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Macroeconomic linkage of exchange rate pass-through to domestic prices in Azerbaijan: with the application of ARDL econometric model

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ABSTRACT

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This diploma work was related the exchange rate risks are analyzed using econometric methods. Using ARDL (Autoregressive Distributed Lag) models, the paper examines the macroeconomic linkage of exchange rate pass-through and domestic prices in Azerbaijan. The degree to which changes in the exchange rate pass through to prices is an important economic issue in Azerbaijan.

The work is divided into five chapters. As above, Chapter one presents a general introduction to the study and motivates the importance of this research. Chapter two reviews the theoretical and empirical framework underpinning the study. Then, Chapter three provides the description of data and methodology. Chapter Four specifies the model and provide an analysis of the empirical results. Finally, Chapter five concludes the study.

The empirical results show that ERPT to import prices is immediate and moderately high reaching a peak within three quarters for the ARDL models respectively. In contrast, ERPT to producer and consumer prices is gradual.For instance, long-run ERPT is below for producer prices and for consumer prices. Moreover, the results indicate a high of producer price shocks to consumer prices. In sharp contrast, the extent of pass-through of import price shocks to consumer prices as reported in the ARDL in the short run and declining.

Table of Contents

LIST OF TABLES

LIST OF FIGURES

Chapter 1.Introduction to the study

1.1 Introduction

One of the main indicators used in the analysis of macroeconomic indicators when economic literature is analyzed is exchange rate. Besides the variables such as imports, money supply, FDI (Foreign Direct Investment) and oil prices, the exchange rate is also included to explain the inflation variable in the regression. In this study, the exchange rate risks is analyzed using econometric methods. This research, also with using ARDL(Autoregressive Distributed Lag) models the exchange rate producer"s and consumer prices that examines the impact of the macroeconomic linkage of domestic prices in Azerbaijan. In this thesis, the determinants of the exchange rate pass-through to domestic inflation in Azerbaijan economy is investigated. The degree to which changes in the exchange rate pass through to prices is an important economic issue in Azerbaijan.

In this thesis, the determinants of the exchange rate pass-through to domestic inflation in Azerbaijan economy is investigated. Exchange rates, especially in developing countries, have been for many years is at the heart of macroeconomic policy debates. The biggest reason is that many of the changes in exchange rates are in the economy. Especially as more export Azerbaijan to make more imports in countries that have to do, in exchange rates the shocks are expected to have a greater impact on the economy. One of these effects is the effect of changes in exchange rates on domestic prices. In the last part of the thesis, an econometric analysis has been made on the Azerbaijani economy.

1.2 Background

In this 21 century,every individual organization has to survive in dynamic environment by considering all the changes within the economy. Nowadays,globalization trend in the world keeps on changing and having different implications like CPI(Consumer Price Index),GDP(Gross domestic product),growth

in MS(money,supply) and others.Globalization is the continuous process of growth among states,that is determined by the openness of trade ,foreign direct investment and capital along with technological and structural changes.

1.3Context of the study

The study is divided into five chapters. As above, Chapter One presents a general introduction to the study and motivates the importance of this research. Chapter two reviews the theoretical and empirical framework underpinning the study. Then, Chapter Three provides the description of data and methodology. Chapter Four specifies the model and provide an analysis of the empirical results. Finally, Chapter Five concludes the study.

Chapter Two of the study provides a discussion on the definition of terms, an analysis of the channels of ERPT and its determinants. The determinants of pass-through also play a role in influencing the speed at which exchange rate fluctuations feed into domestic prices. Empirical literature reviews the evidence of ERPT in advanced and developing countries.

Chapter Three analyses the most commonly used methodologies in estimating ERPT, their respective strengths and weaknesses. The discussion follows a historical approach, which is, starting with the ARDL models.Also covered in the chapter is a review of the various data measurement challenges in pass-through studies. Lastly, Chapter three provides an outline and the sources of the data.

Chapter four begins with the specification of the ARDL model and the Cointegration tests utilised in this study. The specification of the model is followed by an analysis of the short- run empirical results in Azerbaijan using impulse response functions and variance decompositions.

Chapter Five concludes the study by reflecting on the analysed literature, main empirical findings and how these results address the research objective outlined in. The chapter also discusses the limitations of the study and possible areas of future

research that can be conducted to enhance knowledge on the impact of exchange rate variations on domestic inflation.

1.4 Objective of the study

The purpose of this study is to analyze the macroeconomic linkage of exchange rate pass-though to domestic prices in Azerbaijan using ARDL econometric model.Another words this paper is to investigate the relationship between exchange rate risks, producers and consumers prices focusing on domestic prices. Also, this study would have following another objectives based on issues describes above as research problem. For instance,primary objectives are included - to determine to analyze the impact of ERPT(Exchange Rate Pass-Through) on CPI(Consumer Price Index),to identify the power of ERPT on domestic prices in Azerbaijan,to find out the impact of ERPT on (LargeScale Manufacturing),to know the effect of ERPT on domestic prices,to find out the impact of ERPT risks on growth in MS(money supply). In order to achieve the primary objective,the following therotical objective were formulated for this study:define and review literature EXPT,identify the role of domestic prices,define and review literature macroeconomic linkage,define and revire literature ARDL econometric model,Analysis of the similar studies,comparison of the studies faund through the literature review,description of the process used to study this paper content.Also, Empirical Objectives consist of to investigate the relationship between illustration of the ARDL model amongst Model estimation Techinique,to investigate the relationship Approach to Cointegration Testing amongst ,the steps of the ARDL Cointegration Approach.

1.5 Ratinale and Significance of the study

The results in this study can help to understand how exchange rate shocks affect domestic prices. To further strengthen this knowledge, research into the presence of ERPT asymmetry can help to deepen understanding. Similarly, there is also need to investigate ERPT at disaggregate price level across different sectors or industries in Azerbaijan. The analysis of ERPT is

important in determining a country's optimal monetary policy mix. Exchange rate movements have a strong bearing on the monetary policy that a country should adopt. The choice of an optimal monetary policy is more important especially where the country is under an inflation targeting framework, for example Azerbaijan. Low pass-through credits the implementation of inflation targeting and provides more autonomy to pursue independent monetary policy.

Chapter 2. Review of Theoretical and Empirical Literature

2.1 Introduction

It is worth highlighting the impact of macroeconomic policies on the exchange rate. At the same time, we should not forget about the dependence of the results of macroeconomic policy on the system of the existing exchange rate. At the moment, the restrictions for the Azerbaijan Republic have become much more substantial and can harm the Azerbaijan economy already in the near future. A large structure of empirical and theoretical literature studies the pass-through from the exchange rate to various domestic price measures. As it is stated in the context, most of the empirical and theoretical studies on exchange rate pass-through are concerned with the pass-through to import prices. This chapter is divided into two main sections: the theoretical approach to the questions and the empirical literature review on exchange rate pass-through (ERPT). The first section provides a theoretical discussion on the definition of ERPT followed by an analysis of channels and determinants of pass-through. The route of ERPT relate to the transfer mechanisms which rate of exchange variations influence internal prices. The section on determinants of pass-through covers the factors that affect the speed and magnitude of transmission of exchange rate variations. These factors include but are not limited to exchange rate volatility, inflation environment, market structure, monetary policy and pricing behavior of firms. The second section on the overview of empirical literature is divided into three categories: discussion of empirical evidence of ERPT ; Empirical Literature Overview among developing economies; and a specific section about

empirical evidence on ERPT in Azerbaijan and concluding remarks. On the off chance that the degree of trade rate pass-through is low, that's , in the event that purport costs react as it were weakly to developments within the trade rate, the expenditure-switching impacts will be little, in this way constraining the short-run alteration part of ostensible trade rates and subsequently the allure of adaptable trade rates.

Monetary policy, adequate to the prevailing macroeconomic conditions, plays a significant role in achieving macroeconomic stability. At the same time, the state authorities have a desire to solve economic problems with the help of monetary policy, maintaining the rate of national currency at one level or another. This raises the question of how this level is due to the fundamental economic indicators of the country. That is why the question of the correspondence of the exchange rate to a certain "equilibrium" value is an important and urgent problem of macroeconomic analysis. The high volatility of the exchange rate seems undesirable because it has a bad effect on international trade and economic growth.

Numerous studies have shown that in the long run, there is a return of the real exchange rate to a certain trend. However, in the medium and short-term periods, steady deviations of the course from the long-term trend can be observed, which can arise for various reasons: overheating of the economy, global macroeconomic imbalances, economic policy, etc.

In recent years, up to the onset of the economic crisis in 2008, the Azerbaijan manat has almost continuously strengthened in both nominal and real terms. At the same time, this trend had both positive and negative sides. On the one hand, the strengthening of the ruble leads to a decrease in the competitiveness of Azerbaijani goods, and, therefore, the Central Bank of the Azerbaijani Republic is advisable to prevent the further strengthening of the national currency. On the other hand, according to various estimates, the equilibrium exchange rate of the ruble before the 2008 crisis was much higher than the actual one. In such a situation, we can say that the Bank of Azerbaijan is successfully implementing monetary policy, restraining

the growth of the ruble exchange rate. Moreover, the excessive obstruction of the ruble strengthening leads to an increase in the money supply and inflation, which causes the strengthening of the real exchange rate of the national currency. During the acute phase of the economic crisis in the winter of 2008-2009 there was a significant depreciation of the manat in both nominal and real terms, and since spring 2009, the real exchange rate of the national currency has resumed in the Azerbaijan Republic. In our opinion, the question of how fundamental the post-crisis ruble strengthening is due to fundamental factors is also a subject of interest for the study.

The next problem that arises in determining the real exchange rate is the choice of weights with which it includes bilateral rates. Suppose that the national currency has risen against the currency of some other country. Then imports from another country will become cheaper relative to imports from all other countries. Therefore, it is logical to assume that the share of imports from a country with a cheap currency will increase, which will lead to a change in weights if the weights are calculated taking into account the share of imports of a particular country in total imports. If weights are calculated based on the export share, then similar reasoning is applicable. When calculating the weight can be changed both continuously and discretely. In fact, it is a choice between accuracy and convenience of construction. A detailed description of the various methods for accounting for changes in weights over time is given in Ellis. The choice of scales is determined by the task. For example, when studying the effect of the exchange rate on the prices of imported goods in the domestic market, weights can be used as shares in the import of a given country of the main countries, trading partners. Consider the main types of scales used in the calculation of real effective rates.

Multilateral weights, calculated on the basis of the share of countries in world trade, do not have this disadvantage. They better reflect the role of other countries in determining competitive pressure on exporters of a given country in the foreign market. However, unlike bilateral scales, they do not take into account competition in the domestic market. For example, with the use of such weights, the bilateral

exchange rates of the national currency relative to the currencies of countries with a greater weight in world trade will be given a big weight. However, if these countries trade little with our country, then the effective exchange rate calculated using such weights will not speak much about changes in the competitiveness of domestic producers in the domestic market in relation to imports.

2.2 Theoretical Overview

2.2.1 The key concepts

Exchange rates are among the foremost vital macro financial prices, influencing many aspects of an economy. This post introduces exchange rates and their importance for macroeconomic alteration. There are a lot of determinants and variables which affect exchange rate. Determinants of the nominal exchange consist of three broad categories of determinants. Determinants of the nominal exchange rate consist of : variables on the "real" side of the economy ; monetary and financial variables decided in cross-linked markets; past and expected values of the same financial market with its autonomous dynamics. The original variables contains exports, imports and trade balance which their affects to the demand of the currency targets at unique transactions. At last years, the progression towards powerful economic integration among world economies has made changes in exchange rate as a determinant of domestic inflation and trade processes of countries. Before providing an overview of the theoretical literature, it is considerable to provide a discussion of the different concepts to be constantly used in this study.

2.2.1.1 Exchange Rate Pass-Through (ERPT)

On the whole, rate of exchange is comparison between internal exchange and external exchange. The exchange rate strategy divided into two parts which could be fixed or floating. The Floating exchange rate occurs when Central Bank do not interfere any market transactions to boost it is value and stay neutral. This actions cause the price would determines from both international and domestic markets. However, fixed exchange rate happens when Central Bank decides to interfere and

make some deeds to keep and also improve value of currency. Central bank main reason to influence the value of money , because of international market. Every currency have value which compared to other countries value. Every country wants their money value bigger in order totake immense proportions against other competitive currencies.

