EXCHANGE RATE PASS-THROUGH AND MONETARY POLICY REGIMES IN TURKEY:A STUDY OVER THE PERIOD 1994-2020

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ÖZET

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Bu çalışma Türkiye ekonomisinde enflasyon dinamiklerini döviz kuru geçiş etkisi, ithalat fiyatı geçiş etkisi ve para politikası rejimleri bağlamında 1994-2020 dönemi için inceliyor. Bu çerçeve kapsamında araştırma dönemi üç alt döneme ayırarak inceliyor. Yüksek enflasyonun yaşandığı birinci dönemde (1994:01-2001:12) sabit döviz kuru rejimi uygulanmıştır. Kur ve enflasyonda göreli istikrarın yakalandığı ikinci dönemde (2002:01-2020:12) esnek döviz kuru ve enflasyonu hedeflemesi rejimi yürütülmüştür. Kurun artış trendinde olduğu üçüncü dönemde (2011:01-2020:12) enflasyon hedeflerinden de uzaklaşılmıştır. Bu kapsamda Vektör Hata Düzeltme Modeli (VECM) kullanılarak her bir alt dönem için döviz kuru geçiş etkisi ve ithalat fiyatı geçiş etkisi inceleniyor. Tahmin sonuçları her bir alt dönem için farklı dinamiklere işaret ediyor. İlk dönemde döviz kuru geçiş etkisinin ithalat fiyatı geçiş etkisinden daha güçlüdür. İkinci dönemde ise birinci dönemin aksine ithalat fiyatı geçiş etkisi döviz kuru geçiş etkisinin önündedir. Üçüncü dönemde ise döviz kuru geçiş etkisi çok güçlüdür. Döviz kurunun enflasyon üzerindeki etkisi ithal girdi ve ara malı üzerinden dolaylı etkilere, ithal tüketim malları üzerinden doğrudan etkilere sahiptir. Ayrıca, endeksleme kanalı üzerinden iktisadi birimlerin fiyat beklentilerini ve fiyatlama davranışlarını etkilemektedir. Bu güçlü geçiş etkisi para politikasının etkinliğini de zayıflamaktadır. Bu nedenle öncelikle yapısal sorunların çözülmesi ve döviz kurunda istikrarı sağlayacak bir iktisat politikasının yürütülmesi önemlidir.

Anahtar Sözcükler: Döviz Kuru Geçiş Etkisi, İthalat Fiyatı Geçiş Etkisi , Üretici Fiyat Endeksi, Tüketici Fiyat Endeksi

ABSTRACT

EXCHANGE RATE PASS-THROUGH AND MONETARY POLICY REGIMES IN TURKEY:A STUDY OVER THE PERIOD 1994-2020

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This study examines the inflation dynamics in the Turkish economy in the context of exchange rate pass-through, import price pass-through, and monetary policy regimes for the period 1994-2020. Within this framework, the research analyzes the period by dividing it into three sub-periods. In the first period of high inflation (1994:01-2001:12), a fixed exchange rate regime was applied. In the second period (2002:01-2020:12), when relative stability was achieved in exchange rates and inflation, a flexible exchange rate and inflation targeting regime were implemented. In the third period (2011:01-2020:12), inflation targets were also moved away when the exchange rate was in an upward trend. In this context, the exchange rate pass-through effect and the import price pass-through effect are analyzed for each sub-period using the Vector Error Correction Model (VECM). Forecast results point to different dynamics for each sub-period. In the first period, the exchange rate pass-through effect is stronger than the import price pass-through. Unlike the first period, the import price pass-through is ahead of the exchange rate pass-through in the second period. In the third period, the exchange rate pass-through effect is very strong. The effect of the exchange rate on inflation has indirect effects on imported inputs and intermediate goods and directly affects imported consumption goods. In addition, it affects the price expectations and pricing behavior of economic agents through the indexing channel. This strong pass-through effect also weakens the effectiveness of the monetary policy. For this reason, it is vital to solve the structural problems first and implement an economic policy that will ensure stability in the exchange rate.

Keywords: ERPT, Import Price Pass-Through, Producer Price Index, Consumer Price Index

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ETİK İLKE VE KURALLARA UYGUNLUK BEYANNAMESİ

Bu tezin bana ait, özgün bir çalışma olduğunu; çalışmamın hazırlık, veri toplama, analiz ve bilgilerin sunumu olmak üzere tüm aşamalarında bilimsel etik ilke ve kurallara uygun davrandığımı; bu çalışma kapsamında elde edilen tüm veri ve bilgiler için kaynak gösterdiğimi ve bu kaynaklara kaynakçada yer verdiğimi; bu çalışmanın Anadolu Üniversitesi tarafından kullanılan "bilimsel intihal tespit programı"yla tarandığını ve hiçbir şekilde "intihal içermediğini" beyan ederim. Herhangi bir zamanda, çalışmamla ilgili yaptığım bu beyana aykırı bir durumun saptanması durumunda, ortaya çıkacak tüm ahlaki ve hukuki sonuçları kabul ettiğimi bildiririm.

Hilal Armağan RUFAİOĞLU

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STATEMENT OF COMPLIANCE WITH ETHICAL PRINCIPLES AND RULES

I hereby truthfully declare that this thesis is an original work prepared by me; that I have behaved in accordance with the scientific ethical principles and rules throughout the stages of preparation, data collection, analysis and presentation of my work; that I have cited the sources of all the data and information that could be obtained within the scope of this study, and included these sources in the references section; and that this study has been scanned for plagiarism with "scientific plagiarism detection program" used by Anadolu University, and that "it does not have any plagiarism" whatsoever. I also declare that, if a case contrary to my declaration is detected in my work at any time, I hereby express my consent to all the ethical and legal consequences that are involved.

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SYMBOLS AND ABBREVIATIONS

ADF : Augmented Dickey- Fuller

AIC : Akaike Information Criterion

DF : Dickey Fuller

HQ : Hannan-Quinn Information Criterion

IMF : International Money Fund

SC : Schwarz Criterion

CBRT : The Central Bank of the Republic of Turkey

M2: Money Supply

CPI : Consumer Price Index

USD : American Dollar

TL: Turkish Lira

PPI: Producer Price Index

IPI: Import Price Index

VAR : Vector Autoregression

VECM : Vector Error Correction Model

CHAPTER ONE

1. INTRODUCTION

The beginning of the studies with the exchange rate pass-through effect goes back to the 1970s. The inadequacy of Philips analysis on the cause of the rising inflation in America in these years and the investigation of whether there is a relationship between inflation and exchange rate has focused all the attention on the transition effect (Arat, 2003; 3). After the collapse of the Bretton-Woods system, as economies preferred flexible exchange rate regime, uncertainty in exchange rates increased and affected foreign trade prices. Since the 1990s, the relationship between exchange rates and foreign trade prices has become an important research area with studies on the Law of One Price and Purchasing Power Parity. The Exchange Rate Pass-Through (ERPT) Effect; is expressed as the change caused by the changes in the nominal exchange rate in the domestic import and export prices expressed in national currency (Arı, 2010; 2834, Goldberg and Knetter, 1997: 9). In this context, first of all, the theoretical framework of exchange rate regimes and exchange rate pass-through will be discussed. Following this, firstly, the definition of the exchange rate and exchange rate regimes will be briefly mentioned, and the advantages and disadvantages of the exchange rate regime selection will be discussed. The classification of the exchange rate regimes will be discussed. Later, the importance and components of exchange rate pass-through will be explained, and the definition of exchange rate pass-through will be made, and then explanations will be given in the headings on the effects of exchange rates on domestic, import and export prices. In addition, in this section, a literature review related to the subject will be carried out to evaluate on theoretical explanations.

1.1.The Concept of Exchange Rate

The exchange rate is defined as the amount of national currency that can be exchanged for foreign currencies or the amount of foreign currency that meets the national currency. We can also define the exchange rate as the exchange rate between a national currency and a foreign currency (Seyidoglu, 2007; 354). Exchange rates determine the amount of our local currency we give up for a unit of foreign currency (Gerber, 2018; 239). The exchange rate includes foreign currencies, or all payment

instruments used in payments in a broad sense, and includes checks, bonds, treasury bills, stocks, and bonds other than foreign currencies (Öztürk, 2014; 342).

1.2.Types of Exchange Rate

Exchange rate types will be explained under sub-headings as short definitions, respectively; nominal exchange rate, real exchange rate, effective, direct-indirect exchange rate and forward-spot exchange rate.

1.2.1.Nominal exchange rate

The definition of the exchange rate currently used in the market is called the nominal exchange rate (Seyidoğlu, 2007; 359). The nominal exchange rate is the price of one country's currency in another country's currency. Specifically, the nominal exchange rate is the amount of foreign currencies that can be purchased with one unit of local currency (Acemoğlu, Laibson, & List, 2016; 379).

1.2.2. Real Exchange Rate

The foreign exchange rate definition derived from the regulation of nominal exchange rates according to the external inflation rate and domestic inflation rate in a certain period is called the real exchange rate (Seyidoğlu, 2007; 359).

1.2.3. Effective Exchange Rate

In exchange rate systems left to the market functioning, the national currency from time to time gains value against some foreign currencies and loses value against others. In such cases, it is necessary to calculate the effective exchange rate to calculate the external value of the national currency. Thus, the effective exchange rate is equal to the average of the national currency with the currencies of the country's trading partners, and the trading rates of the trading partners in question are used (Seyidoğlu, 2007; 359).

1.2.4. Direct and Indirect Quotations of the Exchange Rate

Indirect and direct quotes are generally used methods of determining exchange rates. Expressing a currency as a foreign currency unit is called indirect quotation and defining the exchange rate as the amount of national currency per foreign currency is called direct quotation. In Turkey, a unit of the foreign currency that is a direct quotation method is used as the amount of money in the national currency. Indirect quotation is used mainly through countries with strong currencies (Öztürk, 2014; 343). The exchange

rate is the amount of national currency that can be exchanged for foreign currency or the amount of foreign currency equivalent to the national currency. Direct quotation is the amount of national currency per foreign currency. Indirect quotation is the amount of foreign currency equivalent to each unit of the national currency (Seyidoğlu, 2007; 354).

1.2.5.Forward and Spot Exchange Rate

Foreign exchange includes the payment and receipt of foreign currency within two business days after the transaction is decided.Within this period ,it allows a certain period of a tie for the parties to send instructions to lend and debt appropriaate bank accounts at domestic and abroad.

These transactions are generally called spot transactions, and the rate where the transaction takes place is called the ‘’the spot rate’’. The forward exchange rate can be expressed as an agreement made today to sell or buy a certain amount of foreign currency at a certaion future date at a rate decided today (Salvatore, 2013; 434). Spot exchange rates manage the trade on the spot ,meaning foreign exchange transactions take place instantly. On the other hand, forward exchange rates, indicate that foreign exchange transactions are determined on a date that is away from a month or even years (Krugman,Obstfeld &Melitz, 2015; 382).

Suppose the transaction immediately occurs in foreign exchange transactions. In that case, it is called a spot exchange transaction,but the transaction of buying and selling in another currency at a fixed rate after more than two business days is called a forward exchange transaction (Parasız, 2005; 592-593).

1.3. Exchange Rate Regime

Exchange rates are the mandatory value of a country's currency in terms of another country's currency, both in financial markets and in foreign currency-dependent transactions in real markets.We explain the system of exchange rate regimes as a set of rules on how to determine the country's exchange rate value and its change over time and the most crucial function of exchange rate regimes. It is the realization of the effectiveness and continuity of international goods, services, and capital movements by bringing the balance of payments to sustainable levels within the shortest time. Based on this, it is an essential mechanism for exchange rate regimes that determines the change in the exchange level and the domestic currency value within a certain period (Bağış, 2016: 367).

1.3.1. Fixed Exchange Rate Regime

The exchange rate that a government can intervene in, determine, and maintain in the foreign exchange market is called a fixed exchange rate (Acemoglu, Laibson, & List, 2016; 381). The most distinctive feature is the exchange rate fixed exchange rate system, which maintains exchange rates at a certain level, and the Gold standard is the oldest known fixed exchange rate system. On the other hand, The Bretton Woods System was a fixed exchange rate system applied around the world from the second world war to the early 1970s (Seyidoğlu. 2007; 362). In the fixed exchange rate system, the authorities determined exchange rate and kept within the limits determined without being affected by the foreign exchange supply and demand conditions (Öztürk, 2014; 349).

1.3.1.1.The Advantages of the Fixed Exchange Rate Regime

The most essential advantages of fixed exchange rate systems are as follows; (Pınar and Erdal; 2008; 290).

Encourages foreign trade and investments by reducing the exchange rate risk andtransaction costs. It provides monetary control for the fall of inflation and price stability. It prevents inflationary pressures from the private sector for political and wage-price adjustments to finance budget deficits, and provides discipline in economic policies. Based on the pre-determined fixed exchange rate regime, the monetary authority resists the pressures. Another advantage of the fixed exchange rate regime is the prevent of speculative movements.

1.3.1.2.The Disadvantages of the Fixed Exchange Rate Regime

Disadvantages of the Fixed Exchange Rate Regime**;** (Pınar and Erdal; 2008; 290).
It is not possible to implement an independent monetary policy in the fixed exchange rate regime. In addition, it becomes impossible to use monetary policy in cases of exogenous shocks. When the demand for exported goods decreases, there is a decrease in employment and production as it is not possible to adjust the relative prices of the country's exports and imports.

In order to keep fixed exchange rate constant, the country must have sufficient foreign exchange reserves. Since the exchange rates are determined by the public authority in the fixed exchange rate system, it is not always possible for the exchange rates to reflect the true value of the national currency.

1.3.2.Flexible Exchange Rate Regime

The movement in the exchange rate during the day according to the exchange rate value formed in the country without the intervention of the state in the market, or in other words, according to the change of market forces, is called the flexible exchange rate. (Acemoglu, Laibson, & List, 2016; 381). This exchange rate regime is also known as floating exchange rate system: In this system exchange rates are left to the functioning of supply and demand forces under competitive market conditions like a commodity; that is, exchange rates occur at the level where the foreign exchange demand and foreign exchange supply are equal (Seyidoğlu, 2007; 365).

1.3.2.1.The Advantages of the Flexible Exchange Rate Regime

Advantages of flexible exchange rate system ; (Seyidoğlu ,2003;368-369 ;Ertürk, 2001;334-336 ; Pınar and Erdal, 2008; 298).

The flexible exchange rate reflects the real value of the national currency because exchange rates are deteermined by the supply and demand in the market.

The balance of payments is automatically provided. As a result, currencies may gain or lose value every day.

It provides independence in domestic economic policies. Since the Central Bank does not aim to maintain the fixed exchange rate parity ,it can implement an independent monetary policy.

There is no need to keep reserves in the Central Bank vaults since there is no concern of keeping the currencies constant.

The flexible exchange rate system is simple, that is ,There are no bureaucratic transactions.

The flexible exchange rate system protects the economy from external shocks. Each country has the authority to affect and regulate its own monetary conditions, and governments cannot affect the monetary conditions of other countries as in fixed exchange rate regimes.

Generally, sudden and significant exchange rate changes are not experienced in flexible exchange rate regimes.

The flexible exchange rate regime is a more suitable exchange rate regie for comparative advantage theories.

1.3.2.2.The Disadvantages of the Flexible Exchange Rate Regime

Disadvantages of the Flexible Exchange Rate Regime; (Seyidoğlu, 2003;370-371 ;Pınar and Erdal ,2008 ;298-299).

It is not possible to predict what exactly the exchange rate will be tomorrow in the flexible exchange rate regime. For this reason, the flexible exchange rate system has a deterrent effect on traders and investors.

Since the exchange rate stability is dependent on the Marshall Lerner condition ,it becomes difficult to stabilize the foreign exchange market when the supply elasticities of imported and exported goods are low.

The flexible exchange rate is open to destabilizing speculation. Speculation about changes inexchange rates can cause instability in foreign exchange markets.

Those who opppose the flexible exchange rate system state that this system has a one-way effect on internal costs and causes domestic inflation. When the national currency depreciates , the price of imported essential items rises. This situation pushes the unions to increase wages to protect their real income. On the other hand, with the depreciation of money, foreign raw materials and semi-finished products used in industry increase. Thus, inflation accelerates as both wages and prices of foreign raw materials and semi-finished products increase production costs. Those who support the fixed exchange rate system state that the flexible exchange rate system destroys the discipline on the public budget by removing the control over themonetary policy. In the short term, exchange rates may exceed the target.

Flexibile exchange rate regimes do not give the monetary authority as much autonomy as it seems. Although de jure (officially) flexible exchange rate is applied in many countries, de facto (in practice) fluctuations in exchange rates can cause the Central Banks to intervene in the foreign exchange market intensively. Therefore, flexible exchange rate regimes only increase uncertainty in the economy without giving too much autonomy in macroeconomic policies.

Many countries are implementing a flexible exchange rate regime following exchange rate stabilization policies. This situation is known as fear of floating. Exchange rate fluctuations are quite low in developed countries that adopt flexible exchange rates. The main reason for this is that these countries follow exchange rate stabilization policies to ensure exchange rate stability.

In its pure form, the flexible exchange rate is not applied in any country in the world. Central Banks sometimes intervene in the market.

1.3.3.Intermediate Exchange Rate Regime

Exchange rate regimes mostly focus on two extreme exchange rate systems,these are flexible and fixed exchange rate regimes. However, there are different systems between the two extreme systems.The main differences in these systems can be summarized credibility and flexibility (Özdemir and Sahinbeyoğlu,2000:1).

1.3.3.1.Free Float

In this exchange rate system, the value of the country's currency is determined by the market and the interventions to market are made to prevent unnecessary fluctuations in the market and to make the changes more moderate, rather than keeping the exchange rates at a certain level. Moreover , although the monetary policy is more effective in this system, the amount of international foreign exchange reserves that the country should hold decreases.This system also positively contributes to the economic stability in the country, as external shocks are absorbed by nominal exchange rates. The free float system ,on the other hand,adversely affects the resource allocation due to uncertainties and increases in foreign economic relations and the adverse effects of the exchange rate system, and since the exchange rate, which has the feature of nominal anchor for monetary policy, loses its feature, it can turn into a system which is suitable for inflation (Özdemir and Sahinbeyoğlu, 2000;2).

1.3.3.2.Managed Float or Dirty Float

In this system, the monetary authority interventions to exchange rates occur, but these interventions do not take place in line with a predetermined plan. The monetary authority carries out these interventions by operating it with its own decision-making mechanism as it deems good for the time being. The failure of the system to progress in a predetermined way expands the operation area of the country's economy. Uncertainties and risks caused by the free volatility exchange rate system can be reduced with the directable exchange rates. This system is also called ''Dirty Fluctuation'' because it is formed as a result of the interventions made by the countries for their economic benefit in a supervised manner by the exchange rates and the negative effects of other countries (Özdemir and Sahinbeyoğlu, 2000;3).

1.3.3.3.Fluctuating within a Band

In this system, exchange rates are allowed to fluctuate freely within a certain range. This Exchange rate system, which can be perceived as a combination of a fixed exchange rate system and a flexible exchange rate system, brings flexibility and stability with it. In this system ,the very narrow gap can bring instability and speculation , and the sustainability of thisinterval is essential for trust in this system (Özdemir and Sahinbeyoğlu, 2000;3).

1.3.3.4.Crawling Peg

It is a system in which one country's is fixed to the currency of another country and the exchange rate is adjusted frequently to balance or control the volatility in the exchange rate (Gerber, 2018; 260). The crawling peg system acts as a kind of exchange rate regulator, that is, it avoids the disadvantages of destabilizing speculation in the exchange rate. With this system, the exchange rates are changed in a predetermined percentage or amount at intervals determined until the exchange rate reaches the balance (Parasız, 2005; 600). In addition, the creeping parities system is a system based on changing the central exchange rate frequently. It allows exchange rates to fluctuate within parity boundaries. The defining feature of the system is that the exchange rate is changed according to the average of the last few weeks and months (Seyidoğlu, 2007; 376).

1.3.3.5.Full Dollarization

Countries can go beyond adopting other country's currency as their legal currency, and this process is called dollarization (Salvatore,2013; 666). According to (Gerber, 2018; 264), dollarization can be expressed as the adoption of another country's currency. In countries with high rates of inflation, individuals's turning to foreign currencies which represents dollarization (Öztürk, 2014; 348). With this system ,countries use their monetary independence by preferring another country's currency, but its reliability is high due to the increase of monetary discipline and also eliminates the instabilities that can occur in the foreign exchange market (Özdemir and Sahinbeyoğlu, 2000;6).

1.3.3.6.Currency Board

Being a system that realizes the exchange of the selected country's currency at a fixed rate, the currency board prints the country's currency merely for exchange foreign

money. In addition this system provides benefits such as increasing the reliability of monetary and fiscal policies stabilizing the exchange rate combining interest rates and increasing financial depth. In this system, while banks become more sensitive. The Central Bank loses its functions such as monetary regulations and lender of last resort. In order to implement this system, a sufficient amount of foreign currency sources are required, apart from a robust public financing and adequate financial structure (Özdemir and Sahinbeyoğlu, 2000;6). When it comes, to explain the currency board system through the example of the Argentina crisis; Argentina had a currency board system between 1991 and 2001, and this currency board regulation worked well until 1999, but due to the peso being tied to the dollar, Argentina lost international competitiveness against Brazil and went into recession. However, besides having an excessive amount of money, the uncontrolled budget deficit was the reason Argentina went into crisis. The overvalue of the peso has deepened the crisis. Tightening public finances to attract foreign investment has deepened the recession. Foreign investors were worried if Argentina went to the currency board and devalued the peso, as this would result in repatriation of invested capital and restrictions. Argentina had two options left to make, either devalue the peso or complete dollarization. However, Argentina was hesitant to devalue the peso if the currency board regulation was abandoned and the 1980s returned to the hyperinflationary state. Although dollarization would eliminate foreign exchange risk and attract foreign investors to the country, it was not entirely risk-free. Because it will not be able to stop Argentina's international competitiveness problem with Brazil and will not be able to solve budget problems. Argentina failed to pay its foreign debt in January 2002, and it had to abandon the currency board and devalue the peso and then ignore its volatility. By the fall of 2002, the peso depreciated against the dollar under currency board regulation and eventually repaid 25 cents on the dollar to foreign holders of their bonds (Torre, et al., 2003; 3-4).

1.3.3.7.Adjustable Peg System

In the Adjustable fixed exchange rate system, to maintain stability in exchange rates, The Central Bank holds foreign exchange currency to buying or selling auctions so that prevent the exchange rate from excessively falling or rising. In the case of the exchange decreases, it buys foreign currency from the market, when the exchange rate starts to rise, it offers foreign currency to the market, therefore preventing imbalances in

exchange rates (Öztürk,2014; 349). In the adjustable exchange rate system, the exchange rate is changed periodically. The money can be devalued or revalued depending on the balance of payments deficits or excess. The Bretton Woods System is actually an adjustable fixed exchange rate system, but countries did not change the exchange rate until it was truly destabilizing speculation against the possibility of frequent changes in the exchange rate destabilizing, and thus, although it was initially established as an adjustable exchange rate system, the Bretton Woods System was rather a fixed exchange rate (Parasız, 2005; 599-600).

