEP and, as a consequence, indeterminacies in the evolution of SES. While the restrictions imposed on SEP (first of all - of resource, institutional, technical, technological and other nature) - do not allow randomness to take a definite advantage over determinism in such systems.

4 General Characteristics of Expectations and Preferences of Economic Agents in Socio-Economic Systems

One of the most important factors significantly affecting the evolution vector of SES (practically for system of any nature), and actively involved in the generation of randomness in SEP, are the expectations and preferences of economic agents that are formed taking into account the current set of objectives of each agent.

The set of socio-economic goals of an economic agent (in relation to the analyzed SES) is determined:

- by individual current expectations and preferences of the economic agent on alternative vectors of SES evolution
- by current opportunities of the economic agent's impact on SES (levers of influence on the processes taking place at SES, available to the economic agent);
- current system limitations.

Systemic limitations, affecting the current set of goals of the economic agent and its ability to influence the processes occurring in the SES (resource base of the economic agent) may be as follows:

- resource limitations in the broadest sense of the word (natural, labor, financial and other types of resources required to achieve a specific goal of the economic agent);
- institutional limitations (any economic agent - when reaching the set goal - should act within the existing "game rules", determined by actual institutions of a normative or formal nature, as well as by actual institutions of an informal nature formed in a modern society);
- technical and technological limitations related to the current financial and economic activities of SES and the economic agent;
- individual limitations (individual characteristics of an economic agent, determined by the specifics of his/her/its qualifications, life experience and skills, mentality, psychology, etc.).

In the course of their activities, economic agents may:

- in the process of making decisions on effective impacts on SES - collect, process, create and distort information, focusing on its own current interests;
- change the current set of his/her/its socio-economic goals, focusing on his/her/its own current interests and the current state of the external (in relation to a specific economic agent) environment and the current state of affairs in SES itself;
- change the effectiveness of its activities, adapting it in accordance with its current goals and information about its current state, current state of SES and the actual state of the external environment (in relation to a particular economic agent);
- be ready and able to perform actions in accordance with his/her/its current individual set of socio-economic goals (personal interests) within the existing limitations to achieve these goals.

Economic agents not only endogenously affect the changes in SES (here economic agents act as thinking elements of SES), but they are a source of exogenous disturbances in SES dynamics (in this case, as a rule, economic agents are not elements of SES).

It should also be taken into account that expectations and preferences of an concrete economic agent vary in time. This is facilitated by the following factors:

- changes occurring in the external environment (in relation to the economic agent): including changes of institutional, economic, political, or other nature that affect the current expectations and preferences of an concrete economic agent);
- reflexive processes in the society, affecting the current expectations and preferences of an concrete economic agent;
- changes occurring in the resource base of an concrete economic agent;
- other factors (primarily of socio-economic nature).

Depending on the degree of such impacts and opportunities and readiness, SES either assumes these impacts if they fit within its systemic set of goals and limitations, or seeks resources and mechanisms to counteract such impacts if these impacts contradict the system set of SES's goals and limitations.

It is the anthropogenic nature of expectations and preferences of economic agents, as well as the heterogeneity and heteromorphicity of their subsequent impacts on SES that make it more difficult (in the most general case) to adequately analyze SEP and to predict the behavior of SES. It should also be taken into account that the expectations and preferences of the economic agent, as well as the heterogeneity and heteromorphicity associated therewith, should be considered in dynamics (not only the strength of such impacts shall be changed in time, but also the list of current impacts).

5 The Concept of Identifying the Cause of Randomnicity Occurrence in Socio-Economic Processes

As already shown above - the nature of randomnicity in SES is anthropogenic in nature. At the same time, the current individual expectations and preferences of economic agents are - according to the author's concept - the main generator of randomnicity in SEP.

Within the framework of the current set of goals and current limitations, a particular economic agent forms his/her/its current individual expectations and preferences in relation to the existing state of affairs in a particular SES and on possible trajectories of systemic evolution that are most favorable for achieving the goals of such economic agent. Based on the formed current individual expectations and preferences, the economic agent - within the limits of existing limitations and his/her/its goal setting - affects the SES.

With due regard to the multiplicity of economic agents, in relation to the analyzed SES, these impacts are of heterogeneous (which is not always rational from the point of view of optimizing the costs of available resources or maximizing the expected profit) and heteromorphic (sometimes even mutually opposite) nature. At the same time, intersubject relations develop between economic agents, economic agents and SES

under investigation, which also change in time under the influence of various factors (primarily of anthropogenic nature).

Intersubject relations between economic agents and intersubject relations between a concrete economic agent and the SES under investigation are dynamic reflexive in nature as follows (by the type of impact on SES evolution):

- reflexive intersubject relations of a friendly type that affect the SES evolution in one vector direction and, as a rule, enhance the magnitude of joint impacts on SES;
- reflexive intersubject relations of antagonistic type that affect the SES evolution in opposite vector directions and, as a rule, reduce the magnitude of joint impacts on SES;
- reflexive intersubjective relations of a neutral type, slightly affecting the SES evolution.

At the same time, reflexive processes in intersubject relations between different economic agents and between economic agents and SES have a dynamic iterative nature, which is an additional source of randomicity's generation in such systems.

Such SES property makes the processes in them outwardly "random". In addition, most of the processes occurring in SES are accompanied by bifurcations. At such points of possible branching of the SES dynamics it is not always clear which group of expectations and preferences of economic agents will prevail and direct the process in the direction that is most expected and preferred for the majority of economic agents affecting SES.

In this case, determinism in SES is manifested as an integral of the set of cause and effect chains formed as a result of dynamic interactions of current heterogeneous and heteromorphic expectations and preferences of economic agents. It is the result of their combined effect on the SES under consideration, with due regard to the reflexive nature of such processes, that forms the trajectory of the SES evolution.

But, since the processes of formation by the specific economic agent of their current expectations and preferences are difficult to formalize, heterogeneity and heteromorphism of such preferences and expectations (with due regard to the multiplicity of economic agents and the reflexive nature of any SEP, as shown for financial markets in [21]) which are also difficult to formalize, makes the process of determining the future trajectory of the investigated SES evolution difficult (and, in general, almost impracticable).

6 Ontological Aspects of Formalizing Expectations and Preferences of Economic Agents in Socio-Economic Processes

In [20, 22] it was shown that the current volatility's indicator can be viewed as a measure of the current economic agents' expectations and preferences in analyzing and modeling of the price's dynamics in financial markets. But this toolkit (although it proved to be quite adequate in the financial markets), unfortunately, has one significant drawback: its value represents the net result of all expectations and preferences of

economic agents' impact on the price's dynamics for the analyzed period of time Δt . At the same time, the variety of expectations and preferences of economic agents' impacts on the price's dynamics for the analyzed period of time Δt remain invisible for the researcher. Therefore, the current volatility's indicator proposes rather rough assessment of all expectations and preferences of economic agents' impact on the price's dynamics or the analyzed period of time Δt .

As for (in the most general case) mathematical toolkit that can be adequately applied when analyzing and forecasting SEP with due regard to expectations and preferences of economic agents, then - taking into account the considerations of B. Mandelbrot, set forth in Sect. 2, as well as a number of publications aimed at studying this problem (see, for example, [21–23, 29, 37, 39]), it can be concluded that, most likely, they are differential-integral operator equations. Moreover, integral (additive) operators in this case are aimed at describing the deterministic processes revealed by preliminary analysis of SES. And differential (difference) operators are aimed at describing those processes in which - as a result of the preliminary analysis of SES - they failed to identify the cause and effect relationships in explicit form.

But, as stated in [26], this mathematical apparatus is quite complex and therefore, for sure, is not very effective in the most general case of modeling such complex processes.

Therefore, it is proposed to use agent-oriented systems [4], implemented in the programming environment Anilogic, to formalize the expectations and preferences of economic agents in socio-economic processes.

Such systems allow not only to formalize the expectations and preferences of a particular economic agent in socio-economic processes, but also to take into account all mechanisms of interactions between economic agents and economic agents and SES. In addition, the use of agent-oriented systems makes it possible to study the processes occurring in SES in dynamics, and also allows to rise to a new level of conceptualization and intellectualization of modern information and communication systems.

The achievements of the agent-oriented approach are various mathematical models of agents and agent-based system, concepts and methodologies for multi-agent design and programming, programming languages of agents and sufficiently developed tools and platforms for implementing multi-agent applications.

It should be noted a number of advantages of agent-oriented systems, which make this toolkit as methodologically justified for formalizing the expectations and preferences of economic agents in socio-economic processes:

- agent-oriented systems are open or have the ability to dynamically change the composition of elements which are included in agent-oriented system [16];
- agent-oriented systems have the ability to parallelize processes, which is very important when we are taking into account the dynamic interactions of current heterogeneity and heteromorphy of economic agents' expectations and the preferences [16];
- agent-oriented systems have the ability to take into account social aspects [17] and the specifics of behavioral finance [38], which is also important for dynamic interactions of current heterogeneity and heteromorphy of economic agents' expectations and the preferences;
- agent-oriented systems have the ability to take into account randomness in SES [10].

However, the agent-oriented approach has not yet become the leading paradigm for building corporate industrial applications and information systems, and requires the development of efficient and understandable as well as practically used programming agent-oriented systems' architectures and methodologies, and also requires the advancement of systems engineers and software developers.

Further researches will show the effectiveness of this toolkit.

7 Conclusions

Based on the anthropogenic nature of most of the impacts on SES, it becomes clear why modern economic theory has not yet developed a reasonable and constructive system of scientific postulates and, as a consequence, plausible hypotheses for describing of the SES evolution.

According to the proposed concept on identifying the causes of randomicity in SES, such a cause is the heterogeneity as well as heteromorphicity of the current individual expectations and preferences of economic agents, which, dynamically changing, are the main generator of randomicity in SEP, as well as an increase in system complexity. Randomicity in SEP - as it turned out in [26] - that makes these processes (in the most general case) quite complex for adequate mathematical modeling and forecasting.

Further studies of deterministic and random impacts on the SES evolution will be aimed at modeling a particular type of SEP taking into account the provisions and conclusions noted in the work.

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Prospects for the Development of International Trade in Liquefied Natural Gas

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Abstract. In modern geopolitical conditions, the processes of international hydrocarbon trade are becoming more complicated. World trends dictate the development of new solutions and adaptation to the external environment. The key factors contributing to the development of the global gas market are the shift in priorities towards environmentally friendly energy sources; greater opportunities for transport of liquefied natural gas, compared to pipeline gas transport, which has significant geopolitical risks; the ability to meet emerging gas demand during peak demand periods.

The article looks at the prospects for the development of the LNG industry in the Russian and world markets. Since the technologies for liquefying natural gas are technologically simple and cost-effective, they therefore open up broad prospects for the development of international gas trade.

The study examined the place and role of LNG production in the world and in Russia. The volumes of LNG export supplies from Russia and other manufacturers, the change in their production structure and the features of organized gas exchange trading platforms in Russia are given.

As a result, it was revealed that the prospect of developing large-scale production and transportation of LNG in Russia should be based primarily on domestic developments and is an integrated state task. Such an opportunity by 2018–2020. will complete the development of Russian technologies for the production of basic cryogenic equipment, as well as solve the tasks of implementing import substitution programs and improving the economic security of the country.

With regard to increasing the efficiency of exchange trading in gas, it is proposed to introduce new and improve existing gas indices.

Keywords: LNG · Liquefaction · Gas · Prospects · Export · Supply · Market

1 Introduction

Until recently, the global gas market was based on long-term supply contracts that contained harsh conditions, directly depended on the price of oil or oil products before the ban on reselling gas to other consumers. In real geopolitical conditions, the situation on the gas market is rapidly changing. The shale revolution and the development of LNG technologies have led to significant transformations in regional energy balances, which have become the drivers for the implementation of complex trading operations on a global scale [14, 15].

