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# **The role of financial ratio in signalling financial distress**

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## **ABSTRACT**

This dissertation demonstrates that financial distress in worldwide enterprises is very huge. It investigates how financial ratios decayed as the firm moved into financial distress. The financially distressed companies have a higher working expense ratio and lower benefit. Plus, their liquidity, turnover, profitability, work efficiency, and scope ratios were additionally fundamentally lower.

Financial analysis is a method of assessing the current and prospective financial condition of an enterprise based on the study of financial information using analytical tools and methods for determining the essential relationships and characteristics necessary for making managerial decisions. The purpose of financial analysis is to obtain the most informative, key parameters that give an objective and most accurate picture of the financial condition and financial performance of the enterprise. Financial ratio analysis is the analysis that obtained data from the statements and doing some analysis. This analysis helps to predict future condition of the company.

It is proved that financial ratios can predict future bankruptcy even on high uncertainty conditions such as an economic crisis. The research indicates that the accuracy of prediction is more increasing in line with a coming bankruptcy.

The recent financial crisis has questioned the earlier view that the capital in the financial sector has been adequately regulated. As a result, global regulators are in the process of uncovering new capital requirements that will result in higher and higher quality capital. At the same time, there is little evidence presented to the public to date about the impact of bank capital on reducing fiscal strains that have been learned from the last crisis.

Key words: Financial ratio, Signalling, Financial Distress

## **ACKNOWLEDGEMENT**

Thank for my teacher, SABAH GROUPS that why to teach me knowledge. I also thank my friends because they motivate me every time.

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# INTRODUCTION

## 1.1 Background

Financial stress is a crisis state and its overcoming requires special methods of financial management. The market economy has developed an extensive system of financial methods for diagnosing bankruptcy, insolvency, financial crisis and developed a method for making managerial decisions in the face of financial distress. This methodology is intended not only for enterprises where the crisis is obvious and it is necessary to take urgent stabilization measures, but for all enterprises operating in market conditions, since its features are such that they allow identifying at an early stage and eliminating negative factors of enterprise development, outlining their ways elimination.

The basis of the methodology are three provisions: -diagnosis of financial distress; -the identification of factors that affect crisis development; -development of anti-crisis financial management mechanisms. From the point of view of financial management, financial distress characterizes the realization of catastrophic risks of the enterprise in the process of its financial activity, as a result of which it is unable to meet the claims submitted from creditors in due time and fulfill obligations to the budget. Although the bankruptcy, insolvency and crisis of the enterprise is a legal fact (only the arbitration court can recognize the fact of these cases of the enterprise), mainly the financial reasons are based.

The main of these reasons are:

1. Serious violation of the financial stability of the enterprise, preventing the normal implementation of its economic activities. Realization of this catastrophic risk is characterized by an excess of financial liabilities of the enterprise over its assets. Such financial

condition of the enterprise is reflected by the indicator "net negative value" (or "net cost of deficit"), which is determined by the formula:  $FOC = ZK - A$ , where FVS is the net negative value of the enterprise; ZK - the amount of borrowed capital used by the enterprise (its financial obligations); A - the sum of assets of the enterprise (not including the amount of loss of previous years and the reporting period reflected in their composition by balance sheet).

2. Significant imbalances in the relatively long period of the volume of its cash flows. Realization of this catastrophic risk is characterized by a continuous excess of the negative cash flow over the positive and lack of prospects for the reversal of this negative trend.

3. Prolonged insolvency of the enterprise, caused by low liquidity of its assets. Realization of this catastrophic risk is characterized by a significant excess of the company's urgent financial obligations over the balance of its cash and assets in a highly liquid form that is chronic. The nature of the reasons considered shows that the financial insolvency of the enterprise, which determines the legal fact of its bankruptcy, is largely a consequence of inefficient financial management.

## **1.2 Research Purpose**

The purpose of financial analysis is to obtain the most informative, key parameters that give an objective and most accurate picture of the financial condition and financial performance of the enterprise.

The purpose of financial ratio analysis is achieved as a result of solving a certain interrelated set of analytical problems:

- assesses the structure of property and sources of their formation;

- reveals the degree of balance between the movement of material and financial resources;

- assesses the structure and flows of own and borrowed capital in the process of economic circulation, aimed at extracting maximum profit, increasing financial stability, ensuring solvency, etc .;

- assesses the proper use of funds to maintain an effective capital structure;

- assesses the impact of factors on financial performance and performance

- use of assets;

- It monitors the flow of financial flows, observance of the standards for the expenditure of financial and material resources, the expediency of carrying out costs.

The significant purpose for this paper is to decide the degree of financial distress in the enterprises, to show how financial ratios decay as the firm moves into financial distress to dissect legitimate structure concerning financial distress, and to bring up different measures to be received for the restoration of financially distressed firms including concessions to be made by different partners in the rebuilding procedure.

This study targets to discover comprising a model of an arrangement of financial ratios in which every ratio has its own weight that demonstrate its significance in separating between modern distressed and non-distressed firms. The early expectation of company's distresses cautioned the concerned parties that they can mediate and take restorative activities previously the crumples of the firm. These ratios were dissected utilizing the measurable technique known as the calculated relapse to achieve the best type of financial ratios that can

recognize modernly distressed and non-distressed firms in the primary, second and third year before distress. Likewise, prescribed the incorporation of non-financial pointers, for example, firm size, its age, the different monetary variables,... and so on, and in addition financial markers, for example, financial ratios when building scientific models to foresee financially a failure.

### **1.3 Methodology**

In this study was used secondary data. Information was collected from the internet, articles, sites and etc. This study analyzes the existing institutional failure methods and measures the ability to signal each method in anticipation of bankruptcy. The article applies Moody's financial ratios, Standard and Poor's financial strength, Financial ratios of the Bank, Z-score of Altman and later logit model and discriminant analysis and measures the predictive ability of this model for future use. And also was applied indications of Kapital bank and Access bank of the Azerbaijan. To tried to define their ratios and predict some information. The article also analyzes the reasons such as market, politics, economics and political effects that cause business. Banks or financial institutions from Europe, America and Asia are considered as examples. Samples are taken from the same period to measure the effect of different methods. The results from this measurement should help me find the most important method that can be used to see the risk so that necessary measures can be taken to prevent or reject the effect of the project which may lead to future work. The study will also present a policy recommendation that sets out which factors need to be analyzed in depth and how a preventive measure can be implemented before any possible question.



## 1.4 Literature Review

In an unstable economy, a slowdown in payment turnover, inadequate managerial skills and their commitment to aggressive forms of financial activity, the institution of bankruptcy is becoming more widespread. It is subject to extensive state regulation because of the negative consequences of the activities of financially insolvent enterprises for the development of the country's economy as a whole.

These negative consequences are characterized by the following negative aspects: - a financially bankrupt enterprise generates serious financial risks for successfully operating enterprises - its partners, causing them tangible economic damage in the process of their activities. This reduces the overall economic development potential of the country;

- a financially bankrupt enterprise complicates the formation of the revenue side of the state budget and extra-budgetary funds, slowing the implementation of the envisaged state programs of economic and social development;

- ineffectively using the credit resources granted to it in commodity and monetary form, a financially bankrupt enterprise affects the reduction of the general rate of return on capital used in the sphere of entrepreneurship;

- forcibly reducing the volume of their economic activities due to financial difficulties, such enterprises generate a reduction in the number of jobs and the number of people employed in public production, thereby increasing social tension in the country.

Taking into account the foregoing, the mechanism of financial distress of enterprises should be regarded as an effective form of

redistribution of social capital with a view to its more efficient use. The concept of financial distress is characterized by its various types. In the legislative and financial practice, the following types of financial distress are identified:

1. Real financial distress. It characterizes the company's total inability to restore its financial stability and solvency in the coming period due to real losses of used capital. The catastrophic level of capital losses does not allow such an enterprise to carry out effective economic activity in the forthcoming period, as a result of which it is declared bankrupt legally.

2. Technical financial distress. The term used characterizes the state of insolvency of the enterprise, caused by a substantial delay in its receivables. At the same time, the amount of accounts receivable exceeds the amount of the enterprise's accounts payable, and the amount of its assets significantly exceeds the amount of its financial liabilities. Technical financial distress with effective anti-crisis management of an enterprise, including its reorganization, usually does not lead to its legal bankruptcy.

3. Deliberate financial distress. It characterizes the deliberate creation (or increase) by the head or owner of the enterprise of his insolvency; causing them economic damage to the enterprise in the personal interest or in the interests of other persons; knowingly incompetent financial management. The revealed facts of willful financial distress are prosecuted in criminal procedure.

4. Fictitious financial distress. It describes a deliberately false declaration by the enterprise of its insolvency with a view to misleading creditors for receiving from them a deferral (installment plan) for the

performance of their loan obligations or a discount from the amount of credit debt. Such actions are also prosecuted in criminal procedure.