1.4.The Concept of Exchange Rate Pass Through

Portfolio investments are effective on the exchange rate of countries as a consequence of the variable capital. The exchange rate is vital to achieving macroeconomic stability, especially the effect of the exchange rate on domestic prices. The effect of the changes in the exchange rate on the prices of the country can be defined as the Exchange Rate Pass-Through (ERPT) (Sıklar, Kocaman and Kapkara, 2017; 203). Exchange rate pass-through can be defined as the percentage change in domestic prices resulting from the percentage change in the exchange rate,In other words, exchange pass-through is the system in which import prices in local currency change due to exchange rate fluctuations.It means that an increase in the exchange rate makes imports expensive and,after that,prices are expected to adjust to reflect these new prices.Wholesale and consumer prices are important for measuring price transitions for small open economies because changes in import prices will directly affect the share of imports in the index proportional to the domestic price index. As a result of a change in import prices affecting the costs of domestic producers,it will cause a change in the prices of the goods produced.This system is very important in small economies where imports are heavily used as intermediate goods (Arbatlı,E,C., 2005; 86). When the degree of pass-through is one (1) , the exchange rate pass-through is fully reflected in import prices. Conversely, the exchange rate pass-through may be lacking. It can be said that international market segmentation, which allows imperfectly competitive firms to charge the market by charging different prices for the same product in other countries, is one of the reasons for incomplete pass-through. While the nominal exchange rate change may fully reflect import prices in the long run, the degree of pass-through may be much less than one (1)

for the short term. Incomplete pass-through will have complex effects on the timing of currency account adjustments (Krugman, Obstfeld, 2015; 437-438).

1.4.1. The Process of Exchange Rate Pass-Through and Its Effects

Defining the exchange rate pass-through as the volatility or fluctuation in the exchange rate reflected on domestic prices, the effect on the exchange rate is processed in a system that depends on many factors. In general, two channels can be specified through which changes in exchange rates are directly or indirectly transferred to consumer prices. The effect of the exchange rate shock on the price level operates within a complex transmission mechanism depending on many factors (Aliyu et al. 2009; 7-8). The effect of exchange rate fluctuations on the domestic price level through import prices can be explained by the directly channel. That is, by increasing their prices in local currency, the importers maintain their price from increasing and as a result the local currency depreciates due to the increase in the nominal exchange rate. Therefore, consumers have to pay more in local currency when purchasing the same imported goods.On the other hand, if the manufacturing sector is dependent on imported goods priced in foreign currency, the depreciation of the local currency causes the production costs to increase for the manufacturing sector, after which local producers demand higher prices from consumers to protect their profits. In other words, the depreciation of the local currency causes an increase in consumer prices.The extent of the pass-through is related to the dependence of local production on imported inputs priced in foreign currency. In short, importers change their prices of imported consumer and producer goods depending on changes in foreign exchange rates, and thus changes in the exchange rate are transferred to the domestic price level. The indirect channel is related to the effect of the fluctuations in the exchange rate on the total demand and wages. Increases in the exchange will make import inputs more expensive for domestic buyers, causing domestic consumers to turn to domestic substitutes. On the other hand , as domestic products become cheaper for foreign buyers an increase occurs in the exchange rate and export demand rises. This leads to an increase in foreign buyers demand for domestic production. In short the depreciation of the local currency leads to an increase in aggregate demand through increased demand from domestic buyers for imported substitutes and foreign buyers for exports. Increases in total demand pull the domestic price level up. In addition as a result of the increased demand for domestic products. It leads to a high production and,

therefore, a high labor demand, which may be followed by wage increases. This causes upward pressure on domestic prices (Karahan,2017; 38-39).

1.4.2.Theoretical Framework of Exchange Rate Pass-Through

The causal relationship between exchange rates and terms of trade has emerged as an important subject area after the 1990s. Exchange rate pass-through effect based on Single Price Law and Purchasing Power Parity; It is defined as the change caused by one unit of change in the nominal exchange rate in domestic import and foreign prices expressed in local currency. Goldberg and Knetter expressed the exchange rate pass-through in 1996 as a percentage change in import prices in local currency due to a 1% change in exchange rates between countries with foreign trade relations (Arı, 2010: 2834, Goldberg and Knetter, 1996: 9). According to the elasticity approach that links the effect of the trade balance to the changes in the exchange rate; the effects of devaluation are related to supply and demand elasticities. In other words, it states that a devaluation affects the country's export goods in terms of foreign currency and increases the number of exports, while increasing the prices of imported goods in domestic currency and reducing imports (Seyidoğlu, 2013: 114).

1.4.2.1.Law of One Price and Exchange Rate Pass-Through

Law on one price is based on the logic of selling a commercial good at the same prices all over the world. Therefore, Arbitrage activities, which are the definition of buying and selling a good in different markets at the same time, cannot be performed in cases where the single price law is valid. If we define the single price law in another way; In the case of zero trade barriers and transportation costs, goods of the same quality are sold at the same prices in different countries (Krugman and Obstfeld, 2003: 389). To show it as an equation; (Dwyer and Lam, 1994: 4).

$$P = P^{*}.\varepsilon \qquad (1.1)$$

Here in the (1.1), P denotes domestic prices of imported goods, P * world prices, and ε nominal exchange rate. Unless such equality is achieved, a profitable arbitrage opportunity will arise. Here $P < P^{*}$. If ε, the person who performing arbitrage will earn arbitrage income by buying the product at the price of P at home and selling it at the price

of P * abroad (Uçan, 2011: 10). At the end of arbitrage activities, prices will be equalized again and within this framework, it will be possible to list the assumptions of the single price law as follows: In the case of a fully flexible structure in the goods markets, there are no factors that prevent the trade between countries and the transportation costs of the goods subject to trade between countries can be ignored (Uslu, 2012: 9). In economies with a single price law, there may be a full exchange rate pass-through. In case of deviations from the single price law, there may be an incomplete exchange rate pass-through. The single price law can be valid in both commodity markets and money markets. According to the single price law, regardless of where similar goods are sold, they must be subject to mutual trade at the same relative prices (Alacahan, 2011: 52). It is possible to say that the single price law is not valid in the real economy. Because we can explain that transportation costs and trade barriers eliminate the possibility of arbitrage and companies can apply different prices in different or divided markets (Accı, 2015; 33-35).

1.4.2.2.Purchasing Power Parity and Exchange Rate Pass-Through

The single price law introduced by T. Gustav Cassel in 1918 is the application of the single price law of the purchasing power parity approach to the foreign exchange market (Seyidoğlu, 2007; 380). In the absence of transportation costs and foreign trade restrictions, it means that the goods subject to foreign trade are at the same price level in all world markets (Claassen, 1996; 30). It specifies that the exchange rate between currencies of the two countries is equal to the rate of the countries. Purchasing power parity theory states the fall in the domestic purchase of a currency unit predicts a proportional depreciation in the foreign exchange market. That is, symmetrically, it predicts that an increase in domestic purchasing power will be associated with a proportional currency appreciation (Krugman, Obstfel and Melitz; 447). According to this approach, a good with the same quality should be sold at the same price, that is, the prices of the goods with the same characteristics should be equal in all countries of the world. This relationship also applies to foreign exchange and money markets. That is, a unit of national currency should have the same purchasing power all over the world (Doğukanlı; 2001: 74; Oksay, 2001; 42).

1.4.2.3.Elasticity Approach and Exchange Rate Pass-Through

According to the elasticity approach that links the effect of the trade balance to the changes in the exchange rate; the effects of devaluation are related to supply and demand elasticities. In other words, it states that a devaluation affects the country's export goods in terms of foreign currency and increases the number of exports, while increasing the prices of imported goods in domestic currency and reducing imports. This situation shows that devaluation positively affects on the foreign trade balance in different ways (Seyidoğlu, 2013: 114). The elasticity approach connects the positive effect of a devaluation on the foreign trade balance to the Marshall-Lerner condition.

The Marshall-Lerner condition is expressed as shown below;

$$+ e_m \geq 1 \qquad (1.2)$$

Here in the (1.2) , e_m defines the domestic demand elasticity of imported goods, and e_x ; is the external demand elasticity of export goods. + =1 ; According to the Marshall-Lerner condition ; the increase in exchange rates will not have an impact on the foreign trade balance.

But still e_x+ e_m<1 ; an increase in exchange rates will adversely affect the country's foreign payments balance sheets and + e_m>1 explains ; with an increase in exchange rates, it is possible to balance the balance of payments.

The Marshall-Lerner condition shown (1.3) as a detailed equation;

$$\frac{e_m e_x (h_m + \eta^x - 1) + \eta_m \eta^x (e_m + e_x + 1)}{(e_m + \eta_m)(e_x + \eta^x)} \geq 0 \qquad (1.3)$$

η_m ; Although it is used to express the import and export demand elasticities of the exporting country, it is also defined as positively. Supply elasticities are defined as e_m or e_x and η_m express the domestic prices of the exporting country and e_m or η^x defines the prices of the foreign country (Karluk, 2003: 466). Failure to fulfill the Marshall-Lerner condition is associated with low short-term elasticity. In other words, the

devaluation made in case of low elasticities disrupts the foreign trade balance, but causes improvements afterwards. Over time, the changes that occur in the foreign trade balance sheet form a shape similar to the letter J and this is called the J curve effect (Seyidoğlu, 2001: 462). The curve of J is shown as in the figure.

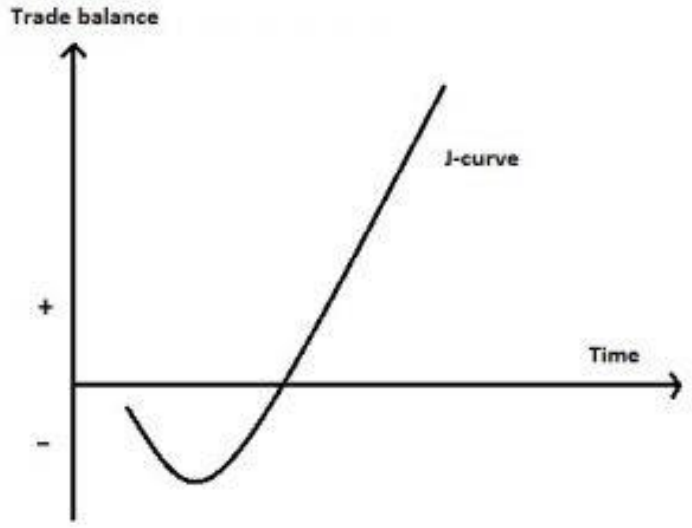

Figure.1.1: *J Curve*

As can be seen in the figure, a devaluation applied firstly causes damages in foreign trade and this damage being experienced in the zone I; but over time, the foreign trade balance will improve. The process of these positive effects may vary from country to country, but it has been revealed because of the studies that this process will take more than two years (Seyidoğlu, 2001: 463).

1.4.3.Exchange Rate Pass-Through Effect According to Price Channels

The Exchange Rate Pass-Through (ERPT) Effect; It is expressed as the change caused by the changes in the nominal exchange rate in the domestic import and export prices expressed in national currency (Arı, 2010; 2834, Goldberg and Knetter, 1997: 9).

1.4.3.1.Domestic Price Channel

Exchange rate pass-through effect, which is an important research area after the 1990s and whose main source is Single Price Law and Purchasing Power Parity; It expresses the change in import and export prices in national currency caused by a one-unit change in the nominal exchange rate.When talking about the pass-through effect in general terms, it is understood how the changes in the exchange rate affect import prices in local currency (Menon, 1996: 434).That is, the effect of exchange rate pass-through ;

It can be expressed as a 1% change in local prices resulting from 1% unit change in the exchange rate, and the full pass-through effect to the one-to-one reflection of the changes in the exchange rate to the sales prices by the companies, and the reflecting only a part of it, but not completely is expressed as a partial pass-through effect and if the these changes are not reflected in sales prices by companies, there is no way to be mentioned about the pass-through effect (Yang, 1997: 95). In other words, the absence of a pass-through effect means that the price in local currency is not affected by the changes in import costs (Flamini, 2003: 12).

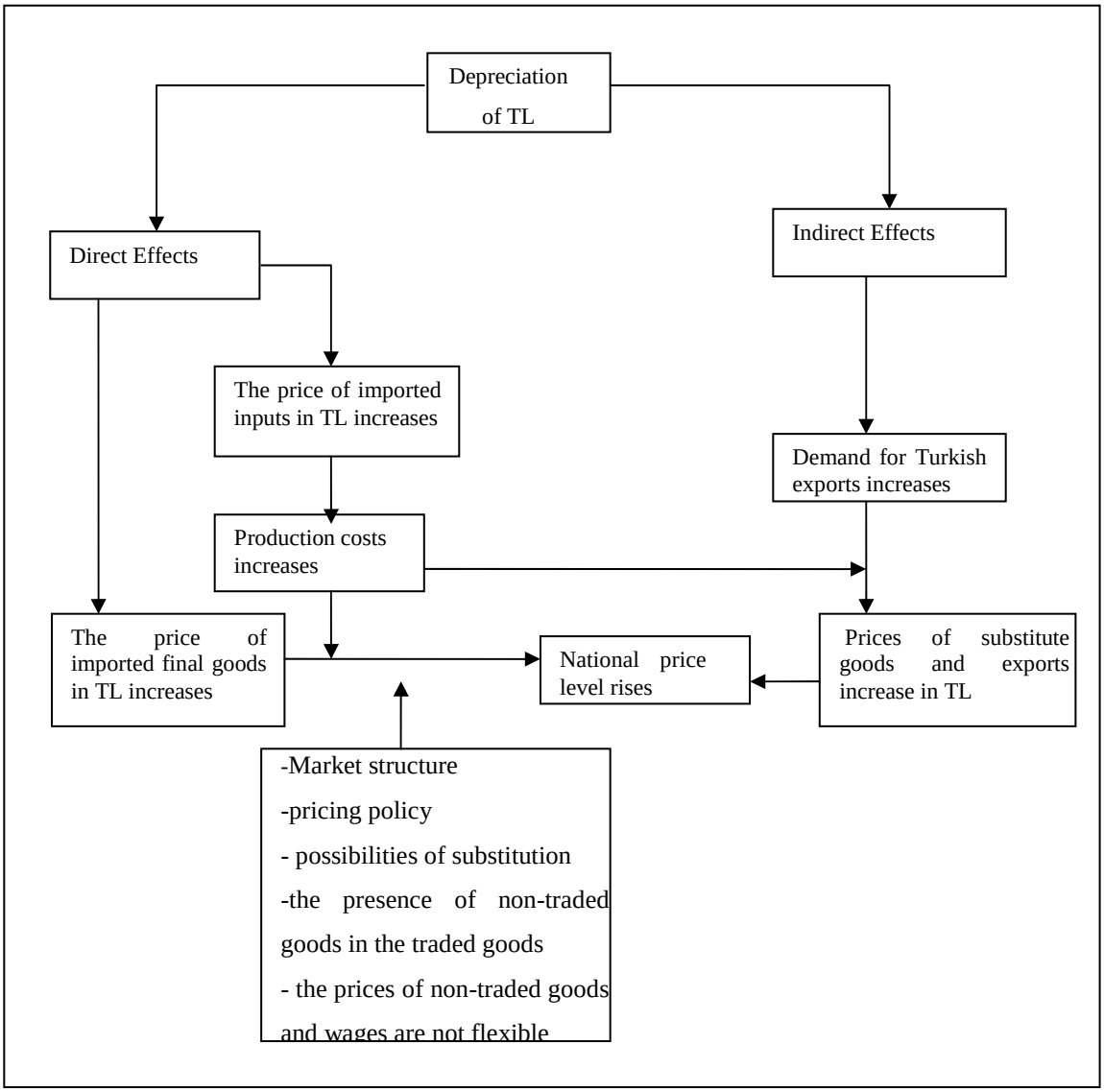

Figure 1.2: *Domestic Prices Effect of The Exchange Rate Pass-through Effect*

Source: *Hyder, Zulfiqar ve Sardar Shah; (2004), "Exchange Rate Pass-Through to Domestic Prices in Pakistan", State Bank of Pakistan Working Paper No:5, p: 4.*

1.4.3.2.Import Price Channel

The pass-through of nominal exchange rate changes to import prices, which is related to the sensitivity of the domestic price level to exchange rate changes; The rate of transition of exchange rate changes to domestic prices is important for predicting inflation and choosing monetary policies to be implemented against inflationary shocks. This is important in countries where inflation targeting is in place (Kiptiu et al., 2005: 1). Therefore, increases in import prices will cause an increase in local prices due to the high pass-through effect in the economies of developing countries.The high pass-through effect will delay reaching the inflation target (Pinto and Junior, 2006: 2).As a result, some academicians argue that in cases where the pass-through effect is low, the inflation pressure from abroad will decrease, but this will also be a positive development.

However, it is clear that this inflation-oriented assumption does not take into account the role of relative prices and real exchange rates. Obviously, changes in the nominal exchange rate have an impact on relative prices, and these changes in exchange rates can have an impact on prices depending on the size of the traded and non-traded or imported. This will not affect the prices of goods in different sectors of the pass-through effect equally.Thus, the pass-through effect will show its effect on inflation indirectly by changing the relative prices (Kara et al., 2005: 7).

1.4.3.3.Export Price Channel

Briefly touch on the effects of exchange rate movements on export prices, that is, the pricing behavior according to the market; Akat and Yazgan (2012) stated that real exchange rate movements in Turkey are reflected in export prices in foreign currency, but this process takes time. Knetter (1993), examined the pricing behavior according to the market in the international literature. He emphasized the importance of industry characteristics. In his study, in which he examined the changes in export prices in the 7-digit product category in the examples of the USA, England and Japan, it was determined that the pricing behavior according to the market in the products belonging to the same sectors, regardless of the country in which the sector is located.It emphasized the examination of the pricing behavior of industry-specific features in line with the market. Also Feenstra. (1996) and Yang (1997) tried to explain the pricing behavior according to the market by emphasizing the sectoral characteristics, and Yang (1997) stated in his study that exchange rate pass-through is directly proportional to the degree of

differentiation of products belonging to the sector and inversely proportional to the production flexibility. Feenstra (1996) showed in his study that the exchange rate pass-through is directly proportional to the market share in the exporting country.

1.4.4.Theoretical and Empirical Literature on Exchange Rate Pass-Through

McCharty (2000) measured the effect of the exchange rate on prices with the VAR model approach and laid the groundwork for future studies.In his study, he investigated the impact of exchange rates and import prices on producer and consumer prices by using the VAR model of nine developed countries and 1976: I -1998 : II period oil price ,output gap ,exchange rate change ,import prices, producer price indices were used.According to the results of the study , it has been revealed that although the pass-through effect from exchange rate to PPI and CPI is less effective than the pass-through effect from import prices and producer prices respond more to import price shocks than consumer prices.

Minella et al.(2002) investigated the effect of exchange rate shocks on inflation for the Brazilian economy by using the VAR model approach with the data of 1994:09 - 2002:06. As a result of the study, it was observed that 32.8% of the changes in the consumer price index were caused by exchange rate shocks.

Leigh and Rossi (2002) examine the effect of pass-through from exchange rate to consumer and wholesale price indices. According to the results of 1994- 2002 quarterly data and VAR model approach , they revealed that the pass-through effect was hgh and the effect of pass-through began to be completed in the first four months.

Hüfner and Schröder (2002), studied the effect of exchange rate pass-through effect on consumer prices for Germany, Italy, France, Netherlands and Spain. They calculated the weights of the Harmonized Consumer Price Index (HICP) using time series data from 1981 to 2001, and according to the study results, the country where exchange rate pass-through affects consumer prices most rapidly in the Netherlands , but in the long run, this effect is valid for Italy and France.

Arat (2003) examines the effect of pass-through to domestic prices using the monthly date of 1994-2002 by using VAR model approach. Analysis indicated that compared to the developed economies of the pass-through effect in Turkey higher than in developed countries.

Kara et al. (2005) have tried to show the impact of exchange rates on domestic prices and differences, and they included determining the extent of the pass-through effect

between different subsectors. According to the study results, they claimed that the pass-through effect decreased more than the domestic prices compared to the period pre-2001. It has been shown that exchange rate regimes transition and in the fight against inflation caused a significant decrease in pass-through effect. However, it has been determined that the exchange rate affects inflation, especially on traded goods.

Arbatlı (2005), which was made using the model Yes there is a transition effect for Turkey in the research that by using TVAR model to estimate the asymmetries between exchange rate-inflation measured by Wholesale and CPI. According to the research results, it has been concluded that the pass-through effect on prices is low during the periods of recession in the economy. However, it has been argued that the evidence for asymmetries due to the magnitude of the volatility in exchange rates is weak and not very remarkable in quantitative terms.

Kara and Ögünç (2005) examined the effect of pass-through to domestic prices with the monthly data of 1995- 2001 and 2001-2004. As a result of the study, the pass-through effect tends to decrease for both different periods, and in which two separate year groups were selected to examine the pass-through effect on both fixed exchange rate and floating exchange rate. Moreover, it has shown in the study pass-through effect was lower in the floating exchange rate regime compared to the fixed exchange rate regime.

Ito and Sato (2005) analyzed the pass-through effect in East Asian countries by using the VAR model approach with the 1975- 2003 quarterly data. In their study , where they used five different variables, they use of oil prices, output gap, monetary base, nominal exchange rate, and price index. As a result of the study, it was found that the pass-through effect on import prices in countries affected by the crisis was quite high but the pass-through effect on consumer prices was low.

Campa and Minguez (2006b) examined the exchange rate pass-through effects 11 countries for different products and examined the effect of the exchange rate pass-through to the total import basket from different products by country. As a result of the study, the exchange rate pass-through effect for countries in the short run is low, but the exchange rate pass-through effect is higher but incomplete in the long run.

Şıklar and Caglarırmak (2007) the pass-through effect on domestic producer and consumer prices in Turkey were examined by using the VECM method also valued the impact of the pass-through effect on monetary policy. According to the results the pass-through effect in Turkey is incomplete and decreasing pass-through effect to inflation.

Tüzün (2007) analyzes the pass-through effect coefficients for domestic prices by using the VAR model approach with monthly data from 1994-2001 and 2001-2006. In the study, it was concluded that the pass-through effect coefficient from the exchange rate to domestic prices in the period of 1994-2001 was higher compared to the 2001-2006 period, and the reason for the slowdown in the pass-through effect over time was the transition from a fixed exchange rate to a floating exchange rate regime and disinflation policy.