The real exchange rate (RER) is defined as the relative national price levels between two economies. It is explained , that appropriate nominal exchange rate being an helpinger to transform the unit of account such that two price levels are measured in a single currency. Its subject is not only the currency or exchange rate, on the other hand. This note offers to define the real exchange rate of a currency as the nominal exchange rate regulated for relative purchase power.

Additionally, real effective exchange rate is the nominal effective exchange rate adjusted for change in the level of prices or other indicators of production costs, characterizing the dynamics of the real exchange rate of the country to the currencies of countries - major trading partners. The real effective exchange rate index is the main indicator characterizing the generalized dynamics and direction of movement of the main currencies. In addition, it is one of the main indicators characterizing the change in the competitiveness of countries in the world the market. If the real effective exchange rate of the national currency rises, then the country's competitive position on the world market is deteriorating: exports become more expensive, and imports, on the contrary, become cheaper.

Thus, the nominal exchange rate reflects the cost currencies of a given country in relation to currencies of other countries, and real - serves as a measure of competitiveness. Real exchange the rate is the nominal rate multiplied by the ratio of prices within country and abroad. The equation for calculating the real exchange rate is written as follows:

$$Q = S * \frac{P*}{P},$$

Where Q is the real exchange rate (expressed in units of the national currency per unit of foreign); S is the nominal rate; P - price level inside the country, and an asterisk indicates the value of the corresponding parameter abroad.

Exchange-rate pass-through is the impact that when the worldwide market changes so that a country's currency changes in value relative to others (the exchange rate), it will also affect prices within that country's economy. As well, ERPT is defined a measure of how responsive universal prices are to changes in exchange rates. Currencies could use in investments, transactions and many financial sectors. . It also determines purchasing power and their economic power of every country.

ERPT could be analyzed with the delivery chain. It could be either pass-through to trading system or customer prices.

The word "pass-through" firstly used in economics writings which written by Steve Magee (1973).There Steve explains the impacts of currency devaluation. This concept today used in literature broadly. Dourbusch model has considers mode of Dixit-Stiglitz (1977) and the Salop model (1979) of competition to restrict the effects of defective the product differentiation on price answers to the alteration in the currency. Despite the fact that the rate of exchange pass-through has long-lasting of interest which aim of this interest has flourished significantly over time. Early of 1980, after a long debate over the rule of one price and convergence over countries, Rate of exchange pass-through studies strained industrial association theories. The Function of segmentation and also price discrimination over geographically different goods markets were strongly studied. Few years ago, pass-through problems had played a key rule friendly conversations over related both monetary policies as well as ultimate exchange rate law in conventional equilibrium models. These debates have broad suggestions for attitude of the monetary policy, also macroeconomic stability, and finally efforts which includes immense fluctuations in the trade and universal capital flows.

Weights based on the shares of countries trading partners in trade, export and import:

One of the most frequent approaches to building effective rates is to choose as a weights a measure of the importance of the country's trading partners, namely, the share in the foreign trade turnover (exports + imports) of each country according to the balance of payments. When applying such weights, it is assumed that the more one country trades with another country, the more important is the bilateral exchange rate between them for evaluating the effective exchange rate of each country. In other words, if trade with any one country is of decisive importance for our country, then it is the bilateral exchange rate of the currency of our country in relation to the currency of this country that more weight should be attached when calculating the effective exchange rate.

The disadvantage of choosing such a system of scales is that they take into account only bilateral trade, thus not paying attention to the so-called "third country effect". That is, they do not take into account the fact that exporters of a given country face the foreign market with competition due to the existence of third countries exporting the same goods. Moreover, it is not at all obvious that the third countries mentioned are trade partners of the given country. At the same time, the exchange rate of the national currency to the currency of such a third country can grow, reflecting a decrease in the competitiveness of exported products, and this is not taken into account when calculating the effective exchange rate, since the weight of a third country in trade with our country is minimal. Thus, bilateral weights take into account only competition in the domestic market between imported goods and similar goods from domestic producers, because a high share of a country in foreign trade with our country means that it is most likely that it is the national that have to compete with imports from that country.

Multilateral weights are inferior to bilateral and in terms of ease of construction. To calculate the former, it is necessary to collect substantially more data for all countries, including those that are not trading partners of the given country and may not collect data of the required quality.

The "third country effect" mentioned above, weights based on third-country exports are used. When building them, more weight is given to countries whose basket of export goods is closer to that for the given country. In other words, to calculate such weights, it is necessary to determine the shares of the world's largest exporters in those markets to which the bulk of exports from the country in question is supplied. In case of Azerbaijan, when using such weights, the greatest weight in calculating the effective exchange rate of the ruble would be the exchange rates of the ruble to the currencies of those countries that are key players in the global market for energy, metals, fertilizers, and forests.

2.2.1.1.1 Incomplete ERPT

Devaluation of country's national currency is normally anticipated from the results of raising price of imported goods. If the consequence of devaluation of money was completely observed from import prices, it means the pass-through model was advised to be complete. If only a tiny portion of the devaluation is reflected from import prices, it would say that pass-through model is the depicted as a partial. Pass-through model in import prices depends on some components which includes expectations of the devaluation, the amount of the adjusting prices, and demand. Pass-through procedure comprised in two stages. Initial stage contains of the exchange rate actions and import costs. However, in second stage, modification in import charges are conveys to customer prices.

The extent to which those alteres are reflected in the consumer price index (CPI) depends on the share of imports.This applies to the prices of both intermediate and final imported goods.For intermediate goods, an increase in the price of imported inputs would translate into higher production costsin the consumption basket.

As a rule, in any case, a change in the exchange rate will affect consumer prices through an additional channel such as, currency depreciation, which leads to higher prices for imported goods, in turn, will increase the demand for domestically

produced goods that compete with imports . When demand increase, there would be increasing trend on internal prices in goods and nominal budget.

2.2.1.1.2. The implications of ERPT on monetary policy

A acceptable explanation for the decline in exchange rate pass-through involved that the degree of market segmentation has increased also, a larger proportion of goods are subjected to price discrimination across international markets.

This process suggests that endogenous procedure does rely on state economy. Monetary policy also the inflation cause environmental factors. A decade ago, various industrialized countries lowered their inflation rates and joined a period of relatively stable prices. A few spots might contribute to this trend. In many cases deals that shifts in the direction of reasonable monetary policy would play important role.

The fact that this transition to a low-inflation environment coincided with a formalized decline in the exchange rate, popularized the view that these two phenomena may be related.

Taylor's research was one of the first to formally formulate the hypothesis that low inflationary environments in several industrialized countries successfully reduced the rate of exchange rate penetration to domestic prices. He argued that the transfer of the exchange rate is, above all, the constancy of payment per unit, as well as price shocks, which tend to decrease in conditions when inflation is low and financial policy is credible. In addition to being intuitively appealing with anecdotal proof, this scientist's hypothesis is also consistent with the recent theory of political economy and is supported by empirical evidence. Theoretically, theoretical models, direct linkage exchange rates, and inflationary circles, have emerged as part of a novel literary economy with an open economy (NOEM). Chudri and Hakura (2001), such as the Taylor Channel (2000), describe in the context of the DGE 's supplementary competition with the uncompromising competition and contracted contracts. In their model, the low-inflation mode reduces the end-to-end

transmission, since the latter reflects the expected impact of financial shocks on current and future prices, which, in turn, are reduced by using the low-inflation mode. Two scientist (Devreux and Yetman) also explore the relationship between cross-cutting and financial policies in the context of the DGE structure. In their model, pass-through transfer is determined by the frequency of changes in value among commercial companies, and this frequency may be a mainstay of the financial policy regime. Countries firms wherever financial policy is additional credible can tend to change their costs comparatively less frequently, resulting in a lower degree of pass-through in the short run however not within the future. Finally, Devereux, Engel, and Storgaard (2003) additionally develop a econometric models linking pass-through to financial policy. At last, Devereux, Engel, and Storgaard (2003) conjointly develop a DGE model linking pass-through to financial policy. In their framework, the mixture degree of pass-through is decided by the currency during which the price of foreign product is pre-set. In contrast to earlier studies, however, wherever the selection of currency of denomination is exogenous, the authors show that countries with comparatively stable financial policies can tend to have a prevalence of LCP within the economy. This suggests that a additional stable financial policy is related to a lower degree of pass-through.

Finally, Devereux, Engel and Storgaard (2003) are jointly developing the models, which links the transition to financial policy. Within their framework, the degree of confusion is determined by the currency in which the price of a foreign product is set in advance. However, unlike earlier studies, where the choice of currency for a denomination is exogenous, the authors show that countries with relatively stable financial policies may tend to dominate the LCP in the economy. This suggests that a additional stable financial policy is related to a lower degree of pass-through. Although it's declined in recent years, empirical proof suggests that pass-through is partial (and therefore that industrial countries are best characterised as economies).

Thus, additional analysis is required to see the optimal style of financial policy in the case of partial passage of the exchange rate. Empirical proof additionally

suggests that pass-through to imported product is above pass-through to shopper costs. Indeed, as mentioned in the section on empirical estimates, it seems that the transition to import costs, although not complete, is extremely high. On the other hand, the transition to consumer prices since the early 1990s seems to be very low. Therefore, a higher rate of transfer of import costs may mean that there is a possibility of the exchange rate to act as a shock absorber, regardless of whether the transfer of costs to the buyer is very low. As Engel (2002) mentioned, as soon as this assumption concerning completely different rates of transition to import and consumer spending is included in economic science models, the best financial policy no longer provides for fixing the exchange rate.

Trade between countries has a long history and is influenced by various factors. At the same time, the dynamics and structure of export and import of countries always has been the subject of attention of the respective governments, which regularly tried to achieve beneficial changes in these indicators, stimulating the development national exports, especially high value-added goods, and suppressing the growth imports, especially competing with local producers, using various impact factors. Accordingly, the more simple to use any factor of influence, more motives were to use it, while failures in foreign trade are logical. It was explained by more active use of this factor in competing countries. It seems certain that on the development of exports and imports in the first. The following factors affect the queue: trade barriers (tariff and non-tariff), as well as the size, dynamics, structure of supply and demand in the markets interacting countries. However, the introduction of trade barriers, although quite simple measure, but may be accompanied by similar countermeasures trading partners, and the impact on the size and structure of the market is quite complex and long-term task for the government.

In such conditions, over many decades of the last century, governments of a number of countries attached great importance to the exchange rate factor, despite the obvious negative economic consequences that bring manipulations with the exchange rate of the national currency (especially devaluation).It was believed that

increasing the country's exports and suppressing its imports could be achieved through the weakening (devaluation) of the national currency, and strengthening will accordingly have the opposite (negative) effect on export and at the same time stimulate import growth.

Thus, it is obvious that the theoretical legacy that has developed in exceptional period of development of international economic relations retains influence at the level of decision-making in the field of foreign trade policy. In fact, the exchange rate continues to be currently regarded as one of the most powerful and determining factors, among all others, on foreign trade. Therefore, it may seem that such an approach confirmed by the theory of international trade. However, this is not the case if would briefly review its main provisions.

Classical theory based on the works of A. Smith and D. Ricardo, about absolute and relative (comparative) advantages of various countries in their foreign trade, uses the concept of price, or replacement cost. But they are expressed not in monetary units, but through the amount of working time, spent on the production of comparable goods, that is, the exchange rate is simply not could be present in this model. Although during the development of the classical theory in the world economy experienced a greater variety of monetary systems than in modern period.

In this study, special attention is paid to the asymmetry of the effect of the transfer of the exchange rate to inflation. Analysis performed for shows that domestic prices react differently to uniform exchange rate changes in case of strengthening and the weakening of the national currency. This characteristic of the transfer effect is still has not been studied in papers addressing the impact of the exchange rate on inflation in Azerbaijan.