Financial distress has been seen in different ways. One perspective is that it is specialized bankruptcy; others view it as genuine indebtedness where the liabilities of a firm surpass assets. Sometimes, it is determined one of the strict sense of liquidation while at different circumstances a firm is taken to be in financial distress when it starts to bring about financial losses prompting the disintegration of assets. A firm is viewed as a financially distressed firm when it isn't probably going to proceed with its operations or pay profits to its shareholders or pay wages and salaries to its representatives. A general perspective of financial distress is that it comes about because of a crisscross between the at present accessible liquid assets of a firm and its present commitments (John 1993). Financial distress does not really bring about the fall and disintegration of a firm. In a financial sense it could imply that a firm is losing cash – its incomes don't take care of its expenses. It could likewise imply that its profit rate is not as much as its cost of capital (Weston & Copeland 1992). A related definition would be that the present estimation of cash flow of the firm is not as much as its commitments. In still another case, it implies the association's real cash flows are beneath its normal cash flows – its projections have not been met. Accordingly, financial distress might be seen in differing ways.

There are different purposes behind any firm moving into financial distress (Pradhan 1986 and 1994). A portion of these reasons is government strategy, recessionary patterns, regular disasters, shortage of raw materials and power, an absence of good management, poor usage, advertising issues, deficiency of working capital, work inconvenience etc. Before a solid firm turns out to be extremely financially distressed, it

will first give signals and manifestations of financial distress. The signals of financial distress tend to begin with here and now liquidity issues took after by working losses, over the top utilization of outside debt and failure to meet commitments. Step by step these signals will rise into indications which might be reflected in a ceaseless decrease in showcase cost of offers, lack of finance, the decrease in liquidity, gainfulness, turnover and other financial ratios, default in the payment of materials, wages and salaries, interests etc.

Studies have been led on the advancement of factual models that are valuable for forecast of financial distress (Beaver 1966, Altman 1968, Deakins 1972 and 1976, Blum 1974, Bird and Mc Hugh 1977, Chen and Shimerda 1981, Horrigan 1979, Pradhan 1986 and 1994, et cetera). The significant feedback of each of these investigations is the restricted endeavors made to build up any hypothesis of financial distress that would determine the factors to be incorporated into the discriminant work. The exact approach of picking around 20 to 40 factors and after that utilizing a stepwise discriminant model to choose the factors in the last discriminant work has been utilized as a part of a few studies. This approach is constrained in its capacity to give generalizable outcomes with respect to what financial ratios are probably going to be reliable indicators. Consequently some more exercise is required in order to toss some light towards the improvement of hypothesis of financial distress.

## **2. Comparative predictability of failure of financial institutions using multiple models**

### **2.1. The reasons behind the Global Financial Crisis**

Banks and financial institutions are the backbone of a country. When banks go bankrupt it affects the economy of the country and risk of recession to the country and to integrated global economy. Asset markets would experience high level of volatility through huge movements in the exchange rates, interest rates and commodity prices. Banks and financial institutions must add risk management to their investments decisions, as the level of risk is unpredictable.

Financial risk cannot be forecasted as it does not rise by a single factor; it is a result of multiple exposures. If risk management system is implemented in the right way, it would help nullify systematic and market risks. However, if the bank does not follow zero tolerance for irresponsible speculation, the effect of risk management system would be nullified. Strategies for risk management should be revised with changes in market and requirements.

Many banks and financial institutions were affected in late 2017s due to Global Financial Crisis. Affected banks and financial institutions are merged, taken over by other banks or financial institutions, partly nationalized by the government, or liquidated.

Some of the reasons behind this crisis include: subprime mortgages, collateralized debt obligations, frozen credit markets, and credit default swaps. The purpose of this study is to determine the causes for financial distress which lead to bankruptcy of financial institutions and banks in the USA, Asia and Europe in late.

Understanding the causes would help the banks from taking projects that could lead to bankruptcy and increase capital for times of distress. Several models exist in the literature. I analyze and compare the forecasting ability of each of those models. These models are: Moody's, Standards & Poor's, Z-score model, and Vaziri's system. Using these models, I attempt to identify major signals and to find out if there is significance between their mean and deviations.

The major signals include: excessive loan/asset growth, excessive lending concentrations, deteriorating financial ratios, tracking loan recoveries to gross loan charge-offs, deposit rates higher than market rates, off-balance sheet liabilities, delayed financials, change in auditors, change in management, use of political influence, rumors in the money market, share price volatility, and deteriorating economy.

## **2.2. Crisis In The World**

An economic downturn like the 1997-98 Asian financial emergencies brought about hosed business certainty, poorer organization financial performance and expanded organization insolvencies. In a study by Cirmizi, Klapper, and Uttamchandani (2012), the 2007/2008 financial crisis influenced organizations around the globe bringing about diminished interest for merchandise and enterprises, withdrawal inaccessibility of business financing and a declining flow of between fringe investment funds.

There was an expansion in the level of insolvency among business elements because of declining interest in products and ventures and diminishing accessibility of outside back. Another study by Erkens, Hung, and Matos (2012) expressed that because of the expansive quantities of collapses in the financial foundations around the globe, there was a stop of global credit markets that requires far-reaching

government mediations. Shama (1978) found that shoppers felt more unreliable over their employment amid economic stoppages and their buying conduct changes with the changing economic conditions.

Organizations that are influenced all the more seriously amid economic crisis might be compelled to liquidate also, stop business, while others influenced less seriously may need to curtail their operations, saving a portion of their specialists, requesting that representatives acknowledge a littler remuneration bundle and discovering ways and intends to slice costs to stay competitive. The study by Koksai and Ozgul (2007), found that administrators are asked to either defer or desert investment ventures amid an economic downturn while the study by Ang, Leong, and Kotler (2000) found that businesses will experience cash flow issues as loaning organizations and providers are hesitant to offer good financial terms and clients default on their extraordinary credits or they essentially buy and spend less. The subsequent blends of tight financing, diminished request and fall in sends out, lessened customer spending and shopper slants will add to tight cash flows, declining cash positions, falling productivity furthermore, losses prompting potential insolvency and bankruptcy.

Crisis, in the expansive sense, implies precarious circumstance. Any extensive imbalance in financial markets at home and abroad caused by endogenous and exogenous market factors is called economic crisis. A portion of the crisis happen in the stock market (crisis 1929), some in the credit showcase (crisis 2007), some in the exchange market and some in the market of products. These emergencies influence a nation, a gathering of nations or even some of the time the whole world. Two extraordinary world emergencies, the crisis of 1929 and 2007, influenced the entire world that the previous started with falling stock

market and the last with falling credit showcase. There was a rise in the two emergencies; the crisis of the 1920s in the stock market and the current crisis in the land advertise. Expanded price of housing in the U.S started from 2001 and 2002 and developed progressively. This expansion in prices prompted the development of investment in this division and in the meantime gave permitted the development of requests for merchandise and enterprises that was trailed by the development of investment in different parts. Every one of these components caused the development of employment and greater success of economic exercises, so the housing price was expanding quickly and the housing rise in US economy was framing. At long last, the air pocket was blown and caused financial, credit and therefore financial crisis. Mortgage advance crisis in the U.S started nearly from late 2006 and rapidly spread to the managing an account system of the U.S and huge Credit Institutions of Europe. This crisis has spread to vast financial foundations and turned into a plague crisis in financial markets and furthermore prompted the sharp drop in stock prices. The bankruptcy of somewhere in the range of 163 of financial banks and establishments, which was the typical result of this procedure, caused pressure and worry in the financial markets, sharp drop of credits, economic recession, and expanded unemployment. The principle reason of the crisis 2007 must be looked in three zones: 1) Fake boom in the US housing market; 2) financial advancements in high-risk mortgage loaning; 3) absence of satisfactory supervision on the performance of stock exchanges, major financial establishments, and theorists in the worldwide capital market. Because of communications of the markets with each other (money and capital, work, merchandise and ventures), the crisis spreads from a market to another and now and again influences the entire economy. Amid the economic crisis, as long as the viewpoint of change isn't risen for various exercises and they don't see



things better, the desires have a tendency to decline the circumstance. The antagonistic impact of the emergencies develop in different structures, for example, high inflation rate, moderate economic development, across the board recession and falling employment, balance of payments deficit and so on and will be additionally reached out to different nations at the worldwide level. Following the global financial crisis, most nations have seen variances in their economies. Despite the fact that our nation has a shut economy, it speaks with the global economy through the three sections of crude oil, imports and fares. Consequently, the crisis influenced the nation's economy through these three components. Financial crisis not just influences genuine economic variables at the macro level, yet in addition impacts on financial variables and the ratios of business firms at the micro level. The global emergencies influence both the nations and the business level of organizations. In the meantime with the crisis, certain progressions have emerged in the organizations' financial statements. These progressions significantly influence the organizations' level of movement and getting. These issues negatively affected the gainfulness, getting, cash return and debt payment of the organizations. Benefit of business units amid the crisis tends to diminish that prompts negative rates of gainfulness.