Şıklar and Uslu (2007) investigated the effect of pass-through to consumer and wholesale price indices in their study. According to the results of the research conducted using the vector error correction model with monthly data for the 1994-2006 period, it is concluded that the effect of pass-through to the consumer price index is lower than the effect of pass-through to the wholesale price index. The reason for this is that the wholesale price index includes more traded goods compared to the consumer price index and it was also concluded that the pass-through effect was mostly completed in the first four months, but the exchange rate policy implemented after the 2001 crisis and the structural changes in the economy weakened the pass-through effect.

Ghosh and Rajan (2007), as a result of their study on the effects of exchange rate pass-through on export prices of Thailand, Korea and Singapore with the data for the period of 1980 - 2006, concluded that the degree of pass-through effect of the volatility in the exchange rate to export prices varies from country to country and that the reason for the differences of countries is that they do not reflect the constantly changing exchange rate changes on the prices in order to avoid loss of reputation in trade.

Ca'Zorni, Hahn and Sanchez (2007) measured the pass-through effect in their study for twelve developing countries and concluded that the transition effect decreased throughout the production chain.

Jabara (2009) examined the exchange rate pass-through effect of the USA with Japan, Canada, Latin America, the European Union and some Asian countries on total import and consumption goods prices. According to the study results using quarterly data for the years 1999: I - 2008: II, the exchange rate pass-through effect is quite low. The reason for this is that the changes in exchange rates are not reflected in prices due to the competitive nature of the countries.

Şen (2009) examines the effect of the pass-through to domestic prices in the manufacturing industry. According to the results of his study using monthly data covering

the period 2002: 1 - 2009: 3, it has been suggested that the reaction of prices to exchange rate changes may vary according to aggregate demand conditions and the exchange rate pass-through effect is more effective in growing economies and prices may be affected by past inflation while the economy is shrinking.

Kara and Öğünç (2012) analyzed the effect of exchange rates and import prices on consumer prices with the help of data from 2002-2011 and it was concluded that the exchange rate pass-through was around 15 percent for both variables over a one-year period. They argued that the reason for the decrease in the pass-through effect from exchange rate to prices after 2001 was the high volatility in the nominal exchange rate and the possibility of a contraction in the economic activity branches using imported inputs during the crisis.

Masha and Park (2012) studied that the exchange rate pass-through to consumer and producer prices in the Maldives, compared with other countries, the effect of exchange rate pass-through on consumer prices is high. In addition, the effect of exchange rate changes is reflected in the second year.

Arslaner (2014) shown in the analysis that in Turkey for the period 1986-2013 examined the exchange rate pass-through and concluded that domestic inflation significantly ERPT in Turkey. Also, the majority of the pass-through effect happens instantly. The results suggest that the openness in the economy and past currency crises were factors contributing to the high pass-through effect.

Choudhri and Hakura (2015) using both VAR model and regression estimates in their study, they conclude that the exchange rate pass-through effect for most countries has an incomplete pass-through effect on import prices but is higher than export prices.

Savoie and Khan (2015) also examined the effect of the exchange rate pass-through effect on consumer prices and discussed the effects of the exchange rate pass-through effect on monetary policy implementation and as a result they concluded that the exchange rate pass-through effect played a key role in the recent inflation dynamics in Canada.

1.5.Exchange Rate Regimes and Monetary Policy Implementations

After the economic crisis in the late 1990s, there has been an increase in developing economies that have implemented variable of exchange rate regimes in recent years. According to the IMF classification of developing country economies, the number

of countries, which total was 55 in 1991, 26 of those countries which were applied free-floating exchange rate regimes and 29 of which were applied managed floating exchange rate regime, in 1999 this rate increased by %40 to 75 countries. In 2006, 40% of 187 IMF countries applied the floating exchange rate regime, while the number of countries applied managed floating regime increased by 89% compared to 1999, and the number of countries that applied the free-floating regime decreased by 48%. When it comes to Turkey, Turkey applied managed float in 1991, crawling peg system in 1999 and that 25 countries including Turkey in February 2001 adopted free-floating exchange rate regime. In terms of monetary policies adopted as of 2006, 91 (48.7%) of 187 countries are target the exchange rate; 29 (15.5%) target monetary aggregates and 25 countries (13.4%) target inflation rate. As it can be understood from here, the exchange rate regime does not occupy an essential role in the main policies of most of these economies or we can say that it has lost a nominal anchor feature. However, exchange rate fluctuations have important implications for many macroeconomic variables. Therefore, it is important to evaluate the appliacability of monetary policy regulations and exchange rate regimes in order to identify the factors that cause exchange rate pass-through. Hence, as stated in some studies, the high rate of reflection on domestic inflation in developing countries necessitated an alternative to the floating exchange rate regime applied in these economies (Arslaner, 2009; 281).

1.5.1.Interaction of Exchange Rates and Inflation Targeting Strategy

The exchange rate has been one of the most controversial issues of emerging market economies in recent years. Nominal exchange rate targeting has been one of the methods used to reduce inflation in many countries. Many countries, such as Latin America, have used the exchnage rate implicitly to tax the export sector and then it caused monetary crises due to the overvaluation of real exchnage rates. 1990 has been a period in which the appropriateness of different exchange rate regimes for developing countries' economies was discussed. Many academics have argued that applying a strict targeting regime is the right choice for transition and developing economies. This is "fear of fluctuation" in developing countries. However, after the monetary crises between 1990 and 2000, the economies of most developing countries moved away from strict exchange rate targeting. They adopted the combination of flexible exchange rate targeting. After this trend,the exchnage rate has moved away from being the center of discussion for the

economies of developing countries' economies,but it has not been completely excluded (Arslaner, 2009; 286).

1.5.2.The Central Bank Policy in the Inflation Targeting Strategy and Exchange Rate Pass-Through

Within the exchange rate targeting program, framework, policies aimed at price stability were implemented in various countries for a while. However, due to the problems of the fixed exchange rate regime, many countries sought new monetary policies, and the inflation-targeted monetary policy strategy is one of them (Çevik and Yıldırım, 2018: 32). The inflation targeting strategy made it easier for economic agents to react to country developments and internal shocks. While a certain inflation rate is determined as the anchor in the inflation-targeted monetary policy strategy, the flexible exchange rate system is preferred as the exchange rate system (Mankiw, 2009: 399). The stabilization program with inflation targeting was implemented for the first time in New Zealand, but it has been preferred by many countries afterwards. In this system, a low and stable inflation rate is set as an intermediate target for a certain period, and as a result, the target inflation rate fulfills the anchor role to monitor and control price stability in the economy. In the stabilization program with inflation targeting, the targeted rate is reached by using interest rates as a policy tool. Central Banks also prefer interest rates as an essential tool within the framework of Taylor rule. Accordingly, interest rates are used as a regulatory factor in cases where there are deviations from the targeted inflation level with actual inflation (Ataç, 2011: 31). Under this system, exchange rates are left to free floating. Price stability and continuous growth are two main objectives in terms of economic policies. Interest rates are considered as an external independent variable, while exchange rates are considered as an internal dependent variable. Accordingly, depending on the management of domestic interest rates, it does not constitute an obstacle to freely determining the exchange rate of capital movements realized according to the difference in interest rates abroad (Arslaner, 2009; 33). In the inflation-targeting regime, interest rates are considered as the primary policy tool. With the preference of the flexible exchange rate regime, the effect of fluctuations in exchange rates on prices is negated. It is predicted that the relation between exchange rates and prices will weaken in the process of determining the exchange rates by their market power, while inflation expectations are constantly lowered. Thus, the Central Bank tries to weaken the relationship between

inflation and exchange rate by directing inflation expectations. As a result, under the inflation targeting regime, it is normal for the flexible exchange rate regime to decrease the exchange rate pass-through (Coricelli et al., 2006: 19-20). In countries where inflation-targeted monetary policies were in effect, fluctuations in exchange rates were observed after a while after the free exchange rate regime was preferred.

Consequently, problems have arisen under inflation-targeting regimes. Accordingly, the phenomenon of exchange rate volatility, which defines the reflection of exchange rate changes on prices, has started to gain meaning.In other words, it is concluded that there is a relationship between the exchange rate and the inflation level.It has been observed that exchange rate fluctuations in developing countries have started to react differently due to the inflation targeting regime. In short, under the inflation targeting regime in developing countries, monetary policy practices have become more susceptible to exchange rate fluctuations. The reason for this is that the floating exchange rate regime has effects distorting price stability in developing countries. Since the production structure in developing country economies depends on foreign input imports, the production structure and costs become sensitive to exchange rate movements (Erdoğan and Yıldırım, 2008: 105). In the economies of developing countries, the fact of currency substitution is an important variable that causes the price movements in the country to be influenced by the exchange rate due to the inability of the domestic currency to fulfill its function.As a result, exchange rate movements in developing countries become determinants of inflation due to their inflationary expectations (Erdoğan, 2011: 14).

1.6.The Monetary Transmission Mechanism Channels

The monetary transmission mechanism, which expresses the delay and how much it will affect the real economy and prices in line with the decisions taken regarding the monetary policy, may vary from country to country according to the structure, size and openness of the economy (Cengiz, 2009; 226). The monetary transmission mechanism explains how policy-induced changes in the nominal money stock affect variables such as aggregate output and employment (Ireland,2005;1). Monetary policy affects the real economy through various channels. These channels are; traditional interest channel, asset prices channel, exchange rate channel, credit channel and expectation channel.

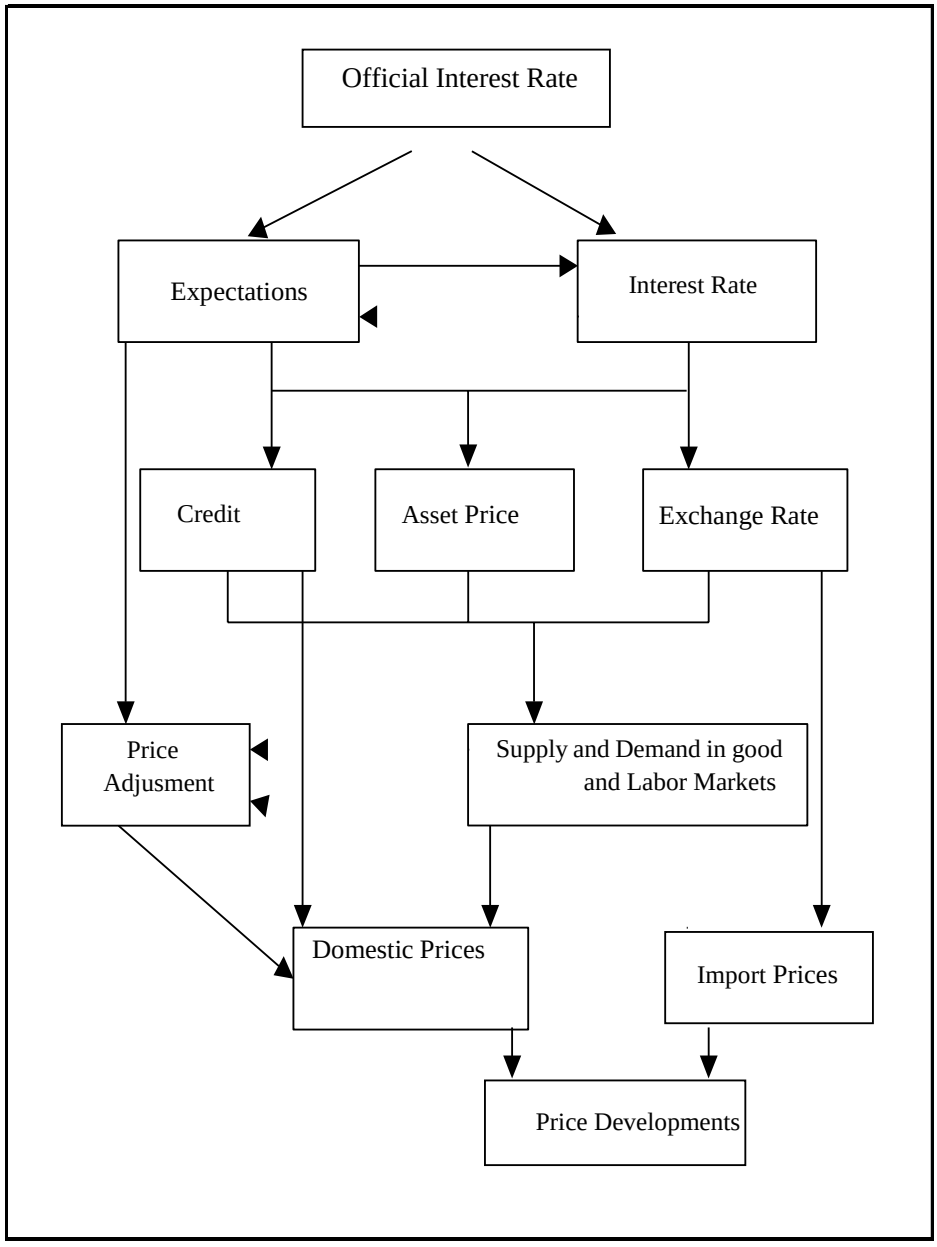

Figure 1.3: *Monetary Transmission Mechanism (European Central Bank).*

1.6.1.Interest Rate Channel

In addition to being a standard feature of monetary policy,the Interest rate channel , which has been in the economic literature for more than 50 years is also known as the Keynes effect (Mishkin,1995;4). Changes in the real money supply affect interest rates and investments.Changes in money supply are associated with changes in interest rates. Investments of changes in interest rates in commodity markets depending on the marginal productivity of capital,on the other hand an increase in investments affects the balance of income level with multiplying effect (Öztürk;2014;256). Consumers and companies

make their decisions based on real interest rates. Long-run interest rates determine the maximum impact on expenses. Changing short-term nominal interest rates by the Central Bank due to sticky nominal prices level will change short-term and long-term real interest rates. With an expansionary monetary policy, nominal interest rates and real interest rates will decrease (Mishkin,1995; 5). As a result of the decrease in real interest rates, it will cause an increase in total production (Örnek,2009;106).

1.6.2.Asset Price Channel

The Asset Price Channel which taking its theoretical basis from Modigliani's "Life Cycle Hypothesis", affects the volume of economic activity as it will change the net worth of the total amount of wealth through contractionary or expansionary monetary policies. So; When the money supply is expanded, spending on consumer goods may increase due to increased in purchasing power. The level of consumption excpenditures; creates life-long resources consisting of human, real capital and financial wealth (Orhan and Erdoğan, 2008;81). According to the asset prices channel theory ; An expansionary monetary policy leads to an increase in equity prices, making investments attractive and increasing aggregate demand. However, by bringing high stock prices and growing wealth, consumption, that is , total demand will increase (Loayza and Schimdt-Hebbel, 2002, 5). Changes in asset prices are directly related to changes in interest rates. A fall in interest rates results in an increase in asset prices , whch in turn causes and increase in the wealth of asset holders. The continuity of the downward trend in the interest rate, the expectation that the gap between asset prices and interest rate will open ,and maintains the positive return expectations of asset owners. Therefore, interest rate policies of policy makers are import for asset owners. Given the signal that interest rates will be lowered with the expansionary monetary policy, the weatlh of economic units that see an increase in asset prices will also increase.This increase in wealth triggers consumption expenditures, manufacturing firms will increase production and as a result , there will be expansion in the economy (Orhan and Erdoğan,2008 ;81-82).

1.6.3. Exchange Rate Channel

The exchange rate channel shows the effect of exchange rates on the real economy, especially on aggregate demand and aggregate supply. In addition ,it refers to the change in production as a result of the reflection of the effect of monetary policy on exchange rates on net exports. As the share of imports and the depreciation of the notinal currency

unit against other countries' currencies , in other words the magnitude of the devaluation increases, the transfer level of the exchange rate channel increases (Horvarh and Maino,2006;4). After a monetary contraction, the increase in real interest rates will increase the foreign capital market entering the country and increase the value of the domestic currency. As a result ,the price of export goods will increase ,while the prices of import goods will decrease and this will cause real production to fall. With the entry of foreign capital, the value of the domestic currency will increase. The increase in the value of the domestic currency will cause the price of goods produced within the country to increase compared to the price of similar foreign goods (Horvarth and Maino,2006;4). It is worth noting that it is also seen that the transmission channels are interconnected. The interest rate channel is linked to the credit channel by affecting debt costs and the exchange rate channel is linked to the interest parity (Örnek;2009;107).

1.6.4.Credit Channel

The reflection of the changes in the amount of money on the economy by affecting the bank loans constitutes the credit channel.Expansionary monetary policies that increase reserves also increase bank loans. Credit increases leads to the expansion of investment expenditures (Mishkin,1996;9-10). For the effective use of the credit channel ;Bank balance sheets should not be abstracted from monetary policies,that is ,changes in policies should affect bank balance sheets and the bank balance sheets of firms that have a function in the economy should be affected, that is, companies should react to changes in banks'credit facilities. For example; When the banks 'lending opportunites decrease ,firms may demand less credit or when there is an increase in banks abitlity to lend, firms may deman more loans (Farinha and Marques,2001;7-10). After applyin a contractionary monetary policy ,banks do not allow interest rates to rise in response to customer demands and resort to loan rationing. Loan rationing referes to the situation where those who want to barrow are willing to pary higher interest rate but cannot get a loan. Firms with risky invesment projects are ready to pay high interest rates,but banks hesisate to give loans to these companies even if they offer interest above the market interest rate ,as banks think that the loans will not be repaid due to the high invesment risk (Ozturk,2014; 260). With the expansionary monetary policy ,there is an increase in bank reserves and deposits, resulting in an increase in the loan volume that banks can provide, increasing the

borrowing limit of the investors. As a result of it, total invesments in the economy increase and the level of national income rises (Kashyap and Stein ,2000; 410-412).

1.6.5.Expectations Channel

The first research on the expectation channel was introduced by Kydland and Prescott (1977) with Barro and Gordon.The expectations channel has an important place in the transmission process and can be chosen as a target variable. They stated that unexpected expansion in monetary policy will cause an increase in the real economy (Kydland and Prescott, 1977; 477). The monetary policy implemented can change the actual expectations by affecting the expectations of the economic agents. It also affects the effectiveness of the policies implemented in the changes in expectations. If the monetary policy implemented affects the expectations in the same direction the reactions of the economic agents will be in the targeted direction.In other words, information obtained regarding monetary policy can move the markets in a certain direction. At the same time, it will take time for the goods markets to come to balance as it takes a certain time to start production phase with the production decision. But when a policy that is perceived as temporary, it will not be possible for the expectations and the reactions to be shown accordingly to comply with the policies being implemented. There is also close relationship between the expectations channel and the reliability of The Central Bank. For the monetary policies implemented to reveal the desired effects on the expectations of economic agents, The Central Bank must be reliable (Orhan and Erdoğan, 2015; 87-88)

CHAPTER TWO

2. Introduction

Monetary policy tools, which are effectively implement and modify in order to achieve predetermined goals, are essential for monetary policy implementations. Monetary policy refers to the asset-liability behavior of banks, in other words, the ability to adjust the amount of money in circulation in line with the general objectives of the economy. According to another definition, monetary policy is to meet the cash needs of the market with indirect monetary policy tools such as open market operations and legal reserve ratios. The function of monetary policy is limited to adjusting the cash flow in the market with the monetary policy tools of the Central Bank. In order for monetary policy to function effectively in a country, there must be a free market economy. Decreases in the amount of money lead to increased interest rates, while increases in money volume decrease interest rates. The most important feature in monetary policy is to determine the amount of money and the rate of interest by the monetary authority but not to intervene in how the money will be used (Gayıbov, 2001; 10). There are determinant variables for monetary policy to be effective on the cash level in the market (Orhan and Erdoğan, 2007; 60). To summarize them briefly; Interest rate elasticity of loan demand; that is, the level of interest is the most fundamental factor that determines the loan demand. The banking sector development level; determines the level of lending transactions of the level of development the sector is in. Response of banks and borrowers to monetary changes; In other words, the liquidity preferences of borrowers or banks determine the expectations of economic agents, the level of liquidity in the economy. The influence process of monetary policy, which affects the level of liquidity in the economy, can be shown as follows (Orhan and Erdoğan, 2007; 61).

2.1. Purposes of Monetary Policy

While the aim of the Monetary Policy, which changed at the time, was to protect the monetary value before the First World War. Later tried to protect the value of the money outside the country while aiming to maintain the price stability of the country's economy due to inflation-related economic problems. In this direction, achieving price stability has become its main objective, but apart from price stability. It has also goals

such as full employment, economic growth, the balance of payments, and interest stability (Eroğlu, 2004; 148).

2.1.1. Price Stability

Price stability is commonly used to describe a low inflation rate that is negligible in people's investment, consumption and savings-oriented preferences.Inflation values between 1 percent and 3 percent in developed countries are regarded as low inflation rates (Serdengeçti, 2002; 1). Price stability is expressed as the situation in which all kinds of economic activity do not make the changes in the price level as a determining variable by the economic agents when planning. Due to the damage caused by inflation-related problems, the main objective is to achieve price stability among monetary policy objectives. Since it causes an environment of uncertainty, increases in the general level of prices make it difficult for economic agents to make decisions about the future (Orhan and Erdoğan, 2007; 66). As a result of the coordination of fiscal policy and monetary policy, price stability is achieved. In addition, this is the case when these two policies are used in line with the same goal. If monetary policies and fiscal policies are supported with similar policies, an effective result will be achieved in inflationary or deflationary periods. In countries where public deficits constantly increase and become unavoidable, fiscal discipline should be provided for effective use of both monetary policy and fiscal policy. The ever-increasing public debt is financed directly or indirectly through central bank resources or borrowing to the market and the monetization concern arising from this situation limits the effectiveness of the use of monetary policy and makes it difficult to achieve price stability. The reliability and independence of the Central Bank increases the effectiveness of monetary policy in maintaining price stability (Eroğlu, 2004; 150).

2.1.2. Full employment

Full employment broadly; expressed as the effective and full use of production factors throughout the production process and the determination of the income level, that is, by measuring it with the Gross Domestic Product (GDP) expressed as the value of the goods and services produced in a certain period. To express full employment in a narrow sense; It is the level of employment at which the population who wants to work at the current wage level can find a job. Full employment as an economic policy goal is based on the 1929 economic crisis (Yıldırım, 2009: 5). Purpose of full employment; It includes preventing cyclical unemployment, minimizing or eliminating structural, seasonal and

occasional types of unemployment. However, in measuring full employment, a minimum unemployment rate arising from the difficulty of removing seasonal and occasional unemployment defines the phenomenon of full employment (Parasız, 1993: 1).

2.1.3. Economic Growth

Economic growth, defined as the increase in economic production capacity; The most crucial indicator of the rise in the production volume in a country is the changes in GDP (Turan, 2008: 11). Economic growth is an important issue for both developed and developing countries. The growth goal, which is handled together with the aim of development in developing countries; Different economic variables are preferred because it determines the growth and development rates as the real growth rate per person (Aslan, 2009: 536).