The formation of the world gas market is also conditioned by large-scale LNG transport, which became possible through the creation and implementation of energy-efficient and economically efficient LNG production technologies with subsequent regasification, the construction of cryogenic large-tonnage vessels of gas carriers. The advantage of liquefying natural gas is that this process, firstly, allows to reduce gas volume 600 times, secondly, LNG shipments by tankers and cryotechnics are cost-effective compared to the supply of pipeline gas transport and the third, under geopolitical conditions becomes more economically safe business process [1, 2].

Also, the importance of world gas trade became stronger after the entry of new suppliers to the gas market and the increase in the supply of LNG from the US, Australia, Russia and Mexico, and led to the fact that buyers began to make decisions on the market, and suppliers only have to take into account their preferences.

2 Results and Discussion

Prospects for Gas Production and Development of LNG Production. According to forecasts [6], by 2035 year the share of natural gas in the world energy balance will exceed 25%, where LNG will be 13–16% of the total gas consumption, if in 2016 year this share was already 10%.

Demand for energy resources continues to increase worldwide and accounts for 60% of growth since the early 1990 years. In the face of stricter environmental requirements, consumers are more likely to use natural gas in general, including LNG. Over the past 25 years, the growth in demand for LNG as an energy carrier has been 2.3% per year. The key factors characterizing the expansion of demand for natural gas (Table 1) are:

Table 1. Market factors and their possible impact on the LNG market.

Market factors	Possible impact
Growth of supply in the world natural gas market and price reduction	Gradual transition to spot and short-term contracts
Growth of LNG projects aimed at future sales under long-term contracts	Transition to new pricing mechanisms
Construction of new transnational pipelines and growth of supply in regional markets	Refusal to link contracts to the delivery basis
A growing supply of renewable energy sources as an alternative fuel	Increase in trade with portfolio investment
Decrease in demand for energy carriers on the background of slowdown in the rates of economic growth of developing countries	Refusal from low-profit investment projects
Formation of a long-term demand for LNG in connection with the transition to environmentally friendly fuels	
New sources of demand for LNG (for example, as ship or reserve fuel)	

- shifting priorities towards clean energy sources in both developed and developing countries (e.g. China);
- greater opportunities for supply of liquefied gas, allowing to expand the trading logistics network, in comparison with the pipeline transport of gas, which has significant geopolitical risks;
- the ability to meet emerging gas demand during peak demand periods.

By 2005 year, the tendency towards globalization of the natural gas market began to be viewed, which was due to the positive dynamics of aggregate gas demand, the growth of capital investments in production and development and expansion of trade flows of gas exporters.

Russia continues to hold strong positions in world gas exports, despite a decline in the share below 20% in 2014–2015 years. The share of LNG in world trade is in the range of 30–32% (Fig. 1) [10–12].

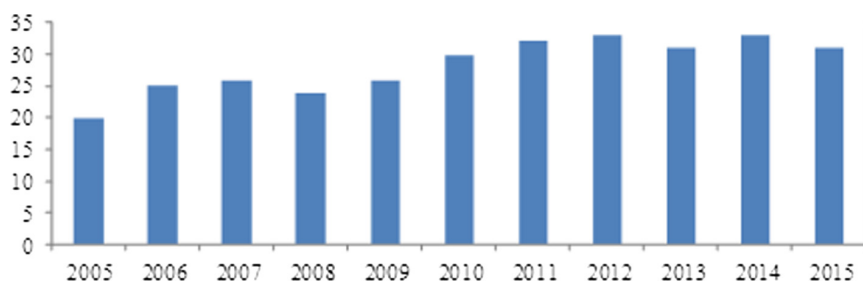


Fig. 1. LNG share in international gas trade, %. Source: IEA.

The development of shale gas production can significantly change the situation on the world market of hydrocarbons [10–12]. This is possible due to the use of American technologies of shale gas production in various regions of the world, allowing to increase the volumes and economic efficiency of extractive industries.

For example, the export of technologies from the United States in the field of shale gas production, and the expansion of the liquefied natural gas market will allow a number of countries to enter major exporters and increase the world supply of gas several times. Shale gas producing countries include Argentina, Algeria, Australia, Brazil, Canada, Mexico, South Africa, and others (Fig. 2). The US is a net importer of gas, but plans to increase its production capacity to increase exports. Currently, the production and export of LNG in Russia is being implemented at the plant. Sakhalin, the installed capacity of production is 9.6 million tons per year with the actual increase in volume in 2012–2016 year up to 10.8 million tons per year, equivalent to about 14.7 bcm in gas equivalent.

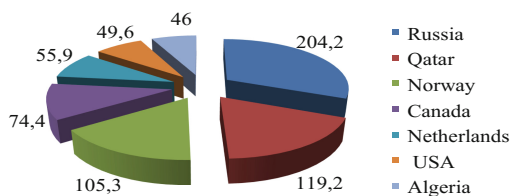


Fig. 2. LNG exports to the world gas market in 2015, bcm. Source: IEA.

The entire volume of liquefied natural gas is exported by sea to the APR countries, mainly to Japan, the Republic of Korea, Taiwan and China. Projects on the construction of new LNG plants are being implemented. So, in early December 2017 year the first technological line of the plant on Yamal Peninsula (Yamal-LNG project) with the capacity of 5.5 million tons per year was launched. The total production capacity of the plant is 16.5 million tons per year. It is also planned to commission the PJSC “Gazprom” plant in the Leningrad region “Baltic LNG”.

For 2000–2016 years the geographical structure of gas exports from Russia has not undergone significant changes - the main buyers are the countries of Europe (Fig. 3) [10–12].

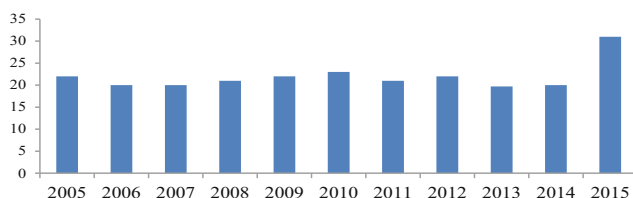


Fig. 3. Russia's share in international gas trade, %. Source: IEA.

In 2009 year, together with the launch of the LNG plant on Sakhalin for Russian gas, a new market for the ATR opened. The main LNG supplies are to Japan and the Republic of Korea.

In 2016 year [11], the eastern direction accounted for 7% (15 bcm) of gas exports from Russia. Over half of the Russian gas exports were directed to four countries: Germany (23%), Turkey (12%), Italy (9%) and Belarus (9%). In 2016 year Germany (+6.2 bcm by 2015 year), Great Britain (+6.5 billion m³) and France (+1.8 bcm) provided the largest absolute increase in deliveries. Significantly reduced the purchase of Russian gas Italy (−4.2 bcm by 2015 year) and Turkey (−2.2 bcm). Ukraine in 2016 stopped direct gas imports from Russia after its sharp reduction in 2015 year.

According to forecasts [11], the APR and Europe remain the main market for the sale of Qatari LNG. The change in the structure of LNG supplies occurred in Qatar, which diversifies them at the expense of Pakistan, Argentina and the countries of North Africa (Fig. 4).

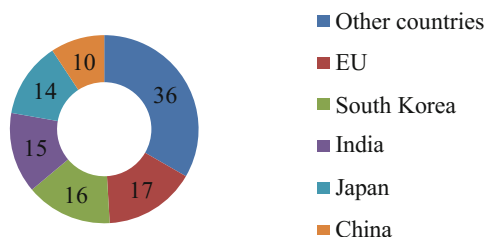


Fig. 4. Volumes of supply of Qatari LNG in 2017, bcm. Compiled by the author according to [8].

In the structure of LNG export from Qatar for 2017 year, the share of countries not belonging to the APR and Europe increased to 22% (+15 pp compared to 2014), while the share of supplies to the premium market of the ATR decreased to 63% (–7 pp).

The main consumers of natural gas are Pakistan, Argentina and the states of North Africa, where the demand for blue fuel is steadily growing. In the medium and long term, Qatar is actively developing new LNG sales territories and is in line with the strategy of increasing export volumes.

The increase in gas consumption in Pakistan is due to the development of domestic hydrocarbon production. So, at the end of 2017 year, the Pakistani state company OGDCL opened the 2nd deposit at the Baratai oil and gas block in the state of Khyber Pakhtunkhwa, which will cover these needs by 30% in oil and about 70% in gas. The rest is planned to be provided through imports, namely LNG supplies [12].

According to [12], LNG import to Pakistan increased more than 3 times in 2015–2017 years against a background of falling production and growth in consumption. Completion of the construction of the regasification terminal by 6.8 billion cubic meters. m/year in 2015 year allowed to increase LNG import to Pakistan, whose deliveries for January–October 2017 year amounted to 5.2 bcm (+45% against the same period in 2016 year). The growth of imports is associated with the need to cover the gas deficit (production has fallen since 2012 year) in the electricity and agricultural sectors. By 2018 year, Pakistan plans to increase the regasification capacity to 12 bcm/year, and by 2020 year to build a gas pipeline from Karachi to Lahore (the project is being implemented by the Rostek Group of Companies).

Considering the world trends affecting the development of energy markets at the present stage, i.e. The reduction in prices for hydrocarbons, the reduction of own funds as profit as a resource base for investment of gas companies, the prospects for the development of the gas industry, both for the immediate period and long-term, become topical.

Estimates of the IEA and AEI forecasts of the development of the gas industry in Russia correlate with the baseline scenarios and suggest an increase in gas production by 20–23% by 20–23% compared to 2016 year. The increase in consumption by 2040 year in the IEA forecast is expected to be 3%, and according to the forecast The AEI of the United States will remain at the level of 2016 year. The probable increase in production is directly related to the increase in exports and the commissioning of major

infrastructure projects: the Siberia-Siberia gas pipeline to China, the second and third phases of the Yamal LNG, the Baltic LNG and the Arctic LNG - 2. [4, 5].

According to analysts' forecasts [8, 9], the development of interregional gas trade will be influenced by North American liquefied natural gas (LNG), which is in the long run the most demanded. This will depend on the development of the world's LNG industry, i.e. from the rates of shale gas production, the period of construction of export LNG terminals and in the future may strengthen the price regionalization of the hydrocarbon market, in particular natural gas.

So, according to Michael Denison, due to the increase in LNG supplies, the natural gas market is becoming global, the inter-regional pipeline network is growing, the pricing system that combines spot and long-term supply contracts is changing. This is facilitated by the following factors [14, 15]:

- planning by the state and large industrial producers of the use of gas fuel as environmentally friendly with the transition to renewable energy sources;
- prospects for gas production in a non-traditional way in North America, taking into account the improvement of gas supply and production drilling technologies;
- development of diversification of the world distribution of reserves of shale, dense gas and methane of coal seams;
- political changes in the consumption of hydrocarbons in Germany and Japan, with the transition from nuclear fuel to gas;
- possible use of the gas conversion mechanism in freight transport.

According to expert estimates [5], the forecast prices for natural gas in the world's major consumer regions have a positive trend (Table 2). The increase in global LNG consumption is due to the fact that at the beginning of 2018 year there are 120 sea and river vessels (0.001% of the world fleet) consuming LNG as the main fuel. Also there are ferries, merchant ships and tankers using fuel oil as fuel, and 111 ships are under construction [6].

Table 2. Forecast prices of natural gas in regional markets (doll/1000 m³).

Countries	2018	2019	2020	2021	2023	2025	2030
Europe	204	208	215	222	233	247	286
USA	111	115	122	125	136	147	179
Japan	297	304	308	311	322	333	358

Compiled by the author according to the [4].

According to the forecast of DNV LG analysts, by 2020 year the number of ships operating on LNG will increase to 1,000 units. Also, the Oxford Institute for Energy Studies predicts that in 2030 year more than 50 bcm of gas will be used as fuel for bunkering ships compared to 2017 year when less than 1 bcm were consumed [6].

In the world market of the LNG industry, in particular bunkering of LNG tankers with the necessary infrastructure, there are three major ports: Rotterdam, Vancouver and Singapore (opened in September 2017 year). The level of development of the LNG

industry in this area is at an early stage. It is planned that during the competition between ports in Europe, Asia and North America, the implementation of infrastructure projects will contribute to a steady increase in demand and supply for LNG bunker services [16].