Numerous looks into have been led in the field of the global financial emergencies. Some were hunting down the causes and arrangements, and some others try to foresee financial emergencies utilizing accounting figures and furthermore finding the approaches to keep from the event. A portion of the inquiries about was additionally looking to investigate the spread of the financial crisis to the markets of various nations and its effect on stock markets and macroeconomic variables. Inspecting the progressions made in the capital markets can uncover the effect of the crisis on a nation's economy. One approach to

look at these progressions is to analyze the organizations' financial ratios of previously, amid and after the crisis.

Malliaris and Urrutia (1987) investigated the stock market file of 6 distinct nations previously, amid, and after the Crisis of October 1987. At long last, they arrived at the conclusion that the Crisis of October 1987 was a global crisis likely happened in other capital markets at the same time. Bazdresch and Werner (1392) investigated the spread of the financial crisis in Asia, Brazil, and Russia amid 1997-1999 to Mexico.

They inspected the level of this spread by various statistical strategies. As per them, the best direct paradigm to inspect the spread of crisis is the expanded connection between's Mexican markets and different nations. In light of their outcomes, the crisis of Asia and Brazil has been compelling on Mexican capital market, while the crisis of Russia had no effect.

Furthermore, the proof proposes that businesses are attempting to help the liquidity structure amid the crisis, yet they look with a lack of liquidity. Robo and Istit (2014) investigated the effect of the global financial crisis on accounting data. They trust that the global financial crisis has prompted an imbalance in the economy and influenced the business condition. Keeping in mind the end goal to look at the effect of the global financial crisis on financial status and performance of the organizations recorded in Romanian Stock Exchange, they have investigated the effect of this crisis on a portion of the ratios speaking to financial status and performance. Their outcomes demonstrate the effect of the global crisis on some these ratios. Anagnostidis et al. (2015) analyzed the effect of the financial crisis of 2008 on the performance of 12 stock exchanges in Europe. They presumed that adjustments in the stock price before the crisis was more arbitrary. While amid the crisis,

the stock price changes were anomalous that prompted real wasteful aspects in the stock exchange. Erkens in 2012 investigated the effect of corporate administration components on financial organizations' performance amid the crisis 2012. His example comprised of 296 organizations from 30 nations (the nations for the most part influenced by the crisis). He reasoned that those organizations with higher autonomy of the managing board and higher institutional ownership have not suitable performance amid the crisis. The reasons are expressed as takes after: 1) the organizations with higher institutional ownership go for broke before the crisis, it brings about losses of the shareholders amid the crisis; 2) the organizations with higher autonomy of the managing board aggregated more capital from the equity amid the crisis, so it would exchange the riches from shareholders to creditors.

### **2.3. Effects On Global Crisis And Financial Markets**

During almost two centuries of the formation and development of the world industrial society, crises occurred in the economies of many countries, during which there was a growing decline in production, the accumulation of unrealized goods on the market, a fall in prices, the collapse of the system of mutual settlements, the collapse of banking systems, the ruin of industrial and trade firms, a sharp jump in unemployment.(Hertzel, 2006)

An in-depth study of the history of world financial crises and their causes will help in the near future to effectively overcome new, large-scale financial crises and their consequences.

The first financial crises did not have such a scale as the current one, but as international relations, globalization and trade developed, they became stronger and began to affect all sectors of life not only of developed countries but also of peripheral zones.

The first world economic crisis, which struck the national economy and public life at the same time, the United States, Germany, Britain and France occurred in 1857. The crisis began in the United States.

The reason was the massive bankruptcies of railway companies and the collapse of the stock market. The collapse in the stock market provoked the crisis of the American banking system. In the same year, the crisis spread to England, and then to the whole of Europe. There was a general decline in production in the developed countries of that time.

The next world economic crisis began in 1873 with Austria and Germany. The crisis of 1873 is regarded as a major international financial crisis. The prerequisite for the crisis was the credit rise in Latin America, fueled from England, and the speculative recovery in the real estate market in Germany and Austria.

In 1914, there was an international financial crisis, caused by the outbreak of the First World War. The reason - the total sale of securities of foreign issuers by the governments of the United States, Britain, France and Germany to finance military operations. This crisis, unlike others, did not spread from the center to the periphery, but began almost simultaneously in several countries after the belligerents began liquidating foreign assets. (McKee, 2000: 162)

1929-1933 - the time of the Great Depression.

October 24, 1929 (Black Thursday) on the New York Stock Exchange there was a sharp decline in shares, marking the beginning of the largest in the history of the global economic crisis.

Industrial production during this crisis declined in the US by 46%, in the UK by 24%, in Germany by 41%, in France by 32%. Stock

prices of industrial companies fell in the US by 87%, in the UK by 48%, in Germany by 64%, in France by 60%. Unemployment has reached enormous proportions. According to official data, in 1933 in 32 developed countries there were 30 million unemployed, including 14 million in the US.

In 1973, there was also the first energy crisis, which began with the submission of OPEC countries, which reduced oil production. Thus, black gold miners tried to raise the cost of oil on the world market. 16 October 1973, the price of a barrel of oil rose by 67% - from \$ 3 to \$ 5. In 1974, the cost of oil reached \$ 12.

Black Monday, 1987. October 19, 1987, the US stock index Dow Jones Industrial fell by 22.6%. Following the American market, the markets of Australia, Canada, Hong Kong collapsed. The possible cause of the crisis: the outflow of investors from the markets after a strong decline in the capitalization of several large companies.

And even the world financial crisis of 2008 was predicted. In America, the ruin of the oil markets was predicted, in Eurasia - the complete defeat of the dollar.

In the history of the economy, the sources of the crisis should be sought in 2006, when unexpectedly for all the house price boom suddenly fell. This trend accelerated in 2007 and became one of the factors in the collapse of the US market, which offered loans to individuals with a bad credit history or those who could not pay an advance payment. And already during February-March 2007, 25 companies that were engaged in the provision of such loans, announced their bankruptcy. It is clear that this immediately had a negative impact on the world stock markets and stock indices. (Bei, 2005: 73)

Over time, there were hopes that the crisis would be limited only to the financial sector, but it quickly became clear that its scale would be much larger than expected.

In the second half of 2008, the situation in many markets began to deteriorate rapidly, which forced governments one by one to announce the beginning of the recession. Therefore, 2008 was marked by the development and implementation of anti-crisis programs aimed at international coordination of national economic policies in order to resume economic activity.

If we talk about the real causes of the crisis, then, according to the leaders of the G20 (G-20), they are as follows:

Firstly, during the economic growth, increasing capital flows and long-term stability, market participants tried to get the maximum profit, but at the same time they did not adequately assess the risks and could not provide the necessary technical audit;

Secondly, weak underwriting standards, ineffective methods and instruments of risk management, the appearance of complex financial products, whose characteristics were difficult to understand, also contributed to the formation of systemic problems, resulting in excessive borrowings;

Thirdly, politicians, regulatory and supervisory institutions in some developed countries failed to adequately assess and respond to the risks that have accumulated in the financial markets, timely and adequately monitor the emergence of financial innovations or fully assess the impact of regulation;

Fourthly, the inconsistency and ineffectiveness of macroeconomic policy coordination, inadequate structural reforms,

which together led to serious disparities in the proportions and functioning of the market.

Thus, in the end, it is actually a complex combination of two groups of macro and microeconomic factors: (Manning, 2007)

1) Among the causes of the micro level is the propensity of economic agents to excess risk, which was provoked by a long period of economic growth and macroeconomic stability;

2) among the causes of the macrolevel should be called ineffective regulation and supervision of the financial market, inconsistent macroeconomic policies, the lack of structural reforms.

But behind each of these statements are complex and controversial economic processes, the nature and mechanism of action of which requires a deep and impartial analysis.

If we try to track the development of the crisis step by step, then we can reach a possible continuation in the future. We divide the development of the crisis into phases:

The first phase: The basis for the crisis

- high money supply (loans, balance of payments surplus, stock market growth, growth of foreign investments);

- high consumer demand;

- Rapid growth in asset prices, as demand outstrips supply due to significant unmet consumer demand.

Phase two: The onset of the crisis

- the flight of foreign investors from the stock market;

- a negative balance of payments is formed due to a decrease in export earnings, but also significantly higher import costs, as well as by

reducing the balance of the financial account (reducing foreign direct investment);

- the growth of the credit pyramid stops due to the global crisis (external shock), ceases to issue new loans, laid the foundation for the crisis;

- Consumption is still high (psychological factor - no one can recognize that the crisis began, because there was no culture of crisis in the country);

- To avoid currency risk, a massive release from the national currency begins, a sharp devaluation of the hryvnia occurs.