2.1.4. Interest Stability

Interest rate stability, one of the goals of monetary policy, and ensuring economic stability, it also aims to prevent fluctuations in interest rates. Unstable volatility in interest rates cause an environment of uncertainty, which causes investors to make unhealthy decisions about their investments or to hesitate to invest. Changes in the interest rate level adversely deteriorate the debtor-creditor relations and make forward-looking productivity calculations difficult. As a result of the differences between the actual inflation and the expected inflation, financial intermediaries can earn large profits, otherwise they may lose money. Therefore, Central Banks are very sensitive to changes in interest rates (Eroğlu, 2004: 156).

2.1.5. Balance of Payments

The purpose of the balance of payments, which is expressed as a table in which all economic activities of residents of a country and residents of other countries are recorded in a certain period of time, improves the balance of payments. Balance of payments; It is a balance sheet showing the numerical status of payments between domestic and foreign economic units in a certain period. The assets of this balance sheet include payment inputs, and the liabilities include expenses resulting from trade with other countries (Seymen and Bilman, 2013; 19). Considered among the reasons for the balance of payments deficits; inflation, appreciation of the national currency, spending expansion policies, speed of development, productivity and technology, foreign dependency in

terms of raw materials, taste and preferences, to close deficits such as economic fluctuations, foreign exchange speculation and balance of financial crises, imports and transactions that will cause foreign exchange outflow from the country are restricted, exports and foreign currency earning transactions are encouraged (Şimşek and Aydın, 2004: 241). Increasing the efficiency of official reserves, benefiting from foreign trade and foreign exchange policies can be counted among the policies aimed at eliminating the balance of payments deficits. It is imperative that monetary policy be handled with the exchange rate system in order to balance the balance of payments. In the fixed exchange rate system, a flexible exchange rate system is preferred when the monetary policy cannot balance the balance of payments. In the flexible exchange rate system, the value of foreign currencies is left to fluctuate and efforts are made to balance the balance of payments with changes in money, another alternative way of maintaining the balance is to limit foreign payments with the regulations introduced by the government (Yıldırım, 2006: 310).

2.1.6. Stability of Financial Markets

Financial stability concept defining avoiding financial crisis or financial crisis; covers all financial markets. Eliminating the negative factors that can affect the financial intermediation process or minimizing their effects are among the goals of central banks. In this context, it is correct to define financial system stability as eliminating or avoiding financial system deficiencies and problems that may cause significant economic losses. These problems may arise from financial markets as well as from financial institutions (İpeker, 2002: 17). Achieving financial stability has an essential effect on achieving the main objectives of monetary policy, and central banks bear great responsibility in preventing the emergence of financial panics. The function of being the lender of last resort is an important factor in preventing the financial panic of central banks. Sustainable stability in financial markets is vital for the stability of interest rates (Öçal and Çolak, 1999: 80).

3. Tools of Monetary Policy

Changes in economies affect monetary policy and therefore the tools to be used to achieve the goals. The economy is intervened with measures aimed at controlling monetary aggregates during periods of inflation, and through expansionary monetary policies in periods of unemployment.The Central Bank is the responsible institution for

the implementing the necessary regulations to control and implement the monetary policy. In addition, the Central Bank is obliged to maintain its role as the bank of banks and the government bank in the control of money supply and financing of budget deficits at the point of good execution of the banking system (Begg 1994; 407). Monetary policy objectives are examined through direct and indirect means at the point of implementation.

3.1. Indirect Monetary Policy Tools

Indirect monetary policy tools used in the market to affects supply and demand conditions target the Central Bank's balance sheet.

3.1.1. Rediscount Policy

Rediscount, which means to re-discount; The rates determined by the Central Bank in order to allow the re-discounting of the bills of the commercial banks are defined as rediscount rates (Orhan and Erdoğan, 2007; 75). The Central Bank controls the money supply by affecting the loan supply by intervening in the rediscount rates. Purpose of rediscount policy; to meet the needs of banks in need of cash and to prevent the possible cash shortage from turning into financial crises (Paya, 1998; 156). Rediscount transactions; It is processed in two ways as rediscount credits and advances. Rediscount credits transaction, which defines the process of discounting undue discounted bills held by commercial banks at the Central Bank, is applied at the current interest rates of the Central Bank in discounting the bills. In the advance application, a loan is provided to banks at a certain interest rate without discounting and an advance is given in return for a mortgage of a tangible asset (Orhan and Erdoğan, 2007; 76). Central banks adjust the rediscount rates according to the inflationary or deflationary trends in the economy and intervene in the economy by affecting the money supply and interest rates with the changes. Although it is an crucial tool to keep the monetary base under control, rediscount policy; The difference between the rediscount rate and the interest rate can cause fluctuations and these fluctuations often can cause financial concern (Parasız, 1994; 307).

3.1.2. Required Reserves

Required reserves, which define the blocking of a certain ratio of liabilities in banks' liabilities at the central bank in cash and interest-free manner; With this policy, central banks try to be effective on the money supply multiplier.Increases in required reserves cause a decrease in deposits and cause the money supply to shrink. The reverse of this

situation causes an expansion in the money supply. Required reserves policy plays an important role in the process of the central bank to influence the market. The slightest movement in rates can cause significant changes in money stock and reserves.For this reason, central banks often do not change the reserve requirement ratios.When the required reserve ratios are increased, the banks that do not have sufficient cash to sell the securities in their portfolios affect the supply-demand balance in the securities market, and this causes fluctuations in the interest rates of these securities (Paya, 1998; 158). The price effect occurs as a result of the banks selling the securities they have for the liabilities they are obliged to fulfill. Because the increase in required reserve ratios may cause an increase in the amount of assets that do not provide income in the portfolios of commercial banks and may decrease the profitability of loan transactions (Parasız, 1994; 302).

3.1.3. Open Market Operations

Among the monetary policy instruments, the Central Bank transactions to regulate the liquidity and money supply of the economy by buying and selling the bonds in the market are called open market operations (Keyder, 1998; 77). When the Central Bank, which has a wide portfolio of stocks and bonds, wants to intervene in the volume of money in the market and reduce the money volume, it withdraws money from the market by selling some of the securities in its possession, and when it wants to increase the money supply, it purchases securities from the market and saves it in its portfolio, and as a result, it extracts money from the market.Open Market Operations, which cause changes in the reserves of deposit institutions, when central banks intervene in the market and purchase securities, an increase occurs in the reserve levels of deposit banks as a result of the increase in money supply.Open market operations also affect the interest rate because of the bonds. When the Central Bank starts to buy bills from the market, there is an increase in the prices of the bills. However, since the income obtained from the bonds is constant, the increase in the prices of the bonds causes the interest rate to decrease. Otherwise, the interest rate increases (Parasız, 2005; 373). The future expectations of economic units and market experts are also affected by open market operations. The effects of open market operations on variables such as inflation and interest rates are determinant in shaping these expectations.

3.2. Direct Monetary Policy Tools

Direct monetary policy tools aim to affect the interest rates, the amount of deposits, and loans.

3.2.1.Interest Rate Controls

From the Keynesian perspective, changes in interest rates can affect economic activities and Central Banks can make changes in the economy by affecting monetary policies and interest rates. Interest rates are affected by investment expenditures, individual and public expenditures and changes in money supply cause changes in real interest rates. If we explain this with an example, economic institutions will start to buy bonds with this additional money if the central bank increases the money supply. As a result, there will be an increase in bond prices and a decrease in interest rates. This decline in interest rates reduces the cost of funds for investors to invest, making investments more attractive and increasing national income (Orhan and Erdoğan, 2007; 80). The Central Bank, which has the authority to limit the deposit and loan interest rates, can apply different interest rates for different sectors. By applying lower rates of loan rates to the sectors to be encouraged, the distribution of resources in desired sectors and distribution to other sectors is prevented (Önder, 2005; 61).

3.2.2.Credit Ceilings

The Central Bank, which can limit the loans it lends to commercial banks, aims to increase the interest in these sectors by keeping the loan ceiling high for the sectors to be encouraged. Credit ceiling limitation that can also be applied to banks; It is determined according to banks' capital, existing loans, borrowers and deposits (Gayıbov, 2001; 21).

3.2.3.Liquid Asset Value

The liquid asset value is expressed as the closest value of liquidity. Central Banks may insist on buying bonds and bills, which financial institutions and commercial banks take into account with a certain proportion of their funds, free deposits at the central bank and keeping cash in their vaults. While the money supply in the market is aimed to be kept under control with the safe deposit application and free deposits, the effect of bonds and bills on the market depends on the interest rate. If the interest rate in the market is greater than the interest rates of bonds and bills, some of the funds are directed to the public sector. This causes an increase in the cost of funding in financial institutions. In

the opposite case, there is a decrease in the funding costs of financial institutions (Güneş, 1990; 47). In an economy where inflationary effects are seen as a result of the reduction in the amount of money, a tight monetary policy should be applied. In an economy where deflationary effects are in question, a reverse application is required, thus the liquidity ratio decreases (Demirhan, 2007; 20).

3.2.4. Differentiated Rediscount Quotas

Rediscount rate, which is the interest rate determined for the loan given by the central bank to commercial banks; determines the rediscount quotas depending on the banks' goals, risk situations and cash needs.Rediscount quotas aim to encourage some industries (Lipsey, 1984; 188).

3.2.5. Control of Credits for Stock and Bond Purchase

Monetary authorities can determine the amount of advance payment required to purchase stocks and bonds.In this way, some areas on the direction of use of savings can be limited, while others can be encouraged.These credit controls, which were put into practice in the USA in the 1930s, were the banks' speculation in the bond markets immediately after borrowing, and they increased the prices excessively and then borrowed again by showing the securities they bought and as a result, they were put into practice because they increased the money supply. In order to provide monetary control, the Federal Reserve Bank (FED) has approved the banks' prices to be paid in cash by the purchaser within a certain margin (Lipsey, 1984; 187).

3.2.6. Financial Intermediaries Reorganize Portfolios

The Central Bank has the authority to affect the amount and type of securities required to be in the portfolios of financial institutions and commercial banks. And so, The Central Bank can determine in what amount and in which sectors the securities such as bonds and stocks to be purchased by these actors with financial impact should be used. Thus, it is aimed to transfer the funds in the hands of financial institutions to the sectors that will benefit economic growth and the exchange of securities should not be restricted in order for this situation to have a positive effect (Lipsey, 1984; 186).

3.2.7. Control of Consumer Loans

The Central Bank, which can provide long-term consumer loans under extraordinary conditions can encourage or restrict the demand for these durable goods by changing the minimum amount of money to be paid in advance by customers in installment purchases of many durable consumer goods, the term or the loans given for this reason (Parasız, 1994; 307). Thus, with this application, total demand policies can be supported and the demand for these goods can be increased or reduced.

3.2.8. Private Deposits

It is obligatory to be transferred to the central bank and to be deposited and held in commercial banks, which aim to control the money supply through private deposits. The main reason for using private deposits is to control the markets when indirect monetary policy tools do not affect the market economy (Güneş, 1990; 21).

3.2.9. Persuasion Method

Central Banks use their power to persuade financial institutions to act in the public interest. The aim here is to direct activities such as lending following economic conditions. In economies in an inflationary situation, financial institutions can lend money to keep aggregate demand under control and thereby be asked to reduce the amount of funds. However, this policy does not have legal validity (Demirhan, 2007; 22).

3.2.10. Advertising and Unoffical Advice

It is a tool by which the Central Bank expresses its views to the public through advertisements and informal recommendations, which are one of the direct tools of monetary policy. Central banks can make their opinions public through the press or change the expectations of companies with recommmendations (Parasız, 1994; 307).

4. Definition of the Monetary Policy Strategies

Monetary policy, which refers to the decisions taken to affect the cost and availability of money to achieve goals such as economic growth, employment growth, and price stability; It includes all strategies aimed at achieving the pimary goals by affecting the amount and cost of money and the expectations of firms and households (Önder, 2005; 24). Its general purpose is to increase or decrease the economy's liquidity,

in other words, the spending potential in accordance with the current conditions (Aren, 2008; 329). Implementing practices in accordance with the policies followed by the Central Bank to change the volume of money and credit in order to affect the total activity volume of the country's economy as desired (Eroğlu, 2004; 140).

5. Major Monetary Policy Strategies

The Central Bank strives to achieve results in line with specific targets by using monetary policy instruments; It should provide a sound presumption for the interaction between monetary policy instruments and the real economy. According to those who have expressed their opinion on this issue for money to be used as a political tool, it must have effects on real economic variables or monetary policy may not be effective in directly affecting real economic variables, still economic variables can be affected indirectly by changing the interest rate and loan amount through the amount of money. (Birinci, 1998; 26). Monetary policy has two main elements; Active monetary policies, which are at the discretion of the management. They are also monetary policies that set a certain size as the target of monetary policy and, in this direction, adopt this policy target as a rule that the management is obliged to abide by. Active monetary policies with high efficiency in the 1950-1970s; with these policies, the administrations evaluate the economic situation and try to regulate the size such as the amount of money, interest or credit volume in accordance with the needs of the economy. In the period we live in, there has been a shift away from active monetary policies and a tendency towards rule policies (Paya, 2002; 168). There are four different arguments against active monetary policies; First; It is argued that monetary policies require a long and variable period on the economy, Secondly, there is no long-term trade-off relationship on unemployment and inflation, Thirdly, It is argued that the problem of time inconsistency will be experienced. Finally, inflation costs are another argument against active monetary policy. Both these views and the costs brought about by inflation have accelerated the efforts to achieve price stability and brought up the need for alternative monetary policy strategies.

These strategies are;

- Exchange Rate Targeting Strategy
- Monetary Targeting Strategy
- Inflation Targeting Strategy

The general purpose of all these strategies is to break inflation expectations and thus increase the credibility of monetary policy (Orhan and Erdoğan, 2008; 288).

5.1. Exchange Rate Targeting

The foreign exchange targeting strategy is a policy that has been applied for many years, can also be applied in a way that the national currency depends on gold prices or the national currency which is linked to the currency of a country where low and stable inflation is maintained at a fixed rate. The exchange rate monetary policy strategy can also be realized in the form of devaluation of the exchange rate at certain rates in certain periods by announcing it in advance (Özcan, 2006; 41). Exchange rate targeting includes different applications.The main purpose of linking the country's currency to a country's currency with a low inflation rate in the semi-flexible fixed exchange practice, where the dollar is preferred as the country's currency, is to maintain price stability in commodities subject to trade due to the fixed exchange rate and to reduce inflation in a short period of time (Poyraz, 2008; 97). Semi-flexible fixed exchange rate targeting is expressed as a drifting anchor application such as tying the country's currency to a currency basket or floating around an asymmetrical band. Exchange rate targeting provides a solid commitment, as it is an understandable variable in economies where there is a close correlation between the level of prices and the exchange rate, which allows day-to-day developments to be monitored, under the precondition for countries to meet sufficient foreign exchange reserves (Yay, 2006; 6). Strict exchange rate targeting includes two types of practices such as currency board and full dollarization. The application where money printing takes place in exchange of 100% foreign currency is the money board system and in the countries where this system is in force, the authority having the power to issue money binds the exchange between the national currency and the foreign currency to a fixed rate. The size of the monetary base is determined by the capital flow and monetary policy of the anchor country. In addition, in this system, the monetary authority does not have the initiative on monetary policy, buying and selling assets expressed in national currency, managing open market transactions, lending to national banks or the government. The substitution of national currency with foreign currency is called full dollarization. In a country where full dollarization prevails, there is complete abolition of national currency. With this process, transactions made in national currency are expressed in dollars (Erdoğan, 2005; 35-36). The first of the positive arguments of

foreign exchange rate targeting is; The exchange rate behaves as a nominal anchor that makes it easy to understand the public. That is, the exchange rate gives clear signals to the public about the actual actions of the government. For this reason, when the exchange rate is targeted, the decrease in inflation expectations and the inflation rate will converge to the inflation rate of the money country over time. Secondly, in countries with chronic inflation, monetary targeting will not affect on the inflation rate, since the decrease in the domestic currency-denominated part of the domestic currency stock due to high rate of dollarization will not affect on the total money stock. Therefore, it may be reasonable to choose the exchange rate as an intermediate target (Müslümov, 2002; 8).

5.1.1. The Advantage of Exchange Rate Targeting

If we briefly explain the advantages of exchange rate targeting; The nominal anchor of the exchange rate targeting strategy fixes the inflation rate on the goods in question in international trade, thus contributing to keeping inflation rates under control. The more reliable the exchange rate target is, the more the inflation rate of the country's economy is accepted as an anchor, then it's inflation expectations are also accepted as an anchor. In addition, the exchange rate target sets an automatic rule in order not to be affected by the time-inconsistency problem in the management of monetary policy. Exchange rate targeting is a more effective strategy because it is easier to understand by the public, and it is quick to react to changes in the interest rate increase operational target. Exchange rate targeting can be helpful in situations where there is a fixed exchange rate regime and economic-political combinations (Bozkurt, 2006; 46).

5.1.2. The Disadvantage of Exchange Rate Targeting

If we briefly explain the disadvantages of exchange rate targeting; An independent monetary policy is out of the question in the economies of countries where exchange rate targeting is in place. In the economies of the countries where the exchange rate targeting strategy is in question, the demand for the products it exports due to the shock occurring in the anchor country may be affected by an unstable trend. For example, when an unexpected and permanent decline in export demand occurs in the economies of countries where the exchange rate targeting strategy is in question, economic problems may occur even if prices are flexible around the world. During periods of such economic shocks, if nominal wages and prices are not flexible, the impact of economic destruction may be even greater. Since there is no alternative to regulate the relative prices of imports and

exports in the short term, there will be constraints in both employment and output. The expansion tendencies in the economic activity volume of the exchange rate targeting strategy are temporary. Although the exchange rate-based stabilization programs implemented in countries with a history of chronic inflation initially cause increases in output and consumption, these effects are not long-lasting. With the entry into force of this program, the expansion in economic activity will not be valid for the long term. The tendency towards financial fragility in the exchange rate targeting strategy may cause financial crises to occur. In developing countries, since they do not have a strong financial infrastructure, exchange-based stabilization programs are more likely to cause deep economic crises in these countries (Erdoğan, 2005; 38-39).

5.2. Monetary Targeting

In order to keep inflationary expectations under control, the most important factor in choosing the monetary targeting strategy, which refers to the setting of the increase rate for a certain monetary size as a target, is based on the reason that the authorized monetary authorities can direct the money supply variable in a short period of time. To adjust the money supply in a way that is compatible with the economic conjuncture and monetary policy instruments, the existence of money and capital markets with a sufficient level of development is necessary. For this policy strategy to function effectively, there should be a predictable and robust link between inflation and the target monetary indicator (Aslan, 2008; 73). Although the monetary targeting strategy came up in many developed countries in the mid-1970s, the first step was taken by the Central Bank in 1974 and then, it would be correct to explain the reasons that keep the monetary targeting strategy on the agenda in three points (Erdoğan, 2005; 40). The increase in inflation rates in the economies of many developed countries in the 1970s affected central banks to find and implement new and effective strategies. In the same period, with the collapse of the Bretton Woods system and the loss of effectiveness of the fixed exchange rate regime, monetary targeting came to the fore as an alternative anchor function. In the same period, the acceptance of the assumptions of the monetarist approach by the majority increased the tendency towards the monetary targeting strategy and especially "fixed monetary growth rule" was effective. Monetary targeting instantly signals the public and markets about monetary authorities' intention to lower inflation. These signals contribute to low inflation by helping to create inflation expectations. In addition, short-term interest rates

are chosen as the operational target in this strategy, the money supply as an intermediate target and inflation as the final goal (Önder, 2005; 38).

5.2.1. The Advantage of Monetary Targeting

The main advantages of the monetary targeting strategy can be summed up in the following points (Erdoğan, 2005; 41); The most important advantage of monetary targeting is that it enables the monetary authority to choose an inflation target independent of other countries. This strategy also ensures the applicability of monetary policy by observing the fluctuations in output level and external shocks. Like the exchange rate targeting, this policy is a strategy that can be understood and followed more easily by the public. In addition, the Central Bank will be able to stay away from political pressures by announcing the monetary targeting strategy. To have these advantages, the connection between variables such as inflation and nominal income and monetary aggregates is possible with a solid, and stable basis (Yay, 2006; 470-471). Since the mid-1980s, the emergence of many new financial instruments such as an alternative to deposit, repo, investment funds and the emergence of many new payment instruments such as ATMs and credit cards made money demand estimation difficult and in this context, the definition of the money supply was complicated and the effect of the money supply on inflation decreased. Therefore, this strategy has lost its place in the agenda for the last 10-15 years (Önder, 2005; 39).

5.2.2. The disadvantage of Monetary Targeting

If we list the disadvantages of the monetary targeting strategy (Erdoğan, 2005; 41-42). The developments in the financial field and the accompanying increase in the number of financial instruments in recent years have caused various difficulties at measuring money, and there is no consensus among experts on which financial instrument should be used at which point in the measurement of money. The most prominent feature of countries with high level of dollarization problem is the high level of inflation in these countries and in these countries the majority of lease agreements, prices and fees are expressed in dollars. Individuals who try not to be affected by inflation try to keep their savings in foreign currency as much as possible, and this situation limits the power of the monetary authority. Because if the amount of foreign currency increases, the reduction of the local money supply does not have much effect on the total liquidity volume and consequently on inflation. It is difficult to determine a monetary growth rate consistent

with the inflation rate in countries with high inflation rates. Because the velocity of money in these countries is not predictable and follows a fluctuating course. Therefore, it is one of the main reasons for applying the exchange rate targeting strategy as an alternative to the monetary targeting strategy in these countries.

5.3. Inflation Targeting

Inflation targeting, which refers to the official announcement of a numerical target or target range to the public to be realized in a certain period of time for the inflation rate by deciding together with the central bank of the state or solo, in other words, it is the implementation of the variables and data in the economy in a way that the acceptable inflation rate for a certain period of time reaches the target rate with monetary policy tools (Öğretmen, 2004; 4). Inflation targeting is a monetary policy regime targeting the inflation rate and New Zealand for the first time in 1990 followed by the inflation targeting regime by Canada, Chile, England and Israel Central Banks.The popularity and spreading rate of the inflation targeting regime in developing countries has increased with the success of this regime in these countries and the loss of effectiveness of price stability based on exchange rate targeting in many developing countries with the financial crises experienced towards the end of the 1990s. Turkey, of the implicit exchange rate targeting in early 2002 with the collapse of the crisis in February 2001, at the beginning of 2006, passed to explicit inflation targeting applications (Akyazi, 2009; 3).