The real effective exchange rate is calculated by averaging the weighted values of the indices of real two-way exchange rates using the geometric average formula. As was to be expected, the dynamics of the series obtained on the basis of weights, based on the statistics of Azerbaijan's foreign trade, are almost the same. At the same

time, the results show that the real effective exchange rate of the manat index, calculated using countries' shares in global GDP, indicates a much more serious manat appreciation in the pre-crisis period than can be assumed based on Central Bank of Azerbaijan data. Moreover, after the end of the acute phase of the crisis at the beginning of 2009, the real effective manat exchange rate, taking into account the share of countries in world GDP, continued to grow faster than according to the Bank of Azerbaijan.

2.2.1.1.3 ERPT to consumer prices

First, local distribution prices, such as transportation, marketing, and service prices, can lead to discrepancies between import and customer costs, and a wedge between the two costs can fluctuate if distributors change their profit margins in response to changes in rate.

Secondly, as mentioned in Bacchetta and van Wincoop (2002), the differences in the optimal valuation of foreign wholesalers and domestic retailers will justify why the cost transfer to the customer is under the share of imports in the CPI, even if the transition to import costs are completed. In fact, this discrepancy may occur if foreign exporting firms set prices for their goods in the currency of the exporter, while local retailers resell these goods at a price in the national currency. However, as discussed earlier, prices for domestically produced goods usually respond to changes in the exchange rate, and this gives an additional reason why the transfer rate of consumer prices should not be equal to the share of imports in consumption basket, even if the passage to import prices is completed. It should be emphasized that the degree of transfer, by construction equal to 1 for these prices, is most likely calculated by empirical transfer estimates for Azerbaijan. Empirical evidence confirms that the rate of transfer of costs to the buyer is less than the share of imports in the consumer basket.

2.2.1.1.4 The transmission channels of Exchange rate pass-through

Transmission stages of ERPT covers on a distribution chain. The distribution chain is split into 3 stages:production, at the purpose of importation and consumption.Underneath this classification, the transmission of charge per unit changes to domestic prices is then analysed at every stage of the distribution chain. Conversely, some studies like classifying the transmission mechanisms of charge per unit movements to domestic prices into direct and indirect channels of pass-through.

The analysis of pass-through along the distribution chain is divided into two main stages. The first stage relates to the impact of changes in exchange rate on the import and export prices, widely known as the impact of exchange rate fluctuations at the dock. The second stage involves, analyzing the subsequent impact of changes in import prices due to variations in the exchange rate on other aggregate prices, meaning producer and consumer prices.

The theoretical hypothesis is that any change in import prices whether of finished goods, capital goods, raw materials or intermediate goods should eventually lead to changes in both or one of the producer prices and/or consumer prices. In general, the degree of ERPT on the second stage is lower than the first stage of pass-through. This difference is because the price indices on the second stage of pass-through include prices on non-tradable goods which are not directly affected by movements in exchangerates.Moreover, the producer and shopper costs are littered with alternative factors like domestic taxes. The wholesalers and retailers of products could absorb a number of the rate of exchange changes. In literature, some students solely analyse pass-through at the primary stage whereas others analyse each the first and second stage of pass-through. All of this refer to Distribution Chain Channel.

Another transmission channel of Exchange rate pass-through consist of direct versus indirect channel. The direct channel of ERPT refers to things during which associate appreciation or depreciation ends up in a modification in import costs. As a results of the modification in import costs, production and client costs also will

modification. The next modification in producer and client costs can happen if producers arrange to change their prices so as to match the dynamical price of production from the rise in import prices. Within the same manner, define the direct channel because the transmission of rate movements to import, producer and client costs via its impact on prices of foreign intermediate product. This transmission implies that the first impact of rate changes in domestic prices is through dynamical the domestic currency value of tradable product. Direct channel of pass-through are often discovered once charge per unit movements impact on domestic inflation via its effect on foreign inputs and finished product. In general terms,the depreciation of a currency results in higher import costs for intermediate product.

This reaction important costs to fluctuations within the rate of exchange is probably going to carry in the case of little and open economies.

Also the direct channel divided into 2 sub-channels; either through the modification in value on import inputs or through the change of tradable foreign finished merchandise. The primary sub-channel works through the impact of charge per unit changes on cost. for example, depreciation in an exceedingly currency can result in a rise within the value of foreign capital merchandise, raw materials or intermediate merchandise that consequently have an effect on production prices. Ceteris paribus, corporations are probably to reply by increasing the costs of their product. The rise in production prices can successively end in higher shopper costs. This sub-channel is in line with the proposition created by of analysing ERPT on the distribution chain.

The second sub-channel relates to the impact of fluctuations of the charge per unit on costs of foreign finished merchandise. This is often probably to be the case if corporations importation tradable finished merchandise plan to consequently increase costs in native currency to avoid engrossing the upper buying value of the foreign goods. The factors that confirm whether or not corporations can plan to absorb or depart this world the burden to customers are lined in section.

The magnitude of ERPT is possibly to be complete for foreign final product betting on the market structure and currency of evaluation being employed by the importation firm. Capital product and raw materials are probably to possess low pass-through particularly at the consumption level. Moreover, the ERPT of capital product might also be low as a result of these goods are utilized in the assembly of different goods for a protracted time. Parts that are foreign for collecting so exported are probably to not have an enormous impact on the native market. However, they'll have a control on the potential financial gain which will be generated through the export sector. Similarly, pass- through is probably going to be additional on tradable product than non-tradable goods.

The indirect channel operates via the result of rate variations on the competiveness of a country's product and services relative to foreign markets. Any changes within the aggressiveness of a rustic that influence mixture demand also will have a sway on the web exports. The modification in relative costs in favour of the domestic country makes domestically made product cheaper to the foreign market, so increasing foreign demand.

As a consequence, the rise in combination demand thanks to the increase in foreign demand can exert associate degree upward pressure on domestic prices .Currency appreciation will cause deflationary effects by reducing import costs.

İndirect channel depends on the degree of cross-substitution of trade partners between domestic merchandise and foreign products in each the domestic market, also was included foreign market. For example, depreciating a currency may increase domestic demand for local goods while increasing external demand for local goods. Growth in domestic demand due to by the very fact that foreign tradable merchandise that are denominated in domestic currency become comparatively costly.

It may additionally be indicated because the expenditure switch result of charge per unit depreciation. In distinction, the rise in foreign demand for domestic

merchandise is as a results of the goods changing into comparatively cheaper within the foreign market.

Like the direct channel, the indirect channel may also be additional divided into 2 sub- channels; with reference to whether or not the products are finished goods or inputs. If products that are facing increased foreign demand domestically created tradable finished goods, domestic companies can increase costs in order to preserve profits. Compared, if the demanded product are principally intermediate goods, producer costs are seemingly to increase: then eventually shopper prices will rise. Many researchers like better to rather divide the indirect channel into the wage inflation impact and therefore the competition effect.

The result of wage inflation is determined by the ratio between changes in wages, as well as the price of production. As associate degree illustration, if the rate of exchange depreciates it'll cause a rise in worth of foreign consumption product and at the same time the getting power of workers' with fall. Within the short run, nominal wage contracts are sometimes mounted. Therefore, once a rise in domestic prices, real wages are possible to say no while output will increase. However, over time employers are forced to extend nominal wages so as to atone for the autumn in getting power, however this can cause a rise in cost and domestic inflation.

The explanation for the competition result is that the same as in a deprecation of a currency changes relative costs between commerce countries and boosts domestic demand that successively ends up in higher domestic prices. Summarises, the excellence between the direct and also the indirect channel.

Additionally, exchange rate depreciation divided direct effects via import prices and indirect effects via competitiveness. Imports of finished goods become more expensive and Imported inputs become more expensive, this analysis belong to direct effects via import prices. As well, the part of demand for expert rises and demand for substitute goods rises indirect effects via competitiveness.

Consumer prices integrated all this factors also, consist of market structure, inflationary environment, pricing policies, product substitutability, number of non-tradable products in the distribution of all tradable products.

The analysis of the transmission mechanisms of charge per unit changes to domestic prices mentioned on top of would possibly produce a bearing that ERPT is often complete. In different words, the discussion creates a bearing that any change in charge per unit ends up in a proportional change in domestic prices.

2.2.1.1.5 The determinants of Exchange rate pass-through

There are plenty of cluster the factors that have an effect on the speed and magnitude of ERPT to domestic prices into political economy and economics factors. These factors either weaken or strengthen the impact of rate fluctuations on domestic prices. a number of the factors mentioned within the literature embrace rate volatility, financial policy and inflationary surroundings, the rating behavior of corporations, the dimensions and openness of a rustic and therefore the persistence of rate shocks.

In general, exchange rate volatility, monetary policy and inflationary environment, market structure and pricing behavior of firms, pricing policies, product stability include ERPT determinants.

There are numerous factors that cause charge per unit to fluctuate. Factors like a country's charge per unit regime, the independence of the financial organization, the degree of openness of an economy, inflation and the other unexpected hocks play a very important role on the direction of the charge per unit. Many economic expert believes that within the past, excessive cash creation by central banks was the most supply of charge per unit and value instability in countries. The deduction from this observation is important that should be done a correlation between movements in charge per unit and domestic inflation in response to financial shocks. There are several economic science variables that have an effect on the degree of pass-through .One among them is charge per unit volatility .As an example, a high degree of volatility suggests that a additional frequent change in charge per unit.

This frequent modification could force importers to regulate their profit margins instead of perpetually dynamic costs. There in case, ERPT is probably going to be low. This reaction additionally links to however corporations understand the change in charge per unit.

The general agreement within the literature is that the degree of ERPT has conjointly declined over the past 20 years . Taylor (2000: 1390) credits this decline in inflation across the world to the changes in financial policy stance over the years. a rustic with a additional stable financial policy and low inflation is more possible to possess low pass-through (Goldfajn & Werlang 2000: 6). In support, observes that nominal shocks will cause additional volatile exchange rates and inflation in an setting wherever financial policy is unstable. An unstable financial policy might even cause a powerful correlation between nominal rate of exchange fluctuations and domestic inflation. Using a staggered worth setting model Taylor (2000) proves that low inflation environments are completely related to with low degree of ERPT. The low degree of ERPT looks that the modification in financial policy stance by central banks that light-emitting diode to the decline in inflation within the previous couple of decades has contributed to the declining speed and degree of ERPT. In support, McCarthy (2000) highlights that countries with stable inflation environments are possibly to even have low ERPT.

Market Structure and pricing behavior of firms is another important determinants of ERPT. Magnitude of ERPT depends on 3 factors, namely: value snap of demand, value snap of provide and therefore the sensitivity of the rate to firms' value structure. İf a firm's merchandise face inelastic demand within the market, it becomes easier to extend its costs once rate depreciation. Production corporations are unlikely to vary their costs if the value of their inputs is a smaller amount awake to changes in rate. During this instance, corporations might choose to absorb the tiny changes in value by adjusting their mark-ups so as to take care of market share. The reaction of corporations to a change in the payment per unit additionally depends on the extent to which they set the market share over the profit.

If charge per unit changes are appeared to be prolonged, corporations can amendment their costs. However, wherever they believe the change in charge per unit is temporary they are doing not change their costs or they alter prices by little margins. The rating behavior of companies and market structure also can be accustomed make a case for the explanations why ERPT is preponderantly incomplete. Commerce companies could arrange to hold costs constant however change their mark-ups on prices once the charge per unit changes. The adjustment of mark-ups rather than costs has conjointly robust support from the Post-Keynesian value theory of the firm. The Post-Keynesian worth theory of the firm postulates that a firm doesn't continuously amendment its costs. The speed and degree of ERPT conjointly depends on the evaluation policies of corporations. There are principally 2 ways that corporations will follow; native currency evaluation (LCP) or producer currency pricing.

In this regard, these corporations face competition from domestic firms and are forced to line costs up to domestic competitors' prices. The constraint that these corporations need to charge the identical costs as destination market competitors implies that they need to soak up the consequences of rate of exchange changes in their mark-ups so as to stay competitive. So as to totally absorb variations in rate of exchange and still stay competitive, producers mark-ups need to be adjusted on a matched negative proportion to variations in nominal rate of exchange.