Third phase: Crisis (Manning, 2007)

- the stock market is reduced to the minimum values;

- the balance of payments is shifting from sharply negative to negative, as demand for imported goods is sharply reduced due to a decrease in revenues and their appreciation due to devaluation, the first phase of high demand for cash foreign currency is passing;

- the credit pyramid is collapsing, because it is no longer fueled by new loans, loan servicing is deteriorating sharply due to a decrease in market liquidity and general revenues;

- income from all economic entities is sharply reduced, due to the fact that an understanding of the revaluation of future incomes comes, so short-term high incomes fall, and the long-term outlook tends to zero.

The fourth phase: Fighting the crisis

- a sharp reduction in the costs of organizations;

- massive structuring of debts;



- bankruptcy of the most hopeless debtors, who do not have a chance to restructure;

- increase in refinancing of NBU banks;

- obtaining loans from international organizations;

psychological short-term optimism that the crisis is short-lived.

#### Fifth phase: Results of fighting the crisis

- Psychology is changing because of the prolonged crisis. Consumption is sharply reduced, thrift is increased, i.e. return to normal psychology of the person saving from the person wasteful;

- Enterprises and financial institutions with optimized costs still have to be kept at the expense of reserves (income received in the past), by restructuring loans, through loans from the government, the NBU and banks;

- Due to lower costs across the entire economic system, the decline in production intensifies;

- Due to the decline in monetary aggregates, which leads to a lack of non-cash hryvnia liquidity, as well as a decrease in consumption, there are short-term deflationary trends, which further increases the decline in production;

- any kind of middlemen become bankrupt and leave the market, as the value of assets drops sharply, and the margin from resale also decreases.

#### The Sixth Phase: The Second Wave of the Crisis

- A significant state budget deficit leads to the emission of hryvnia hidden and overt;

- Consumption of the population is declining, therefore, the received hryvnia issue goes to the foreign exchange market and provokes an even greater devaluation of the hryvnia;

- the growth of the world economy does not resume due to the same reasons as in Ukraine itself: the destruction of the credit pyramid, a change in the psychology of saving, in contrast to the psychology of consumption;

- Debt restructuring does not bring the desired respite, growth has not started, therefore, any negotiations on further restructuring of debts are terminated, securities holders use the right of offer. There are significant departures from the market and bankruptcy of financial institutions;

- an even greater devaluation, since investments accelerated the withdrawal from the market, there are no grounds for optimism, the hryvnia issue only strengthens the depreciation of the national currency;

#### Seventh Phase: Purification

- After a long period of bankruptcies and low consumption, surviving enterprises and financial institutions acquired highly optimized organizational structures;

- the population is rational in its consumption;

- The re-aligned rate increases export earnings from the sale of natural resources. Against the background of insignificant demand for imports, the export balance is increasing, giving a signal to foreign investors about the country's competitiveness increase.

- Consumption is growing, foreign direct investment is growing ... (Firminger,2003)

### **3. EARLY WARNING SENIORS AND RISK MANAGEMENT IN BANKS DEFINITION AND CONCEPTUAL FRAMEWORK**

#### **3.1. Early Warning Signals Concept and Development**

Emerging technologies, new regulations and globalization put the banking sector in a more complex and risky structure than before, and making credit risk management even more difficult by creating new elements that need to be followed. Depending on this situation, banks are carrying out system development studies to monitor and evaluate loan portfolios easily and effectively. These studies are one of the key concepts enhancing the effectiveness of credit risk management and include the development of qualifications in the course of examining credit indebtedness and the development of mechanisms to detect as early as possible possible credits that worsen or deteriorate during this process. All of the initiatives within this framework examine the financial performance of the borrower and the risk profile with structured quantitative assessments. All of these new approaches are "Risk Management" and Early Warning; system.

"Early Warning Systems" is a system in which one or more risk management models developed to detect possible risks that adversely affect or negatively affect the bank's total credit portfolio, taking advantage of all actual, current and potential future data, to provide effective credit risk and portfolio management is an indispensable element created by having an organizational specific structure. It is aimed at early warning systems to enable the bank management to develop appropriate customer strategies that enable the problems that

may arise in the loan portfolio or in the customers' financial situation and activities to be identified as early as possible so that the necessary precautions can be taken in time. (Levine, 2003)

In the early warning systems, from the processes described below; the company is investigating the potential for financial failure and the financial condition of the company. In the process of monitoring the problematic loans to be examined in the next section; the defaulting firm is focused on bankruptcy and the sinking potential of the credit.

The delay in detecting the problems limits the options available to the bank, as well as the chance to develop the risk profile. It is possible that such a system is possible with the existence and operation of the loan, as long as the risk that the loans given by the bank can not be collected is required. The most vital step in the process of monitoring a loan is to be the first bank to act prematurely by its counterparts in determining the likelihood of bankruptcy of the credit customer and taking the necessary precautions. Late-acting banks are rarely exposed to the disadvantages of a long and costly collection process, with the ability to collect. (Levine, 2008)

Macro factors include the risks that domestic and foreign factors can create. When measuring foreign risk, criteria such as the desire and ability of the borrower to fulfill its obligations, the extent to which the country is willing to fulfill the obligations of borrowers, the sensitivity of the country to the effects of internal / external social, political and economic changes are taken into account. Domestic risks are; economic structuring and management of policies, borrowing / liquidity / access to political factors, institutional infrastructure factors, political system and efficiency level, social system and environmental factors and other external factors. (Jones and Hensher, 1011)

Portfolio trends examine the current atmosphere and changes in the sector, the markets and the business world. Given the damages that may be caused by the effects of negative changes in these areas, the importance of a portfolio-based approach is obvious, apart from the analysis of individual loans. At this stage, the bank should set standards and targets, compare the performance with the actual performance, analyze the negative and positive effects, and act on the timely action by taking the attention of the bank management. (Leksrisakul, 2004)

The problematic credits arise when the economic situation of the operator worsens so that it can not pay principal installments and interests. Such a risk of damage arises especially in the following forms. (Kamath, 2006:97)

- Technical and financial adverse developments caused by failure sources based on a large number of internal and external factors,
- The adverse outcome of the loan financed project due to projected investment costs and basic deviations in expectations in terms of cost or revenue,
- Negativeities arising as a result of the depreciation of the assets that constitute credit guarantee.

As mentioned earlier, the early identification of such adverse factors is crucial to the practice of credit, in order to be able to apply measures to eliminate it at the time of risk. In general, it can be assumed that a number of indicators are stimulant in the worsening of the business situation, which has led to the creation of problem loans. If such stimulus signals are constantly monitored and correctly interpreted, it can be determined at the time of the impending danger. Thus, necessary measures can be taken before the problem is realized and the solution can be easier to find. Such early warning indicators can be grouped

under four main headings: financial criteria, administrative criteria, general criteria for business and bank operations. (Hertzel, 2006)

The most important of the early warning signs are liquidity problems of permanent quality, increasing borrowing requirement, decreasing profitability, unexpected drops in sales, the elements found in financial reporting and problems in accessing the bank. The easiest way to get these signals is to look at the financial tables. (Frino, 2009)

In this frame, the signals that can be obtained from the partner are as follows; (Firminger, 2003)

- Failure to take bilateral relations in time, significant changes in balance sheet structure,

- Prolonged collection of receivables, large increases in trade receivables, ?? Decrease in stock amount and rapid increase, slow down of stock return speed,

- Significant decline in the percentage of current assets in total assets,

- deterioration in the company's liquidity and operating capital,

- Concentrations rapidly changing in non-current assets other than fixed and fixed assets,

- Current, long-term and rapid disproportionate increase in bank borrowings, inadequate own assets and sales relative to borrowing, significant increases in the financing requirements,

- Frequent accountant changes, the income table can be obtained from the following signals;

- Declining sales, non-seasonal decline and fluctuations, increase in sales returns,

- Significant differences between rapidly growing sales, gross and net sales, increasing total assets relative to sales / profits,

- Increase in financing expenses, high cost borrowing, increase in costs and decrease in profit margins, increase in doubtful receivable losses,

The results obtained by examining receivables in the acquisition of early warning signals in financial matters also play a major role. The signals that need to be considered in this direction are as follows;

- Duration of sales periods, concentration of sales at specific customers,

- the age of the receivable age, changes in the credit sales protocol,

- Concentration of overdue receivables, protest of the bonds, debt-to-equity pen, receivables from group companies.

Signals obtained internally by the bank's transactions with the company are the most important of the early warning indicators and have vital preventive measures in place before the danger signs are received. The process of obtaining these signals includes all transactions between the firm and the bank, compliance with credit conditions, strict follow-up of collateral and credit. The following signals must be taken into consideration in this direction.

- The company is forced to pay debt securities, the credit limit is filled,

- The firm declines in funds and deposits in the bank,

- It is possible for the firm to meet the circuit interest rates with difficulty, to not fulfill its obligations on time,

- The existence of protest bills and unrecorded checks related to the company and its partners, negative bank intelligence, failure to obtain information about the financial situation,
- Memorandum bank risks go above company capacity,
- Applying for renewals in subsidiaries and discounts,
- Not being given guarantees on time, continuous renewal of checks and promissory notes without credit, increasing of protest rate in bonds,
- Large-scale short-term and borrowing for operational purposes,
- Large jump in the amount and frequency of loan requests,
- More funding than the old one.
- The groups that provide goods to the credit customers must request intelligence for the new loans and special frauds they will open to the company from the bank,
- Incorrect or bad planning for the purchase of fixed assets or the need for operating capital.