5.3.1. The advantage of Inflation Targeting

When we compare this regime with the targeting of exchange rate and monetary size, it has significant advantages. Inflation targeting has permanent and effective results in increasing the reputation of Central Banks and controlling inflation expectations because there is more transparency and operational flexibility if monetary policy declares its ultimate goal as price stability. However, this regime is more effective than other regimes in terms of flexibility due to the short-term deviations of the targets defined for the medium term. A well-formulated inflation targeting strategy allows central banks to react to medium-term developments without having a negative impact on their reputation in the fight against inflation in the long run. The economic costs of combating shocks in the inflation targeting strategy are lower. For example, while the exchange rate anchor loses its effectiveness completely, significant problems such as loss of reserves, high inflation, financial crises, banking crises and non-payment of public debt may arise, the

deviations in inflation targeting will cause inflation to temporarily stay above the target, causing growth to slow down. Another advantage of the inflation targeting strategy is that it can shift the attention of the public from short-term interventionist policies to a target that will contribute to economic growth, such as low and stable inflation. Inflation targeting is useful in increasing the accountability and discipline of both monetary and fiscal policies. In addition, inflation targeting can effectively institutionalize central banks and realize structural reforms that support the fight against inflation throughout the economy (Kara, 2008; 5-6).

5.3.2. The disadvantage of Inflation Targeting

If we list the disadvantages of the inflation targeting strategy (Akdiş, 2006; 297-298); and being a rigorous policy that must be implemented without compromise, the inflation targeting strategy also carries the potential for increased instability in production. In addition, the inflation targeting strategy allows too much discretionary power and can result in low economic growth.The flexible exchange rate regime needed for inflation targeting may cause financial instability. Another disadvantage of the inflation targeting strategy is that it may result in a weakening of the accountability of the Central Bank. It cannot prevent its fiscal policies from gaining superiority over monetary policies. In addition to the disadvantages of inflation targeting, there are points to be emphasized during the implementation of the policy. For example, the low inflation should be for targeting policy aiming at a low inflation rate in the long run. Inflation targeting is zero or a rate close to zero is not desired (Sönmez, 2007; 115).

6. Exchange Rate Policy Implemantations in Turkey Over the Period of 1989- 2020

In 1980, when problems such as high inflation, deficiencies in oil and other energy raw materials, and insufficient foreign exchange reserves caused import bottlenecks, low economic growth, and non-payment of foreign debts, the implementation of basic economic reforms became inevitable. This period was also a period when foreign trade and exports had to be liberalized in Turkey. Turkey's acceptance of an export-based industrialization strategy in this period led to new developments in the structuring of financial markets. (Ceylan, 2010; 58). In this period, to overcome this crisis, the Stability Program was started to be implemented on January 24, 1980. In line with these decisions, controls on prices were lifted, the fixed exchange rate was switched to a flexible exchange rate regime, and negative real interest rates were terminated and loan and deposit rates

were released. Again, with the Decree signed on May 29, 1980, it was possible to freely determine the interest rates applied to the loans and time deposit accounts opened by the banks. Although the ceiling interest rate application determined by the Central Bank was terminated, the ever-increasing inflation caused an increase in the loan demand. Bankers met the liquidity shortage with high-interest rates due to the insufficiency of bank capitals in the face of this inflation increase. However, after the Banker crisis in 1982, interest rates were determined to the Central Bank. With the "Structural Change Program" put into practice on January 24, 1980, decisions were taken to liberalize the foreign trade and foreign exchange market, apart from the state's infrastructure investments, so that the TL would not interfere with economic activities such as convertible (Dizman, 2008; 119-120 -121). In 1981, the restrictions on exchange rates were lifted and minor devaluations were made, not exceeding 5% until May 1, 1981. A flexible exchange rate policy was preferred to reduce deficit between domestic and foreign inflation rates. Between 1983-1985, the liberalization of the interest rates for bank loans and the determination of deposit rates were tried to be kept under the supervision of the Central Bank. It is thought that inflation will decrease in the long term by trying to keep the short-term interest rates above the long term interest rates. Moreover, it was a period in which individuals were granted the right to hold foreign currency and all kinds of deposits. In addition, banking transactions related to foreign trade were excluded from central bank's monopoly and given to private banks. While a tight economic policy was implemented after the decisions of 24 January, the central bank increased its loans and money supply after the increase in monetary expansion tendency since 1983 and 1984 and with the decree enacted in 1985, the obligation to keep reserves was imposed on banks (Ceylan, 2010; 61-62). In 1986, the monetary policy focused on the banking sector's total reserves without interfering with the portfolio structure of the private and public sectors. Towards the end of 1985, for the first time, a monetary program was prepared according to the inflation and growth rates in the annual program to apply the M2 money supply and some monetary aggregates in 1986. The aim here is to monitor the central bank's TL reserves of the banking sector and to follow an effective interest rate policy and thus to keep the money supply under control indirectly. However, by the end of the year, the program targets could not be achieved by the end of the year. In addition, on April 2, 1986, Interbank (money market) activities between banks started. Banks in need of reserves are enabled to make transactions with banks with excess reserves due to these markets and through the central bank. Again in

1986, the Istanbul Stock Exchange became operational (Dizman, 2008; 120-121-122). Although the new financial instrument will be used with the structural changes, only Treasury bills and government bonds have been used due to the inadequacy of the capital markets. The Central Bank controlled the liquidity in the market by carrying out open market operations such as the reverse repo, direct buying and selling, and adjusted the reserve movements in the market daily. Banks with short-term cash surplus in the interbank money market and banks with short-term cash needs met their needs through the central bank. In 1988, a policy was followed in order to control the money supply and to increase the value of the Turkish Lira.

The February 4 decisions aimed to increase the yield of Turkish lira-denominated financial instruments by increasing deposit interest rates, reserve requirements and liquidity ratios and imbalances in the foreign exchange market have been eliminated. In order to increase the control power of the Central Bank over the liquidity volume in the economy, lower and upper limits in the interbank money market were applied on February 29, and bilateral quotations were applied in the same market on March 21. Also, in this period, transactions made with the prices that banks have quoted bilaterally, including buying and selling, started to be carried out.On February 4, 1988, the interest rates for time and demand deposits were determined as 10% maximum, and the interbank deposit interest rate was released, and on October 12, 1988, the interest rates applicable to official types were released to be determined by the banks and in the same year, an increase in inflation rates and a decrease in economic growth were observed (Demirhan, 2007; 96-97-98).

6.1. Exchange Rate Policy Implementations between 1989 and 1993

In 1989, restrictions were imposed on short-term advances as a result of an agreement between the Central Bank and the Treasury. Due to this restriction on internal assets, it was necessary for the Central Bank to acquire an external asset at the point of creating money (Kepenek and Yentürk, 2009: 233). Therefore, the restrictions on capital and foreign trade movements were released with the Decree No. 32 on August 8 and the Law on Protection of Turkish Currency No. 1567 (Ekzen, 2009; 104). Decree No. 32 liberalized capital movements, and with this liberalization, foreign exchange reserves began to determine the money supply in the economy according to capital inflows and outflows (Kazgan, 2000; 233). In addition, after the liberalization of capital movements,

there was an increase in foreign exchange borrowing and as a result of this, economic policies after 1989 took a tendency to decrease borrowing in foreign currency (Kepenek and Yentürk, 2009; 233). The Central Bank reduced the use of short-term advances between 1989 and 1990, and afterward, the treasury's use of the advance limit made the anti-inflation monetary policy an alternative tool (Kumcu and Eğilmez, 2004; 377). In the 1990s, the aim of the monetary program made by the Central Bank was to reduce the balance sheet of the Central Bank and changing the internal structure of the balance sheet, that is, increasing the existing emission share in the liabilities table and reducing the short-term advances made by the Central Bank to the treasury in the asset statement and two tools were determined for the monetary program in line with these targets.The first of these is open market operations and the other is the sale of foreign exchange in the foreign exchange market.This program put into practice will progress over 4 goals and these goals are (Güneş, 1992; 32):

- Increasing the balance sheet of the CB between 12-22%,
- Increasing the total internal liabilities of the CB by 15-25%,
- Expansion of the total internal assets of the CB by 6-16%,
- 35-48% growth of the CB money

In line with the program, the only duty of the CBRT is to manage the monetary policy in a way to ensure price stability in the medium term. However, the Gulf crisis in 1991 could not be implemented due to the elections and uncertainties in the power change.There was an increase in the balance sheet values due to the resource increase transferred by the Central Bank to the public sector after 1991 and the government's expansionary macro policy preferences (Çolak, 1994; 45).

6.2. Monetary Policy Before 1994 Crisis (1990-1994)

The increase in public deficits after 1990 and the financing of these deficits were provided by domestic and foreign borrowing. The increase in the foreign trade deficit as a result of the over the value of the Turkish lira, the rise in interest rates that could provide hot money flow to the country, and political instability brought the economic system to a point where it would not function (Dikkaya and Özyakışır, 2012; 745). This hot money flow entering the country's economy caused the interest rates to rise in the markets. The interest rate disrupted the balance in the exchange rate and had a negative effect on the

economy.When the difference between the exchange rate determined by the CBRT and the free exchange rate widened, the public and private sector had expected devaluation. In the economy, liquidity increased due to short-term advances and external borrowing by the government from the CBRT. And thus CBRT's delay in withdrawing excessive liquidity in the market has shaken the public's trust in the Turkish lira and so, turned to foreign currencies instead of the Turkish lira (Şahin, 2014; 209-210).

The monetary program was not implemented due to the early election decision stemming from the Gulf Crisis in 1991 and the uncertainties experienced after it. Withdrawals in Turkish lira and foreign exchange deposits increased the exchange rates and interest rates, causing a decrease in reserves and the uncertainties created by the Gulf war have put pressure on the markets. Declining foreign exchange reserves and increasing domestic debt caused the Central Bank to abandon its monetary program targets and pursue stabilization targets in the Turkish lira and foreign exchange markets (Karataş, 2000; 138).The increasing tendency towards currency substitution in the 1990s caused an increase in interest rates.

After 1991, it had an exclusion effect on the private sector.The exclusion of some sector organizations from the money and financial markets after the increasing domestic interest rates caused the reaction of these institutions after 1993. The private sector favors low interest rates, and short-term outsourcing has lost its effect as exchange rates are not lower than in the past and its reflection showed itself as a decrease in the Central Bank’s foreign assets (Parasız, 2002; 380-381).

6.3. Exchange Rate Policy Implemantations between 1994 and 1995

The decisions of April 5, 1994 have the characteristics of an IMF type stabilization policy, that is, although they envisage freezing of wages and salaries, these decisions should keep public expenditures under control and regulations that will increase public revenues. First of all, it was decided to reduce the value of the Turkish lira in foreign currency, and then the rates of short-term advances given to the treasury (10% for 1996, 6% for 1997, 3% for 1998 and after) were decided (Parasız, 2003; 408-409). In order to increase the autonomy of the Central Bank, the applications of the treasury and other public institutions to the Central Bank resources have been tried to be reduced and in this context, the value of the Turkish lira is reduced, additional taxes can be imposed, restrictions can be made in the public's current and transfer expenditures, and the stability

in the financial markets is ensured, in order to protect the confidence in the financial system, measures related to institutional and legal regulations have been taken (Parasız, 2003; 408-409). The government of the period, which announced "Extraordinary Stability Measures" at the press conference held on April 5, 1994, took a series of decisions under the "Economic Measures Implementation Plan". These decisions aimed to reduce inflation, stabilize the TL and the economy, increase exports and regulate its role and organization in the economy by reducing public deficits (Tokgöz, 2011; 247-248). The important point in the government's monetary program is that the Central Bank keeps the amount of money under control and consistency with the monetary program's budget policies to be implemented. It is planned to combine the data obtained here with real growth and real exchange to determine the real conditions of the budget and funds, and to establish consistent goals for the Central Bank. The exchange rate applications of this program and budget and monetary policies are combined with inflation targets; It was reported that financial coordination would be provided. In addition, reforming the financial sectors, especially in the banking field, has been important in the success of the program (Erdem, 2009; 240). When it comes to monetary policy after 1994, the imbalances arising from the balance of payments due to the departure from the budget discipline in the 1990s. The fluctuating course of inflation and the unstable growth were the main causes of 1994, 2000, and 2001 crises. The lack of fiscal discipline between 1985 and 2001 revealed direct and indirect monetary policy tools, and the increase in insufficient national savings and budget deficits led the public and private sector to seek foreign resources. Before 1989, when the Central Bank public deficits were covered, later, it financed the budget deficits through foreign markets in order to ensure exchange rate stability (Aslan, 2007; 7-8)

The financial crisis experienced in 1994 caused public financing to shift to the resources of the Central Bank and the liquidity problem to increase due to the absence of treasury auctions, and foreign exchange was sold to prevent this situation from being reflected in the prices. The effect of interest rates on market conditions put pressure on exchange rates. The free international capital movements caused a rapid decrease in the Central Bank reserves due to the high open positions of the banks. This situation came to an end with the creation of large fluctuations in the markets, high rate adjustment and a Stand By agreement with the IMF. The Central Bank's monetary policy implementation

has been determined as an exchange rate policy that considers the current balance (Erçel, 1996; 10).

6.4. Exchange Rate Policy Implementations between 1996 and 1998

With the termination of the agreement with the IMF in 1996 and the entry into the Customs Union, the uncertainty over the markets increased, The Central Bank has adopted a monetary program that is similar to the monetary policy practices it has implemented in previous years. In this new monetary practice, the Central Bank limited the increase in domestic assets and decided to create liabilities in TL at the rate of increase in foreign assets. Short-term advances given to the treasury specified in the Central Bank Law are certain and cannot go beyond this and the Central Bank-originated non-lending to public institutions outside this limit in 1996 resulted in a low increase in domestic assets. This stable process in money and foreign exchange markets positively affected interest rates (Korap, 2011; 21). The Central Bank decided to develop an audit mechanism in 1996 to influence the portfolios of the banking sector. Deposits of commercial banks in the Central Bank consist of free and required reserves. It is seen that in 1996, it decreased the deposit rates and general liquidity ratio from 30% to 6%, and the reserve requirement from 20% to - 8% compared to 1980 and thus, it is observed that the Central Bank prefers open market operations as a tool in its monetary policy implementation (Eroğlu, 2009; 29). The monetary base variable was observed as the operational target. In 1997, CBRT published 6-month money programs according to macroeconomic developments.The high real exchange rate policy provided an inflow of liquidity, thus increasing the CBRT's foreign exchange reserves. In addition, in accordance with the agreement made between the Treasury and the CBRT in 1997, the Treasury completely abandoned the use of short-term advances (Eren, 2014; 240-271). In 1998, the CBRT started to announce quarterly economic programs and aimed to stabilize the markets by setting the fight against inflation as a target (Eren, 2014; 271). Between 1992 - 1998, which induced movements of money with international financial liberalization move to expanding the influence of interest rate fluctuations experienced in public debt in Turkey. Thus, there has been an increase in re-borrowing in order to pay off due debts.Borrowing interest rates increased. In order to prevent currency substitution, interest rates were raised to encourage savings in Turkish lira against foreign currency.However, devaluation and crisis expectations could not prevent foreign currency holding instead of Turkish lira

despite high interest rates. Therefore, interest is not preferred as a policy tool in real investments (Kepenek and Yentürk, 2009; 247). The fluctuating growth caused by the high amount of foreign capital inflows and outflows in the country's economy in the 1990s created an increase in per capita income in 1997-1998 and caused an increase in the current account deficit. Foreign capital has led to a fluctuating situation in the economy and to move to the 2000s with this accumulation (Kazgan, 2001; 26).

6.5. Exchange Rate Policy Implemantations between 1999 and 2001

The monetary policy was put into practice in 1999 to stablize the financial markets and keep inflation under control. Factors such as the economic crisis that occurred in Russia in 1998 and the elections in 1999 kept the monetary policy of 1999 separate from other policies. A strong government was needed for the positive results of programs aimed at lowering inflation rates. It was important to keep inflation under control. Accordingly, attention has been paid to ensure that the exchange rate policy is consistent with inflation. In order to achieve the goal of economic stability, short-term liquidity needs of financial institutions were met through open market operations and the interest rates were released against exogenous shocks, thus meeting the liquidity needed in the system, and the value of the Turkish Lira was tried to be formed within the determined exchange rate policy limits. The year 1999 has the distinction of being a period point for the Turkish economy. In 1999;

- Total borrowing average real interest rates from 15% to 25%
- Total Debt Stock / GNP from 44% to 61%
- WPI inflation increased from 51% to 67%,
- Economic (GNP) Growth has decreased from 4% to minus 6%.

As a result of the negotiations with the IMF in June 1999, it was aimed to transform the Close Monitoring Agreement into a stand-by agreement that is depend on the program and which can provide financial support, and the framework of macroeconomic policies to be implemented in the period 2000-2002 was decided (Demirhan,2007 ;109). Regulations have been made in the Turkish economy to prevent the informal economy by taxing capital gains and wealth. With the effect of the Southeast Asian Crisis in 1998 and the crisis in Russia in 1999, the country entered into an economic depression when a large amount of capital outflows from the market, which had entered a recession and as a result, the Government signed a Stand by agreement with the IMF as a solution. With

this agreement, it has been announced that an economic program will be implemented, which includes the reforms needed for stability in the economy and sustainable growth. When it came to January 2000, implementing the economic reform and stabilization program called the Fight Against Inflation Program (EMP) was initiated (Şahin, 2014; 241). This program aims to reduce inflation to single digits, increase growth by lowering real interest rates, and achieve an efficient and fair distribution of resources and monetary policy practices were carried out in accordance with the exchange rate targeting strategy (Akyazı and Ekinci, 2009; 347-348).

6.6. Monetary Policy Between the November 2000 Crisis and the February 2001 Crisis

In the year 2000, a departure from the anti-inflation program, the economy was dragged into a crisis in November 2000 as a result of the liquidity squeeze. The tension in the markets decreased with the decrease in interest rates due to the additional reserve facility created by the IMF and short-term capital inflows. The February 19, 2001 crisis that occurred after the November 2000 crisis started as the currency crisis. Fixed exchange rate and financial liberalization practices in the IMF-supported program had a negative impact on companies and banks, resulting in foreign borrowing. Overnight repo rates continued to be 1500% on the first day and reached 7000% on the second day and the Central Bank had to sell 6 Billion dollars (Fırat, 2009; 510-512). Later, the overnight repo rate decreased to an average of 4018% (Engin, 2007; 58). November 2000 and February 2001 as the most important reason for the fragility of the banking sector crisis in Turkey's economy may be highlighted.After the crisis, the effect of the recovery plans of the banking sector was observed in the increase of public debts. The weakness of the banking sector caused inadequate efficiency in monetary policies. It abandoned the monetary targeting regime applied by the Central Bank before the crisis and turned to the application of explicit inflation targeting. The exchange rate regime of the period was a floating exchange rate regime (Oktar and Dalyancı, 2011; 8). After 22 February 2001 in Turkey, arrangements were made to the monetary and exchange rate policies with the entry into force of the floating exchange rate regime. The Central Bank has primarily focused on making the interest rates controllable in monetary policy implementations, activating the payments system in order to ensure financial stability, and financing the transferred liabilities of the Savings Deposit Insurance Fund (SDIF) with low interest in

the long term (Yakupoğlu, 2011; 37). On April 25, 2001, in order to strengthen the banking sector and to ease the burden of the public sector on the economy, an amendment was made in the CBRT Law and price stability was determined as the main objective of the Central Bank and after 2002, price stability was targeted instead of the exchange rate (Çevik, 2016; 711). In the Inflation Reduction Program, which is envisaged to be implemented for the period 2000-2002, the exchange rate policy in the form of a " currency basket towards the inflation target " between January 2000 and June 2001 and a 'gradually widening band' in the period of July 2001 - December 2002, two different exchange rate policies of the Central Bank are mentioned, in the way that the basket is included in a one-year time frame and announced to the public on a daily basis (Aldemir, 2011; 141).

6.7. Monetary Policy in the Aftermath of the 2001 Crisis and in the Transition Program to a Strong Economy

The government of the time had determined three strategies to implement in order to overcome the economic crisis. The first was to outsource debts by printing money, second by a moratorium, that is, by declaring that they would not pay their debts. Finally, by implementing a strong economic reform program, the government opted for strong economic reform to overcome the crisis. Spend it on behalf of the World Bank Vice President Kemal Dervis force was invited to Turkey. As Minister of State responsible for the economy, Turkey has begun preparations for a Strong Economy Transition Plan (Tokgöz, 2011; 286-287). In the Transition Program to a Strong Economy, prepared to reduce the effects of the crisis to lesser levels and to restore stability, more emphasis was placed on the banking sector and financial markets. Including the banks under the Savings Deposit Insurance Fund, improving the relations between banks and the real sector and restructuring are among the factors of the studies (Akdoğdu, 2012; 201-202).Transition to a Strong Economy Program is establishing of a medium-term and targeted banking system and the reorganization of public banks accordingly. However, as a result of not achieving the desired effective result from this restructuring program, a stand-by agreement was signed with the IMF, which started in 2002 and will last only 3 years and the implicit inflation target in the program brought a new perspective to monetary policy practices (Yiğitbaş, 2009; 219). With the Transition to a Strong Economy Program, new regulations were made to ensure that the Central Bank is transparent and monetary

policies can function efficiently. In 2001, the implementation of the Central Bank Law No. 4651 was initiated by making some changes in the Law No. 1211. While increasing the instrument independence of the Central Bank, it was aimed to be transformed into an accountable institution. Price stability has been determined as the primary objective. In the exchange rate regime preferences, a floating exchange rate has been applied.The ban of the Central Bank from using resources to the Treasury and other public institutions has been enacted. (Tokucu, 2008; 108). In that period, it was seen that the Central Bank overnight interests were the main monetary policy tool, and the Banking Regulation and Supervision Agency was restructured and new regulations were made in the banking system (Demiralp, 2008; 7).

6.8. Exchange Rate Policy Implementations between 2002 and 2005

In the program implemented with the 18th Stand-by agreement in 2002, when implicit inflation targeting was in effect, the inflation target was announced over the Consumer Price Index inflation and planned one year later (Kara and Orak, 2008; 44-45). The Central Bank used short-term interest rates as a policy tool for targeted inflation (Şahin, 2014; 262). During the same period, the control of inflation expectations implemented by the Central Bank in accordance with fiscal discipline played an important role in ensuring price and economic stability. The primary surplus target and public debt stock have been lowered to levels in line with expectations. In this way, the value of fiscal dominance in monetary policy implementations has decreased and progress has been made in the transition to official inflation targeting (Kara and orak 2008; 44-45). This program includes targets such as monetary base and net international reserves and net domestic assets. In 2005, the program was completed (Ak and Akbingül, 2008; 12). The Central Bank uses the exchange rate as an anchor, in 2000, Turkey 's aim to reduce inflation in the year was due to the currency crisis in 2001, but the program has not been successful. The implicit inflation targeting process implemented in the 2002-2005 period has provided the necessary conditions for explicit inflation targeting that will come into force in 2006 (Kansu, 2007; 65).