Another determinant of ERPT is called product stability.The nature of the products is beneath trade matters. during a scenario wherever commerce corporations face low competition within the destination market, they not solely maintain market share however additionally pass the entire burden of the unsteady rate of exchange to the customers. However, wherever corporations face sturdy competition, they'll defend their market share by interesting the results of the rate of exchange. The presence of competition within the domestic market additionally implies that there are shut substitute goods to the products being foreign. This presence of substitutes forces corporations to vary costs less oft as they face risk of losing market share to different competitive merchandise.

2.3 Clear formulation and argumentation of the theoretical problem researched

The theoretical framework was justify the trail of a quest and grounds it firmly in theoretical constructs. The aim of the 2 frameworks is to create analysis findings a lot of substantive, acceptable to the theoretical constructs within the analysis field and ensures generalizability. They assist in stimulating analysis whereas guaranteeing the extension of data by providing each direction and impetus to the research inquiry. They conjointly enhance the empiricism and rigor of a quest.

Available evidence suggests that over the past decade, in industrialized countries, the exchange rate for both import and consumer spending has declined. The literature has put forward several plausible explanations for this potential decline, along with the transition to an atmosphere with low inflation in industrialized countries (due to the transition to additional credible monetary policy regimes) and changes in the structure of imports in sectors that have lower exchange rate indicators. An assessment of each degree and the reasons for this decline is vital, given the potential political consequences, such as its effect on central bank inflation forecasts, the international transfer of financial shocks, and the optimal choice of exchange rate, financial policy regime and regime.

2.4 Empirical Literature Overview

Although some studies conducted associate analysis of pass-through on the identical or on similar countries, their results tend to different. Distinction in results is because of variations in variable constructions, methodologies and model specifications. Therefore, this section aims to analyze the results from varied studies taking knowingness of their methodologies. The empirical literature on ERPT may be classified into 3 classes. The primary class consists of studies examining ERPT to import costs at a disaggregated price index. Similarly, the second class is on ERPT to import costs however at combination price index. Lastly, the third class contains studies on ERPT to producer and shopper worth indices. As mentioned earlier, the abundance of papers mentioned in the previous section, which attempts to provide a

theoretical explanation of why the pass-through is not complete, was conceived as a typical conclusion in empirical literature that import costs do not respond completely to exchange rate changes. Although exchange rate estimates vary by trade and country, it appears that the overall result of the depreciation / appreciation of the national currency is not cross-cutting.

Empirical evidence confirms that the rate of transfer of costs to the buyer is less than the share of imports in the consumer basket. Researchers estimate that the long-term average rate of pass-through during a sample of industrial countries over the amount 1972 to 2000 was roughly adequate to 20 per cent, though this figure showed to regarding five per cent within the latter a part of the sample.

In additionally, this decline occurred to the extent that international trade (and, consequently, imports) sharply increased its share in the consumer basket.

ERPT refers to the responsiveness of domestic prices to rate of exchange shocks. A shock to the rate of exchange are often passed to domestic prices either entirely or partly (incomplete ERPT). It's additionally potential that totally different magnitudes of rate of exchange shocks will result in different degrees of pass-through. Similarly, currency depreciation could have a unique impact on domestic inflation as compared to a currency appreciation of the identical magnitude (ERPT asymmetry). it's necessary for policy manufacturers to grasp the impact of rate of exchange on domestic inflation as a result of fluctuations in exchange rate are one among the determinants of inflation.

From a review of the literature, there are 2 transmission mechanisms of ERPT. The channels are often classified as on the distribution chain therein rate shocks have an effect on import costs, then import costs have an effect on producer prices that successively affect client prices or direct versus indirect channels of pass-through. The direct channel is comparable to transmission of rate shocks on the distribution chain however the indirect channel is that the impact of changes in exchange rate on domestic inflation via its effect of demand. The speed and magnitude of ERPT via these channels is influenced by numerous factors like the volatility of the rate,

valuation behavior of corporations, product replaceability, inflation atmosphere and market structure.

There is a general accord from empirical proof that ERPT is generally incomplete no matter the extent of advancement of the country. However, most studies realize that ERPT is higher in developing economies than in developed economies. Additionally most countries have old a decline in pass-through over the years. The degree of pass-through differs considerably across countries.

2.4.1 Empirical evidence on Azerbaijan's exchange rate

Azerbaijani manat was denominated twice - in 1992 and 2006. Modern manat consists of 6 types of coins (1, 3, 5, 10, 20, 50 gyapik) and 7 types of banknotes (1, 5, 10, 20, 50, 100 ,200 manats). The design of the banknotes was developed by the Austrian currency designer Robert Kalina, who also designed the modern design of euro banknotes.

In fact, are a return to the old course - after the restoration of prices for oil and natural gas, which form 90% of Azerbaijan's exports and 70% of its budget revenues. At the same time, the tightening of state policy contrasts markedly with the policies implemented by many other developing countries seeking to increase the flexibility of the exchange rate of national currencies.

The Central Bank does not declare directly about its further intentions in the sphere of monetary policy and does not explain whether it has returned to the previous peg of the manat to the dollar. Instead, the regulator explains the events of the past year by a number of factors, and also notes that a strong national currency helped to reduce inflation expectations and the dollarization of the economy. According to the Central Bank, "the balance of payments surplus determined the balance in the foreign exchange market last year. The market remained stable, since the levels of demand and supply at foreign exchange auctions coincided in annual terms. "

To control the manat, Azerbaijan uses funds such as sales of dollars from the Welfare Fund (worth $ 3.6 billion) and auctions held by the Central Bank to help absorb

liquidity in the national currency due to the placement of cash of auction participants in short-term accounts. In addition, to ease the pressure on the manat, the authorities decided last year to help the International Bank of Azerbaijan, which defaulted, to partially pay off the debts accumulated in foreign currency.

Azerbaijan economy demonstrates rapid economic growth mainly driven by the oil sector in recent years. It is noteworthy that according to official statistics, GDP in real terms grew approximately 2.5 times during the period 2004-2008 bringing Azerbaijan to leading positions in the world with 34.5% in 2006[1]. Increased oil extraction, surge in oil prices and its exports leads to huge inflow of foreign exchanges into the country, which, in turn, creates great opportunities for implementation of large scale infrastructure projects contributing to socio-economic development of the economy. However, the given boom in the oil sector in parallel with the above-mentioned noble infrastructure development intentions also causes some macroeconomic problems. As such, there is an increasing dependence of the state budget on the oil revenues resulting in the high fiscal expansion, raising the price levels, appreciating exchange rate, while lowering the share of the non-oil sector output in GDP as well as the share of the non-oil exports in total exports. According to official statistics, the share of the non-oil value added and exports in the GDP and total exports respectively decreased from 66.2% and 52.5% in 2004 to 38.2% and 4.7% in 2008. Moreover, the share of the oil revenues in the government revenues increased from about 40% in 2004 to 80% in 2008,while the real effective exchange rate appreciated approximately two-fold during 2004-2008.

Also in 2017, in order to "ensure macroeconomic stability" and support its currency, the authorities transferred 7.5 billion manat ($ 4.4 billion) from the Welfare Fund to the balance of the Central Bank of assets.

According to analysts of the Asian Bank, a slight increase in inflation in Azerbaijan to 4 percent in 2019 is associated with an increase in wages, which in turn will

growing domestic demand. As a result, according to forecasts, inflation in 2020 will reach 5 percent. "A stable exchange rate in Azerbaijan should prevent high inflation," the report says.

According to ADB analysts, the decline in inflation in Azerbaijan from 12.9% in 2017 to 2.3% in 2018, and core inflation to 1.8 percent was achieved due to rising oil prices and tightening monetary policy, which led to the stabilization of the exchange rate, there by minimizing the rise in prices in the consumer market of the country.

As a result of the decline in the cost of more expensive imported food, the rise in food prices in the domestic market decreased from 16.4 percent in 2017 to 1.7 percent, for other goods - from 11.6 percent to 2.6 percent, and services - from 9.3 percent to 2.7 percent.

"Success in reducing inflation nevertheless allowed the Central Bank of Azerbaijan to reduce the discount rate from 15 to 9.75 percent in four phases during 2018 and to 9.25 percent in January 2019. Money supply growth slowed from 9 percent in 2017 to 5.7 percent. Banks continued to face problems with interest payments on non-performing loans, which remained high at 12.2 percent. Meanwhile, confidence in the Azerbaijani manat continued to strengthen, as indicated by the share of deposits in local currency, which increased from 27 , 6 percent and at the end of 2017, to 34.6 percent a year later, and the share of loans in national currency increased from 59.1 percent to 62 percent. The exchange rate stability and great consumer confidence increased the supply of loans by 10.7 percent, stopping the decline by 28 , 5 percent in 2017, "the report says.

In recent years until the beginning of the economic crisis in 2008 the Azerbaijan manatwas almost continuously weakend in both nominal and real terms.

The part of article discusses the current problems faced by most modern economies, namely the problems of inflation, poverty and unemployment. In particular, the dynamics of the consumer price index in Azerbaijan are analyzed, and changes in the level of poverty are also investigated and unemployment rates over the past two decades. The database for the study was statistical sampling, compiled mainly on

the basis of economic indicators provided by the State Committee on Statistics of the Republic of Azerbaijan, Central Bank of Azerbaijan and the World Bank. A number of measures aimed at improving socio-economic situation and ensuring inclusive and sustainable economic growth in Azerbaijan.

The level of employment, the number of people living below the poverty line, and the change in price indices are the most important socio-economic indicators, which largely determine the sustainability of the economic system and the welfare of the nation. On the sustainable nature of socio-economic development in the country affects a complex of factors that are often not subject to unambiguous interpretation.

The distribution of GDP per capita also does not take into account the dynamics in such socially significant areas as the availability of medical services and the quality of education. In other words, the quality of life of citizens on average can decrease in parallel with the growth of GDP per capita. Nevertheless, the dynamics of the gross domestic product remain the most important macroeconomic indicator in assessing the economic situation in society. At the analysis of the socio-economic situation in Azerbaijan, we first consider two key macroeconomic indicators, such as the rate of annual change in GDP and the rate of change in the general price level (inflation rate). It should be noted that Azerbaijan has come a long way since independence in 1991, demonstrating high rates of economic growth at certain stages. In particular, the volume of per capita GDP in the Republic of Azerbaijan has undergone significant changes since 1991 [2]. In the first years after independence, there was a sharp decrease in the volume of GDP per capita. So, in 1993, a record drop in gross domestic product per capita was recorded; the annual decrease of this macroeconomic indicator reached almost 25%. At the same time, starting from 1994, there is a tendency towards a gradual increase in this indicator. Record growth in GDP per capita was recorded in 2006, when the value of the annual growth of this indicator reached nearly 34% [2].
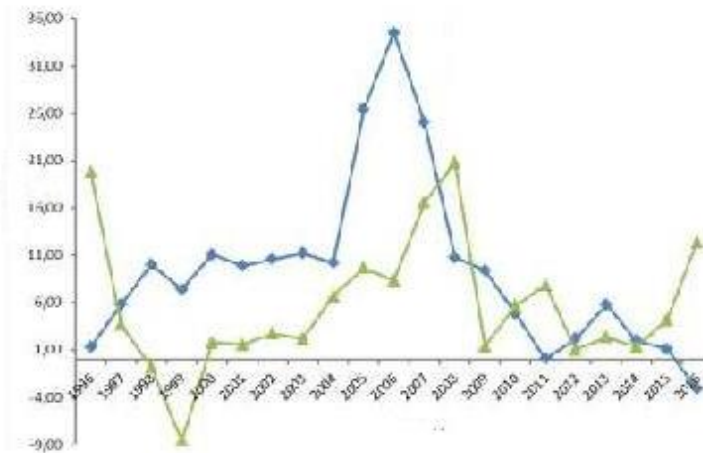
Figure.1 The dynamics of key indicators of macroeconomics: the growth rate of GDP and the pace inflation in Azerbaijan (1996-2016)

Source: World Bank; State Statistical Committee of the Republic of Azerbaijan

Figure 1 is one of the most common examples showing the dynamics of the annual IRA (2) and GDP inflation (3), two main fundamentals in the economy. The chart refers to the empirical data for the past two decades (from 1996 to 2016). In the meantime, macroeconomic data can be explored by looking at the identifiable relationship between the two parties. In fact, in the period, the economic downturn is evolving in the rate of inflation, when the time is at the peak of the economy, while the inflation is observed by the slowing down of inflationary processes (Figure 1) .Recent return on inflation and inflation, low inflation rate (when the rate of inflation does not exceed the defined rate, the rates may vary from 2 to 10% for the country to the various levels of economic development), and are observed in the multi-country world (4, 5) (Phillips, 1998, Khan, Senhadji, 2001).