If the bank ignores or completely ignores these signals, then a more serious signal will be accepted to the bank. The problem with the loan repayment between the bank and the customer is manifested by the deterioration of the customer's relationship with the bank, the delay in payment of debts, the overrunning of the credit limit, the bad check, and the negligence of the terms of the loan agreement. Often third parties also warn the bank about the problem. (Ginoglou, 2002: 12)



### **3.2. Early Warning Situations In Bank Loans**

At present, a wide range of tools has been developed in the world practice that can prevent large-scale disasters and crises. One of the most common tools is the early warning system (hereinafter - the PSA). In modern conditions, individual methods of PSA are used to prevent currency crises (Beaver, 2005: 93), bank (Bei and Liu, 2005 : 73) and corporate bankruptcies (Berenson, 2009).

There are many definitions of applied nature, but there is no single definition, as well as unified universal PSA methods. For example, with respect to military conflicts, there is a definition: an early warning is an early warning to the competent authorities about the threat of a conflict to take preventive measures (Charitou, 2004: 455). At the conference in Shanghai, the following definition was proposed: the PSA is the social process of creating the most accurate information about the possibility of damage and ensuring that this information is transmitted to those who are at risk and those who need to protect ( Chi, 2006: 17).

It should be taken into account that special attention is paid to monitoring, forecasting crises and searching for indicators, which allow early detection of an increase in the likelihood of a crisis and warning of a possible danger.

Thus, the purpose of the early warning system is to provide such a volume of necessary information that allows us to assess the current situation, to forecast its development and to level out the possible consequences of the development of the crisis situation.

Proceeding from the declared target installation, the early warning system is a set of methods and mechanisms for collecting, processing and analyzing information on the development of the

situation in the financial and credit sphere and providing early warning of the occurrence of negative factors with a view to taking preventive measures and leveling the possible consequences of the development of the crisis situation.

World experience in the use of the PSA testifies to the wide use of specialized communication systems that allow the risk groups and responsible bodies to be correctly and within a limited time period.

H. Foster in 1980 introduced an idealized early warning system (Figure 1). (Darayseh, 2003: 23)

It seems possible to identify the main elements of an early warning system:

- identification and evaluation of external and internal threats, accounting for lessons learned from the past, collection and processing of information;
- preparation of the system for work, verification, training of personnel and groups of users;
- formulation of a warning and dissemination of hazard information for target groups and society as a whole, evaluation of response to a warning.

For the banking system, the following list of elements should be added to:

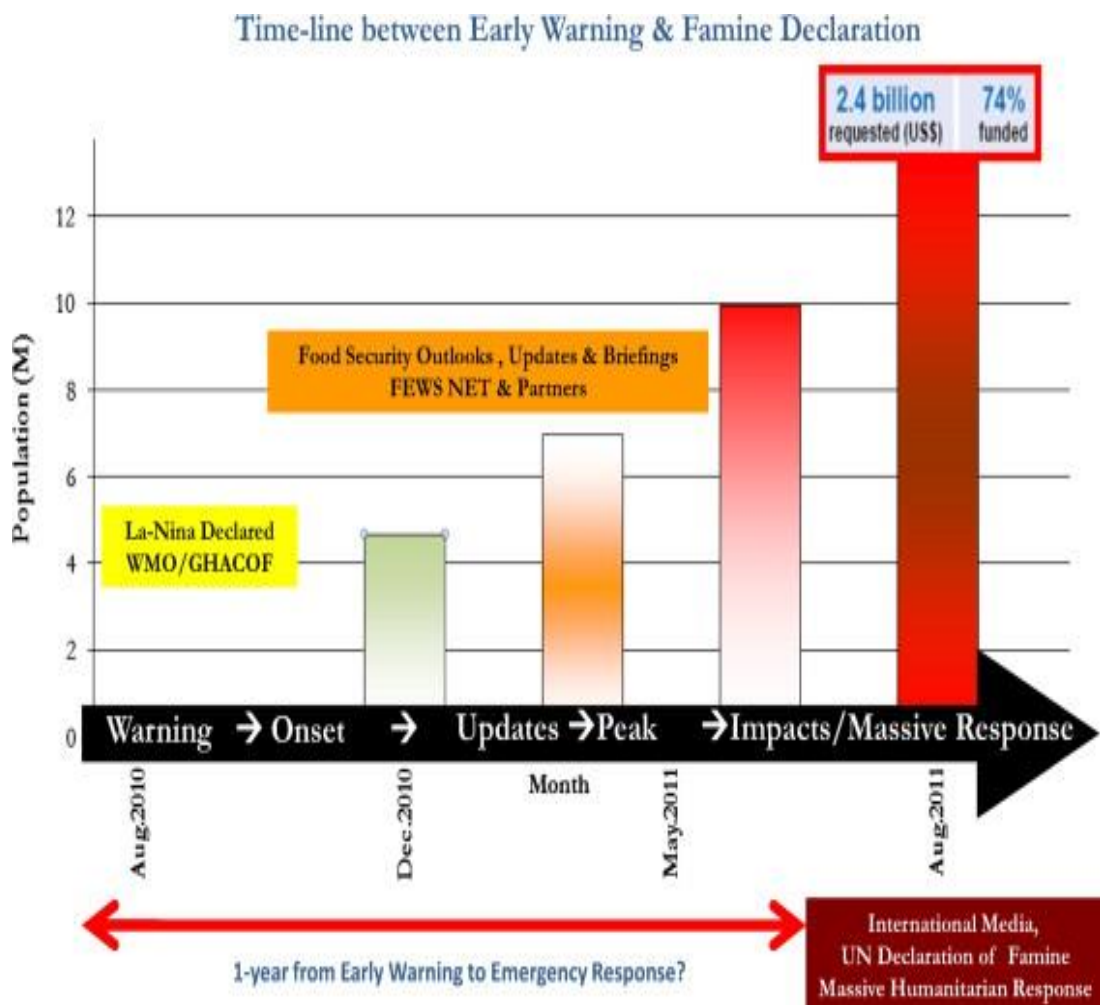
- forecasting possible crisis situations in the financial and credit sphere;
- development and application of preventive measures that exclude or reduce risk;

- development and implementation of effective response mechanisms.

Quantitative methods for assessing the financial performance of banks are based on the construction of various indicators, on the determination of their development trends, comparison of indicators with their average values for a group of homogeneous credit institutions. Some statistical early warning models are designed to assess the probability of occurrence of banking problems within a fixed period of time, others - to predict the loss of liquidity of banks based on forecasting future losses.

**Fig. 1.**

**The general structure of an early warning system for crises**



The input parameters for these models are fixed indicators of the development of the banking system and an individual bank, which can be estimated with a sufficient degree of reliability. The existing models do not take into account indirect indicators: quality of management, risk assessment, internal control, competitiveness and influence of external factors.

Therefore, existing systems only give a signal about the possibility of a crisis, without showing how stable the banking system or a separate bank will be to a change in external conditions.

Existing PSA statistical models, actively used by the supervisory authorities, use a mathematical tool to identify in advance banks with a growing risk level, forecast bankruptcy, etc. The table provides a brief overview of the methods used to prevent crises in the banking sector (Davis, 2005).

It is advisable to outline the following basic requirements for the development of a PSA for crisis situations in the banking sector.

1. It should be determined at what stage of the crisis development the warning system will function: during the period when the prerequisites for the crisis were formed; with the manifestation of the first symptoms; at the height of the crisis or at the stage of overcoming the consequences.

It is obvious that the PSA should work during the period when the prerequisites for the crisis are formed and provide detailed information on the first symptoms of the crisis.

2. Identification of the type of possible crisis serves as a basis for the creation of a PSA, determines its relevance. At the same time, it is expedient to take into account the interconnection of the main segments

of the financial market. Therefore, the PSA should distinguish between the first signs the type of crisis and, if possible, determine its character (systemic, local).

3. The target setting of the PSA is aimed at ensuring and maintaining the stable functioning of the banking system, assessing the possibility of its adaptation to the changed external conditions.

The PSA should have in its arsenal measures to prevent crisis situations, especially in the early stages of the crisis.

4. The hierarchy principle provides for the review of the PSA as an element of a higher-order system and determines the priorities of its goals and objectives.

If there are several options for the actions of the crisis prevention system, the one that most closely meets the goals of sustainable development of the country as a whole is given priority.

The system approach determines the formation of a crisis prevention system as part of the strategic planning process for the development of the banking system, a particular region and the country as a whole. This makes it possible to unequivocally determine the priorities for the functioning, tasks and place of the PSA in the structure of state and corporate governance aimed at sustainable social and economic development. If as a result of changes in external conditions there is a danger of a systemic crisis, the PSA should be able to make adjustments to the current socio-economic policy of the state.