The prospect of the development of large-scale production and transportation of LNG in Russia is based primarily on domestic developments and is a complex task. Such an opportunity by 2018–2020 years will be the completion of the development of Russian technologies for the production of basic heat exchange equipment and equipment for storage and transportation of LNG including cryogenic heat exchanging equipment of tubular type, transport cryogenic tanks, cryogenic pumping equipment, flexible cryogenic pipelines for LNG transportation, cryogenic pipelines with screen-vacuum and vacuum insulation for transportation LNG. By 2020 year, it is planned to conduct industrial tests of the LNG plant based on domestic technology with mixed refrigerant. Technologies for the production of ice-class gas carriers, new ship propulsion systems, floating plants can be completed and introduced into production no earlier than 2035 year [6].

Experience of International Gas Trade in Russia. The next direction of development of the world gas market is the creation of a modern exchange trade in Russia. The domestic state policy in the field of development of economically justified competition in the natural gas supply market is realized through the introduction of foreign experience and the experience of related industries. One of the foremost areas today is the development of exchange trade in natural gas in the domestic market. Since 2008 year, Russia's exchange trade in gas is carried out at the St. Petersburg International Commodity Exchange (SPMMEX) [8, 9].

In 2018 year, 75 companies took part in the SPMEEX [7], including 31 permanent participants, the remaining 44 - with a limited period, 21 companies are part of the existing marketing network of PJSC Gazprom and, in particular, LLC «Gazprom Mezhregiongaz». These companies are represented mainly by the European part of Russia. Trades are carried out on the resources of four compressor stations (KS)/balance points: KS Nadym, KS Vyngapurovskaya, KS Yuzhno-Balykская, KS Pabel. The results of exchange trades in gas are presented in Table 3.

Table 3. Natural gas production and pipeline exports in Russia.

Gas production		Gas export		Gas index SPbMTSB		Volume of exchange trade	
Jan.–Dec. 2017 bcm	% of Jan.–Dec. 2016	Jan.–Nov. 2017 bcm	% to Jan.–Nov. 2016	Dec. 2017, rub./thous. m ³	% of Nov. 2017	Jan.–Dec. 2017 bcm	% of Jan.–Dec. 2016
690,9	+8,1	179,8	+1,0	3179	–1,2	20,4	21,5

In December 2017 year, gas production in Russia decreased by 3.8% by December 2016 year. This could be caused by favorable weather conditions in December in most of the country. In general, in 2017 year, gas production increased by 8.1% by 2016 year and reached 690.9 bcm, which is a record indicator for the post-Soviet period. The total

trading volume at SPIMEX (at all balance points) for 2017 year was 20.4 bcm (+21.5% by 2016 year). The largest deviation between the price at the exchange (at the Nadym compressor station) and the regulated wholesale price (Table 4) for gas was observed in the Sverdlovsk region (−7.3% to the regulated price) Fig. 5 [7].

Table 4. Average price of gas sales.

Period	Russia			Far abroad			Countries of the FSU		
	rub/1 thous m ³	doll/1 thous m ³	euro/1 thous m ³	rub/1 thous m ³	doll/1 thous m ³	euro/1 thous m ³	rub/1 thous m ³	doll/1 thous m ³	euro/1 thous m ³
2012	2868	92	72	11 969	385	299	9 489	305	238
2013	3 265	102	77	12 138	381	286	8 499	267	201
2014	3 507	91	69	13 487	349	265	10116	262	198
2015	3 641	59	54	15 057	246	222	11911	194	175
2016	3816	57	52	11 763	176	159	10263	154	139

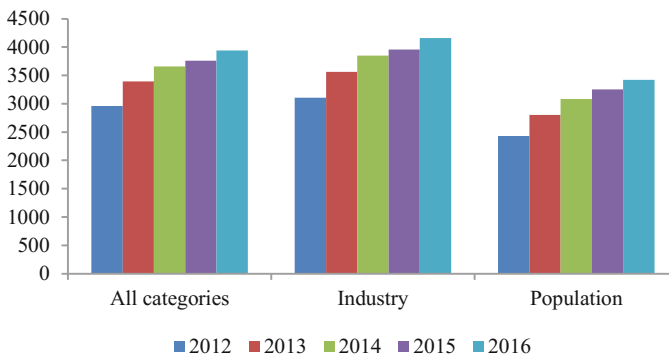


Fig. 5. Weighted average wholesale regulated gas prices in Russia, rub/1000 m³.

With the launch in October 2014 year of the gas index at the St. Petersburg International Commodity Exchange, liberalization of Russia's domestic gas market became possible. For five months of 2016 year, the volume of exchange trading in gas increased fivefold as compared to the same period in 2015 year. The gas field in Russia is at an early stage of development compared with the level of development of the gas exchange indices Henry Hub in the US and NBP in the UK. The opening of the Russian gas index was preceded by Resolution No. 323 of the Government of the Russian Federation of 16.04.2012, providing for the regulation of gas prices on the domestic market, access to the gas transportation and gas distribution system of Gazprom (GTS), and the sale of natural gas on the commodity exchange [7]. The creation of exchange gas trading in Russia was to solve two long-term tasks of the domestic market:

- replacement at exchange prices regulated in long-term contracts by achieving equal yields of supplies and the abolition of cross-subsidization;
- the formation of a transport tariff based on the creation of a transparent system, established by the FAS Russia in a cost-effective manner by analyzing the reporting of PJSC Gazprom.

The implementation of these tasks will make it possible to stagnate in the gas industry, its dynamic development in the long term and enhance the competitiveness of Russian gas both on the domestic and foreign markets.

According to SPbMTSB, as of May 2016 year, the difference in the price level for the gas sold was 9.8%, which contributes to the growth of demand for exchange contracts and may lead to the need for long-term gas contracts and stock indices by refusing regulated prices [9].

All gas indices within the framework of vertically integrated companies (VIC) and independent gas producers (NPG) undergo the same stages of development, outstripping in the sphere of gas transportation and sales or a competitive market (Table 5) [3].

Table 5. Establishment of the internal gas market.

Gas sectors	Stages of formation		
	VIC domination	VIC control over the GTS and dominance in marketing	Competitive market
Gas production	VIC	VIC and NPG	NPG, VIC
Transportation of gas	VIC	VIC	Independent transport company
Timing	VIC	VIC	Independent gas distribution company
Gas sales	VIC	VIC and NPG (insignificant volumes)	Trading through stock exchange

Expansion of exchange gas trade in Russia and the positive dynamics of its development is hampered by continued control over the gas transportation system and sales, which is located at the vertically integrated companies (VIC). An example of and an important factor in the development and growth of the volume of exchange trade in petroleum products in Russia is the creation of an independent transport company - Public Joint Stock Company PJSC Transneft.

The most advanced gas indices are the Henry Hub index in the US and the NBP index in the UK, which passed the main stages of the competitive market development.

For example, in the international gas trade in December 2017 year, there was a tendency for the decrease in spot gas indices in the US and Europe, against the backdrop of an increase in natural gas prices in Asia [4]. In Japan, the decline in the spot LNG index reached 362 doll per thousand. m^3 (+3.6% by November 2017), while the index-indexed JCC on the contrary increased to 297 doll/thous. m^3 (+4%). The growth trend of spot prices in Asia is associated with an increase in demand for natural gas in China, and the growth of JCC with a gradual increase in oil prices. The decline

of the American Henry Hub index to 96 doll/thous is noted. m^3 (–7.5%) and this is due to an increase in the extraction of shale gas. The European TTF declined slightly (–1.4%) to 258 doll/thous m^3 .

3 Conclusion

Currently, the LNG industry is one of the most important and relevant areas for the development of international trade in natural gas.

The ongoing changes in the LNG market have a significant impact on the business processes of all participants in international trade from producers to end users. In the world market, the growth in supply of LNG changes the ratio of demand in favor of buyers. These structural changes in the demand and supply of the LNG product on the world market will contribute to the development of international trade through the emergence of new trading floors and hubs. Also, market participants will have to make serious investment decisions in the face of greater uncertainty about pricing [13].

The main criterion for the sustainable development of the world market for key LNG producers is the increase in the efficiency of existing production capacities. It requires the development of new marketing strategies that allow for effective sales after the expiration of long-term contracts. In complex geopolitical conditions, the implementation of new investment projects of the LNG industry should be characterized by a high degree of resistance to price changes and minimum payback periods [8, 9].

In the course of the analysis of foreign indices, the problems of the development of the Russian gas index at the SPBMSEX exchange were revealed: a limited number of participants leads to a decrease in exchange trades and the future development of the exchange; the imperfection of the formation of tariffs for the use of the gas transportation system creates an incorrect formation of prices for associated petroleum gas, reducing trading volumes; lag in the development of a competitive market due to the lack of an independent transport company and the involvement of new potential consumers and producers; Reduction of exchange supplies in the physical market due to the lack of a virtual gas market for futures supply and hedging of risks [3, 4].


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Integration Assessment of the Condition of Agrarian and Industrial Complex of the Republic of Crimea in the Context of Sustainable Development of the Region

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Abstract. In this article the author presents her approach to assessment of regional development of the Republic of the Crimea, carries out the analysis of scientific research in the sphere of regional economy, agrarian regions and rural areas, and provides contemporary domestic and foreign approaches to methods of studying economic and social situation of regions. To identify problems and creation of strategic directions of sustainable development of the Republic of the Crimea as an agriculture-focused region, the article introduces the results of analytical review on functioning of the agrarian sector of the peninsula's economy and provides integration assessment of the cumulative indicator of food market condition in the Crimea using the coordinates matrix method. On the basis of the conducted research it has been established that in 2005–2011 the clear tendency of growth of the cumulative indicator of social and economic condition of agrarian and industrial complex of the Republic of the Crimea was traced; in 2012–2014 it demonstrated its steady decrease; in 2016 it reached the level of 2007 and made 15,09. The results of the conducted analysis allow to reveal the main problems of sustainable development of the agrarian sector of regional economy (the termination of water supply for needs of hydromelioration, reduction of irrigated lands, limitation of material resources of farms, decline in volumes of agricultural production, etc.) and to outline the strategic directions of stabilization and increase in efficiency of its functioning (allocation and regional support for priority branches of agrarian production, development of rural areas and their infrastructure, improvement of social and demographic situation, etc.).

Keywords: Region · The Republic of Crimea ·
Agrarian and industrial complex · Integration assessment ·
Food market · Problems · Sustainable development

1 Introduction

The Republic of Crimea is one of the few regions having complicated and contradictory characteristics of its social and economic, geopolitical, spatial and territorial position. It can be equally related both to donor regions and recipient regions, as well as

boundary, crisis, conflict and pioneer areas [1–3]. Even in structure of the gross regional product which is one of key indicators of branch economy of the region, its role as recreational destination and resort area isn't traced, although the created image of the peninsula with its unique climatic resources demonstrates the opposite. At the same time the agrarian sector of the Republic of Crimea being in stagnation for many years occupies over 20,0% [4] in structure of a regional gross product that allows to characterize the peninsula as the agriculture oriented region. In this regard the strategic direction of sustainable development of the Republic of Crimea is the course towards agrarian transformations, stabilization and development of a raw materials source of the food industry as the basis of food security of the region.

2 Short Literature Review

The problems of the subject considered in this article are concentrated on the joint of three questions, which are important for the Republic of the Crimea. They are: scientific justification of priorities for the development of regional economy, methodical tools for their complex and system assessment and practical value to introduce into activities of governing structures and economic entities of the analyzed region.

The regional economy as the object of research is in the center of attention of many domestic and foreign researchers. In this case, the attention must be paid to conclusions of the Round table discussions “Regional economy in the system of the sustainable development” devoted to the 80th anniversary since the birth of O.S. Pchelintsev, where there has been considered not only the scientist's heritage on problems of development of regional economy, but analyzed the wide range of issues of macroeconomic and territorial conditions of sustainable development of Russia, social and economic development of cities and rural areas, etc. [5]. In the context of methodical and methodological ensuring of regional development of certain areas and territories the research by A. Baranov, E. Malkov, L. Polishchuk, M. Rochlitz, G. Syunyaev [6], A.K. Cherkashina, A.V. Myadzelets [7], T.A. Bondarskoy, O.V. Bondarskoy [8], O.M. Gusarova, V.D. Kuzmenkova [9], V.S. Misakov, A.H. Sabanchiyev, A.V. Misakov, A.A. Dyshekova [10] are of scientific interest. These studies display authors' approaches to the index analysis, statistical groupings, strategic planning, economic-and-mathematical modeling and other methods of studying the regional economy as complicated structured system.