As you know, the inflation rate in the majority of the countries is measured by the

help of an integrated indexer like an index of consumer prices. Investigating and modeling the dynamics of the index of consumer goods indexed by the use of non-research labor (6, 7) .Inflation, representing the first, the first, the monetary phenomenon and the development of the general price of goods and services is one of the basic factors that define the nominal value interest rates (Effect Fischer), and the profitability of the investment projects. Wasting on the real estate, the inflation rate is widespread in the social stratum and the material blessings of the society, and all of them are slaughtered. Two-dimensional frequently encountered inflationary tendencies refer to the fast-paced intermediate (when coupled with the fastest, the more coincidental proposal) and the inflation, driven by rationale (Makkonnell, Bryu, 2002). The Central Bank of Azerbaijan has shown that the indexes of consumer price indexes (IPCs) have been analyzed for notably data on the inflation factor, Integrated indexes from December 2009 to December 2017 (Figure 2), representing the dynamical position of the current index). The inflation rate in Azerbaijan has undergone significant fluctuations (Fig. 2). In particular, as seen from the graphics, the consumer price index in the Consumer Price Index in 2016.
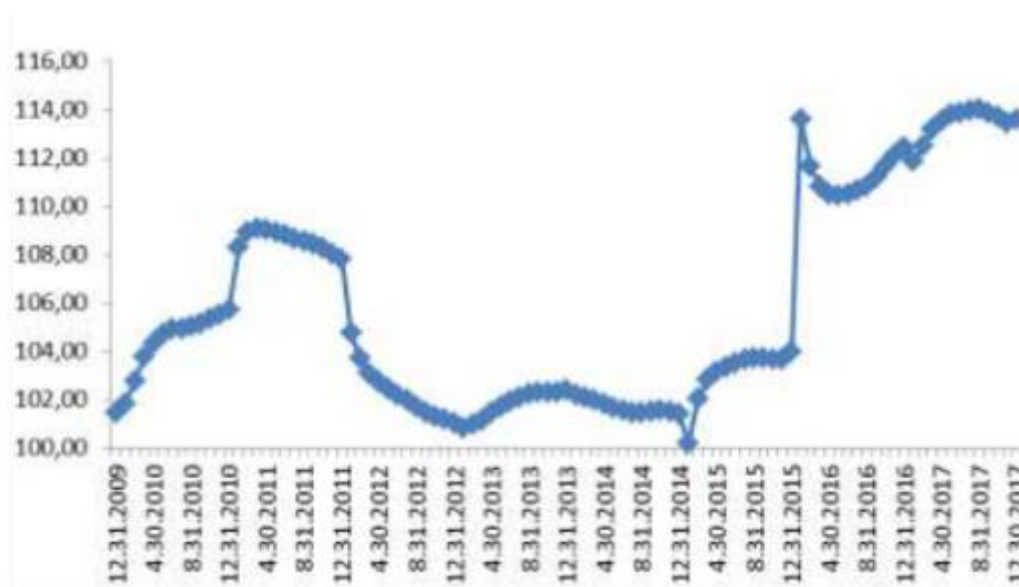
Figure. 2. Changes in the price level in Azerbaijan December 2009 to December 2017 Source: Central Bank of Azerbaijan
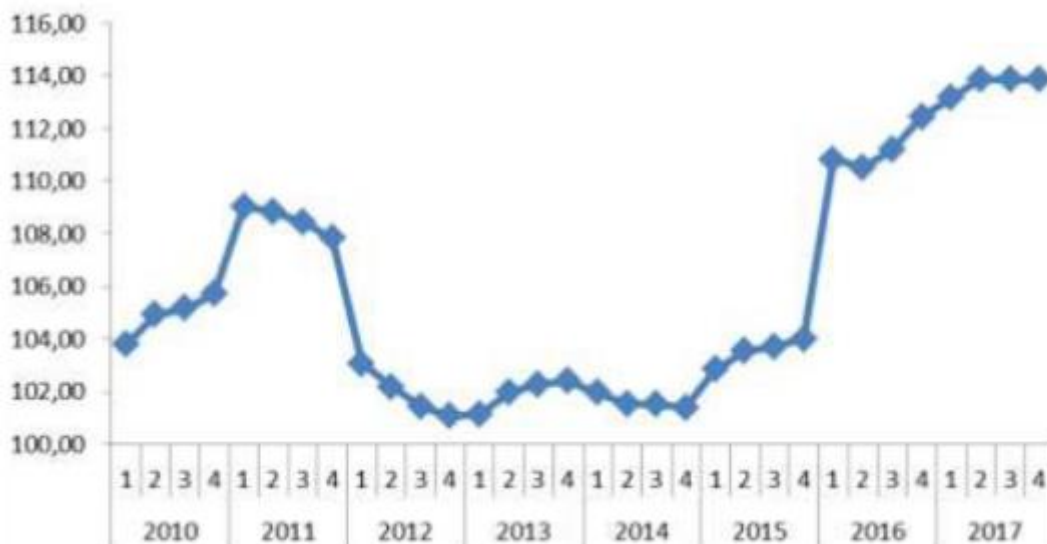
Figure 3. Quarterly dynamics of the consumer price index since the first quarter of 2010. Source: Central Bank of Azerbaijan

In this context, mention should be made of changes in market conditions, expressed primarily in the change in world prices for energy resources during this period, which led to a depreciation of the national currency and an increase in prices for imported goods.

Earlier there were also jumps in the consumer price index, in particular, at the end of 2010 - the beginning of 2011. There was a significant increase in the price level. On the contrary, throughout 2012 there was a steady downward trend in prices in the Azerbaijani economy (Fig. 2). We also considered the development of inflationary processes in Azerbaijan by quarters from 2010 to 2017. For this, a dynamic time series of quarterly values of the consumer price index was built [8]. The results in the form of the distribution of CPI values by quarters for the studied time period are shown in the graph (Fig. 3). The quarterly distribution of CPI shows that during the first two quarters of 2011, as well as during the first two quarters of 2016, there was a -the real increase in prices for goods and services. At the same time, in the last quarter of 2011, a noticeable decrease in the rate of inflation was noted. In the period from 2012 to 2015 values of the consumer price index did not experience strong fluctuations, the inflation rate on average fluctuated around 2.3% [3, 8]. Note that

the consumer price index, despite some of its shortcomings, remains one of the main tools for measuring and comparing the cost of living in different years.

2.4.2 Concluding Remarks

According to the all this approaches, as a result of this researches main goal of the state's monetary policy is to ensure a balance of payments and a stable exchange rate in national currency. The economic content of monetary policy in practice, it is implemented through its constituent elements and tools, which are designed to serve as elements of integrated regulation foreign economic sphere, creating conditions for the favorable development of the country's economy. However, monetary policy does not exist outside connection with the monetary, budgetary, fiscal and other components of the economic policy of a state.

Monetary policy adequate to the existing macroeconomic conditionals, plays a significant role in achieving macroeconomic stability. At the same time, public authorities have the desire to solve economic problems with the help of monetary policy, maintaining the rate of the national currency at one level or another.

This raises the question of how this level is due to fundamental economic indicators of the country. That is why the question of the correspondence of the exchange rate to some "equilibrium" value is an important and urgent problem of macroeconomic analysis. High exchange rate volatility seems undesirable because it has a bad effect on international trade and economic growth. Numerous studies have shown that in the long run there is a return of the real exchange rate to a certain trend. However, in the medium and short term there may be observed steady deviations of the course from the long-term trend, which may arise for various reasons: "overheating" of the economy, global macroeconomic imbalances, economic policy, etc.

2.4.3 Reasoning and description of the research logic and methods

Research is active and purposeful intervention in the course of the process being studied, a corresponding change in the object under study or its reproduction in specially created and controlled conditions determined by the objectives of the

experiment. .

The main features of the research: a) a more active (than under observation) attitude towards the object of study, up to its change and transformation; b) the ability to control the behavior of the object and verify the results; c) multiple reproducibility of the studied object at the request of the researcher; d) the possibility of detecting such properties of phenomena that are not observed in natural conditions. Analysis is the real or mental division of the object into components. Parts and synthesis is their integration into a single organic whole, and not into a mechanical unit. The result of the synthesis is a completely new education.

Applying these methods of research, it should be borne in mind that, firstly, the analysis should not miss the quality of objects. In each field of knowledge, there is a limit to the division of an object, beyond which we move into a different world of properties and laws. Secondly, a kind of analysis is also the division of classes of objects into subclasses - their classification and periodization. Third, analysis and synthesis are dialectically interrelated. But some types of scientific activity are primarily analytical or synthetic .

Chapter 3.Metodology and data

3.1 Introduction

Quarterly data for the period of 2007 to 2018 is utilized in the reported research here.Not likely to several studies in the over, the quarterly informations are applied in the paper. Short-run results established by using ARDL technique in yearly data assumes for long-lasting period of the year that could be prevented when quarterly statistics are used. The following factors are chosen to be enclosed within the paper: imports, real effective exchange rate (REER), inflation (GDP deflator), FDI, oil prices and money supply (M2). Throughout the paper, the short-run and the long-run relationship between the REER and the inflation will be analyzed in order to reveal the macroeconomic linkage of exchange rate pass-through to the domestic prices in Azerbaijan. The data on imports is from Azerbaijan State Statistical Office.

REER, inflation (GDP deflator), FDI and money supply (M2) are obtained from the Central Bank of Azerbaijan. REER is added as the weighted average of the domestic currency against the basket of major currencies used in the country (NEER), adjusted for inflation (REER). Oil prices variable is denoted as U.S. dollar per barrel for the determined period of time.

3.2 Approaches to estimate ERPT

Over the years, the preferred method of evaluating ERPT has been constantly changing. However, various models led to the development of new methods such as ARDL, VAR (Sims, 1980s). The development of these models was made possible by new developments in the field of econometric modeling, such as the improvement of computational capabilities as a result of the technological revolution. However, these new methods have own vulnerability. In modern years, ARDL modeling has become more suggested macroeconomic tool. Identifies an econometric model of ARDL (Autoregressive Distributed Lag) with a single equation of structural macroeconomic models and how economic methods are widely used to evaluate ERPT weaknesses.

3.2.1 An implementation and use of the ARDL Model

Current developments in the econometrics have revealed that series are not fixed as ordinary mostly. In order to prevent this non-stationary and prior restrictions in the lag formation of the model, econometric analysis of the time sequences information have ascended towards to the problem of cointegration. The cointegration process has gotten to be an over-riding prerequisite for any economic model utilizing non-stationary time arrangement information. In case the variables probability don't cointegrate, at that point we have the issues of spurious relapse and the results there in become almost meaningless .In different circumstances, if the variables do cointegrate then there may be a statistically significant long-run relationship between the variables. In applied econometrics, the Granger (1981) and, Engle and Granger (1987), Autoregressive Distributed Lag(ARDL) cointegration technique or bound test of cointegration (Pesaran and Shin 1999 and Pesaran et al. 2001) and,

Johansen and Juselius (1990) cointegration techniques have become the solution to determining the long run relationship between series that are non-stationary, as well as reparameterizing them to the Error Correction Model (ECM). In addition to the reparameterized result, short-term dynamics and long-term relationships of the main variables are given. Using ARDL approach in the econometric model requires some necessary steps before its implementation.

One of the preferences of the ARDL econonometric model is unlike other techniques is that it allows the presence of the unit roots until the second order of integration.

Subsequently, ARDL cointegration strategy is best when managing with variables that are I(0), I(1) or combination of the both.