The main task of the PSA is to prevent and reduce losses as a result of their occurrence by informing about the emergence of negative phenomena based on observation, analysis and forecasting at each stage of the crisis development, from the emergence of preconditions to its

development, overcoming the consequences and taking appropriate measures to ensure stable functioning banking system.

### **3.3. Comparison Of Banks Basic Risk Dividers And Management**

Large banks usually have two risk management committees: the Credit Risk Committee and the Asset and Liability Management Committee of the bank.

Responsibility for the implementation of the policy developed by the committee on credit risk is borne by the credit department. The operations department, the securities departments, international loans and payments, banking analysis, marketing are responsible for implementing the policy developed by the risk management committee related to assets and liabilities.

The Committee for Credit Risk usually includes: the head of the bank (the chairman of the committee), the heads of the credit and operational departments of accounting, the chief economist or head of the research department, the head of the unit for the analysis of credit risks, two or more other senior bank executives. (Denzin, 2008)

The structure of the Bank's Assets and Liabilities Management Committee includes: the head of the bank (chairman of the committee), the heads of the operating and credit departments, the chief economist or head of the research department, the heads of the financial control and accounting department, and several top-level managers.

Danne banking committees should:

create internal bank instructions on risk management;

determine the objectives of the risk management policy and bring them to the attention of the bank's staff;

if necessary, to delegate the authority to implement this policy and control the units and individual employees of the bank;

develop limits and standards for volumes, zones, types of risks, methods for their evaluation and regulation.

Credit risk is the probability of losses due to non-fulfillment, untimely performance or non-fulfillment in full of the borrower's obligations undertaken by the Bank, on the basis of the terms of the contract. Credit risk management components, monitoring of credit risks by the Supervisory Board, the Management Board and senior management, organizational structures, systems and procedures, issuing loans, measuring credit risks, managing loans, approving loans, monitoring and controlling credit risks, setting limits, granting of authority, management of problem loans. (Davis, 2005)

Market risk is the probability of losses due to unfavorable changes in the market prices of financial instruments and derivative financial instruments available in the banking trade portfolio, as well as foreign exchange rates and precious metals. Market risk management elements, monitoring of market risks by the Supervisory Board, Management Board and senior management, organizational structures, evaluation, measurement of credit risks, measurement of market risks by a simple method, risk accumulation, risk monitoring, risk control, audit.

Currency risk is the probability of losses due to negative changes in the foreign currency and precious metal interest rates where the banks are open in foreign currencies and precious metals. The main purpose of managing and controlling foreign exchange risks is to minimize the loss

of bank capital in the formation of assets and liabilities using foreign exchange. Currency risk management is carried out in stages:

Risk identification - definition of an open currency position and the risk of its exposure to risk; (Darayseh, 2003: 23)

Quantitative assessment of currency risk;

Setting limits.

Interest rate risk is the probability of losses due to adverse changes in interest rates on assets, liabilities and unbalanced instruments of the Bank. This risk is prone to all assets and liabilities sensitive to changes in the Bank's interest rates. To determine the potential volume of the interest rate of the Bank, the method of analyzing the interest rate gap (GAP - analysis) is used. In the GAP analysis, the level of imbalances in interest rate sensitive assets / liabilities is taken as the basis for the percentage risk. In addition, the sensitivity test of assets and liabilities sensitive to interest rates is applied, the effect of 1% increase and decrease in interest rates of the bank's net profit is projected. The spread of interest margin on the bank was set at 8%.

Operational risk is the probability of violations and errors related to the execution of internal business processes, personnel actions, the operation of information systems and technologies, and the likelihood of losses resulting from external events (as well as operational risks).

Liquidity risk is the probability of losses due to incomplete performance of the Bank's financial obligations; the risk of a shortage of liquid assets necessary for the timely performance of their duties.

There are two types of liquidity risk that can affect the bank's operations: (Chi,2006:22)



Inability to save enough money and securities to meet the requirements set for short-term cash;

Inability to receive additional financing.

Compliance risk is the probability of loss of profit or capital as a result of a breach or failure to comply with legislation, regulations, regulatory requirements, specified practices, internal policies and procedures, or ethical standards. This risk may expose the Bank to fines, payment of damages, non-fulfillment of contracts. Compliance risk can lead to a deterioration in credibility, a decrease in trust, a reduction in business opportunities, a reduction in the development potential, and a decrease in the client base. The basis of compliance risk is the clash between the interests of participants in the financial market due to non-compliance with rules and regulations.

Legal risk is the probability of making legal mistakes in the course of carrying out activities (improper execution of documents, improper legal advice), failure by the Bank or its counterparty to comply with the requirements of normative legal acts or concluded contracts, and the likelihood of losses resulting from the absence of a perfect legal system.

Strategic risk is the probability of losses due to insufficient consideration of mistakes made in making decisions that determine the Bank's business and development strategy and possible mistakes that could adversely affect the Bank's operations, misidentification of promising areas where the Bank will gain advantages over competitors, lack of necessary resources and organizational arrangements necessary to ensure the achievement of strategic goals in the activities of the Bank.

State risk - (including the impossibility of transferring funds) - is the probability of losses due to non-fulfillment of obligations by foreign

counteragents (individuals and legal entities) due to economic, political, social changes, as well as the impossibility of being at the disposal of the counterparty of the monetary obligation due to features that take place in the legislation of the country, the currency of which expresses this circumstance.

The system of decision-making on risk management in the Bank is distributed in the following order: (Charitou,2004: 472)

Risk management department - bank risk management, all kinds of risks, global limits

Credit Committee - to summarize credit risks, state risks, payment risk and credit portfolio

Board of Directors - for operational, legal risks

Audit Council - strategic and organizational risks

Treasury Department - market, interest rate risk, liquidity risk

Structures that manage risk and their authority:

Supervisory Board - determines the acceptable levels of all risks faced by the Bank in the course of its activities and ensures the creation of an effective risk management system that correctly defines, evaluates and controls them. In this regard, the Supervisory Board confirms the organizational structure that carries out risk management and all rules and procedures for risk management.

Despite the fact that the Supervisory Board is fully responsible for risk management, administrative responsibility is imposed on the Board.

Board - The Board creates an organizational structure that is approved by the Supervisory Board and carries out risk management, prepares all rules and procedures for risk management.

Internal Committees - Committees that can make independent decisions on risk management in a bank are organized from several members of the Management Board who have detailed information on banking activities and who have a specific responsibility for risk management in the bank, as well as senior managers of the bank's structural divisions.

Credit Committee (KK) - carries out credit confirmation and manages loans

The Risk Management Committee (CSD) - Manages the different risks to manage existing risks and manages the activities of internal committees “Strategic Planning Group” - defines the risk policy for information technology and manages IT risks.

The Risk Management Department is a structural department that manages all the specific risks that a bank may face in carrying out its activities and exercising appropriate control in this area. The Risk Management Department monitors the Bank's performance of activities within the limits of risk limits approved by the Supervisory Board. The Risk Management Department ensures the identification of all the specific risks that each operational department faces as a result of activities, the preparation of rules and procedures for their management, and the preparation of job descriptions for each employee in the field of risk management. The Risk Management Division also discusses possible risks and informs the CSD about the measures that must be taken urgently. (Berenson, 2009)

Control of risk management in "Bank Silk Way" OJSC is carried out in the following hierarchy:

Strategic level - The Supervisory Board and the Board ensure the recognition of risk, the definition of the bank's risk profile, determines the risk management strategy and policy, the construction of an adequate system and control to ensure an acceptable level and compensation of risks.

Macro level - Reflects the control and management of risks in the spheres of business and business areas. Risk management activities are carried out by specialists and structural departments engaged in risk review in the relevant categories.

Micro level - carried out by persons taking a risk on behalf of the Bank, for example, front ofis and the structural department that issues the loan.

“GAP (GAAP - Generally Accepted Accounting Principles) - Analysis” Liquidity risk management tool and interest rate risk by measuring the deficit between assets and liabilities for an advance time deficit; the closing price of the liquidity deficit and the quantitative assessment of the effect of changes in interest rates on the Bank's net interest income (on interest margins).

## **4. EMPIRICAL RESEARCH**

### **4.1.Data and methodology**

The financial institutions selected for this study are from the USA, Asia and Europe. 100 banks are selected as samples of which 3 are acquired banks, 17 are helped by the government after the crisis, 20 banks have claimed bankruptcy and 60 of them are active banks. The

banks are studied for 10 years (2001 to 2010). The reason for choosing this period was that most banks went bankrupt at this time. There was less information about bankrupt banks as they were not acquired or merged.

Moody's, Standard and Poor's, The Hedge, the Z-score model and the Logit model, four methodologies were chosen for analyzing financial distress and bankruptcy.