It is possible to distinguish among foreign researches of the recent years works by T. Okabe, T. Kam (concerning the role of capital, labor and political factors in the growth of regional economy) [11], V. of Liu, M. of Xu, J. Wang, S. Xie (regarding application of the coefficient and index analysis in studying sea economy of coastal areas of China) [12], M. Feldman, N. Lowe (as regards to studying of regional economy in the context of entrepreneurial activity of its subjects on the example of the State of North Carolina, the USA) [13], I. Holúbek, M. Vrábelová, M. Maroš (concerning use of quantitative methods in the regional analysis of GDP in the Slovak regions) [14].

In view of the importance of agricultural production for life support of the nation and food security of the state, in many countries of the world rural and agrarian regions

whose features of functioning are researched by A.S. Narynbayeva [15], Yu.P. Mamontova, T.M. Akimova [16], M.S. Oborin [17], P. Plummer, M. Tonts, N. Argent [18], M. Lacoste, R. Lawes, O. Ducourtieux, K. Flower [19], E. Kiryluk-Dryjska, P. Beba [20] have been allocated. Within the conducted research the scientific works revealing features of development of agrarian and industrial complex of the Republic of the Crimea present the particular importance, especially, the monographs by the Crimean scientists “Economy of agrarian and industrial complex of the Crimea: state and prospects of development” [21] and “Regional economy of the Crimea: growth points” [22], as well as articles of L.A. Kravchenko, M.V. Goryachikh [23], T.N. Bugaeva [24] and some other authors.

Thus, a large number of researches on social and economic development of the certain regions including those specializing in production of agrarian produce allows to claim for the high relevance and scientific importance of the subject considered in this article. At the same time, the dynamism and variability of external and internal environment demands continuous updating of methodical and practical approaches to complex assessment of regional development for the purpose of adjustment and adaptation of regional economy to national and international processes.

The purpose of the conducted research was identification of problems and formation of the strategic directions of sustainable development of the Republic of Crimea as the agriculture oriented region.

To achieve the objectives of the present research the following **tasks** have been set:

- to carry out integration assessment of the current state of agrarian and industrial complex of the Republic of Crimea;
- to reveal problems of functioning of agrarian branch of regional economy;
- to define vectors of sustainable development of the Republic of Crimea as the agriculture oriented region.

3 Methods

In modern conditions the great value is given to complex assessment of social and economic development of the region, its budget forming branches and enterprises which represents its characteristic received by the simultaneous and coordinated studying of set of the indicators reflecting all aspects of economic processes, and containing the generalizing conclusions about results of activity of production equities on the basis of identification of qualitative and quantitative differences on the basis of comparison. The coordinates matrixes method has been applied to conduct a complex assessment of development of the agrarian sector of economy of the Republic of Crimea. The algorithm of implementation of this method is presented below:

1. The choice of set of the indicators characterizing results of functioning of the researched object (Table 1).
2. The choice of the maximum indicator for each line.

Table 1. Indicators for calculation of a cumulative indicator of development of the agrarian sector of economy of the Republic of Crimea.

Types of production	Unit of measure	2005	2006	2007	2008	2009
Grain crops	thousands tons	1159,9	1220,8	1228,2	1734,1	1662,5
– wheat	thous.tons	982,6	758,4	761,9	1006,1	894,8
– rye	thous.tons	2,7	2,1	1,1	2,2	0,5
– barley	thous.tons	238,1	349,7	364,1	593,6	611,1
– oats	thous.tons	9,2	13,5	7,1	14,9	12,3
– corn for grains	thous.tons	30,1	30,3	21,2	37,6	35,8
– millet	thous.tons	0,4	1	0,3	1,7	1,9
– rice	thous.tons	60,6	59,8	67,9	61,2	94,9
– leguminous	thous.tons	3,6	4,4	3,5	10,6	10,5
Sunflower	thous.tons	26,4	36,7	16,5	28,6	18,2
Potatoes	thous.tons	158,8	180,1	186,9	349,8	401,4
Vegetables	thous.tons	127,9	160,3	210	286,1	398,4
Fruit and berry	thous.tons	58,6	37,3	55,0	105,7	77,1
Grape	thous.tons	116,3	58,7	118,6	116,9	125,3
Essential oils	thous.tons	10,9	9,1	11,2	13,6	10,2
Meat (in slaughter weight)	thous.tons	114,8	120,4	135,9	137,8	139,0
Milk	thous.tons	346,8	336,5	359,6	363,4	367,2
Egg	mln.pieces	581,9	608,7	652	699	762,5
Flour	thous.tons	131,7	110,2	153,3	169,5	160,6
Pork	thous.tons	1,6	2,3	4,6	5,2	4,0
Beef	thous.tons	3,3	5,3	6,8	5,6	3,3
Poultry	thous.tons	56,5	46,5	51,7	52,8	53,3
Sausages produce	thous.tons	3,7	4,7	7,7	14,4	16,7
The processed liquid milk	thous.tons	8,4	8,4	11,0	12,2	10,6
Butter	thous.tons	2,0	1,6	2,1	1,6	1,1
Cheese, sour-milk cheese	thous.tons	1,9	1,6	1,8		1,7
Fermented milk products	thous.tons	11,4	11,4	13,6	12,7	10,5
Bakery	thous.tons	80,9	64,8	71,4	69,6	65,2
Pasta	thous.tons	11,8	11,5	12,0	13,0	11,5
Cereals	thous.tons	7,5	10,1	29,1	31,2	26,1
Grape wine	thous.decal.	3866,8	3896	6333,3	6760,6	7846
Cognac	thous.decal.	644	759	1063,9	1331,1	1038,9
2010	2011	2012	2013	2014	2015	2016
1403,8	1930,8	908,3	764,8	1102,1	1263,1	1286,5
772,3	1172,6	452,5	351,1	630,2	738,0	761,1
0,3	0,9	1,3	0,5	1,7	3,1	3,0
470	569,7	255,7	209	418,1	462,1	445,8
8,9	8,6	11,1	5,7	7,2	8,4	11,1
40,4	48,5	50,9	87,6	7,3	4,9	5,1

(continued)

Table 1. (continued)

Types of production	Unit of measure	2005	2006	2007	2008	2009
1,5	3,1	4,3	2,9	3,8	6,9	4,9
96,5	103,3	99,6	81	0	0	0
11,3	19,2	26,5	19,9	21,0	32,0	49,5
36,2	56,4	73,7	109,3	101,2	107,4	152,0
366,5	467,1	343,8	402,5	387,8	272,6	258,1
398,7	432,5	391,3	472,9	413,9	354,3	365,6
115,6	99,7	123,1	113,8	113,4	121,6	143,9
111,9	125,4	94	95,2	70,2	58,3	56,3
16,4	21,7	12,2	9,8	15,7	15,9	16,2
145,0	147,8	146,5	128,3	126,4	115,5	111,3
352,9	335,2	310,2	292,4	286,7	243,3	243,8
810,7	792,9	746,3	507,0	550,5	487,6	485,1
144,8	164,3	158,6	137,0	113,6	98,3	106,2
4,1	4,5	6,8	6,4	7,1	7,9	8,7
2,7	1,7	1,6	1,3	1,7	8,0	1,4
55,3	60,9	63,7	49,4	44,7	33,9	29,4
20,4	20,5	18,3	14,6	11,0	9,5	9,7
10,6	8,0	7,7	7,2	9,2	12,1	12,0
1,1	1,1	1,2	1,4	1,4	2,0	1,5
1,6	1,4	1,6	1,8	1,7	1,8	1,6
7,8	6,0	5,5	5,1	6,3	8,5	6,6
61,4	61,1	59,9	56,6	50,9	56,1	61,2
10,9	9,8	7,3	7,4	4,9	2,0	3,3
37,4	36,4	45,7	22,9	17,3	2,3	3,1
7377,1	5113,3	4322	4308	3443,3	5522	5909
835,7	1074,4	1250,4	1586,9	990,4	367	522

Source: made by the author on the basis of Territorial office of Federal State Statistics Service's data in the Republic of Crimea [25, 26].

3. Creation of the first matrix: all indicators in each line are divided by the above chosen maximum indicator.
4. Creation of the second matrix: results of calculations of the first matrix are squared (Table 2).
5. The sum of the received results is an integrated consolidated indicator of perspective efficiency of agrarian and industrial complex of the Republic of Crimea.

Table 2. Coordinate matrixes.

The first matrix											
2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
0,601	0,632	0,636	0,898	0,861	0,727	1,000	0,470	0,396	0,571	0,654	0,666
0,838	0,647	0,650	0,858	0,763	0,659	1,000	0,386	0,299	0,537	0,629	0,649
0,871	0,677	0,355	0,710	0,161	0,097	0,290	0,419	0,161	0,548	1,000	0,968
0,390	0,572	0,596	0,971	1,000	0,769	0,932	0,418	0,342	0,684	0,756	0,730
0,681	1,000	0,526	1,104	0,911	0,659	0,637	0,822	0,422	0,533	0,622	0,822
0,344	0,346	0,242	0,429	0,409	0,461	0,554	0,581	1,000	0,083	0,056	0,058
0,058	0,145	0,043	0,246	0,275	0,217	0,449	0,623	0,420	0,551	1,000	0,710
0,587	0,579	0,657	0,592	0,919	0,934	1,000	0,964	0,784	0,000	0,000	0,000
0,073	0,089	0,071	0,214	0,212	0,228	0,388	0,535	0,402	0,424	0,646	1,000
0,174	0,241	0,109	0,188	0,120	0,238	0,371	0,485	0,719	0,666	0,707	1,000
0,340	0,386	0,400	0,749	0,859	0,785	1,000	0,736	0,862	0,830	0,584	0,553
0,270	0,339	0,444	0,605	0,842	0,843	0,915	0,827	1,000	0,875	0,749	0,773
0,407	0,259	0,382	0,735	0,536	0,803	0,693	0,855	0,791	0,788	0,845	1,000
0,927	0,468	0,946	0,932	0,999	0,892	1,000	0,750	0,759	0,560	0,465	0,449
0,502	0,419	0,516	0,627	0,470	0,756	1,000	0,562	0,452	0,724	0,733	0,747
0,777	0,815	0,919	0,932	0,940	0,981	1,000	0,991	0,868	0,855	0,781	0,753
0,944	0,916	0,979	0,990	1,000	0,961	0,913	0,845	0,796	0,781	0,663	0,664
0,718	0,751	0,804	0,862	0,941	1,000	0,978	0,921	0,625	0,679	0,601	0,598
0,777	0,650	0,904	1,000	0,947	0,854	0,969	0,936	0,808	0,670	0,580	0,627
0,184	0,264	0,529	0,598	0,460	0,471	0,517	0,782	0,736	0,816	0,908	1,000
0,413	0,663	0,850	0,700	0,413	0,338	0,213	0,200	0,163	0,213	1,000	0,175
0,887	0,730	0,812	0,829	0,837	0,868	0,956	1,000	0,776	0,702	0,532	0,462
0,180	0,229	0,376	0,702	0,815	0,995	1,000	0,893	0,712	0,537	0,463	0,473
0,689	0,689	0,902	1,000	0,869	0,869	0,656	0,631	0,590	0,754	0,992	0,984
0,952	0,762	1,000	0,762	0,524	0,524	0,524	0,571	0,667	0,667	0,952	0,714
0,905	0,762	0,857	1,000	0,810	0,762	0,667	0,762	0,857	0,810	0,857	0,762
0,838	0,838	1,000	0,934	0,772	0,574	0,441	0,404	0,375	0,463	0,625	0,485
1,000	0,801	0,883	0,860	0,806	0,759	0,755	0,740	0,700	0,629	0,693	0,756
0,908	0,885	0,923	1,000	0,885	0,838	0,754	0,562	0,569	0,377	0,154	0,254
0,164	0,221	0,637	0,683	0,571	0,818	0,796	1,000	0,501	0,379	0,050	0,068
0,524	0,528	0,859	0,916	1,064	1,000	0,693	0,586	0,584	0,467	0,749	0,801
0,406	0,478	0,670	0,839	0,655	0,527	0,677	0,788	1,000	0,624	0,231	0,329
The second matrix											
2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
0,361	0,399	0,404	0,806	0,741	0,529	1,000	0,221	0,157	0,326	0,428	0,444
0,702	0,419	0,423	0,736	0,582	0,434	1,000	0,149	0,089	0,288	0,396	0,421
0,759	0,458	0,126	0,504	0,026	0,009	0,084	0,176	0,026	0,300	1,000	0,937
0,152	0,327	0,355	0,943	1,000	0,591	0,869	0,175	0,117	0,468	0,572	0,533
0,464	1,000	0,277	1,219	0,830	0,434	0,406	0,676	0,178	0,284	0,387	0,676