The chief advantage of this commence buried in its recognition of cointegrating vectors which there are manifold cointegrating vectors. But,this method would crash in presence of the integrated stochastic tendency of the I(2).To forestall endeavour to futility which may be recommended to test for the roots of units,thought it could in unnecessary are not guided,it could lead to the model unnecessary and flexible and impractical calculations with it is suggestion for the future forecasts and policies. Based on forecast and policy stance, there's got to investigate the essential conditions that provide rise to ARDL cointegration procedure in arrange to avoid its wrongful application, estimation, and interpretation. If the conditions are not followed, it may lead to model misspecification and inconsistent and unrealistic estimates with its implication on forecast and policy.

3.3 Model estimation Techniques

This section deals with issues related to data analysis. The nature of the time series data and its effect on econometric modeling and analysis was also discussed. Then follows the analysis of long-term relationships in data (cointegration) in section 3.4.2. Section 3.4.3 covers the approaches or tests commonly used in econometrics to test the adequacy of the model, which should be listed in Chapter 4. The last section focuses on methods that are commonly used to interpret the results of ARDL models, that is, the impulse response functions and dispersion decomposition.

3.3.1. Stationarity and Non-stationarity

Cointegration makes it conceivable to recover the important long-term relationship by considering the parameters that had been misplaced on differencing.

Especially, it coordinates short-run elements with long run balance. This may be a prerequisite for obtaining a reasonable size model, which is the useful driver of an important figure and the use of the scheme. The ARDL cointegration procedure is utilized in deciding the long term relationship among arrangement with diverse order of integration (Pesaran and Shin, 1999, and Pesaran et al. 2001). Also,these sources are very suitable for studying stationarity and non-stationarity in the ARDL model. Re-parameterized results provide short-term elements and long-term relationships of the variables in question.Even though ARDL cointegration procedure doesn't require to test beforehand, in order to save time and not repeat the process from scratch,the stationarity of the variables is assessed beforehand. The assessment is for being sure that none of the variables has more than 1 order of integration. For testing unit roots has a lot of different methods. For instance, they are; Durbin-Watson (DW) test, Augmented Dickey-Fuller (1981) (ADF) test, Philip-Perron (1988) (PP) test, Dickey-Fuller test (1979) (DF), among others. Resarcher's approach to the problem affects the test choice. It is troublesome to follow up the most recent changes in this area or to compare and define the pross and cons of using different tests. The unit root test is required to determine stationarity. For this type of test essential component is variables. In general, random stochastic trend is the reason why a single root is observed in many of these time series data. The unit root occurs when the time series data is a random walk.As aresult, integration can be defined as: A variable Y, is integrated with the number of order d, I(d)] so it achieved stationarity after differencing d period.

3.2.1. The Augmented Dickey-Fuller (ADF) (1981) tests for Unit Root

Observing the variable stationary from the graph is a non-formal test on the other hand, by conducting the Augmented Dickey Fuller (ADF) test, we can also perform

formal testing. In this paper,ADF test is conducted to investigate the stationary of the variables.

Letting Yt to be random walk , Yt = Yt−1 + μt, regression model at that point gets to be Yt = ρY_{t-1}+ u_t where t is the trend factor and u_t is a white nose residual.

Restrictive ADF Model: $\Delta Y_t = \rho_1 Y_{t-1} + \sum_{i=1}^{k} \alpha_i \Delta Y_{t-i} + u_t$

Restrictive ADF Model: $\Delta Y_t = \rho_1 Y_{t-1} + \alpha_2 T + \sum_{i=1}^{k} \alpha_i \Delta Y_{t-i} + u_t$

General ADF Model: $\Delta Y_t = \alpha_0 + \rho_1 Y_{t-1} + \sum_{i=1}^{k} \alpha_i \Delta Y_{t-i} + u_t$

General ADF Model: $\Delta Y_t = \alpha_0 + \rho_1 Y_{t-1} + \alpha_2 T + \sum_{i=1}^{k} \alpha_i \Delta Y_{t-i} + u_t$

ut is a pure white noise error term and ΔYt-1 =(Yt-1 –Yt-2), ΔYt-1 =(Yt-1 –Yt-2), etc. In accordance with many practices, if the value of ADF is less than its critical value, then the time series turns out to be non-stationary. The time series is always stationary when the ADF value is more than its critical value. Unit root is quite important,if the process has a unit root then we know that the stability condition is violated and time series can not be stationary. This decision can be find confirmed utilizing such types of tests, like Kwiatkowski-Phillips-Schmidt-Shin test. Philips-Perron. The Philiphs-Pheron test also has the same formof assessing the stationarity with the same null hypothesis of non-stationarity as in ADF test. So in the PP test, he also takes care of autocorrelation in the error term, and its asymptotic distribution is similar to the that of the ADF t-statistic.Due to its sample use and application.ADF test is usually applied in the studies.After all,the choice of the test depends on the point of view and the goal of the analysts and authors.

3.4. Cointegration Test

Estimating and modelling the long-run relationship among the variables can be accomplished through cointegration. So, cointegration methods help to determine long-term relationship. Engle and Granger were the primary to formalize the thought of cointegration, giving tests and realizing outcomes to assess the presence of long-run relationship between different variables. Cointegration test analyzes how time

series variables, which may also be non-stationary and include the trend or drifts in contrary to the requirements of some econometric models, are related to each other.

The existence of a long-run equilibrium that mimics among underlying economic time series variables and merges over time has an econometric concept, thus this econometric concept is called cointegration. Empirical error correction processes are in cointegration models. This empirical error correction helps on interpretation of the short and long-run linkage among the variables. Thus, cointegration models sets up a stronger statistical and economic basis information while modelling the relationship.if a model empirically exhibits meaningful long-run relationships, testing it is a necessary step. For some cases,there is no cointegration between the variables. In this case, it becomes imperative to continue to work with variables in differences instead the level form of variable (Engle and Granger, 1987).There are a various tests of cointegration,Autoregressive Distributed Lag cointegration technique or bound cointegration testing technique is one of them.From this point of view, it becomes the focal point of this research paper.

3.4.1 Autoregressive Distributed Lag Model (ARDL) Approach to Cointegration Testing or Bound Cointegration Testing Approach

ARDL econometric model contains the lagged values of the dependent variable, the current lagged value of regressors as explanatory variables. Also, this model uses a combination of endogenous and endogenous variables, unlike a VAR model that's strictly for endogenous variables.

The cointegration approach to application of ARDL will provide realistic and efficient estimates. Application of Autoregressive Distributed Lag (ARDL) approach to cointegration helps in identifying the cointegrating vector(s),however this process is different than the Johansen and Juselius (1990) cointegration procedure. As a result, each of the underlying variables stands as a single long run relationship equation. ARDL model can be specifiedwhen the variables are integrated of different orders:Long run relationship of the variables of a single model and short-run dynamics (i.e. traditional ARDL) gives reparameterized result In this

situation, re-parameterization is reasonable, so for that reason what the ARDL's value gives us is a dynamical resulted model equation and it is identical as it is in the ECM model.

By applying, the ARDL techinique, unbiased long-run estimates are obtained.

The generalised ARDL(p,q$_1$,q$_2$......q$_k$) model is specified is as;

$$\varphi(L,p) = \sum_{i=1}^{k} \beta_i(L,q_i)x_{it} + \delta w_t + u_t$$

where,

$$\varphi(L,p) = 1 - \varphi_1 L - \varphi_2 L^2 - .. - \varphi_p L^p$$

$$\beta(L,q) = 1 - \beta_1 L - \beta_2 L^2 - .. - \beta_q L^q$$

for i=1,2,3...k $\hspace{6cm}$ $u_t \sim iid(0,\delta^2)$

L can be seen as the lag variable which "$L^0 y_t = X_t$, $L^1 y_t = y_{t-1}$" and w$_t$ is considered as x1 vector of variables that are intercept, trends of time, seasonal dummies, or exogenous variables with their lags. P=0,1,2...,m, q=0,1,2....,m, i=1,2....,k: "(m+1)$^{k+1}$ number of different models. Among the values, the number of lag order is set by the researcher depending on which lag estimation technique is used and the approach chosen.

The ADRL(p,q) model specification:

$$\varphi(L)y_t = \varphi + \theta(L)x_t + u_t$$

with

$$\varphi(L) = 1 - \varphi_1 L - .. - \varphi_p L^p$$

$$\theta(L) = \beta_0 - \beta_1 L - .. - \beta_q L^q$$

in terms of, the common ARDL(p,q$_1$,q$_2$......q$_k$) model;

$$\varphi(L)y_t = \varphi + \theta_1(L)x_{1t} + \theta_2(L)x_{2t} + \theta_k(L)x_{kt} + u_t$$

Each component of vector includes its own operator L, L^{k}y=y$_{t-k}$, researcher use this due to define the lag (Φ(L,p)) and vector polynomial (β(L,q)) too. Since "u$_t$" is a white noise process, then the ARDL models are valid to be estimated via OLS.

3.4.1.1. The steps of the ARDL Cointegration Approach

First step is the determination of the Existence of the Long Run Relationship of the Variables. The existence of the long-run relation between the variables investigation is tested at the first stage. Additionally, F-statistic (Bound test) is also calculated due to test and estimate a long-term relationship among the values of components. In practice, long-run relationship among the underlying variables leads to hypothesis testing in the ARDL model: such as, testing the relationship between the forcing variable(s). In doing this, current values of the underlying variable(s) are excluded from ARDL model approach to Cointegration. It requires implementing an ARDL regression with a I(d) regressor,

$$y_t = \varphi_1 y_{t-1} + .. + \varphi_p y_{t-p} + \theta_0 x_t + \theta_1 x_{t-1} + .. + q_1 x_{t-p} + u_{1t}$$

or

$$x_t = \varphi_1 x_{t-1} + .. + \varphi_p x_{t-p} + \theta_0 y_t + \theta_1 y_{t-1} + .. + q_1 y_{t-p} + u_{2t}$$

t =1, 2,...T $u_t \sim iid(0, \delta^2)$

To see situation better, main regressors, like intercept and linear trends, are not included. In that case, Φ, $\theta 0$ and $\theta 1$ are parameters, which we don't know.

If $\Phi = 1$, it means there is no proof for long-run relationship. Below mentioned relationship is given:

ARDL model approach to Cointegration testing;

$$\Delta X_t = \delta_{0i} + \sum_{i=1}^{k} \alpha_1 \Delta X_{t-i} + \sum_{i=1}^{k} \alpha_2 \Delta Y_{t-i} + \delta_1 X_{t-1} + \delta_2 Y_{t-1} + v_{1t}$$

$$\Delta Y_t = \delta_{0i} + \sum_{i=1}^{k} \alpha_1 \Delta Y_{t-i} + \sum_{i=1}^{k} \alpha_2 \Delta X_{t-i} + \delta_1 Y_{t-1} + \delta_2 X_{t-1} + v_{2t}$$

k - maximum order of lag in ARDL model, selected by the user. For the null hypothesis of testing joint significance where ($\delta_1 X_{t-1}$ $\delta_1 Y_{t-1}$ or $\delta_1 Y_{t-1}$ $\delta_1 X_{t-1}$) are zero,F test is used.. ($\delta_1 - \delta_2$) correspond to long-term relationships, while ($\alpha 1 - \alpha 2$) represent the short-term dynamics of the model. The null that the coefficients of the

lag variable variables are zero should be tested. The hypothesizes in the long-term relationship are defined as;

Ho: δ1 = δ2= 0

H1: δ1 ≠ δ2 ≠ 0

This is tested in each model, as indicated by the number of variables:

$F_X(X_1 \mid Y_1,. \ldots . Y_k)$

$F_y(Y_1 \mid X_1,. \ldots . X_k)$

In general, hypothesis is tested by the means of the F test. F-test is conducted irrespective of the order of integration (I(0) or I(1)) the variables have and the distribution of its statistics (F-statistics) is therefore non-standard.

Number of critical values of the test, presence of the intercept and trend in the ARDL model are available in Pesaran and Pesaran (1996a), and Pesaran et al. (2001)..