6.9. Exchange Rate Policy Implementations between 2006 and 2020

The 2006 period, in which the Explicit Inflation Targeting applied by the CBRT was in effect and the inflation targeting program was trying to guide the inflation expectations of the economic institutions through short-term interest rates, also aimed to

affect prices through expectations and again in 2006, as a result of the fluctuations in the exchange rate due to the rise in oil prices, the Central Bank expected to make a regulation in inflation targeting. Thereupon, the Central Bank announced that it increased the interest rates to prevent possible deterioration in expectations. It is understood that inflation targeting is a flexible monetary policy. In addition, the high credibility of Central Bank. It is important in terms of ensuring output and price stability (Baydur, 1997; 44-45). In the explicit inflation targeting regime, the CBRT applies the inflation target as a point target to make it more understandable for the public.The inflation target determined over the CPI is estimated jointly with the government for a period of three years. The Central Bank determines the lower and upper limits for deviations in the point target application, and when the inflation rate is not within these limits, it has to write an open letter to the government due to its accountability (Kaya, 2012; 134). The inflation success achieved in the period of implicit inflation targeting was effective in the Central Bank's transition to an explicit inflation targeting strategy in 2006. The removal of six zeros from the Turkish Lira is important in perceiving 2005 as a transition year, bringing the institutional structure and transparency to the fore. As a result, the currency board became the decision-making body on interest, and the currency board was held responsible for publicizing interest decisions, publishing a quarterly inflation report, and the government and other segments in accordance with explicit inflation targeting (Doğru, 2015; 169). In May 2006, against the change in the developing countries, including all the conditions of Turkey's need for international capital, it has led to capital outflows from Turkey.Therefore, the implementation of inflation targets and inflation targeting regime has had a negative effect (Ermişoğlu, 2011; 23-24). In 2008 and before, the difference between the targeted inflation rate and the actual inflation rate negatively affected the anchor function of inflation targeting.In addition, controlling inflation in a period of crises is considered successful. (Ermişoğlu, 2011; 23-24).In the first half of the 2009 crisis, the reflection of the global crisis on prices had a downward impact on prices and inflation was below expectations. As there was no quantitative expansion in the post-crisis monetary policy implementations, the probable risks decreased (CBRT 2009A).

In order to achieve the financial stability target after 2010, the central bank reduced short-term interest rates to low levels and increased the required reserve ratios to keep short-term capital inflows and credit expansion below the observed course (Kumsarı, 2016; 59). By the end of 2010, it was used as a frequently used method as a

supportive target.With one-week repo auctions, the central bank formed the variables in the interest rate corridor as lower band, upper band and width (Ünalmış, 2015; 2). In the same year, the Central Bank preferred to apply an unusual interest rate corridor and funding policy in order to react to financial volatility on time, that is to say, it was preferred to change the composition of the short-term funds provided by the Central Bank to the market at high levels and to deviate the market interest rates from the Central Bank funding rate and the official interest rates when needed.The interest corridor refers to the area between the overnight borrowing and lending rate. Under normal conditions, short-term market rates cannot exceed the central bank's lending rate, nor can they show a course below the borrowing rate. In other words, the interest rate corridor refers to the range in which market interest changes occur (Binici, 2016; 7-8).Demand curve, which shows the relationship between the liquidity demand of banks and market interest rates, has a negative slope as the fund demand decreases as the market interest rates increase. However, as the demand for funds offered at a rate below the interest rate determined by the central bank will increase, the demand curve will become horizontal after the central bank borrowing rate level. Since the central bank can fund at different costs through two different channels, the supply curve representing the diversity of fund supply channels will become steps. The point where these two curves intersect is considered to be the short-term interest rate in the money market. The Central Bank can shift the supply curve horizontally or vertically with price and quantity control (Binici, 2016; 8-9). The Reserve Option Mechanism (ROM), has used by the Central Bank since 2011 to prevent currency fluctuations, increase foreign exchange reserves, and provide flexibility in liquidity, enables banks to keep the required reserves of their TL-denominated deposits in gold or foreign currency. It determines the measure that the ROM should be used, and the coefficient showing the amount of foreign currency or gold allocated per reserve requirement of Turkish Lira is expressed as the Reserve Option Coefficient, or ROC (Kumsarı, 2016; 61-62). As of the beginning of 2010, the Central Bank focused on financial stability with its new monetary policy strategy. While the overnight borrowing interest rate was reduced to 1.5% in November-December 2010, the lending interest rate was kept at 9%, and the forward repo auction interest rate, which is the policy interest, was reduced to 6.5%. Implicit inflation and explicit inflation targeting, implemented between 2002 and 2010, made significant contributions to monetary policy by providing significant improvements in price stability, investment, and economic growth (Kartal,

2011; 88, 89-90). In 2011, the inflation target was preserved at 5%, and our target variable was the Consumer Price Index (CPI) with its 12-month change, accordingly, the inflation target was determined as 5.5% in 2011, 5% in 2012 and 5% in 2013. The amount of foreign exchange purchases realized through foreign exchange buying auctions in 2010 reached 14.1 billion US dollars and the Central Bank did not sell foreign exchange in the foreign exchange market in the same year (CBRT 2011 Monetary and Exchange Rate Policy).

The policies implemented in order to reduce financial risks in 2011 gave positive results and formed the first steps of the economic balancing period. However, with the emergence of global risks after August, the Turkish lira depreciated and inflation exceeded the determined value. In October 2011, the Central Bank tended towards monetary tightening in order to prevent this situation. The interest rate corridor was preferred as an active policy tool, as uncertainties in the economy and changes in risk appetite required a flexible structure in monetary policy. Since 2002, in the floating exchange rate regime, exchange rates have been shaped depending on the supply and demand conditions in the market, while the supply and demand of foreign exchange are determined by factors such as the applied monetary and fiscal policies, international developments and expectations. In 2011, the Central Bank bought USD 6.5 billion from the market through foreign exchange buying auctions, and USD 10.1 billion entered the market through foreign exchange selling auctions (CBRT's Monetary and Exchange Rate Policy for 2012). Thus, with these policies implemented, the excessive appreciation pressure on the exchange rate was reduced, and loan growth was reduced to desired rates.

In 2012, approximately USD 2.5 billion was entered into the market through foreign exchange selling auctions and direct selling interventions. Developments in global monetary policies after May 2013 have been the main reason for the dynamism in financial markets. During this period, financial assets were re-priced, and during this period, the Central Bank's a-week repo interest rate, interest rate corridor, Turkish lira and foreign currency liquidity policies and the Reserve Options Mechanism were used to prevent adverse effects on the country's economy. The depreciation of the Turkish lira after May had a negative impact on inflation expectations. In the first quarter of 2013, the Central Bank made interest rate cuts. Thus, with the increase in economic activities, an increase in imports occurred, as a result, a current account deficit occurred and the Turkish Lira depreciated against the US dollar. Domestic demand also tended towards

recovery in 2013. However, due to uncertainties regarding monetary policy in global markets, capital flows decreased. In 2014, a slowdown was observed in loan growth with a more careful monetary policy stance. During this period, there was a depreciation in TL and an increase in the risk premium. In the later periods of 2014, there was a decrease in the market interest rates with the decrease in uncertainties and the improvement in the risk premium indicators. Again, in this period, efforts were made to improve inflation as a consequence of the tight monetary policy stance in order to minimize the negative effects of high inflation rates due to the increases in food prices and geopolitical risks. In 2015, the Central Bank announced that new regulations will be made regarding the required reserves of foreign currency liabilities that the positive effect of the decline in oil prices in global markets, commodity prices, and the tightening monetary policy on inflation (Çetin, 2016; 88). By the end of 2015, targets were set to be tight, against inflation, stabilize foreign exchange liquidity and support financial stability in order to formulate correct policies. Thus, keeping the annual growth rates of loans at a certain level with a tight monetary policy, and continuing growth of commercial loans at a higher level compared to consumer loans will contribute to the balancing process of the economy. The Central Bank continued its tight monetary policy strategy in order to limit the effects of the cumulative exchange rate movements and the volatility in energy food prices on inflation and inflation expectations and funded its liquidity need mainly through one-week quantity repo auctions but increased the share of marginal funding after the first quarter of the year (CBRT 2016 Monetary and Exchange Rate Policy). In order to ensure price stability in the economy in the 2017-2019 period, the inflation target was determined as 5% within the scope of the Medium-Term Program. The Central Bank did not intervene in the exchange rate regime determined according to market conditions. In addition, in 2016, it met its liquidity requirement from the marginal funding rate. The energy importer was sold for $ 4.2 billion to state-owned enterprises, and in 2016, no foreign currency sales were made. As a result, gross foreign exchange reserves increased by USD 8 billion in 2016 compared to the previous year (CBRT 2017 Monetary and Exchange Rate Policy). The global geopolitical crises that occurred in 2016 impacted inflation in exchange rates and monetary policy in early 2017. Consequently, there was a tendency towards a contractionary monetary policy. In 2017, there was a significant increase in inflation. The observed exchange rate targets and the increases in oil prices posed a risk in inflation. In the same year, there was an increase of 9.3 billion TL in the

Turkish lira due to the changes in the volume of emission and the free deposit account balances of the banks. In comparison, it decreased by 3 billion TL due to central bank transactions and 29.9 billion TL due to public transactions. Also in 2017, the Central Bank, the instruments it preferred, foreign exchange deposits auctions against Turkish lira deposits, energy importer, foreign currency sales and required reserves made to state-owned enterprises. In 2017, USD 6.9 billion was sold to energy-importing state-owned enterprises, but foreign exchange sales were not made either through auctions or directly. In these transactions directly related to foreign exchange liquidity, gross foreign exchange reserves increased by approximately USD 9 billion in 2017 compared to previous years (CBRT 2018 Monetary and Exchange Rate Policy). By 2018, the deterioration in the CBRT pricing behavior and implemented a strong monetary tightening policy in order to reduce the risks regarding the inflation outlook and ensure price stability. While the tight monetary policy was maintained in the January-March period of 2018, a measured monetary tightening was implemented in April to support price stability and In May, the tightening monetary policy stance was strengthened under the risks posed by the unhealthy price formations in the markets and the rise in inflation expectations against the general pricing behavior. In August, in the face of the depreciation of the Turkish lira due to the extreme volatility in the financial markets, the CBRT kept the Turkish lira in order to ensure the more efficient functioning of the markets and took measures focused on financial stability in order to support foreign exchange liquidity management. Within the scope of the reserve option mechanism (ROM), an upper limit has been set for the exchange rate facility and reserve requirement ratios were lowered, providing liquidity to the markets. Thus, flexibility was brought to the collateral conditions of banks and it has been made possible to repay the rediscount loans in Turkish lira, provided that they are paid on time. In order to prevent the increased exchange rate volatility and unhealthy price formations, the CBRT operates the markets effectively and is used effectively by expanding the tools it has to support the transmission mechanism. In November, the Turkish Lira Swap Market for Foreign Exchange was launched. Therefore, it is aimed to contribute to the deepening of the futures markets and indirectly to the currency risk management of the real sector (CBRT 2019 Monetary and Exchange Rate Policy). In the first half of 2019, as a result of the tight monetary policy of the CBRT and strong policy coordination, the cumulative exchange rate effects decreased and the milder course of domestic demand showed a significant correction in inflation dynamics. The CBRT

gradually reduced the policy rate to 14 percent in July, September, and October due to the improvement in the inflation outlook. Economic activities slowed down starting from March due to the effects of the epidemic on foreign trade, tourism, and domestic demand, and this situation made itself felt more in April and spread across sectors. The interest rate cut process initiated by the CBRT in July 2019 continued with the interest rate cuts made in the March-May period of 2020 in order to minimize the economic and financial effects of the epidemic. With the gradual easing of epidemic-related restrictions in mid-May, the impact of supportive policies on domestic demand and economic activity became evident. Thus, GDP, which declined by 10.8 percent in the second quarter of the year, increased by 15.6 percent in the third quarter and exceeded its pre-epidemic level. In this period, the deterioration of domestic inflation expectations along with global uncertainties increased the tendency towards dollarization. The increase in macro-financial risks and deterioration in expectations, foreign capital outflows, increased asset dollarization, acceleration of the real sector's tendency to reduce its foreign currency liabilities, and the deterioration in the current account balance increased the risk premiums, resulting in pressure on the exchange rates and foreign exchange reserves. The determining driver of consumer inflation in 2020 was exchange rate developments. As of mid-December, the Turkish lira depreciated by 40 percent against the basket currency. Increasing cost pressures, mainly due to exchange rate and demand-side factors due to credit accelerations negatively affected inflation expectations in the second half of the year. In the first ten months of 2020, inflation progressed in a nearly flat line at the rate of 12 percent, and the main reason for this was energy and tobacco-based base effects, while inflation in food and core goods groups entered an upward trend as of July. In addition, the effects of the rapid expansion in credit volume and monetary aggregates on domestic demand continued in the last quarter of the year and increased upward pressures on consumer inflation together with the cumulative exchange rate effects. Developments in the balance of payments and dollarization have also effectively increased the risks to price and macro-financial stability on exchange rates and reserves (CBRT 2020 Monetary and Exchange Rate Policy).

CHAPTER THREE

3. Introduction

In this section, the exchange rate pass-through to domestic prices is analyzed by employing an econometric model. For this purpose, variables were introduced and tests were applied within the framework of VECM analysis, and the results obtained were interpreted and transferred.

3.1. Data Set and Features

The aim of this study is to examine the effect of monetary policy and exchange rate pass-through on domestic prices between 1994 and 2020 in Turkey with an econometric model analysis. There are three subperiods for the period of 1994M01-2001M12, period of 2002M01-2010M04, and period of 2011M01-2020M12. The data used in the analysis were obtained from the Electronic Data Dissemination System (EDDS) of the Central Bank of the Republic of Turkey (CBRT). In the study, monthly data is used for five macroeconomic variables. The variables are nominal exchange rate (NER), import price index (IPI), producer price index (PPI), and consumer price index (CPI), and money supply (M2). For the nominal exchange rate, the buying rate of average nominal USD/TL is used because most of the Turkish imports are traded in the US Dollar. In addition, the value of USD has a more substantial influence on inflation expectations (Kara et al., 2017:14). In order to determine the inflation caused by global conditions, import prices, which are the unit value of the import price index in USD, are used. In addition, it supports the exchange rate variable (USD/TL) supports (Yunculer, 2011:75). For CPI, core CPI inflation is used to see the changes in the underlying trend in inflation.

3.2. Estimation Process

In the study, all variables used in the model were seasonally adjusted using the X-12 census method. In addition, natural logarithms of the data were used to eliminate the seasonal cutoffs and the effect of varying variance. Augmented Dickey-Fuller test (ADF) and Phillips-Perron (PP), as well as Breakpoint (BP) tests, were applied to examine the stationarity of the series in the analysis. The lag length was obtained by Akaike and Schwartz information criteria. Then, the Inverse Roots of the AR characteristic polynomial, Variance Decomposition, and Auto-correlation problems were investigated

and the Vector Error Correction Model (VECM) was estimated due to the existence of cointegration between the variables, and also impulse-response analysis test was applied and all tests results were interpreted.

3.2.1 Unit Root (Stationarity) Analysis

In order for the analysis to cause spurious or statistically insignificant regression, it should include non-stationary time series (Gujarati, 216; 320). If a time series is not stationary, it is first stabilized provided that it is taken different from the first order or higher. Unit root analysis is performed in the process of determining the stationarity of variables (Dikmen, 2012; 310). In this study, Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) unit root tests were used to determine the stationarity of the series.

Table 3.1: *Unit Root Test Results (1994:01 2020 :12)*

	First Period (1994-2001)			Second Period (2002-2010)			Third Period (2011-2020)		
	ADF test with Intercept								
Variables	**t-Statistic**	**p-value**	**Order of Integration**	**t-Statistic**	**p-value**	**Order of Integration**	**t-Statistic**	**p-value**	**Order of Integration**
Log CPI	-2.539322	0.1095	I(1)	-2.474792	0.1245	**I(1)**	-0.651138	0.8519	I(1)
Log PPI	-1.878991	0.3408	I(1)	-2.255725	0.1883	**I(1)**	-0.022385	0.9531	I(1)
Log IPI	-1.764543	0.3959	I(1)	-1.783459	0.3869	**I(1)**	-1.654438	0.4501	I(1)
Log USD	3.641854	1.0000	I(1)	-3.052166	0.0335	**I(1)**	-0.721939	0.8344	I(1)
Log M2	-1.699484	0.4283	I(1)	-0.907612	0.7825	**I(1)**	-0.822818	0.8067	I(1)
	ADF test with Intercept and Trend								
Log CPI	-7.140493	0.0000	I(1)	-6.389013	0.0000	**I(1)**	-8.028073	0.0000	I(1)
Log PPI	-5.731634	0.0000	I(1)	-6.801141	0.0000	**I(1)**	-7.626644	0.0000	I(1)
Log IPI	-12.410814	0.0000	I(1)	-6.355800	0.0000	**I(1)**	-8.082454	0.0000	I(1)
Log USD	-7.016450	0.0000	I(1)	-7.805812	0.0000	**I(1)**	-7.645170	0.0000	I(1)
Log M2	-9.220804	0.0000	I(1)	-11.069848	0.0000	**I(1)**	-8.613700	0.0000	I(1)

Table 3.1. *(Continued) Unit Root Test Results (1994:01 2020 :12)*

	First Period (1994-2001)			Second Period (2002-2010)			Third Period (2011-2020)		
	PP test with Intercept								
Variables	**t-Statistic**	**p-value**	**Order of Integration**	**t-Statistic**	**p-value**	**Order of Integration**	**t-Statistic**	**p-value**	**Order of Integration**
Log CPI	-3.236474	0.0209	I(1)	-3.214839	0.0218	I(1)	-0.649533	0.8523	I(1)
Log PPI	-2.381393	0.1497	I(1)	-2.904775	0.0481	I(1)	-0.066478	0.9486	I(1)
Log IPI	-1.689705	0.4332	I(1)	-1.692245	0.4323	I(1)	-1.732830	0.4108	I(1)
Log USD	2.892383	1.0000	I(1)	-2.214114	0.2026	I(1)	-0.713056	0.8366	I(1)
Log M2	-1.681947	0.4371	I(1)	-0.910295	0.7816	I(1)	-0.820251	0.8074	I(1)
	PP test with Intercept and Trend								
Log CPI	-6.871848	0.0000	I(1)	-6.007537	0.0000	I(1)	-8.004464	0.0000	I(1)
Log PPI	-6.156247	0.0000	I(1)	-6.795590	0.0000	I(1)	-7.601653	0.0000	I(1)
Log IPI	-12.250084	0.0000	I(1)	-6.528377	0.0000	I(1)	-8.082454	0.0000	I(1)
Log USD	-6.379367	0.0000	I(1)	-6.857856	0.0000	I(1)	-7.579072	0.0000	I(1)
Log M2	-9.349676	0.0000	I(1)	-11.050840	0.0000	I(1)	-8.613654	0.0000	I(1)

Table 3.1: *(Continued) Unit Root Test Results (1994:01 2020 :12)*

	First Period (1994-2001)			Second Period (2002-2010)			Third Period (2011-2020)		
	BP test with Intercept								
Variables	**t-Statistic**	**p-value**	**Order of Integration**	**t-Statistic**	**p-value**	**Order of Integration**	**t-Statistic**	**p-value**	**Order of Integration**
Log CPI	-3.484508	0.3958	I(1)	-3.883154	0.2000	I(1)	-3.282396	0.5141	I(1)
Log PPI	-3.123407	0.6127	I(1)	-3.289763	0.5090	I(1)	-2.427193	0.9203	I(1)
Log IPI	-4.258820	0.0828	I(1)	-2.460819	0.9124	I(1)	-5.223673	<0.01	I(1)
Log USD	0.853762	>0.99	I(1)	-3.991374	0.1591	I(1)	-3.483237	0.3965	I(1)
Log M2	-3.062572	0.6493	I(1)	-3.585582	0.3395	I(1)	-3.379725	0.4544	I(1)
	BP test with Intercept and Trend								
Log CPI	-8.511946	<0.01	I(1)	-7.237950	< 0.01	I(1)	-24.49943	<0.01	I(1)
Log PPI	-7.648162	<0.01	I(1)	-7.650851	< 0.01	I(1)	-12.98900	<0.01	I(1)
Log IPI	-13.575514	<0.01	I(1)	-7.198188	< 0.01	I(1)	-17.66365	<0.01	I(1)
Log USD	-8.767218	<0.01	I(1)	-8.581793	< 0.01	I(1)	-12.23366	<0.01	I(1)
Log M2	-9.701533	<0.01	I(1)	-25.87829	< 0.01	I(1)	-12.64252	<0.01	I(1)

3.3. Johansen Co-integration Test

Co-integration, which is the linear component of non-stationary variables, cointegration test that helps to preserve long-term relationships, and allows the analysis of dynamics for the short-term. A two-step process is anticipated. First step, the common complement value is estimated for the level level variables, and then the second step, these estimates are used in the error correction model. In order for both partners to be complementary, they must be complementary at the same degree, and the errors obtained from the equilibrium relationship between them must be stationary at the level and the regression in which the co-integrating vector is found is called the cointegrating regression. (Granger and Engle ; 1987; 251).

In this part of our analysis, we need to apply a cointegration test in order to choose which of our VAR or VEC Models. According to our Cointegration test results, all our models have a long-term relationship, namely Cointegration. Therefore, we estimate the VEC model.