Different financial ratios required for the models were calculated and analyzed. To find if there were any risk management system at place the policies and procedures for lending were studied and the bank's liquidity was identified using risk management models. To find if there were any government regulations that influenced the failure of banks, secondary data was collected and studied.

## **4.2. Moody's financial ratios.**

Moody's system helps a bank to find out the probability of default and if default occurs how much will be the loss. Moody's model helps to identify if a bank is efficient to pay off its debt. It also helps investors to find if the bank is capable of asset and shareholders' equity into profit. It helps to identify if the banks are liquid enough to pay off their short-term debt.

Ratios used in this paper to analyze it is as follows: Interest Coverage Ratio (EBIT/Interest Expense, EBITDA/Interest Expense) and Asset Coverage Ratio could be used to find if the financial institution are capable of paying their leverage.

The excess cash available for interest payment shows that there is less risk involved. Leverage ratios (Total Liability/Total Asset,

Equity/Total Liability, Short-Term Debt/Equity Book Value) is used to determine the debt of financial institution.

The higher the ratio, the higher is it's debt and the more risky it is. Liquidity Ratios (Current Asset/Current Liability, Intangible Asset/Total Asset, Cash/Net Sale, Working Capital/Total Asset, Cash/ Total Asset) can be used to determine if banks have enough liquid assets to meet their short-term debt obligation. Ratios must be higher to reduce the risk. Profitability ratio (ROA) determines if banks have some earnings after their expense to estimate how profitable the institution is. High percentages are indicators that the bank is doing well.

### **4.3. Standards & Poor's financial ratios.**

S&P's system can be used to determine the probability of bank's default. It helps to find, how much the banks are in debt and to find if they can pay off their debt.

This method shows if the banks have made profit with the money they borrowed. It includes ratios like Coverage ratios (EBIT/ Interest Expense, EBITDA/ Interest Expense, Net Operating Income/Total Debt) which could be used to find if the financial institution are capable of paying their leverage. The excess cash available for interest payment shows that there is less risk involved. Leverage Ratio (Total Debt/EBIT, Total Debt/EBITDA, Total Debt/Capitalization) is used to determine how much the financial institution is in debt.

The higher the ratio, the higher is it's debt and more risky it is; and Profitability ratios (ROE, Net Operating Income/Sale) which help to determine if the bank is doing an idle investment with the shareholders' investment by generating profit.

#### **4.4. Vaziri's model.**

The system includes a number of interest rates on Moody's and S & P's system and other financial ratios such as the productivity rate that can be used to determine whether the bank is sustainable or at high risk. The model of the bank determines how much the banks are leveraged and how they will pay their debts.

It also helps to determine whether the banks are effective and can profit from the money they borrow. The model of Vaziri helps explain why banks are bankrupt in the long run.

Interest rates on this method include: Coverage ratios (Current Ratio, Quick Ratio, Cash Rate, Time Interest Rate), Leverage ratios (Total Liabilities / Total Assets, Short Term Debt / Equity Book Value, Equity / Total Liabilities) ROE), Net Revenues / Sales, Retained Earnings / Total Assets, EBIT / Total Assets, Net Profit / Total Assets and Productivity Ratios (Asset Revenue, Fixed Savings, Inventory Turnover, Net Operating Capital Inventory).

#### **4.5. Z-score model.**

For Z-score, I analyzed the model which is established by Edward I. Altman. Altman applied the statistical method of discriminant analysis to a dataset of publicly held manufactures. The estimation was originally based on data from publicly held manufacturers, but was re-estimated based on other databases for private manufacturing, non-manufacturing and service companies. In this paper, I use Z-score models for predicting bankruptcy which was developed by Altman (1968, 1983, 1993) for non-manufacturing industries.

Financial ratios are one of the data that can be utilized as a tool for anticipating the performance of the organization, including data about potential bankruptcy prediction helpful for some individuals, particularly with respect to creditors and investors. In 1968, Altman Edward presented a formulation that serves to anticipate the potential bankruptcy of an organization. Altman through trials by taking an example of organizations that have experienced bankruptcy that specific financial ratios have "predictive power" than others in anticipating financial troubles (financial distress) and bankruptcy. Altman has discovered five financial ratios which can be utilized to distinguish the bankruptcy of the organization, known as Z-score.

In his examination, Altman utilized an example of 33 sets of organization bankrupt and not-bankrupt the correct formulation of the model and can distinguish 90% of bankruptcy cases in 1 year before the bankruptcy happened. During the time spent determining the Altman Z-score utilizes statistical systems by utilizing various discriminant investigation (MDA). MDA can be utilized to determine the variables that separate the gathering identifier existing populace, can likewise be utilized as a grouping criterion. MDA for the most part is  $Z = V_1 (X_1) + V_2 (X_2) + \dots + V_n (X_n)$  where  $V_1$  and  $V_2$  are parameters (weights) while  $X_1, X_2, \dots, X_n$  the financial ratios that add to predictive models.

By basing the financial ratios of the Z-score model Altman effectively used to characterize organizations into groups that have a high likelihood of bankruptcy or a gathering of organizations that are probably going to encounter bankrupt low Z-score model Altman permits to foresee bankruptcy for up to 2 years before the bankruptcy happened.



#### 4.6. Ratio analysis of Kapital and Access Bank

It is known that ratio analysis is involved to determine condition of the company and define which gaps have in the company to moves it bad situation. It is able to identify the future status of the company. In this analysis was used some ratios. From the liquidity ratios is taken current ratio and also from the profitability ratios is taken gross profit, net profit and return on asset ratios. Not only is utilized these ratios also solvency ratio was used in this research. Solvency ratio include debt/asset and equity ratio. In our research was taken 2 main banks of Azerbaijan. They are Kapital bank and Access bank. These banks are very popular in Azerbaijan. If we look at their statements, for example specialy p/l statement we will see that the loss of Access bank is 56 million 380 thousand AZN and profit of Kapital bank 94 million 839 thousand AZN. The main purpose taking these banks, one of them to finish year end with profit the other finished year with loss. Ratio analysis will be involved from 2013 year to 2017 year and will be tried to define what is a reason of them which the financial performance of one company is so good, another is not good. Also will be tried to predict some forecasting or information. To do this analysis was taken information from the balance sheet and profit/loss statements of 2 banks. The below table is given the ratios of Access bank and Kapital bank.

Access bank:

Ratios	2013	2014	2015	2016	2017
Currentasset/current liability ratio	1.04	1.03	1.00	0.92	0.90
Debt/Asset ratio	0.91	0.92	0.93	0.95	0.92
Debt/Equity ratio	8.90	9.99	11.76	19.18	11.27

Gross profit/sales	0.72	0.69	0.64	0.52	0.38
NI/sales ratio	0.22	0.21	0.01	0.20	0

Below table is refer to Kapital bank:

Ratios	2013	2014	2015	2016	2017
Currentasset/current liability ratio	1.21	1.26	1.16	1.11	1.12
Debt/Asset ratio	0.83	0.79	0.86	0.89	0.88
Debt/Equity ratio	4.93	3.67	5.89	8.22	7.53
Gross profit/sales	0.59	0.78	0.69	0.54	0.57
NI/sales ratio	0.53	0.53	0.48	0.40	0.40

The top of the table is shown some ratios. First of all if we look at the movement of the current ratio, we will see that the result of ratios decrease during five years in Access bank. It means that Access bank could pay its short-term obligation in the 2013 and 2014 years, but after these years it could not pay all of short term obligation. Year by year its short-term liability increases and its current asset can not cover its liability. And after 2015 year its ratio goes under 1. So to prevent like this condition the bank should convert short-term obligation to long-term liability or it can gather its receivables faster. But if we look at current ratio of Kapital bank it will show that all indications more than 1. It means Kapital bank can easily cover its current asset to current liability. It is right that these numbers are changable year by year but all five years

numbers is shown that this bank is good situation and is not expected any dangerous in the near future.

According to solvency ratio of Access bank is looking at 2 ratios. At first lets look at debt/asset ratio. Debt/asset ratio means the debt of the bank is in which part of the its asset. It is clear that if the debt is less than its asset, it is most suitable for bank. Access bank debt/asset ratio increases from 2013 to 2016 year. It is not good case. Because this is told us liability of the Access bank increase year by year or in contrast the asset decreases. To continue such as case can bring distress for Access bank in the future. However the last year its indication was 0,92. This is also not available result. The more the result is near 1, the more the company will face distress. In contrast, in the Kapital bank the results of this ratio are far from 1. It means their debts does not make more part of asset than Access bank. And if we pay attention this table we are able to see the ratios of Kapital bank does not consistently increase such as Access bank. The results are changable in the Kapital bank. In generally, the purpose of the soveny ratio calculation to define the stability of the company or bank. Another solvency ratio is debt/equity ratio. This ratio is also different between Access bank and Kapital bank. This is indication of total debt makes which part of the equity of the bank. In this calculation also it is significant that to be debt less than equity is most favourable. According to Access bank debt/equity ratio changes each year. For instance, it increases first four years but only decreases the last year. To be more ratio is not suitable for bank. Because of it is shown the debt is more than equity. If we compare the results of 2 bank we will realize that the indications of Kapital bank is more suitable than Access bank indications. Obtained numbers showed that Kapital bank results are less than Access bank at least two times. We come to the conclusion that Access bank can meet failure more than Kapital bank.