Test is conducted in the following way. When the variables are cointegrated, then H0 is rejected. In this situation computed F-statistic is great than the upper bound critical value. However, in some cases, H0 cannot be rejected.In this case, the F-statistic is below than the lower bound critical value. It is to state that there is no cointegration among the variables. There is also the case that the computed F-statistic falls between the lower and upper bound critical values. If it is the case, then the result is inconclusive and also may depend on the order of integration of the variables. If the order of integration is more than 1, then it leads to the inconclusive result in the model. In order not to get the inconclusive results at this stage, the stationarity test is implemented for each variable before building the model.

Another issue building the model is when there is more than one cointegration vector in the model. If there are long run (or multiple long-run relationships) relationships exist in both equations,above, then ARDL approach is not applied to the model. Instead Johansen and Juselius (1990) approach becomes the alternative and suitable. This investigation gives a results. After all, the main requirements before applying

the ARDL approach to the model are to be sure that the variables have no more than one order of integration and there is no more than one cointegration vector present as a result of the cointegration test. Upon performing the bounds cointegration test, there are two likely outcomes: either the variables are cointegrated or they are not. If the variables are not cointegrated, the next thing to do is to specify the short-run model, which is the autoregressive distributed lag (ARDL) model but if cointegration is the outcome, then the appropriate model to specify is the error or vector error correction model (ECM/VECM) as the case may be. This research details the different model specifications under the ARDL framework.

Second step is choosing the appropriate lag length for the ARDL Model or estimation of the long run estimates of the selected ARDL Model. As it is already mentioned, ARDL approach is applied to the model, if there is only one cointegration vector in the model, or in other words, the long run relationship exists between the underlying variables in one equation, while the null of absence of the long-run relationship between the variables aren`t rejected in other equations. Since the Gaussian satisfied error terms need to be obtained, finding the appropriate lag length for each variable in the ARDL model is very crucial. The optimum lag length(k) is also necessary to be determined via the proper order selection criteria. In order to select the appropriate model of the long run underlying equation there are number of order selection criteria used: the Akaike Information Criterion(AIC), Schwarz Bayesian Criterion (SBC) or Hannan-Quinn Criterion(HQC) and etc. Besides, ARDL econometric isestimated based on the level forms of the variables (undifferentiated data). While applying model selection criteria to choose the proper lag order, a model with the lowest AIC value, SBC scores or small standard errors, and high R^2 performs much better.The estimates of the chosen model become long-term coefficients. The selected ARDL (k) long-term equation model is as below:

$$Y_t = \delta_0 + \sum_{i=1}^{k} \alpha_1 X_{1t} + \sum_{i=1}^{k} \alpha_2 X_{2t} + \sum_{i=1}^{k} \alpha_3 X_{3t} + \sum_{i=1}^{k} \alpha_n X_{nt} + v_{1t}$$

Xs (X_{1t}, X_{2t}, X_3, ……….. X_{nt}), are explanatory or long-term variables where k is the number of lags chosen via the lag order selection criteria. The model also estimates the parameters of the Error Correction Model (ECM).

Finally, the last step is to re-parameterize the ARDL model into the error correction model (ECM). After all these steps ARDL econometric model can be implemented. As it is already mentioned, when non-stationary variables are regressed into the model, inconsistent and inconclusive results may be obtained. One way of achieving stationarity of the variables is to difference the data. Even the estimates from the model build are correct, and the problem of non-stationarity is solved, the obtained model contains short-run relationship between the variables.

Due to the interest of researchers on analyzing the long-run relationships between the variables and since economists are looking for the long-term relationships with the underlying variables, the new approaches have been occurred throughout the studies. Simply the concept of cointegration and error correction urging from the long-run relationship are the solutions for defining the long-term relationship in the model. ECM especially defines the length of the information, as the accurate and detailed information. The term EC is a parameter of adjustmentof the disequilibrium is corrected. It is always to the extent that any disequilibrium in the lagged period is corrected in y_t..Adjustment is 100% when the error correction term close to -1, while it is 50% when the error correction term equals to -0.5. The closer to -1 is more adjustment there is in the model.

3.4.2 Summary and Conclusion

Study aims to estimate the ARDL model to analyze the short and long-run relationship between the variables, also their;

The ARDL methodshould only consist of the no more than one order of integrated variables, which are I(0) and I(1) or mixture of both. The variable would lead to the spurious results if there is any,(2) variables.In order to prevent this failure of the ARDL method, it is suggested to test for the unit roots before the model built.

Otherwise, it may require to build the model again after solving the stationarity problem.

The cointegration procedure of ARDL is the significant step of the model building and quite well used through the studies since it is found. Consequently, there is vital conditions which leads to the cointegration in the ARDL model. The model is also technically useful since it lets to include until one order of integrated variable in it, but the included variables should be in their level forms.

Chapter 4. Econometric Model Results

4.1 Introduction

The chapter includes the analysis of macroeconomic linkage of exchange rate pass-through to domestic prices in Azerbaijan by applying the ARDL econometric model.

4.2. Stationarity test

One of the main requirements of implementing ARDL methodology is to not having I(2) ordered variable in the model. Thus, it is advised to check the variables for their order of integration first before the implementation of the model in order to be sure the requirement is satisfied. ADF test has been used to check the unit roots in the variables and the results are given in the below Table 1for the level data.

As shown on the Table 1 below, only Inflation variable is significant at 5% and 10% significance levels of the ADF test. Unlikely to the Inflation variable, other variables show insignificant test results in all critical values failing to reject the null hypothesis of a unit root for these variables. Since there is a unit root, Imports, REER, FDI, Oil prices and Money supply variables are not stationary in level.

Table 1. ADF test in level

	ADF test	Critical value			Result
		1%	5%	10%	
Imports	-2.530221	-3.588509	-2.929734	-2.603064	Unit root
REER	-1.618273	-3.584743	-2.928142	-2.602225	Unit root
Inflation	-2.991775**	-3.584743	-2.928142	-2.602225	No unit root
FDI	-1.817473	-3.600987	-2.935001	-2.605836	Unit root
Oil prices	-2.069278	-3.584743	-2.928142	-2.602225	Unit root
Money supply	-1.746627	-3.588509	-2.929734	-2.603064	Unit root

As it is already mentioned, ARDL methodology allows the variables with I(0), I(1) order of integration or combination of the both in the model. However, it doesn't let the 2nd order of integrated variables to be included in the model. Thus, there is a need to test until the order of integration of the variable is defined.

Table 2 shows the result of ADF test for above-mentioned non-stationary variables in their first differenced forms. As a result of the test, all variables are statistically significant rejecting the null hypothesis of the unit root. REER by 1st difference is the only variable having a weak stationary in 10% significance level only, while other variables in their first difference forms are strongly stationary in 1% and 5% significance levels of ADF test.

Table 2. **ADF test in first difference**

Variable	ADF test	Critical value			Result
		1%	5%	10%	
D(Imports)	-2.945310**	-3.600987	-2.935001	-2.605836	No unit root
D(REER)	-2.790885*	-3.596616	-2.933158	-2.604867	No unit root
D(FDI)	-10.28141***	-3.588509	-2.929734	-2.603064	No unit root
D(Oil prices)	-5.774456***	-3.588509	-2.929734	-2.603064	No unit root

D(Money supply)	-4.866778***	-3.588509	-2.929734	-2.603064	No unit root

4.3. Cointegration test

As a result of the cointegration test in Table 3, it is concluded that there is one cointegration vector. Johansan cointegration test is consisted of the ranks, trace statistics, eigenvalues and critical values. The null is "r" equals to the number of cointegrating vectors. The alternative hypothesis is that the number of cointegrating vectors is more than "r". The null is rejected if the trace statistic is greater than the critical value. Starting by r=0, it continues until the null hypothesis is accepted. In our case, H0 : r = 0 is rejected at the 5% level (97.48456> 95.75366). Then we continue to the r = 1. When r = 1, the trace statistic is less than its critical value (65.80115< 69.81889) and we stop to reject the null hypothesis which means we can conclude that there is one cointegration vector in the model. The existence of cointegration vector (one cointegration in our model) explain that the variables have a long run relationship and by the methodology using ARDL model will give us robust and efficient results.

Table 3. Johansan cointegration test:

Sample (adjusted): 2007Q3 2018Q2

Included observations: 44 after adjustments

Trend assumption: Linear deterministic trend

Series: FDI   IMPORTS   INFLATION   M2

OIL_PRICES REER

Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized		Trace	0.05	

No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.513286	97.48456	95.75366	0.0378
At most 1	0.473673	65.80115	69.81889	0.1003
At most 2	0.358547	37.56053	47.85613	0.3216
At most 3	0.247146	18.02368	29.79707	0.5643
At most 4	0.108716	5.532803	15.49471	0.7499
At most 5	0.010597	0.468763	3.841466	0.4936

Trace test indicates 1 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

4.4.Structual Analysis of ARDL model application

Choosing the appropriate lag length for the model is the next step for its application. In order to do so, there are number of selection criteria such as ; the Akaike Information Criterion(AIC), Schwarz Bayesian Criterion (SBC) or Hannan-Quinn Criterion(HQC). Since it will define the optimum lag length (k) for building the appropriate model of the long run relationship.

Akaike`s information criterion (AIC) is used for selection of the lag structure. ARDL (5, 4, 5, 5, 5, 5) is automatically lag selected model of the study. The ARDL model should be estimated given the variables in their levels (nondifferenced data) form.

4.4.1. Diagnosis tests of the model

For getting valid results, the diagnosis of the model is also conducted via testing serial correlation and heteroskedasticity in the model. It is required that there is no serial correlation and heteroskedasticity in the model. Otherwise, the results of the model will not be consistent and valid.

Table 4. **Correlogram – Q statistics serial correlation test**

For ARDL (5, 4, 5, 5, 5, 5)				For ARDL (6, 3, 5, 5, 5, 3)			
Sample: 2007Q1 2018Q2				Sample: 2007Q1 2018Q2			
Included observations: 41				Included observations: 40			
Q-statistic probabilities adjusted for 5 dynamic regressors				Q-statistic probabilities adjusted for 6 dynamic regressors			
	AC	PAC	Q-Stat	Prob*	AC	PAC	Q-Stat	Prob*
1	-0.375	-0.375	6.2003	0.013	-0.415	-0.415	7.4119	0.006
2	-0.052	-0.224	6.3204	0.042	-0.115	-0.347	8.0011	0.018
3	-0.207	-0.385	8.3026	0.040	0.072	-0.188	8.2351	0.041
4	0.076	-0.290	8.5789	0.073	-0.095	-0.257	8.6566	0.070
5	0.328	0.212	13.857	0.017	0.040	-0.198	8.7343	0.120
6	-0.297	-0.146	18.298	0.006	0.097	-0.045	9.1964	0.163
7	-0.025	-0.181	18.331	0.011	-0.154	-0.188	10.405	0.167
8	-0.124	-0.226	19.149	0.014	-0.039	-0.306	10.487	0.232
9	0.315	0.045	24.611	0.003	0.217	-0.064	13.042	0.161
10	-0.056	-0.087	24.790	0.006	-0.169	-0.210	14.647	0.145
11	-0.191	-0.216	26.925	0.005	0.108	-0.087	15.316	0.168
12	0.099	0.037	27.519	0.007	-0.039	-0.143	15.407	0.220
13	-0.062	-0.091	27.764	0.010	-0.046	-0.129	15.540	0.275
14	0.272	0.006	32.583	0.003	0.054	-0.129	15.730	0.330
15	-0.319	-0.198	39.470	0.001	0.038	-0.072	15.826	0.394
16	-0.022	-0.243	39.504	0.001	0.013	0.105	15.837	0.464

17	0.178	0.013	41.826	0.001	-0.159	-0.108	17.693	0.408
18	0.029	-0.036	41.889	0.001	0.068	-0.110	18.049	0.452
19	0.053	-0.055	42.115	0.002	0.069	0.037	18.427	0.494
20	-0.331	-0.175	51.334	0.000	-0.088	-0.129	19.079	0.517

Serial correlation has been checked for ARDL (5, 4, 5, 5, 5, 5) first, then it is revealed that there is an evidence of autocorrelation among the residuals in the model (Table 4). In order to avoid the serial correlation in the model the number of lags has been increased and the new estimated model is ARDL (6, 3, 5, 5, 5, 3). The serial correlation has been checked for the new model too and the results are given in Table 4 as well. The new outcomes of the test suggests that there is not much evidence of autocorrelation in the model's residuals.