Table 3.2. *Johansen Co-integration Test Results (1994:01 2020:12)*

First period (1994:01 2001:12) Tested for CPI, PPI, IPI,M2,USD	**Unrestricted co-integration rank test (trace)**				
	Hypothesized No. of CE(s)	**Eigenvalue**	**Trace Statistics**	**0.05 Critical value**	**Prob.**
	None	**0.416657**	**103.3251**	**69.81889**	**0.0000**
	At most 1	**0.234629**	**53.19992**	**47.85613**	**0.0145**
	At most 2	**0.201864**	**28.33224**	**29.79707**	**0.0730**
	At most 3	**0.063615**	**7.362924**	**15.49471**	**0.5358**
	At most 4	**0.013352**	**1.250141**	**3.841465**	**0.2635**
	Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
	Hypothesized No. of CE(s)	**Eigenvalue**	**Max-Eigen Statistic**	**0.05 Critical value**	**Prob.**
	None	**0.416657**	**50.12518**	**33.87687**	**0.0003**
	At most 1	**0.234629**	**24.86769**	**27.58434**	**0.1072**
	At most 2	**0.201864**	**20.96931**	**21.13162**	**0.0527**
	At most 3	**0.063615**	**6.112783**	**14.26460**	**0.5988**
	At most 4	**0.013352**	**1.250141**	**3.841465**	**0.2635**

Table 3.2. *(Continued) Johansen Co-integration Test Results (1994:01 2020:12)*

Second Period (2002:01 2010:12)	**Unrestricted co-integration rank test (trace)**				
	Hypothesized No. of CE(s)	**Eigenvalue**	**Trace Statistics**	**0.05 Critical value**	**Prob.**
	None	**0.387212**	**97.19159**	**69.81889**	**0.0001**
	At most 1	**0.200380**	**46.74875**	**47.85613**	**0.0633**
	At most 2	**0.107117**	**23.71599**	**29.79707**	**0.2127**
	At most 3	**0.065358**	**12.04611**	**15.49471**	**0.1547**
	At most 4	**0.048162**	**5.084114**	**3.841465**	**0.0241**
Tested for CPI, PPI, IPI,M2,USD	**Unrestricted Cointegration Rank Test (Maximum Eigenvalue)**				
	Hypothesized No. of CE(s)	**Eigenvalue**	**Max-Eigen Statistic**	**0.05 Critical value**	**Prob.**
	None	**0.387212**	**50.44284**	**33.87687**	**0.0002**
	At most 1	**0.200380**	**23.03276**	**27.58434**	**0.1721**
	At most 2	**0.107117**	**11.66988**	**21.13162**	**0.5805**
	At most 3	**0.065358**	**6.961999**	**14.26460**	**0.4936**
	At most 4	**0.048162**	**5.084114**	**3.841465**	**0.0241**

Table 3.2. *(Continued) Johansen Co-integration Test Results (1994:01 2020:12)*

Third Period (2011:01 2020:12) Tested for CPI, PPI, IPI,M2,USD	**Unrestricted co-integration rank test (trace)**				
	Hypothesized No. of CE(s)	**Eigenvalue**	**Trace Statistics**	**0.05 Critical value**	**Prob.**
	None	**0.436592**	**84.48179**	**69.81889**	**0.0022**
	At most	**0.270501**	**43.17174**	**47.85613**	**0.1285**
	At most 2	**0.139380**	**20.46317**	**29.79707**	**0.3920**
	At most 3	**0.117197**	**9.655816**	**15.49471**	**0.3082**
	At most 4	**0.009411**	**0.680802**	**3.841465**	**0.4093**
	Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
	Hypothesized No. of CE(s)	**Eigenvalue**	**Max-Eigen Statistic**	**0.05 Critical value**	**Prob.**
	None	**0.436592**	**41.31005**	**33.87687**	**0.0054**
	At most 1	**0.270501**	**22.70857**	**27.58434**	**0.1862**
	At most 2	**0.139380**	**10.80736**	**21.13162**	**0.6665**
	At most 3	**0.117197**	**8.975014**	**14.26460**	**0.2882**
	At most 4	**0.009411**	**0.680802**	**3.841465**	**0.4093**
Trace test indicates that there is no co-integrating equations at the 0.05 level. **Maximum eigenvalue test indicates that there is no co-integrating equations at the 0.05 level.**					

3.4. Vector Error Correction Model (VECM) Analysis

Vector Error Correction is a model used to reveal the existence of a causal relationship between the variables used in the analysis. If it is reveals that the variables are cointegrated in the cointegration test, the Vector Error Correction model (VEC) is used instead of the Granger causality test (that is, the VAR Model) to determine the causality between the variables (Granger ;1969 ;424-438). Vector Error Correction Model (VECM), after detecting the existence of cointegration between the series, we understand the existence of a long-term relationship between them, so we consider it appropriate to establish VECM to review the short-term properties of the cointegrated series. In the absence of cointegration, VECM is no longer required but is applied before Granger causality tests to establish causal links between variables. The underlying principle of VECMs is the average ratio of long-term consumption to income. The aim is to reveal the existence of the equilibrium relationship between economic and economic variables in the long run, but this situation may change and get out of balance in the short run. Suppose that Y_{1t} and Y_{2t} are cointegrated in the form of $z_t = Y_{1t} - \lambda Y_{2t}$ where is stationary. The cointegration equation is equal to zero when in equilibrium in the long run, and any deviation from zero can be treated as "short run" equilibrium errors. It is expected that the Y_{1t} and Y_{2t} time series will change to correct the equilibrium errors. In the equation below, a VECM for the two variables is given along with the two lagged values of the dependent variables (Chung, 2019; 237).

$$\Delta Y_{1,t} = \gamma_0 + \gamma_1 \Delta Y_{1,t-1} + \gamma_2 \Delta Y_{2,t-1} + \gamma_3 \Delta Y_{1,t-2} + \gamma_4 \Delta Y_{2,t-2} + \theta_1 z_{t-1} + \varepsilon_{1t}$$

$$\Delta Y_{2,t} = \delta_0 + \delta_1 \Delta Y_{1,t-1} + \delta_2 \Delta Y_{2,t-1} + \delta_3 \Delta Y_{1,t-2} + \delta_4 \Delta Y_{2,t-2} + \theta_2 z_{t-1} + \varepsilon_{2t}$$

$$z_{t-1} = Y_{1,t-1} - \lambda Y_{2,t-1} \qquad (3.1)$$

In the (3.1) equations, the error correction terms $\theta_1 z_{t-1}$ and $\theta_2 z_{t-1}$ show the adjustments for the long-run equilibrium, thus showing us how the previous equilibrium error affects the Y_{1t} and Y_{2t} values of the next period. And θ_1 and θ_2 help us to understand how sensitively Y_{1t} and Y_{2t} respond to the equilibrium error. VECM has made the idea of cointegration practically useful for understanding the dynamics of economic variables.

3.5. Inverse Roots of the AR Characteristic Polynomial

All inverse roots of the unit circle, models are less than unity. Thus, the roots of all models lie within the unit circle.

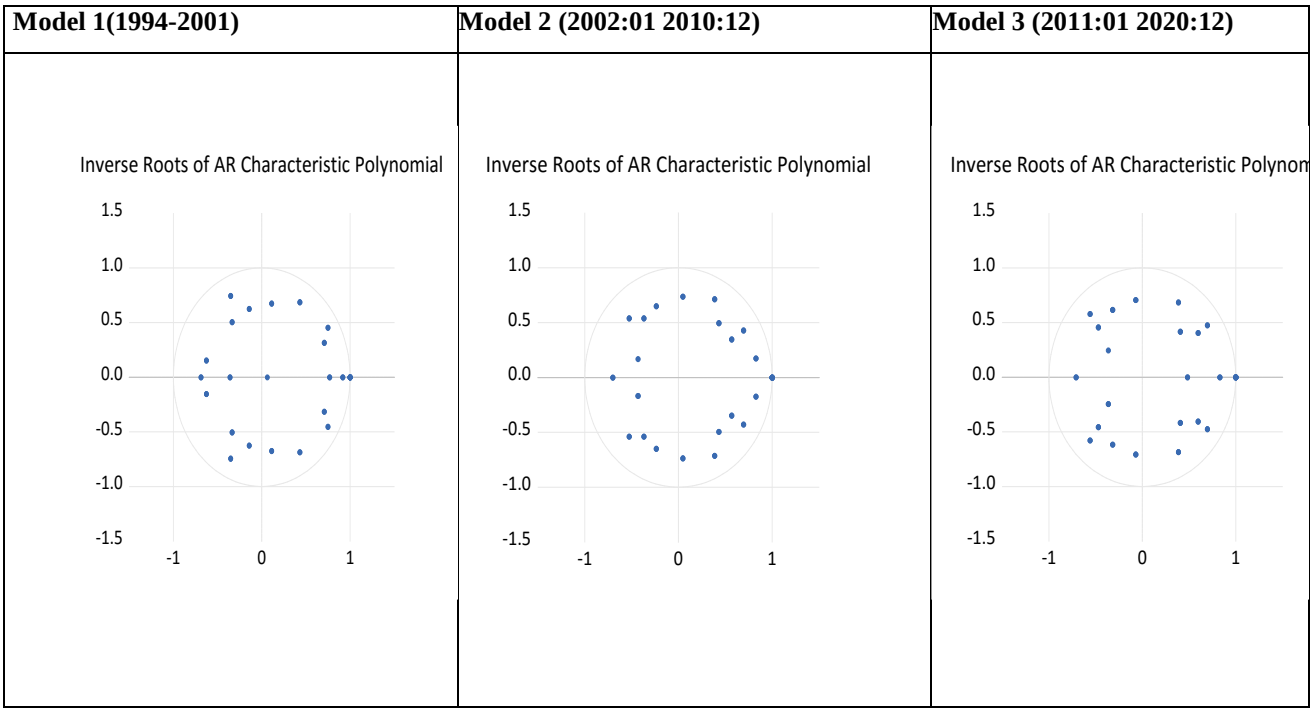

Figure 3.1: *AR Roots Graph*

3.6. Autocorrelation (LM) Tests

Table 3.3. *LM Test Results for Autocorrelation*

	Lags	Probability
First Period (1994:01 2001:12)	**1**	**0.3170**
	2	**0.8810**
	3	**0.3651**
	4	**0.6050**
	5	**0.9838**
Second Period (2002:01 2010:12)	**1**	**0.5401**
	2	**0.0692**
	3	**0.7255**
	4	**0.7027**
	5	**0.6495**
Third Period (2011:01 2020:12)	**1**	**0.7896**
	2	**0.9438**
	3	**0.7663**
	4	**0.4023**
	5	**0.2079**

LM test was performed for autocorrelation, and no autocorrelation problem was encountered since the probability values were greater than 0.05. LM test results also support that there is no autocorrelation problem in our three models.

3.7.Variance Decomposition

Variance decomposition analysis, which explains how many % of the variance of the variables that occur separately in each of the examined variables is due to their own

delay and how many % is caused by other variables, is used to briefly see how the variance of the variables interact and affect each other.With the analysis of variance research, it is decided whether the variables are internal or external. With the analysis of variance, the contribution of each variable to the change in the variance of the series is measured separately during the shock period (Tarı, 2011; 469). In the first period, we can see from both our table and graph that inflation, has been predominantly affected by producer prices and exchange rates for 10 periods. In the second period, we see that inflation is affected by the import price index and the consumer price index. Finally, in the third period, we see that the effect of the exchange rate on inflation very strong.

Table 3.4 *Variance decomposition Test Results (1994:01 200:12)*

	First Period (1994:01 2001:12)				
Period	**LOGUSD**	**LOGM2**	**LOGIPI**	**LOGPPI**	**LOGCPI**
1	**13.26785**	**6.665728**	**0.007870**	**46.99691**	**33.06164**
2	**32.93406**	**2.212535**	**2.327789**	**45.12042**	**17.40520**
3	**41.96183**	**1.619302**	**1.544536**	**44.51790**	**10.35644**
4	**45.11953**	**1.399286**	**1.086280**	**45.11772**	**7.277181**
5	**46.11455**	**1.158768**	**0.931210**	**45.37567**	**6.419796**
6	**46.05823**	**1.408473**	**0.809674**	**45.67033**	**6.053292**
7	**45.87639**	**1.756134**	**0.970899**	**45.36327**	**6.033309**
8	**45.79174**	**2.191824**	**1.166799**	**45.19769**	**5.651941**
9	**45.23173**	**2.502069**	**1.726625**	**45.63725**	**4.902331**
10	**44.26505**	**2.557571**	**2.670497**	**46.24699**	**4.259889**

Table 3.4. *(Continued) Variance decomposition Test Results (1994:01 200:12)*

	Second Period 2002:01 2010:12)				
Period	**LOGUSD**	**LOGM2**	**LOGIPI**	**LOGPPI**	**LOGCPI**
1	**2.906516**	**3.643238**	**10.35052**	**5.230751**	**77.86897**
2	**4.096845**	**2.252935**	**16.50308**	**5.975632**	**71.17151**
3	**4.670756**	**2.210301**	**18.60055**	**7.999043**	**66.51935**
4	**4.951829**	**2.827910**	**22.03520**	**7.572353**	**62.61271**
5	**5.473106**	**2.695594**	**26.10573**	**6.352334**	**59.37323**
6	**6.119004**	**2.664965**	**28.57631**	**5.551271**	**57.08845**
7	**6.432997**	**2.612876**	**29.75916**	**5.232950**	**55.96202**
8	**6.319064**	**2.547542**	**30.33845**	**5.416467**	**55.37848**
9	**6.024736**	**2.491000**	**30.61884**	**5.973521**	**54.89190**
10	**5.631417**	**2.400325**	**30.92560**	**6.494465**	**54.54819**
11	**5.193720**	**2.300279**	**31.07798**	**6.865139**	**54.56288**
12	**4.784123**	**2.209174**	**31.04514**	**7.093065**	**54.86850**

	Third Period (2011.01 2020:12)				
Period	**LOGUSD**	**LOGM2**	**LOGIPI**	**LOGPPI**	**LOGCPI**
1	**82.27583**	**0.251452**	**10.55655**	**2.204216**	**4.711954**
2	**81.16827**	**0.361077**	**9.597560**	**1.487250**	**7.385839**
3	**83.56181**	**0.383237**	**7.440271**	**1.389667**	**7.225018**
4	**83.77851**	**0.310942**	**6.866919**	**1.226700**	**7.816931**
5	**83.58876**	**0.293327**	**7.190849**	**1.041499**	**7.885561**
6	**83.87742**	**0.416481**	**7.254212**	**0.903404**	**7.548485**
7	**83.59526**	**0.460085**	**7.608475**	**0.820018**	**7.516159**
8	**83.23243**	**0.432222**	**8.133428**	**0.866879**	**7.335045**
9	**83.08044**	**0.387863**	**8.434826**	**1.014839**	**7.082034**
10	**82.77196**	**0.351104**	**8.806581**	**1.153542**	**6.916817**
11	**82.39408**	**0.320283**	**9.249315**	**1.230355**	**6.805972**
12	**82.05013**	**0.296016**	**9.598703**	**1.234735**	**6.820416**

Cholesky Ordering: LOGUSD LOGM2 LOGIPI LOGPPI LOGCPI

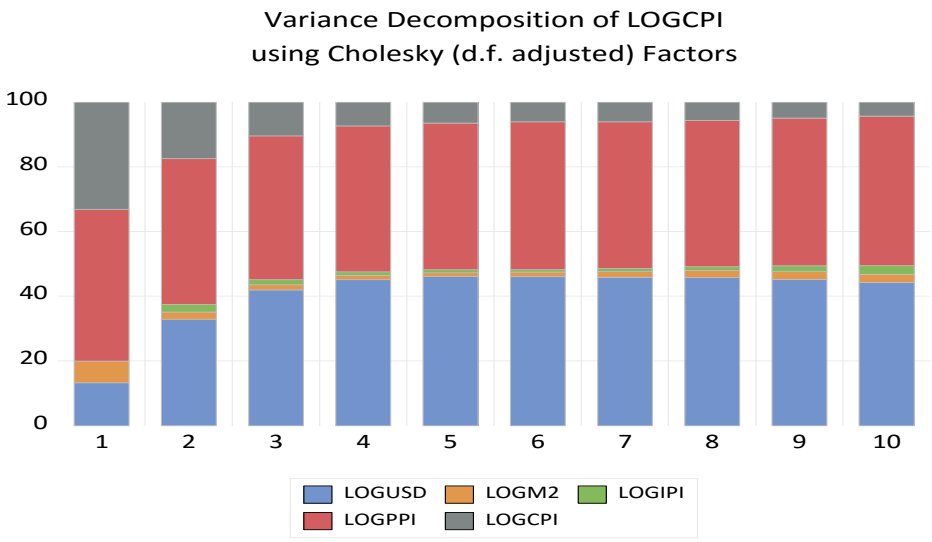

Figure 3.2: *Variance Decomposition (1994:01 2001:12)*

Figure 3.2.show that producer price index and exchange rate are dominant, which creates an inflationary effect comes from producer prices and exchnage rate.

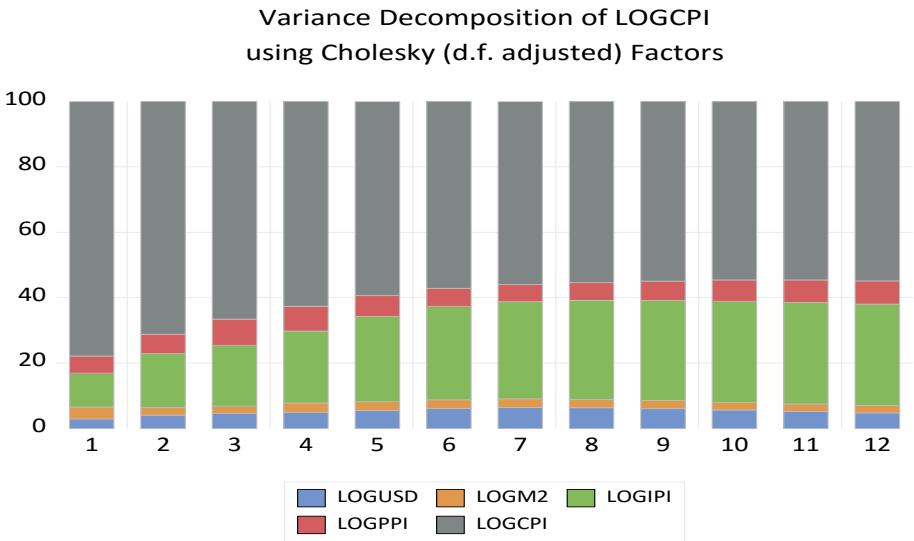

Figure 3.3: *Variance Decomposition (2002:01 2010:12)*

In Figure 3.3. that is, in the second period, the consumer price index explains itself, we have an effective monetary policy, therefore, inflation is affected by it and this effect further reduces the trend. The reason for an effective monetary policy in this period also explains the reduction in inflation. The green trendname defines the Import price index and we see that it is active. Compared to the first period, import price index differs in the second period because of the stable exchange rate in this period, so the stability in the exchange rate makes itself felt here as well.

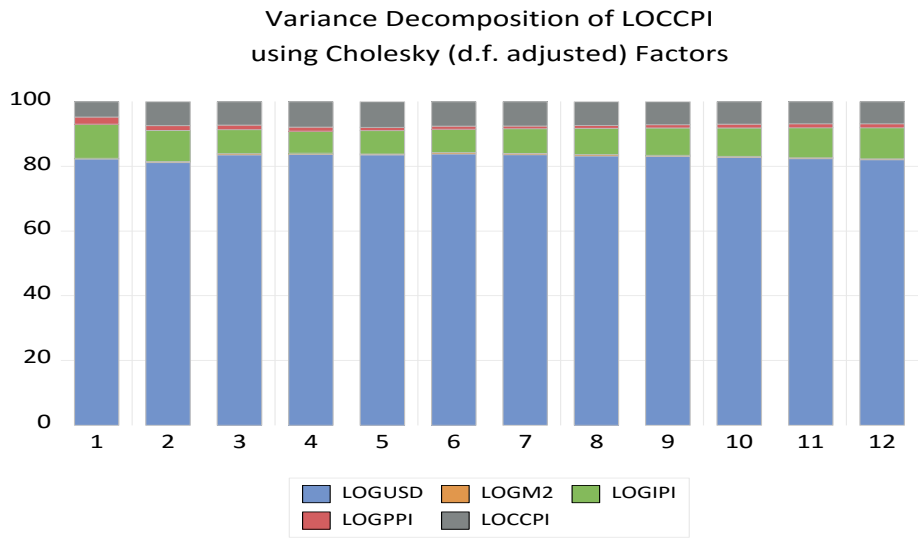

Figure 3.4: *Variance Decomposition (2011:01 2020:12)*

Figure 3.4, clearly reveals that the more dominant exchnage rate pass-through effect to inflation.

The historical decomposition shows us the role of variables explaining inflation in each sub-period.

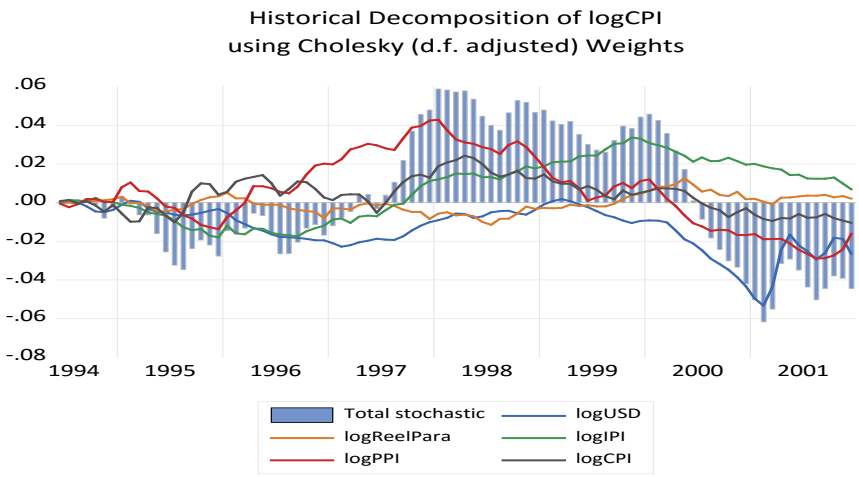

Figure 3.5 : *Historical Decomposition (1994:01 2001:12)*

Historical decomposition in Figure 3.5. present that our consumer price index moved with our producer price index in the first period and there was an effect, which confirms variance deomposition results.

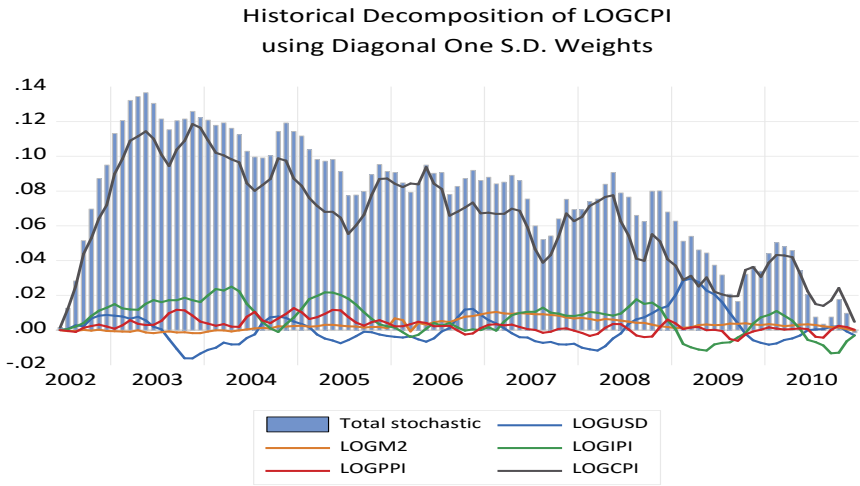

Figure 3.6 : *Historical Decomposition (2002:01 2010:12)*

Figure 3.6. show that consumer price index moves with its own wavelengths due to an effect arising from itself. We also witness the existence of an effect from import prices in this period.