(continued)

Table 2. (continued)

The second matrix											
2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
0,118	0,120	0,059	0,184	0,167	0,213	0,307	0,338	1,000	0,007	0,003	0,003
0,003	0,021	0,002	0,061	0,076	0,047	0,202	0,388	0,176	0,304	1,000	0,504
0,345	0,335	0,432	0,350	0,845	0,872	1,000	0,929	0,615	0,000	0,000	0,000
0,005	0,008	0,005	0,046	0,045	0,052	0,151	0,286	0,162	0,180	0,417	1,000
0,030	0,058	0,012	0,035	0,014	0,057	0,138	0,235	0,517	0,444	0,500	1,000
0,116	0,149	0,160	0,561	0,738	0,616	1,000	0,542	0,743	0,689	0,341	0,306
0,073	0,115	0,197	0,366	0,709	0,711	0,837	0,684	1,000	0,766	0,561	0,598
0,166	0,067	0,146	0,540	0,287	0,645	0,480	0,731	0,626	0,621	0,714	1,000
0,859	0,219	0,895	0,869	0,998	0,796	1,000	0,563	0,576	0,314	0,216	0,202
0,252	0,176	0,266	0,393	0,221	0,572	1,000	0,316	0,204	0,524	0,537	0,558
0,604	0,664	0,845	0,869	0,884	0,962	1,000	0,982	0,753	0,731	0,610	0,567
0,891	0,839	0,958	0,980	1,000	0,924	0,834	0,714	0,634	0,610	0,440	0,441
0,516	0,564	0,646	0,743	0,885	1,000	0,956	0,848	0,391	0,461	0,361	0,358
0,604	0,423	0,817	1,000	0,897	0,729	0,939	0,876	0,653	0,449	0,336	0,393
0,034	0,070	0,280	0,358	0,212	0,222	0,267	0,612	0,542	0,666	0,824	1,000
0,171	0,440	0,723	0,490	0,171	0,114	0,045	0,040	0,027	0,045	1,000	0,031
0,787	0,533	0,659	0,687	0,701	0,753	0,914	1,000	0,602	0,493	0,283	0,213
0,032	0,052	0,141	0,493	0,664	0,990	1,000	0,797	0,507	0,288	0,214	0,224
0,475	0,475	0,814	1,000	0,755	0,755	0,430	0,398	0,348	0,569	0,984	0,968
0,906	0,581	1,000	0,581	0,275	0,275	0,275	0,326	0,445	0,445	0,906	0,510
0,819	0,581	0,734	1,000	0,656	0,581	0,445	0,581	0,734	0,656	0,734	0,581
0,702	0,702	1,000	0,872	0,596	0,329	0,194	0,163	0,141	0,214	0,391	0,235
1,000	0,642	0,780	0,740	0,650	0,576	0,570	0,548	0,490	0,396	0,480	0,572
0,824	0,783	0,852	1,000	0,783	0,702	0,569	0,316	0,324	0,142	0,024	0,065
0,027	0,049	0,406	0,466	0,326	0,669	0,634	1,000	0,251	0,144	0,003	0,005
0,275	0,279	0,738	0,839	1,132	1,000	0,480	0,343	0,341	0,218	0,561	0,642
0,165	0,228	0,449	0,704	0,429	0,278	0,458	0,621	1,000	0,389	0,053	0,108
The cumulative indicator of the food market development of the Republic of Crimea											
13,24	11,77	15,60	20,43	18,29	17,44	19,48	16,57	14,37	12,43	15,28	15,09

Source: made by the author on the basis of the conducted research.

4 Results

The results of assessment of a cumulative indicator of an agrarian and industrial complex condition of the Republic of Crimea presented in Tables 1 and 2 demonstrate that from 2005 to 2011 the distinct tendency of its growth in the region – from 13,24 in 2005 to 19,48 in 2011 is being observed. However from 2012 to 2014 there has been noted a steady decrease in this indicator to 12,43. Unfortunately the cumulative

indicator of development of the agrarian sector of economy in the Republic of Crimea has reached the level of 2007 accounting for 15,09 in 2016.

Today the main problems of agrarian and industrial complex of the region can be defined as the following:

- the termination of the water supply in the North Crimean Canal used for needs of hydromelioration in agrarian and industrial complex;
- the reduction of the areas of the irrigated lands as a result of the irrigating equipment wear;
- limitation of inventory and technical facilities resulting in impossibility to use modern agricultural technologies in the production farms and individual farms of the population;
- reduction in the production of grapes, fruit and berry, vegetables, essential oils, tobacco;
- reduction of the cattle livestock and livestock production, etc.

It's necessary to note that the majority of the listed problems, generally connected with wear of basic funds in agriculture of the Crimea, dates back to 90s of the XX century. In this regard significant structural transformations are required for the development of the regional agrarian sector in modern conditions, assuming as the main reference points of development: growing of grapes and essential oils in plant production, cultivation of poultry and livestock of dairy breeds in livestock production. Providing uninterrupted irrigation of agricultural areas due to use of the river internal drain and artesian wells can be specified as the priority directions facilitating increased efficiency of agrarian and industrial complex of the Republic of Crimea.

Strengthening of a raw material source of agrarian branches within regional specialization of agricultural production as well as radical reconstruction of the prevailing number of the enterprises and food service operations, installation of modern technologies and highly qualified personnel are the urgent necessities that increase the efficiency of functioning of the Crimean agrarian and industrial complex.

To ensure a stable social and economic development of rural areas and effective functioning of agrarian and industrial production it is also necessary to strengthen the state support of social and engineering arrangement of rural settlements, development of non-agricultural types of activity, expansion of labor market, development of processes of self-management, cooperation of production farms and individual farms of the population.

5 Conclusions and Prospects of Development of Present Research

The development level of agriculture, agrarian and industrial production of the Republic of Crimea (as the integrated result of activity of all subjects of the branch economic relations) predetermines the living standards of the population of the region and forms a basis for forward development of its economy.

The important condition and reliable guarantee of further development of the Republic of Crimea is harmonization of economic interests of production entities, the

working part of the population and other public segments who try to increase the level of their personal welfare. Therefore it is extremely important to determine the most optimum ways of stimulation of production and to define the effective mechanism of state regulation of processes of distribution and redistribution of a public product that will allow to avoid further unjustified stratification of the population, to prevent undesirable sharpening of social conflicts and to promote growth of living standards of the population in the Republic of Crimea.

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Benefit Assessment as a Tool of Public Policy-Making in the Development and Implementation of State Programs of the Russian Federation

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Abstract. The paper provides a brief overview of the current system for assessing functional and operational effectiveness in the current Russian practice of result-orienting management. The main shortcomings are identified and the ways to eliminate them are proposed. The category of the life's saving economic equivalent (*EESL*) is proposed, allowing to analyze the social & economic efficiency of state programs based on the benefit and cost framework. The comparison method estimated the *EESL* value for Russia. Experimental assessments of social & economic efficiency are provided.

Keywords: Functional efficiency · State program · Life's saving economic equivalent · Socio-economic efficiency · State regulation

1 Functional and Operational Efficiency

One of the most important functions of public administration, as well as governance in principle, is to the impact valuation of decisions made.

In the Russian practice target-oriented government management appeared as a budgeting tool, therefore, historically continuous attention was paid to ex-post evaluation issues based on the analysis of the actual completeness of budget funds expenditures (cash execution) and the fiscal administration (budget allocations, compliance of expenditures with the stated targets, completeness and timeliness of reporting, etc.) According to the theory of management, this set of issues relates to the category of operational efficiency, or efficiency of processes ensuring achievement of previously set goals. One of the most common tools for assessing operational efficiency is the plan-fact analysis to be applied both to budget expenditure indicators (percentage of cash execution) and to quantifiable targets (percentage of goals achieved).

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1.1 Efficiency vs Effectiveness

Clearly, neither ex-post analysis nor operational efficiency assessment alone fully meets the needs of decision making. The attempts to shape the future agenda solely based on the past lead to the bad practice of “result-based” planning [1].

Unfortunately, this approach is not only confined to minds of executive managers. One of the main existing guidance documents [2] prescribes the budget process to prioritize expenditures including “on the basis of the efficiency and performance analysis of previous periods budgetary allocations provided from the Federal budget for relevant targets”.

We will make a mental experiment. Suppose that some careless official “X” (from an imaginary country) was charged with implementing a very important state project due to an oversight. He poorly planned the terms and scope of work, was unable to build a project management system, did not contract the required amount of work in time and, therefore, had low budget implementation over the reporting period. The mentioned rules require in such case to lower the priority of financing this project (the point is to reduce its funding), but it will be a wrong way, as the project is initially known to be important. The only valid argument for this approach would be that initially the project budget was overvalued but, first, that was only one possible reason for the deviation, and second, project budget planning errors should not in principle be addressed through a target-oriented mechanism.

Thus, our hypothetical example shows that in the case of low operational efficiency, the management impact should be based on an additional analysis of the reason for the deviation and may only in some cases can be reasonably confined to reduced funding.

Imagine another scenario. During the implementation of the project, the official “Y” periodically monitored the cash execution of the allocated budget and by the end of the fiscal year (in Russia, Q4 of the calendar year) he discovered that the current pace will not yield full expenditure of allocated funds. In international practice, this well-known situation has called the “last minute crisis”. In order not to reduce budget execution, a more prudent but no less careless official “Y” may decide to quickly squander resources. To address the “last minute crisis” prerequisites, e.g. U.S. military budget management practices legislatively provided possibility of transferring unused but objectively necessary project funds to the interim account [3, 4]. Thus, if the project (strategic plan) and the budget year (financial plan) were not fully synchronized, a tool for linking them without loss of efficiency was envisaged.

The document also includes a requirement to finance as a matter of priority “the reduction of expenditure receivable, including those arising from the advance of contracts (public contracts)”. While this requirement is reasonable in terms of financial discipline and operational efficiency, it is worth noting the possible negative consequences of its implementation. It is well known that the growth of accounts receivable is accompanied by an investment surge characterized by the need for additional advances in construction and equipment, and that the state’s own receivables are nothing but an additional (and relatively cheap) credit resource for business and suppliers.

These examples demonstrate the antagonism of operational and functional efficiency and show us that decisions cannot rely entirely on one of them. For these

reasons, the reliance on assessing both operational and functional efficiency of management decisions is considered the best global practice.

It should be noted that to describe these two major categories, the English words “Effectiveness” and “Efficiency”, respectively, are used which, despite the fundamental semantic difference, are translated into Russian the same way as “efficiency”. The essence of this difference was expressed by P. Druker: “Efficiency is doing things right; effectiveness is doing the right things”. The closest meaning of the Druker’s interpretation would be the formulation of COBIT5 [5] which, adapted to our tasks, will form the basis of the proposed terminology.