Similarly, test is also conducted for residual homoscedasticity. Breusch-Pagan-Godfrey test has been chosen in order to test for the heteroskedasticity (Table 5).

Table 5. **Heteroskedasticity Test: Breusch-Pagan-Godfrey**

F-statistic	0.974117	Prob. F(32,7)	0.5679
Obs*R-squared	32.66473	Prob. Chi-Square(32)	0.4341
Scaled explained SS	1.633428	Prob. Chi-Square(32)	1.0000

The null hypothesis is that the residuals are homoscedastic. The F-statistic p-value of 0.5679 indicates that it is failed to reject the null even for a significance level of 10%. Therefore, it is concluded that the residuals are homoskedastic.

4.4.2. Long Run Form and Bounds Test

As the model is appropriately built and gone through the diagnosis tests, the next step is to test for the presence of cointegration. Presence of the long-run relationship in the model is tested via the Bounds test where the null hypothesis is "No long-run

relationships exist". In general, it is a Wald test (or F-test) that the significance of coefficient(s) of lagged variable(s) is evaluated.

Table 6. **ARDL Bound test**

ARDL Bounds Test		
Sample: 2008Q3 2018Q2		
Included observations: 40		
Null Hypothesis: No long-run relationships exist		
Test Statistic	Value	k
F-statistic	48.17638	5
Critical Value Bounds		
Significance	I0 Bound	I1 Bound
10%	2.26	3.35
5%	2.62	3.79
2.5%	2.96	4.18
1%	3.41	4.68

The computed F-statistics of 48.18 exceeds the upper bound critical value of 4.68 at 1% level (Table 6). Accordingly, the hypothesis of "No Long-Run Relationship" is strongly rejected. This shows that inflation and independent variables (imports, REER, FDI, Oil prices and Money supply) are cointegrated and approves the result of the cointegration test.

Since, there is cointegration, and then it may be analyzed in detail. So, in the Table 7 the cointegration and long-run form of the model is given. It shows the results for long-run time period.

Table 7. Long run coefficients

ARDL Cointegrating And Long Run Form

Dependent Variable: INFLATION

Selected Model: ARDL(6, 3, 5, 5, 5, 3)

Sample: 2007Q1 2018Q2

Included observations: 40

Cointeq = INFLATION - (0.0118*IMPORTS -0.1135*REER -0.0029*FDI -0.1756*OIL_PRICES -0.0006*M2 + 115.8956)

Long Run Coefficients

Variable	Coefficient	Std. Error	t-Statistic	Prob.
IMPORTS	0.011761	0.001837	6.403145	0.0004
REER	-0.113492	0.086947	-1.305297	0.2331
FDI	-0.002856	0.002219	-1.287140	0.2390
OIL_PRICES	-0.175588	0.039285	-4.469630	0.0029
M2	-0.000597	0.000233	-2.567039	0.0372
C	115.895564	10.277518	11.276611	0.0000

Before to interpret on the long-run coefficients, the cointegration equation coefficient or error correction term should be checked whether it is negative and significant. If it is negative and significant then there exist a long-run relationship between the inflation and independent variables having the significant coefficients. It shows in the appendix along with short-run coefficients that the error correction term (EC term) is negative and strongly significant. However, the term should have

been between 0 and -1 since it is the speed of adjustment towards long run equilibrium and can not be 235% quarterly in that case. So, the term is not valid, thus the coefficients on the long-term relationship are not economically feasible.

In the test estimation, there are lagged variables stating short-run relationships with the dependent variable. In order to analyze their joint effect as a short-run analysis, the Wald test is used (**Table 8).** Since the interesting variable in this case is REER, then the test is applied to the coefficients of REER in the ARDL equation.

Table 8. Wald Test

Wald Test:			
Test Statistic	Value	df	Probability
F-statistic	13.35210	(5, 7)	0.0018
Chi-square	66.76048	5	0.0000

The Wald test result in Table 8 rejects the null that there is no short-run relationship between the coefficients of the REER jointly and the inflation. The joint effect of the lagged coefficients of REER is considered as a short-run impact, because each lag is one quarter and the maximum lag includes 5th quarter. It is a year and one quarter that may be considered as a short-term.

4.5 Concluding remarks

So there is found to be valid short-run relationship between the real effective exchange rate and the inflation indicated with GDP deflator. However, the long-run convergence is found to be not economically feasible for the interpretation. Thus, it may be concluded that the short-run exchange rate pass-through exists in the economy. The changes in real effective exchange rate statistically significantly lead to the changes in the domestic prices shown with GDP deflator. The transmission channel starts with the changes in exchange rate. If the value of the domestic currency is decreased, then the imports are more expensive for domestic

consumption. Since, the imports is considerably large and can be considered relatively inelastic, then much expensive imports will significantly affect the prices in the domestic market.

Chapter 5.General Conclusion

5.1 Introduction

This paper undertakes an extensive empirical analysis based on a large dataset to test his hypotesis. Our data is especially suitable for testing the relationship between inflation and the pass-through because it includes variables.This relation remains robust even when we control for other macroeconomic variables. These results are based on comparison of rejimes across countries as well as across periods.

Additionally, in this research paper, we investigated the variables and the evolution of exchange rate pass-through to domestic prices in Azerbaijan economy by. In that context, firstly we analyzed the effects of exchange rates on consumer prices. A simple analyze showed that importers do not take the fluctuations of manat against foreign exchange rates into account in their pricing decisions. Namely, manat denominated prices of imported goods move one to one with exchange rates. Thus we could assume the absence of pricing to market for imported good. The most important findings of the estimates were the strong evidence on the indexation of prices to exchange rates. According to the results domestic price makers were not treating the exchange rates changes as only a cost shock but as an anchor for pricing considerations. Due to this fact, short-run responses of domestic prices to exchange rates are very high and the long-run pass-through is complete and the convergence to long run is fast.

Lastly, to analyze the effect of openness in the pass-through relation the generic equation is estimated for selected eight manufacturing industry.

Comparison of the short-run exchange rate pass-through relations with the openness (the share of direct and indirect imported inputs in output) showed that

although indexation behavior is still at work the degree of openness is also positively correlated with the degree of short-run pass-through.

To sum up, the degree of exchange rate pass-through to domestic inflation is complete in the long run and substantially high in the short-run. The indexation of the prices to exchange rates is the dominant figure in explaining the link between exchange rate and inflation. However, the openness of the economy, which can also be thought to construct the minimum limit for the degree of exchange rate pass-through, is also found to be significant in the exchange rate pass-through relation. Although, indexation and openness is the most important variables in determining the exchange rate pass-through relation, the pattern of exchange rates like volatility and persistency can significantly affect the short-run dynamics of the exchange rate pass-through. However, as it is stated any decrease originating from the changes in the patterns of exchange rates can only affect the short run dynamics of the exchange rate pass-through to domestic inflation.

An important policy implication of these findings is that the dependence of the exchange rate pass-through on the inflation regime should be taken into account in designing monetary policy rules.This dependency would make it easier for a country to implement a policy targeting for a low inflation rate.It should be emphasized,however ,that the credibility of a low inflation regime would need to be established before the benefits of a low pass-through can be realized.

To focus on the influence of the inflationary environment on the exchange rate pass-through to CPI, this paper's estimate of the pass-through have been based on a model that abstracts from the role of microeconomic factors emphasized in the traditional literature. Exploring the relative importance of these factors emphasized in the traditional literature. Exploring the relative importance of these factors in

determining the pass-through to CPI would be an interesting topic for future research. Our ARDL model assumes producer currency pricing and thus implies that the pass-through to import prices does not depend on the inflationary environment. One interesting extension of the paper's model would be to allow for the possibility that the choice between producer and local currency domestic pricing depends on the inflationary environment.

5.2 Mail Findings

The first part of Chapter Four was dedicated to specifying the ARDL model. Due to the presence of a cointegration relationship between the variables. The conflicting results of the trace and the maximum eigenvalue tests necessitated the use of both models (ARDL). Thus, the study used two baseline models (ARDL) and the results from the two models were analysed and compared.

The second part of Chapter Four provided an analysis of the results from each model which are divided into two categories. The first category provided an estimation of ERPT to all domestic prices while the second category investigated the speed and magnitude of pass-through (PT) of import and producer price shocks to consumer prices.

5.2.1 ERPT to Domestic Prices

The results of unit roots showed that all the variables have unit roots except output gap and interest rate which are stationary.

The results of the single test were determined by the fact that all variables have uniform values, as well as the percentage of percentages and percentages that are stationary. No matter what the variables are, the differentials are followed by the first differentiation, which implies their integration into the first order. Using the Johansan method of cointegration, the test track and the maximum value were determined by three and two vector cointegration. Models are also stable, and in autocorrelation there is no autocorrelation, but no malfunctions are normally normalized. Using permanently changing and restarting variables, in any research or

preprinted any other type of solution for the non-normal normality of the nonsense. From the due to of volatility in research into the exchange rate, as a rule, hard to build heteroscedasticity in the model. As confirmed in a chapter 4, the justification was that these shortfalls have an insignificant effect on the structural analysis of the results.

5.2.3 Areas for further research

The results in this study can help to understand how exchange rate shocks affect domestic prices. To further strengthen this knowledge, research into the presence of ERPT asymmetry can help to deepen understanding. Similarly, there is also need to investigate ERPT at disaggregate price level across different sectors or industries in Azerbaijan. The ERPT analysis at disaggregate price level can help in identifying industries which are likely to be most affected by exchange rate shocks and some of the actual reasons why ERPT is incomplete in Azerbaijan.

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Appendix

Table 9. **ARDL Cointegrating And Long Run Form**

ARDL Cointegrating And Long Run Form
Dependent Variable: INFLATION
Selected Model: ARDL(6, 3, 5, 5, 5, 3)
Sample: 2007Q1 2018Q2
Included observations: 40

Cointegrating Form

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(INFLATION(-1))	0.957102	0.150574	6.356351	0.0004
D(INFLATION(-2))	0.442718	0.112822	3.924026	0.0057
D(INFLATION(-3))	0.821361	0.097833	8.395511	0.0001
D(INFLATION(-4))	0.570448	0.075642	7.541472	0.0001
D(INFLATION(-5))	0.058367	0.060232	0.969045	0.3648
D(IMPORTS)	0.010828	0.002729	3.968127	0.0054
D(IMPORTS(-1))	0.000703	0.002408	0.292085	0.7787
D(IMPORTS(-2))	-0.013846	0.002639	-5.247075	0.0012
D(REER)	-0.461867	0.162205	-2.847433	0.0248
D(REER(-1))	0.295674	0.158759	1.862406	0.1048
D(REER(-2))	-0.618075	0.209766	-2.946492	0.0215
D(REER(-3))	-1.036029	0.235313	-4.402772	0.0031
D(REER(-4))	1.321943	0.191995	6.885313	0.0002
D(FDI)	-0.029578	0.008156	-3.626580	0.0084
D(FDI(-1))	-0.049296	0.009002	-5.476097	0.0009
D(FDI(-2))	-0.053961	0.007744	-6.968350	0.0002
D(FDI(-3))	0.054519	0.007269	7.500335	0.0001
D(FDI(-4))	0.003717	0.005047	0.736486	0.4854
D(OIL_PRICES)	-0.407424	0.071920	-5.664994	0.0008

D(OIL_PRICES(-1))	-0.013942	0.100491	-0.138736	0.8936
D(OIL_PRICES(-2))	-0.423700	0.083814	-5.055238	0.0015
D(OIL_PRICES(-3))	0.163681	0.070493	2.321958	0.0532
D(OIL_PRICES(-4))	0.959765	0.063786	15.046611	0.0000
D(M2)	0.001933	0.000697	2.773653	0.0275
D(M2(-1))	-0.002928	0.001076	-2.719638	0.0298
D(M2(-2))	0.003428	0.000989	3.467106	0.0104
CointEq(-1)	-2.349219	0.204212	-11.503815	0.0000