There is risk for Access bank, but the condition of the Kapital bank is normal. Both two banks should consider like this ratios and try to eliminate problem before goes bankruptcy.

Profitability ratio is most well-known. During prediction frequently is used from profitability ratio. In our investigation we have used three profitabilty ratio. They are gross profit ratio which is calculated gross profit/ sales. The other ratio is net income ratio. It is also calculated NI/ sales. And the last ratio is ROA. The calculation of it is NI/ total asset. These ratios was applied both Kapital bank and Access bank. Gross profit to sales ratio increased first two years. Due to this ratio it is useful result. But after 2014 obtained numbers went down until 2016. But in the 2017 again this ratio went up in Kapital bank. Generally to be g/profit more is suitable for banks. For this reason the result of 2014 year is more useful for Kapital bank. This ratio notice us gross profit makes which part of total asset. High gross profit is significant for banks. If gross profit makes high part of sales it means that the cogs is less. And the more this ratio is over the 0.5, the more banks indication is well. G.Profit/ sales ratio was very good in the Kapital bank during 5 years. It means this bank more prafitabilty. And if we pay attention, each year ratios are near each other and there is not an consistently minimizing. But Access bank g.profit/sales ratio decreaeses each year. It means each year its g.profit goes down and its cogs increases. It may be related to also its sales. Continuing process showed that the profit of the banks each year decrease. Each year bank faced with financial distress. Not only g.profit but olsa should looking at its net profit. Financial distress affects profit of the banks. Also the amount of the profit affects future financial distress. They are interrelated each other. NI to sales ratio can help us to identify to obtained net profit which part of the banks sales. Each bank wants to make a lot of sales and get more profit, specially

more net income. But should consider its expense that expense of some banks may be more, some banks may be not more. NI to sales ratio is almost stable in the Kapital bank. Approximately it changes between 0,40-0,53. It is good numbers. However the last 2 years it went down but generally this indication showed net profit from sales is significantly good in Kapital bank. There is no like this situation in the Access bank. There indicatios is very low and year by year goes down. It is related to n income. So Access bank can not get enough net income from its sales. According to this analysis we can predict that Kapital bank will continue near future with profit, and this bank will be able to pay its all obligation with its resources. Although we will not able to tell such opinion to the Access bank. Due to this investigation we saw that both its ability of paying and the amount of net income is not enough well. For these reasons Access bank can face with difficulties. The main goal of this investigation to show the role of financial ratio that to do ratio analysis to help determine gaps and it can help to forecast about future the company/bank.

## **4.7. Findings and results**

Subprime mortgage loan was the main reason for the bankruptcy of all banks and financial institutions. Nearly 80% of the mortgages that were given out were adjustable-rate mortgages. The price of housing went up in mid-2006 and fell after that which made it impossible to refinance.

Securities that used subprime mortgages lost their values and led to failing economy. This entire problem began when US government was giving only 1% interest for Treasury bond and lending money. Banks started borrowing more money, and they had li-mited rules regarding

lending money to people. They started taking more risk by financing to everyone, even people with damaged credit history.

This type of loan rose from \$100 billion in 1999 to \$625 billion by 2005 (Bloomberg, 2011). Government wanted more home owners and they were more interested in revising more regulations than implementing them, such as Basel II (Michael McAleer, Juan-Angel Jimenez-Martin, and Teodosio Perez-Amaral, 2009).

Feds oversight was also one of the reason behind bankruptcy of so many banks (Bloomberg, 2011). Other than government regulations that led to bankruptcy, some banks also had internal problems. American International Group, Inc. (AIG) had change its management in 2005 when Greenberg was replaced by Martin J. Sullivan. AIG's credit rating had reduced a lot leading to liquidity crisis in September 16, 2008. Sumitomo Trust & Banking Co. Ltd., was affected by the changes that occurred in Japanese banking financial structure. Abbey National bank gave out many mortgage loans in 1980's for 15 years. With the fluctuation in interest rates the bank extended loan payments which led to the downfall with the subprime mortgage crisis. Northern Rock was greatly affected by the U.S. subprime mortgage crisis.

The Moody's model predicted that 11 banks had a year before the bankruptcy of banks, and that the two banks would be bankrupt before 10 banks went bankrupt. Of the 20 banks opened for bankruptcy, 18 were applied in 2010 and 2 in 2011.

Studies show that models can predict perfect bankruptcy two years before the file. The percentage of correct guesses ranges from 69% to 76%. This indicates that this model is 72.5% reliable on average. At the same time, this model shows that most banks have a high leverage ratio and have less liquidity.

S&P's model, though shows that percentage of correct prediction is 80%, lacks to predicts the failure of banks in advance. The correct prediction of failed banks is only 5% in 2010 and 2009 and only 35% in 2008 and 2007, which shows that it is not reliable in predicting bankruptcy.

Vaziri's model predicts much better than Moody's and S&P's model. Percentage of correct prediction is almost 80% for all years and percentage of correctly predicted failed banks is 45% before two years of actual failure.

Of all the models Z-score gives the best prediction. It's prediction percentage of failed banks is 80% and shows 75% correct prediction before two years. Shareholders can relay more on this model.

## **CONCLUSION**

In this research, I analyzed several existing methods of institutional failure and test the signaling ability of each method in predicting the bankruptcy beforehand. The financial institutions selected for this study are from the USA, Asia and Europe. 100 banks are selected as a sample of which 3 of them are acquired banks, 17 of them are helped by the government after the crisis, 20 banks have claimed bankruptcy and 60 of them are active banks. The banks are studied for 10 years (2001 to 2010). I analyzed Moody's financial ratios, Standard and Poor's financial ratio, Vaziri's financial ratio, Altman's Z-score and discriminant analysis.

The Moody's model predicted that 11 banks were one year before the bank filed for bankruptcy and that the two banks would be bankrupt

before 10 banks went bankrupt. Of the 20 banks opened for bankruptcy, 18 were applied in 2010 and 2 in 2011.

Studies show that models can predict perfect bankruptcy before bankruptcy two years ago. The percentage of correct guesses ranges from 69% to 76%. This indicates that this model is 72.5% reliable on average.

At the same time, this model shows that most banks have high credit leverage and less liquidity. The S & P model shows 80% of the correct percentage score, without any predictability of bank failures. The correct estimates of unsuccessful banks are only 5% in 2010 and 2009 and only 35% in 2008 and 2007, which indicates that bankruptcy is not predictable.

The Hood model is much better than Moody's and S & P. The percentage of true estimates is almost 80% over the years, and the percentage of failed banks that were not correctly predicted is 45% for actual malfunction within two years. Both models show that they are 50% reliable. The best prediction is given by the Z-estimator of all models. The percentage of failed banks is 80%, and the correct estimate is 75% two years ago. Shareholders can switch more to this model.

Analyzed are such reasons as the labor market, politics, economics and political results. Examples are banks or financial institutions from Europe, America and Asia. The sample was taken from the same period to analyze the effects of various methods.

In our research also was taken 2 main banks of Azerbaijan. They are Kapital bank and Access bank. These banks are very popular in Azerbaijan. If we look at their statements, for example specialty p/l statement we will see that the loss of Access bank is 56 million 380 thousand AZN and profit of Kapital bank 94 million 839 thousand AZN.



The main purpose taking these banks, one of them to finish year end with profit the other finished year with loss. Ratio analysis will be involved from 2013 year to 2017 year and will be tried to define what is a reason of them which the financial performance of one company is so good, another is not good.

I determined that Kapital bank can easily cover its current asset to current liability. It is right that these numbers are changable year by year but all five years numbers is shown that this bank is good situation and is not expected any dangerous in the near future. If we compare the results of 2 bank we will realize that the indications of Kapital bank is more suitable than Access bank indications. Obtained numbers showed that Kapital bank results are less than Access bank at least two times. We come to the conclusion that Access bank can meet failure more than Kapital bank. There is risk for Access bank, but the condition of the Kapital bank is normal. Both two banks should consider like this ratios and try to eliminate problem before goes bankruptcy.

According to this analysis we can predict that Kapital bank will continue near future with profit, and this bank will be able to pay its all obligation with its resources. Although we will not able to tell such opinion to the Access bank. Due to this investigation we saw that both its ability of paying and the amount of net income is not enough well. For these reasons Access bank can face with difficulties. The main goal of this investigation to show the role of financial ratio that to do ratio analysis to help determine gaps and it can help to forecast about future the company/bank.

The results of this analysis should help future researchers find the most important method that can be used to describe risk; so that

measures can be taken to prevent or eliminate the consequences of the offspring, which may lead to future work.

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