Operational efficiency is a measure of achieving the goals of the state program. The state program is operationally effective if the goals are achieved.

Functional efficiency (effectiveness) – a measure of expediency of the use of resources for the implementation of the state program. A functionally effective state program ensures the achievement of the state’s goals with minimal time, financial, labor, material and other resources.

Mr. Anton Siluanov, First Deputy Prime Minister of Russia, stressed [6] that “the effectiveness of public administration is based on two principles. The first is functional effectiveness, this is the results goal-setting; the second is operational efficiency, this is the activity for the implementation of tasks”. A logical question is how the success of the activity depends on each of these “principles”? This question was partly considered in the work [7], where PMI scientists, after analyzing several held (but not always successful) government projects and programs, conclude that the quality of project management, the essence of operational efficiency, determines about 35% of the success of the project. It also concluded that the evaluation of the success of the project should not focus only on its operational efficiency. The benefits of its implementation should also be considered. One of the effective mechanisms proposed by American specialists [8] is the formation of «Efficiency-Effectiveness» matrix by analogy with the well-known Eisenhower matrix. They also warn about the possibility of the existence of operationally effective, but useless (or even harmful) for the economy projects, citing the example of additional administrative checks that burden the business, but carried out strictly on schedule (100% of the targets) and with the full development of the allocated budget allocations (100% cash execution).

After having considered the categories of functional and operational efficiency, as well as the difference between them, we will focus further on the issues of functional efficiency, bearing in mind that the issues of operational efficiency and the tools necessary to achieve it in terms of project management are widely considered, for example, in [9, 10], and in terms of audit costs-in [11].

1.2 Directions of the Analysis of Functional Efficiency of the State Programs

Currently, attempts to integrate functional efficiency assessment into the processes of program-target management and budgeting are undertaken both in Russia [12] and neighboring countries [13, 14] and in other countries [15].

It is worth noting that, for example, in the USA, Canada, England, the evaluation of the functional efficiency of the measures taken, based on the analysis of benefits and costs, has already firmly entered the contour of public administration and budgeting [16, 17].

The creation of a methodological basis for the analysis of functional efficiency in Russia was facilitated by the development of a wide range of methodological documents [i.e. 18–20]. Although they attempted to establish a methodological system for assessing functional efficiency, including on the basis of the analysis of benefits, it is necessary to recognize their disunity, often weak scientific and theoretical basis and insufficient integration into the system of decision-making. As a result, the use of separate approaches of these methods resulted in substantiation of high-cost projects with non-obvious contribution to the development of economy and society, which Robert Barro in his critical article [21] aptly called “bridges to nowhere”. In the same place, as a solution, it was proposed to enrich the analysis of the measures with an assessment of costs and benefits, implying a comparison of the benefits that society and the economy receive from the implementation of an initiative, with what it will require to spend. Identified problems indicate the necessity of development and implementation in Russian practice of program planning tools of analysis of benefits and costs as a complement and extend the possibility of assessing functional efficiency.

Gathering together the expressed position and given the present order of management of public programs, the following structured evaluation of their functional efficiency

I. Functional efficiency

1.1. Macro-economic effects (depending on the size and economic actions)

- 1.1.1. GDP Use and production
- 1.1.2. Cross-sectoral effects
- 1.1.3. Inflation
- 1.1.4. Employment

1.2. Structural macroeconomic efficiency (considering the qualitative economic characteristics of the measures taken)

- 1.2.1 Innovation
- 1.2.2 Investment
- 1.2.3 Import-substituting capacity

1.3. Socio-economic efficiency

- 1.3.1 Public benefits
- 1.3.2 Public expenditure
- 1.3.3 Net social and economic benefits

It should be noted that usually the assessment of effects is a stage of effectiveness evaluation, and not its structural element. Nevertheless, to simplify the terminology, we will consider the assessment of macroeconomic effects, as well as socio-economic benefits, as types of functional efficiency assessment.

The chronological structure of the evaluation of the functional efficiency of state programs should cover all stages of their development:

1. Ex ante, at the stages of decomposition (cascading) of national goals (high-level goals), at the stage of program development. The assessment may be carried out before the final decision is made, to develop the optimal (least risky or resource-intensive, fastest) way to achieve the goal, promote or popularize (GR, PR) or justify the need for the proposed action.

This phase is particularly relevant for the following reasons. The main goal-setting document in Russia at present is [22], prescribing to provide financial support for high-level goals already at the stage of goal-setting. At the same time, as we will show further, when certain theoretical assumptions are made, the mechanism for assessing functional efficiency becomes an effective budgeting tool.

2. Ongoing assessment is carried out in the process of implementation of the decisions already taken to promptly adjust the ways to achieve the goals, budget, deadlines, change the prioritization of tasks, or monitoring.
3. Ex post analysis, which is the basis for the formation of a holistic view of the de facto results of the implementation of the state program. For example, this analysis may be included in annual reports on the implementation and evaluation of state programs sent by the Government to the state Duma and the Executive branch.

The organizational structure of the evaluation of the functional efficiency of state programs can be implemented from the following principles

1. Government programs are the link between strategic and budget planning
2. Evaluation of functional efficiency, due to the isolation of the used principles and mechanisms, chronological and other reasons described above, should be carried out independently of the assessment of operational efficiency.

Thus, in relation to the Russian practice of public administration, the unit responsible for assessing the functional efficiency of state programs can be formed in the economic Department of the Ministry of Finance or the budget Department of the Ministry of economy, as it is implemented, for example, in the structure of the Generalitat of Catalonia [15].

Legal structure evaluation of the functional efficiency should affect the legislation governing the strategic and budget planning.

Next, we consider in more detail the theoretical and practical aspects of the benefit analysis tools.

2 Benefit Analysis as a Tool for Assessing the Functional Effectiveness of Government Programs

The Conceptual framework for benefit assessment is formed by categories of economic theory like Pareto efficiency, willingness to pay, supply and demand curves, consumer and producer surplus, public benefits, efficiency of resources allocation, opportunity costs, discounting, the welfare theorems, sensitivity analysis, the rate of social discounting, and several others. The Central theoretical position adopted in the context of

this work is the statement that the socially effective state programs must meet the criterion of Pareto efficiency.

The most theoretically verified way to measure benefits is the construction and further analysis of supply and demand curves. However, taking into account the initial level of development of the methodology in Russia, as well as the theoretical and practical feasibility of the proposed approach, we draw attention to the measurement of benefits by indirect market methods, namely, the method of compromise, which includes, among other things, the category of saving life and time, because, in the popular expression of Daniel Granin, "Time is a national wealth, the same as the subsoil, forest, lakes."

2.1 Socio-Economic Efficiency

Based on the definition of functional efficiency, its content structure and theoretical positions given in the previous sections, we formulate the following definition.

Socio – economic efficiency is a metric of the functional efficiency of the state programs, which allows to analyze and compare the social benefits and costs of its implementation. Socially effective state program is characterized by a non-negative value of the net social and economic benefits.

The net socio-economic benefits are calculated as a discounted sum of net benefits (the difference between socio-economic benefits, B_t , and costs, C_t) using the well-known NPV formula.

$$NPV = \sum_t \frac{B_t - C_t}{(1 + r)^t} \quad (1)$$

In this case, the corresponding budget expenditures can be taken as costs, and the assessment of benefits will be discussed in more detail later.

2.2 The Economic Equivalent of the Life's Saving

The category of economic equivalent of the life's saving (EESL) is Central to the assessment of socio-economic benefits and reflects the economic benefits that society (country, people) acquires by making efforts to save lives.

There are different approaches to the measurement of this value, which can be divided into three main groups

- a fundamental evaluation
- evaluation based on surveys
- evaluation based on comparison

In conducting fundamental valuation start from the assumption quite effectively the current market. For certainty (but without limiting the generality of reasoning), suppose that we are talking about the analysis of an effective labor market, in which two groups of workers performing the same job duties are compared, with the only difference that the work of some is associated with an increased risk to life, and others – no

(for example, the work of welders of the same skill level in the shop and during the installation of high-rise structures).

If the researcher has reliable information about the additional risk to the life of employees associated with the performance of more risky work (for example, obtained from the analysis of representative statistical information), p , and the assessment of additional wages, prevailing in the market to compensate for this risk, W

$$EESL = W/p \quad (2)$$

It should be noted that in several publications, the authors point to the potential understatement of the thus obtained estimates due to incomplete accounting of non-monetary forms of remuneration (social package, additional health insurance), as well as such intangible benefits of the employee, as the prestige of the profession, etc.

Also, imperfections in the labor market can lead to a shift in the assessment, for example, information asymmetry, which manifests itself in the deliberate creation by the employer of understated ideas of the employee about the riskiness of work, or in violation of assumptions about the rationality of the choice of employees, that is, simply their frivolity in the correlation of risk and the corresponding compensation.

For our country, the largest in the world in terms of area, we cannot ignore the fact of stratification of labor markets not only by professions and skill levels, but also by their geographical location. This fact should be considered in the analysis, but according to the deep conviction of the authors, the *EESL* as a measure of social benefits, when making management decisions should not be differentiated by regional basis.

Assessment based on surveys involves relevant sociological research and is not discussed in detail in this paper.

Assessment based on the comparison involves a search to find the essence of the category in other systems and direct their operation, or alignment through further evaluated (scaling, conversion) coefficients.

As an assessment based on the comparison of the *EESL* for Russia, an equivalent indicator of a country close to the level of industrial development, for example Poland [23], which was estimated at \$ 2.34 million in 2013, can be used. In this case, the conversion is made to:

- reduction to the prices of one year, α , according to [24]
- considering the difference in welfare, for example, based on GDP per capita, β , according to [25]
- considering the exchange rate taking into account the purchasing power of national currencies, γ , according to [26]

$$\alpha = \frac{GDP_{Per\,capita\,USD\,Poland}^{2017}}{GDP_{Per\,capita\,USD\,Poland}^{2013}} = \frac{13811.7}{13781.1} = 1.0022 \quad (3)$$

$$\beta = \frac{GDP_{PPP_{USD_{Russia}}}^{2017}}{GDP_{PPP_{USD_{Poland}}}^{2017}} = \frac{25533.0}{29026.2} = 0.8797 \quad (4)$$

$$\gamma = Exch_{rate_{2017}}^{\frac{rubles}{USD}} = 24.111 \quad (5)$$

Thus,

$$EESL_{Russia}^{2017} = EESL_{Poland}^{2013} \cdot \alpha \cdot \beta \cdot \gamma = 49.7 \text{ million rubles} \quad (6)$$

It should be noted that this work [27], as of the time of its publication (2007), gave an estimate of a similar category in the range of 30–40 million rubles, which when indexed in the price of 2017 is comparable to the estimate we received.

The question of how *EESL* is decomposed according to the age and sex structure of the population is natural. To answer it, the category economic equivalent of year's saving (*EESY*) and, additionally, the economic equivalent of hour's saving (*EESH*) are introduced. Considering the imperative of gender and age (within the known framework) equality, we will assume in subsequent arguments that *EESY* is invariant and equally applicable to both female and male population of all age groups.

Thus, *EESY* and *EESH* are:

$$EESY = EESL \cdot \frac{(1+r)^t - 1}{r \cdot (1+r)^t} \quad (7)$$

$$EESH = EESY / 8760 \quad (8)$$

Where r is the norm of socio – economic discounting, and t is the average life expectancy of the representatives of the analyzed society. If we take the used in [27] estimate of t for Russia in 30 years and the zero rate (the formula 7 is converted into a simple ratio of *EESL* and t), we obtain estimates of *EESY* and *EESH*, respectively, 1.7 million rubles/year and 190 rubles/hour.

In the long term, with the introduction of the proposed methods in the process of program-target management, a significant proportion of the complexity of assessing the socio-economic efficiency will move to the above – estimated calibration parameters-*EESL*, *EESY*, *EESH*, r . For this reason, their assessment should be the subject of close attention of the expert and scientific community, and their scientifically based values intended for use in the management decision – making process should be annually specified and recorded in the relevant program-target documents.

If the inverse problem is set, namely, based on the estimated, for example, by comparison, the average *EESY* to calculate the *EESL* for a certain age and sex, should be guided by the expression

$$EESL(t) = \sum_{\theta=0}^t \frac{EESY}{(1+r)^\theta} \quad (9)$$

Using the received assessment of the *EESL*, as well as information on the planned reduction of mortality, we conducted a pilot analysis of socio-economic benefits from the implementation of the state program “Protection of population and territories from emergency situations, fire safety and safety of people at water bodies” and the Subprogram “protection of mother and child health”.

The results of the assessment [28] show that the analysis of socio-economic benefits based on the *EESL* is an effective tool for the development, monitoring and subsequent evaluation of state programs aimed at saving the population. The adoption of a theoretically justified provision on the nonnegativity of the net reduced socio-economic benefit allows not only to rank, analyze and compare the benefits in different directions and in different periods of time, but also to assess the socio-economic efficiency of the measures implemented or proposed for implementation.

It is obvious that to give more validity and consistency, the value of the *EESL* should be specified by subtler economic-mathematical, sociological, statistical methods. Following the principle of partitioning, both the value of the *EESL* and the concept of further implementation of the category in the contour of program-target management and budgeting should be discussed with the scientific and expert community before approval at the official level, for which this work was prepared.

3 Conclusion

We have provided a brief overview of the present state of the theory and practice of management of state programs in Russia, marking the most acute problems of evaluation of their functional and operational efficiency, as well as suggested approaches for their solution, based on best international experience.

The category of economic equivalent of life's saving (*EESL*) is proposed as a basis for the future development of the direction of assessing the socio-economic efficiency of state programs. The comparison method was used to obtain the value of *EESL* for Russia, based on experimental calculations of socio-economic efficiency for separated state programs were made.

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Using of Instruments of the State Support for Integration of Science and Business on the Example of Far Eastern Federal University

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Abstract. In the article measures of financial state support of the innovations realized by small and medium scale enterprises from a stage of origin of the innovative idea are considered. The analysis of tender according to the order of the Government No. 218 about cooperation of higher education institutions and production enterprises is carried out. Basic reasons of a deviation of bids at primary stage of selection are established and systematized. The successful experiment of FEFU is shown: the information support of small enterprises; the search of sources of financing of the projects which are at a stage it is scientific researches, on means of the software product developed within the university.

Keywords: State support · Science and business ·
Innovations and scientific developments · Far Eastern Federal University

1 Introduction

In economy of each country the innovative entrepreneurship plays an important role, it promotes creation of workplaces, creates the healthy market competition, provides effective using of resources [1, 2]. In 2015 the reduction of the gross domestic product (GDP) in Russia for 3,9%, because of crisis, sanctions, dip in prices on oil was noted.

In communication with what the Government of the Russian Federation was recognized by need of diversification of economy and support of the small and medium scale enterprises (MSP) which are turning out high-technology products for the purpose of increase in indicators of economic growth (GDP, GDP per capita, performance, human capital investments). Crisis negatively affected entrepreneurial activity, having created limited access to world markets and foreign investors.

For deduction of the leader line items by the enterprises in the market, it is necessary to make the unique products which don't have analogs. Implementation of innovations increases business competitiveness, but aggravates their need for support, in shape privileges, subsidies, grants, leasing, information support, etc. For the enterprises the following types of financing of innovative projects are widespread in the Russian Federation: own resources (profit, depreciation charges), private and public investment funds, market resources (loans, credits, bond issue, share issue) [3].

One of effective measures of support of activities of SME for development and deployment of innovations is the programs stimulating demand for innovations and reducing risks of commercialization. Such measures are implemented on regional and federal levels in particular the Resolution of the Government of the Russian Federation of April 09, 2010 No. 218 "About measures of the state support of development of cooperation of the Russian educational organizations of the higher education, the public scientific institutions and organizations" (Resolution No. 218).

The resolution No. 218 is directed to the support of development of cooperation of the Russian higher educational institutions and the organizations realizing projects in one of the priority directions of development of science, equipment and technology.

The feasibility of participation of the enterprises in cooperation is caused by a possibility of creation of a competitive goods, for the purpose of mobilization of the internal resources and to increase profits. The higher education institution in turn has an opportunity to bring the R&D (research and development works) to real production sector, to expand business contacts. In this case the state support of the knowledge-intensive production acts as a funding mechanism applied RTD (research, developmental and technological works), for the purpose of support of process of import substitution and development of the Russian market of innovative goods that is a basis for development of the industry and decrease in raw dependence of the Russian economy.

Cooperation between higher education institution and the enterprises promotes forming of the model of the entrepreneurial university oriented to commercialization of scientific developments.

In Far Eastern Federal University (FEFU) for all-round development of innovative capacity of the university two models are used: research [4] and entrepreneurial higher education institution [5].

One of sources of financing of these models is participation in tender under the Resolution No. 218. For participation in tender it is necessary to pass all stages of project appraisal which scheme is provided in the Fig. 1.

In the Fig. 1 the bid evaluation stages made on analysis results of basic requirements to the complex project provided in the tender documentation (TD) of 7 queues are provided. Numbering of queue corresponds to sequence number of a competition from the moment of the approval by the government of the Resolution No. 218. In 2010 the 1 and 2 queue of a competition was carried out, 2012 - 3, 2013 - 4, 2014 - 5, 2015 - 6, 2016 - 7.

The quality of the bid depends on that, how responsibly the university approaches compilation of TD which has experience in design of the project documentation. By results of 1 and 2 queues of a competition, 203 projects were supported. In 2014 149 applications from which 21% were rejected at primary stage of selection were submitted for a competition, and won against 13%. It is necessary to mark that the most part of requests implied the cooperation with technical universities. In 2015 150 applications most of which part from Central and the Volga Federal District were submitted for a competition. The list of the most active higher education institutions participating is provided to 5 and 6 queues of a competition in a Fig. 2.

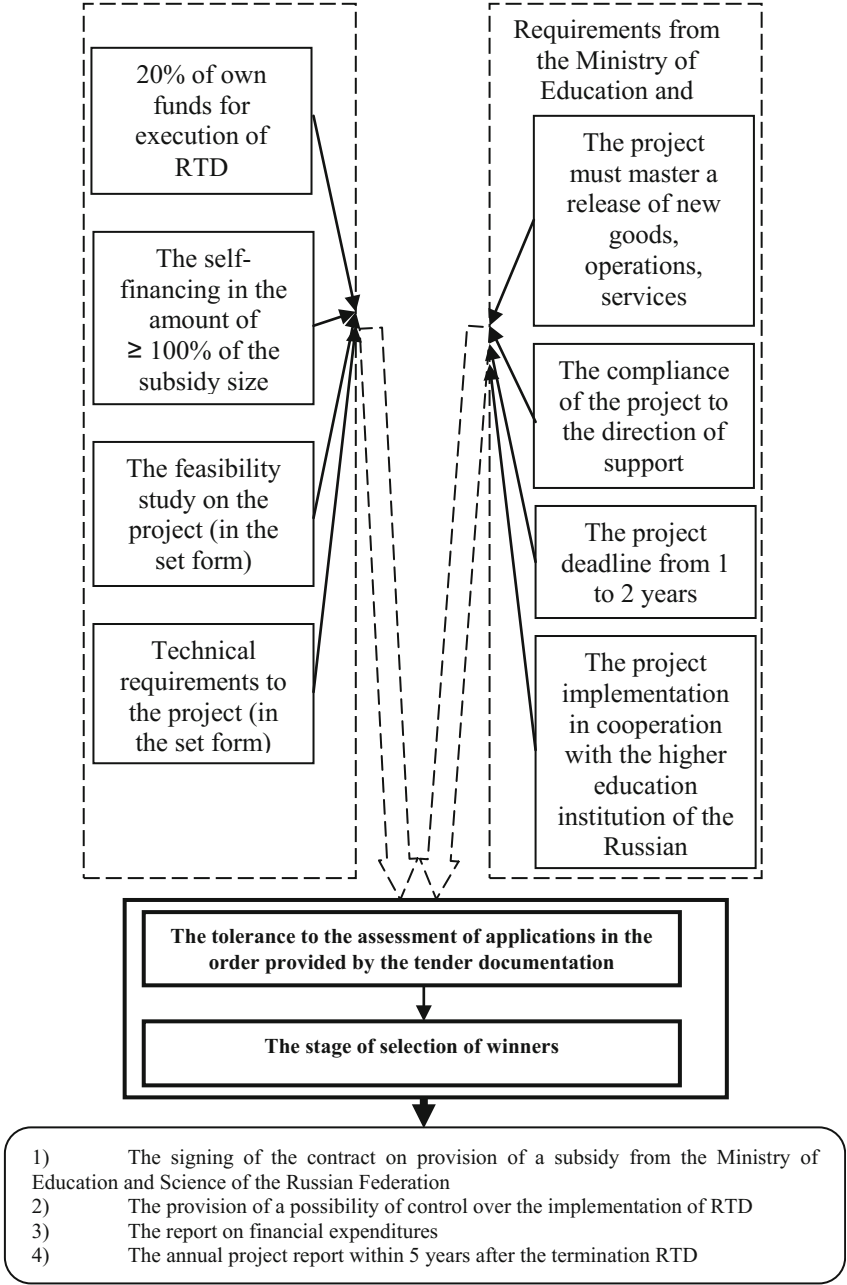


Fig. 1. Bid evaluation stages under the Resolution No. 218.

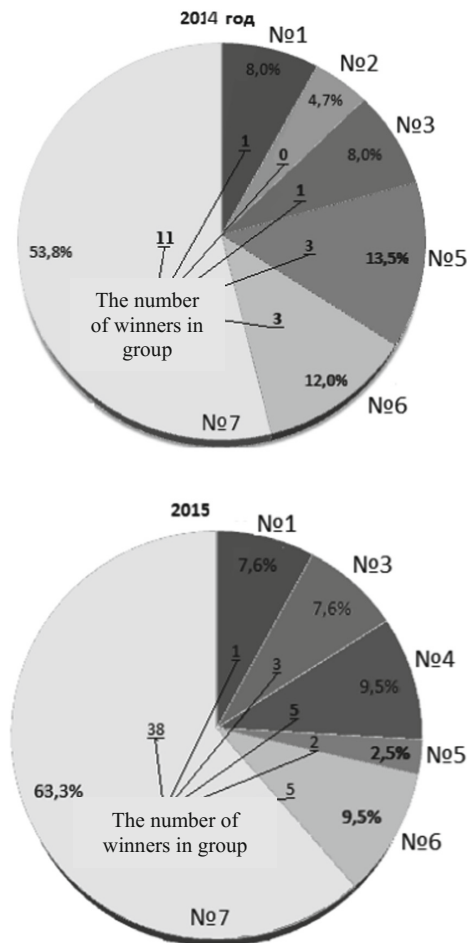


Fig. 2. Percentage distribution of requests by the number of applications from higher education institution in 2014–2015.

In groups No. 1 – 12 requests from higher education institution; No. 2 - 7; No. 3 - 6; No. 4 - 5; No. 5 - 4; No. 6 - 3; No. 7 – 1-2 applications. In 2014 most actively the Southern Ural State University participated in a competition which submitted 12 applications from which only one won. In 2015 4 universities won with two applications and 1 university with three applications – FEFU [6]. Typical errors of specialists of the university when filling TD were revealed. In Table 1 the group of reasons for rejection of applications (in total 31) on occurrence frequency at the primary stage of the selection made before assessment of applications in essence following the results of 2014 is provided.

Table 1. Basic reasons of the rejection of applications.

In total applications	Reasons for rejection of applications
11	The volume of a required subsidy exceeds the costs of researches on the project specified by the participant of a competition
7	The amount of money, directed by the participant competition on financing of NIOKTR from the total amount of own means, is less than 20% The annual amount of the subsidy requested for 2014–2016 exceeds 20% of the annual average size of gross revenue of a participant of a competition The absence of the documents provided by the TD points 9.1 and 9.2 or they are not presented in the set form
6	Copies of the form 2 to the balance sheet for 2011 and 2012 are not provided
5	Sheets of the request are not sewed in uniform volume
4	The copy of the certificate of incorporation has not notarial assurance
3	The head performer of R&D is not the educational organization of the higher education or the state scientific institution In the document in the form 2 as a part of the application contradictory data on the amount of own funds allocated for financing of RTD on the project are provided The separate documents as a part of the request prepared according to the set form are not under seal of the participant of a competition, are not certified by the authorized signature of the participant of a competition
2	The decision on opening of the project and assignment for its implementation is not provided
1	The amount of RTD, executed by the head performer, is less the set minimum The certificate of incorporation is not provided Enclosures to the contract for execution of RTD between the participant of a competition and the head performer of RTD are not provided The document “Bid” is not prepared according to the set form 2 and does not contain necessary data

According to the Table 3 the majority of applications were rejected in connection with non-compliance with the required costs of R&D of the project. The subsidy is in full spent for RTD carried out by higher education institution, at the same time puts at least 100% of the subsidy size from own means from which 20% are spent for RTD. In total in Russia there are more than 1000 higher education institutions and 2000 branches, but about 200 applications are annually submitted for a competition.

2 Research of the Potential Reasons of a Low Performance of Cooperation of Higher Education Institutions and Enterprises

Today, as a rule, exclusively large business participates in the competition. It is caused by the fact that the organization structure of domestic science was created in 1920–30 and represented three sectors: academic, branch and high school. The existence of steadily created business contacts between the organizations of science and business creates barriers to a dimple of the existing integration of science and production. It is necessary to understand the prejudiced relation to the new enterprises, interpersonal communications, absence of a uniform information basis on RTD as barriers carried out by higher education institutions, absence of techbroker. Due to the absence of constant communication channels and system barriers was created the resource from science and the enterprises which is not involved in innovative activities [7] in any way. Increase in efficiency of cooperation requires for increase in number of participants from the sphere of SME. In TD under the Resolution No. 218 the value of a subsidy is not set minimum that allows subjects of SME to submit applications and with the small budget. For example, for the microenterprises the maximum amount of a subsidy can make 12 million rubles. In 2012 the application in which the amount of a required subsidy was 3,6 million rubles was submitted for a competition.

In FEFU the research directed to detection of the potential reasons of a low performance of cooperation of higher education institutions and enterprises of the region was conducted. Within the research all higher education institutions of the region (Primorsky region) and leading enterprises of the region were polled. In a judgement of respondents from higher education institutions of the enterprise are not ready to implementation of innovative projects as:

- (1) Large enterprises are monopolists and lost ability to systematic upgrade of the products and technologies.
- (2) The enterprises are not ready to wait so far the project will pass all stages of development from the idea to commercially implementable goods.
- (3) In case of a project choice for implementation on the basis the enterprises give preferences only to those projects which are capable to quit quickly on the maximum profit.

In turn representatives of the industry of the region mark:

- (1) Focus only on educational process, but not on really competitive applied researches.
- (2) Higher education institutions register objects of intellectual activities more for the sake of the reporting under grants and programs of development.
- (3) Higher education institutions have not sufficient competences of the sphere of R&D.
- (4) The disinterest of higher education institutions in commercialization of innovations, in connection with operation model as the enterprise university is not created.

The inability to development of essentially new products and systematic alteration of earlier conducted researches.

The resolution No. 218 became one of the first stages on the way of leveling of problems and formation of the base for interaction of the science and the industry. Stimulation of science and business to interaction on means of the state support promotes timely adjustment of supply and demand on innovative technologies and goods. The state support of economically and socially effective projects is directed to capital outflow reduction, to increase in labor productivity that promotes stimulation of economic growth of the country and regions.

In Russia the practice of cooperation of SME with higher education institutions was not created. In this regard SME loses the opportunity to realize competitive projects. The higher education institution is in turn incapable to react quickly to needs of the industry, for the purpose of updating of the directions of the researches. If SME wants to save the niche in the market it is necessary to enhance permanently the production, for stimulation of consumer demand. In this regard it is necessary to consider the possibility of the involvement in a competition in the Resolution No. 218.

There are techniques of assessment of project risks at a stage of development of the feasibility study (FS) on the project. Delphi method, method of the analysis of relevance of expenses [8], method of analogies treat such methods. It will be expedient to use these techniques if, the enterprise is more than three years in the market, has experience of implementation of innovations or difficult technical systems. A technique of multiple factor analysis, the balanced system of indices for the analysis of priority of projects on the basis of marketing, financial processes and perspectives of development and training of a project team, a technique of assessment of probability of a technical and commercial project success are the most widespread in the foreign practice of an assessment of efficiency of projects.

Today bid evaluation is carried out on the basis of method of expert evaluations [11–20]. The possibility of using of practical experience of experts is considered primary benefit of a method. The contest committee estimates compliance of participants of a competition, to the project provided to them based on the FS. Advantage of complex project evaluation under the Resolution No. 218 is the emphasis not only on price criteria, but also qualitative characteristics of a product, and experience of the participants of cooperation in projects implementation based on R&D.

3 The Specialized Software Products

If the enterprise has not a possibility of attraction to project evaluation of a large number of experts, it will be expedient to use the specialized software products. The most widespread software is Comfar; “Analyst”; TEO-INVEST; ENERGY – INVEST, Primavera, Open Plan, Microsoft Project for Time-Line. Data software products are directed to simulation of a financial status of the enterprise, and simulation of economic processes of the project. In FEFU there is the successful experience in development of software products (SP) for the enterprises allowing to make complex assessment of innovative projects. SP was developed by FEFU on purpose formations on the basis of one of the largest scientific centers capable to influence high-quality improving of

integration of science and business in the Far East. SP was developed under needs of SME with numbering staff up to 15 people. SP is intended for the analysis of feasibility of an involvement of the enterprise in competitive selection on the basis of project evaluation. SP belongs to open software products, i.e. adjustment of formulas on which means there is a project evaluation and the algorithm provided in a Fig. 3 is available to users.

The need of the enterprises for introspection for an algorithm in a Fig. 3, is caused by the limitation of resources and high probability of ruin, in case of acceptance of strategically incorrect decisions. SP allows to save the intermediate data of calculation, for the purpose of their comparison to alternative versions of the project and a choice of the best. The program interface providing simplicity and convenience in maintenance is developed. Also in FEFU the innovative department capable in a personal order to run for search of sources of financing of the innovative activities which are realized by MSE works.

If the enterprise reveal inexpediency of an involvement in a competition under the Resolution No. 218 it will be necessary to run for search of alternative sources of financing of innovative activities of SME. In FEFU there is an experience of cooperation with Skolkovo Foundation, concerning joint implementation of innovative projects and formation of technological innovative projects. Having become the resident of Skolkovo, the businessman can acquire the right of using of privileges and preferences, convenient infrastructure, access to an investment platform. Projects are evaluated on a level of innovation of the proposed solution and level of development of future product.

Also on the FEFU platform events for selection of innovative projects with an involvement of experts of Foundation, and the Russian Venture Company (RVC) are annually held [9]. Activities of RVK are directed to creation of involvement of private Russian and foreign investors in innovative segments of the Russian economy.

The systems of financial aid to small business are developed also at the regional level. For example, the program of support – “Development of small and average business in Primorsky region” [10, 21]. According to the program subsidies for compensation of a part of costs of organization of events on increase in competitiveness of the SME making innovative goods and (or) implementing technological innovations are provided.

So in FEFU there is an experience of compilation of applications, on the competitions held by financial infrastructure of scientific activities of the Russian Federation which is provided by next organizations: The Russian Federal Property Fund, the Russian humanitarian scientific fund, the Russian fund of technological development, Fund of assistance to development of small forms of the enterprises in the scientific and the technical sphere. These structures finance basic and applied researches on a competitive basis.

The program developed in FEFU works in the mode of a uniform window i.e. it is capable to create recommendations: in what competitions of investment fund it will be necessary to participate if the decision on inexpediency of an involvement in a competition under the Resolution No. 218 is made.

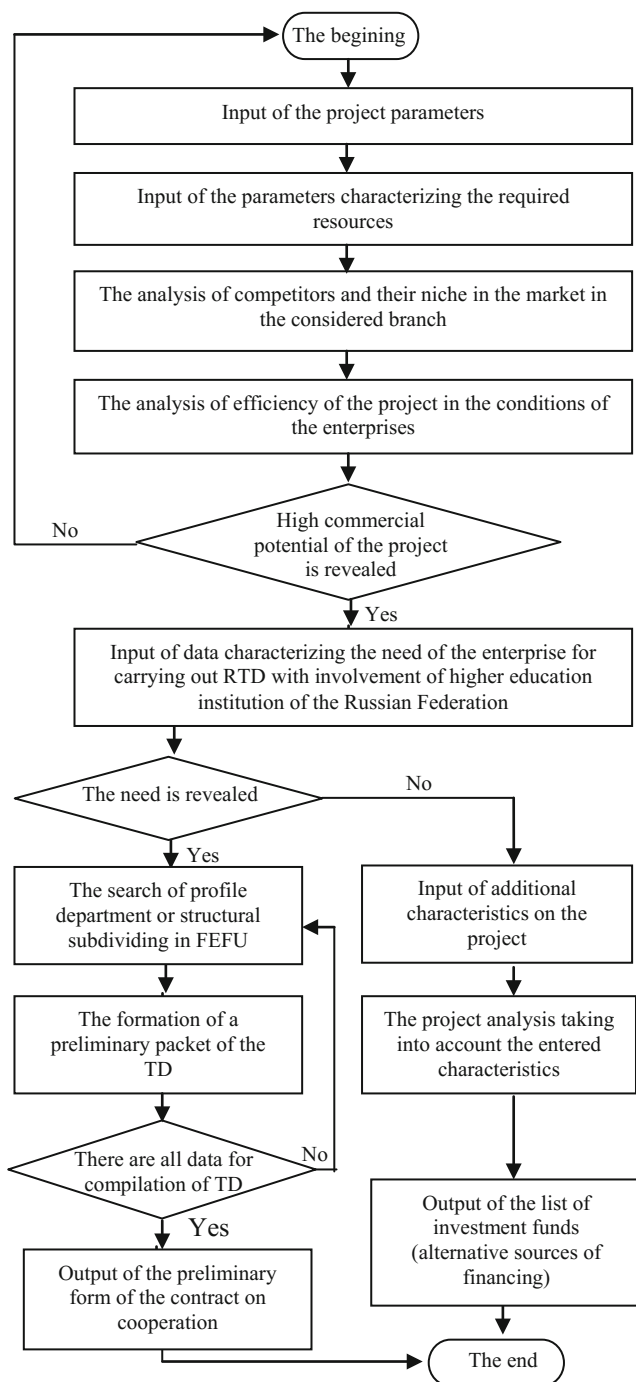


Fig. 3. The algorithm of the SP developed by FEFU.

4 Conclusions

1. The state enhances the support of innovative activities. The resolution No. 218 is directed to the formation of conditions for an output to domestic and foreign market of the Russian innovative products. The development of innovative capacity of the country is necessary for implementation of the strategic directions of development, improvement of the quality of life, the development of science, the industry, the business.
2. Development and deployment on enterprises of domestic innovative projects stimulates to the development of innovative capacity of the country and certain subjects.
3. The analysis of results of competitive selection under the Resolution No. 218 confirms the absence of the leading higher education institution capable to annually generate disruptive innovations. It demonstrates the need of extension of a number of participants of competitive selection from SME which are characterized by a high level of adaptivity to innovations.
4. The analysis which is carried out in article confirms a diversity of existing sources of financing of innovative activities. If universities by an example of FEFU begin to develop and implement innovations within the subdivisions or at the level of the region it will form a basis for implementation of strategy of Innovative development of the Russian Federation till 2020. The successful experiment of FEFU on application of SP intended for complex project evaluation and formation of recommendations about search of alternative sources of financing can help other higher education institutions in the course of adjustment of business connections with the enterprises.

Acknowledgments. The state support of innovations, the integration science – business, the financing of innovations, the technological business, the commercialization of innovations, FEFU.

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