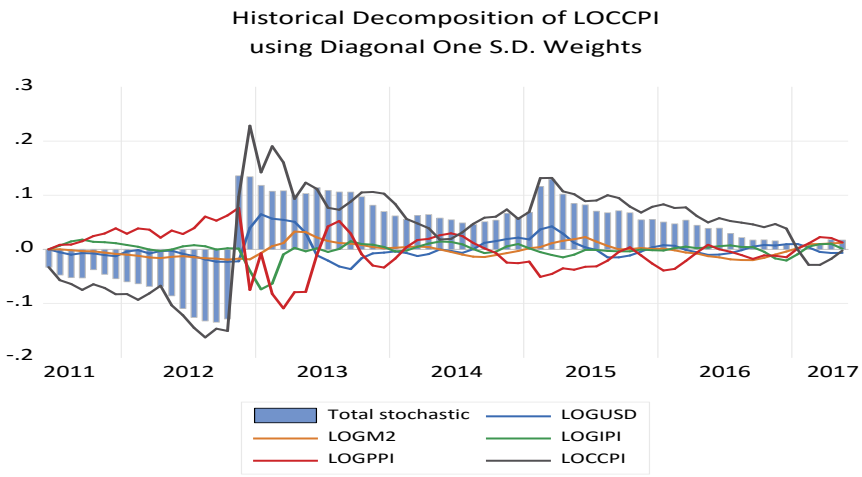

Figure 3.7 : *Historical Decomposition (2011:01 2020:12)*

Figure 3.7. put forth that our consumer price index moves with the exchange rate, again this period shows that the exchnange rate is explanatory and we see that the import prices have retreated, we observe that they fluctuate below zero.

3.8. Heteroscedasticity (White) Test

The White test is one of the LM tests used to check the problem of heteroscedasticity in error terms. When the null hypothesis of no heteroscedasticity is accepted, if the calculated $\chi 2$ value is greater than the table value, H0 is rejected and there is a variable variance problem. Conversely, if the calculated $\chi 2$ value is less than the table value, there is no problem of varying variance (Masakazu and Jiro, 2007; 46-51).White test results show that there is no heteroscedasticity problem in these three models.

Table 3.5. White Test Results for Heteroskedasticity

	Chi-sq	df	Probability
First Period	**651.5650**	**630**	**0.2678**
Second Period	**636.0703**	**630**	**0.4250**
Third Period	**602.2556**	**630**	**0.7807**

3.9. Lag Length Criteria

The accurate determination of the lag length is sensitive to the results obtained after the Var model analysis. In order to determine the lag length, the information criteria applied in single equation time series are used. Commonly used information criteria are Akaike information criterion (AIC), Schwarz information criterion (SC) and Hannan-Quinn information criterion (HQ) (Yavuz, 2015; 343-344).

3.10. Impulse-Response Analysis

The responses of the variables to shocks originating from themselves or other variables are important in the VAR Model. In time series models where shocks are represented by the error term, the response of each variable in the system to the errors of itself or other variables is defined as the impulse-response analysis. Impulse-response denotes two different appearances of the same magnitudes. There is an effect in terms of the variable that originates from the shock, and a reaction in terms of the variable that

receives the shock. The analysis between two variables, which is based on the idea that one of the variables is cause and effect to the other, is called stimulus-response analysis. In other words, it is expressed as an action-reaction analysis if the shock in any variable results in the response of the other variable (Tarı,2011;453). Figure 1, Figure 2, and Figure 3 show the responses of consumer prices to one standard deviation shock in the exchange rate, import prices, and producer prices in the first and second samples.

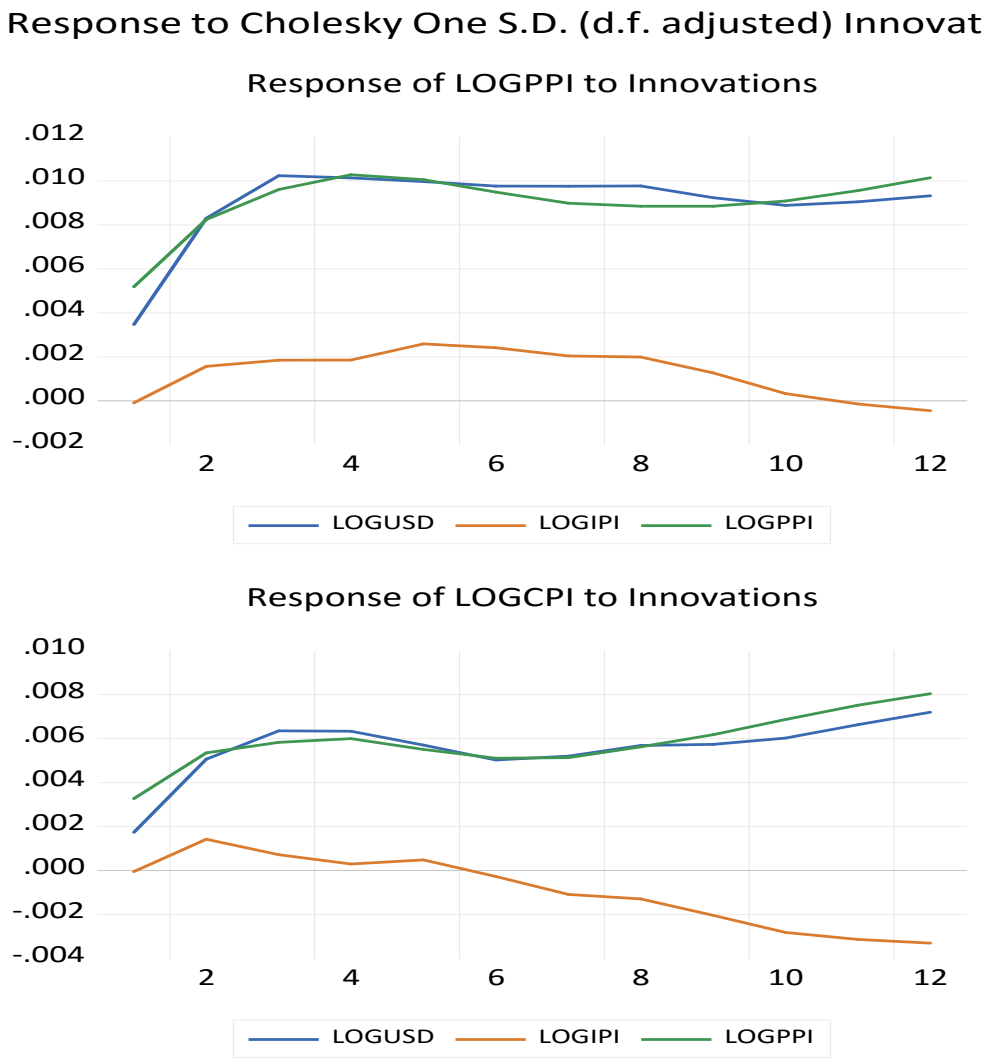

Figure 3.8 : *Response to Cholesky One S.D Innovations for the First Period*

At the CPI and PPI, the exchange rate has a strong effect on import prices. For the first period, the impact of both exchange rate and producer price shocks on the CPI is positive. The exchange rate and producer price (PPI) move together, and both increase rapidly during the first four months. It is seen that both variables have a profound effect on the consumer price index.

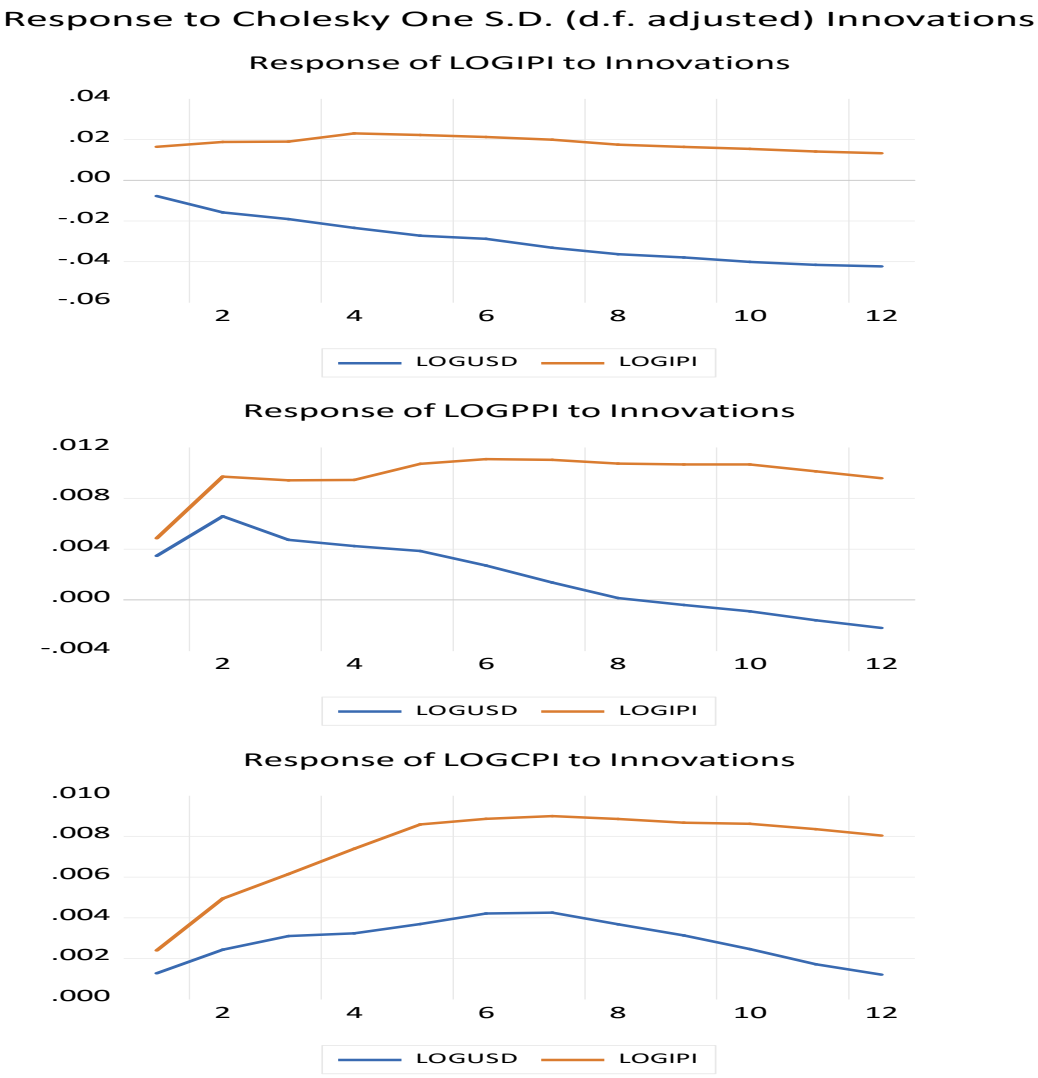

Figure 3.9 : *Response to Cholesky One S.D Innovations for the Second Period*

For the second period, the impact of the exchange rate shock on the CPI is negative. The effect of IPI on consumer prices is positive. The effect of IPI on CPI has a stable trend. The impact of import prices on CPI reaches the highest point after four months. The results show that pass-through from the exchange rate to the CPI works through the import price index(IPI).

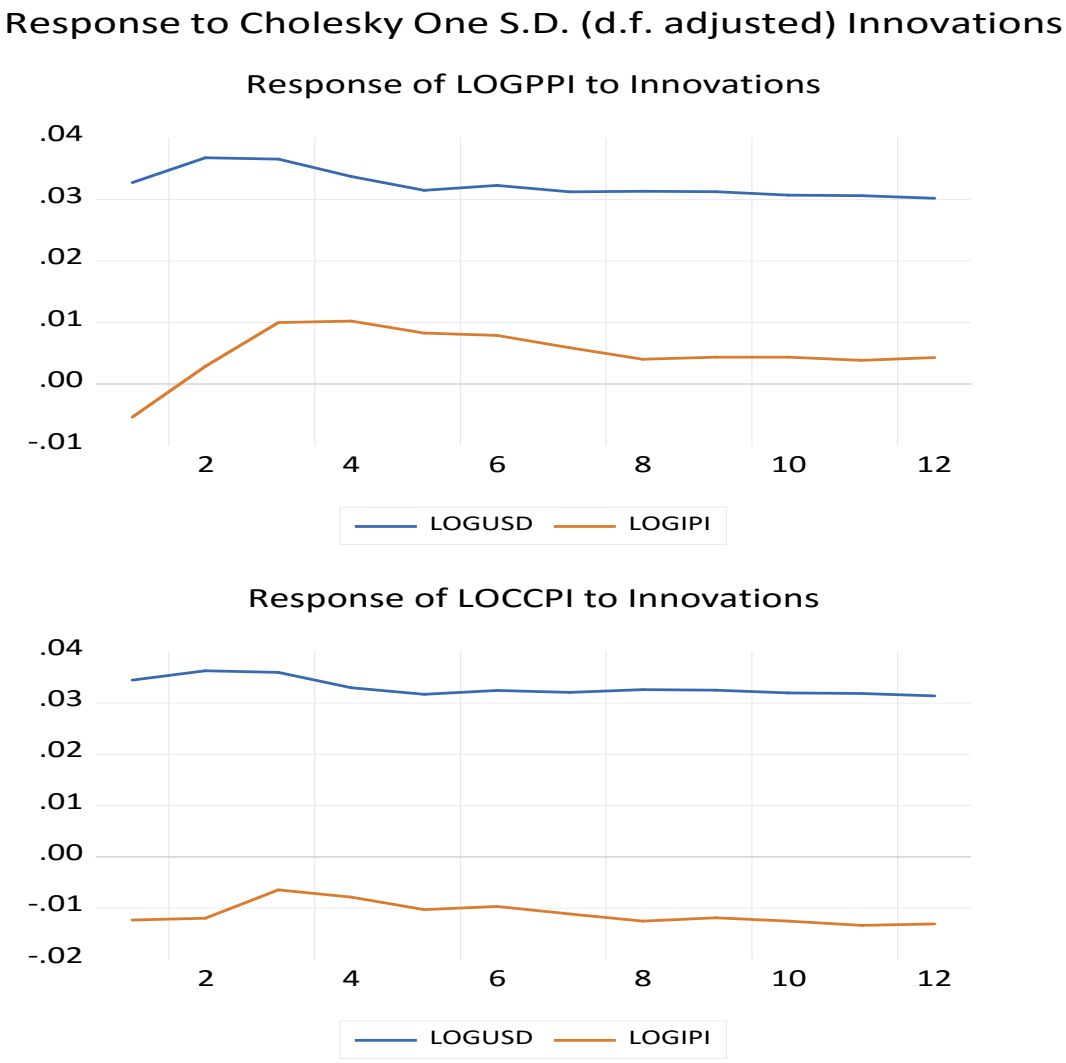

Figure 3.10 : *Response to Cholesky One S.D Innovations for the Third Period*

For the third period, all shocks have a positive effect on CPI. Consumer prices are more sensitive to changes in exchange rates than to changes in import and producer prices. It reaches the highest point in the second month. Import price shock also shows a regular trend. In this period, both the exchange rate and import prices had an impact on the CPI. Consumer prices are more directly affected by the exchange rate than the import price compared with the first period.

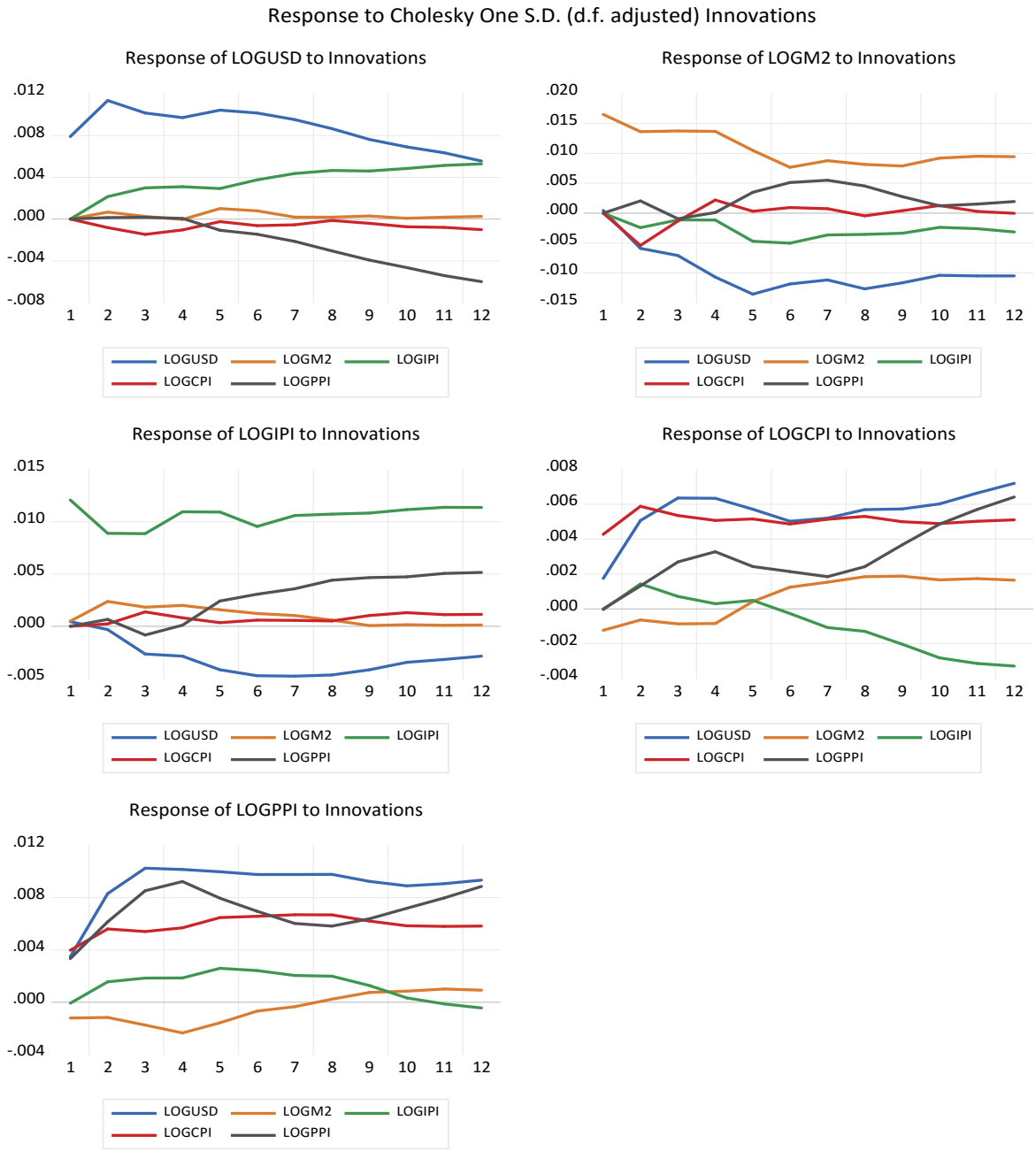

Figure 3.11 : *Impulse Response 2 (1994:01-2001:12)*

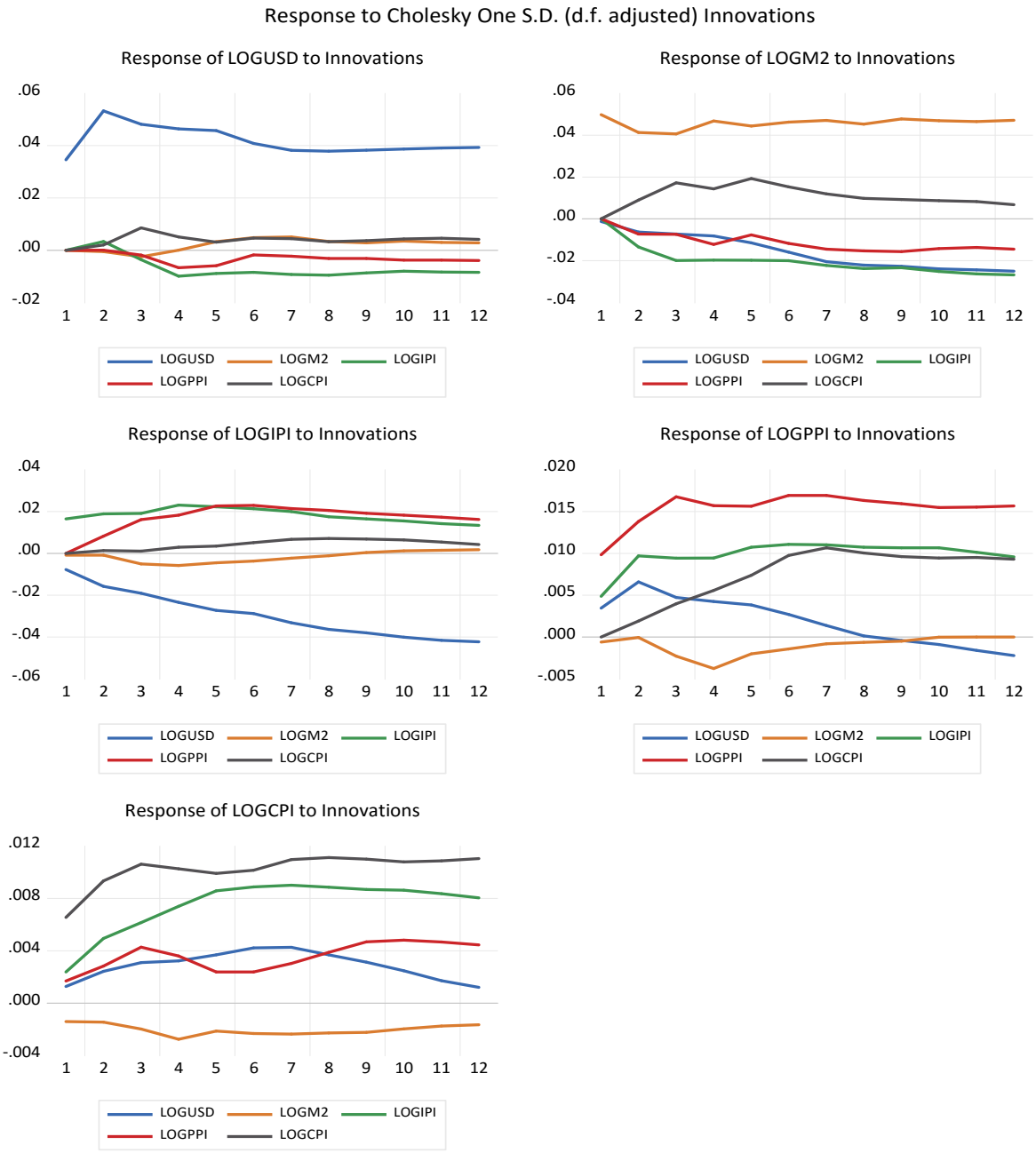

Figure 3.12 : *Impulse Response 2 (2002:01-2010:12)*

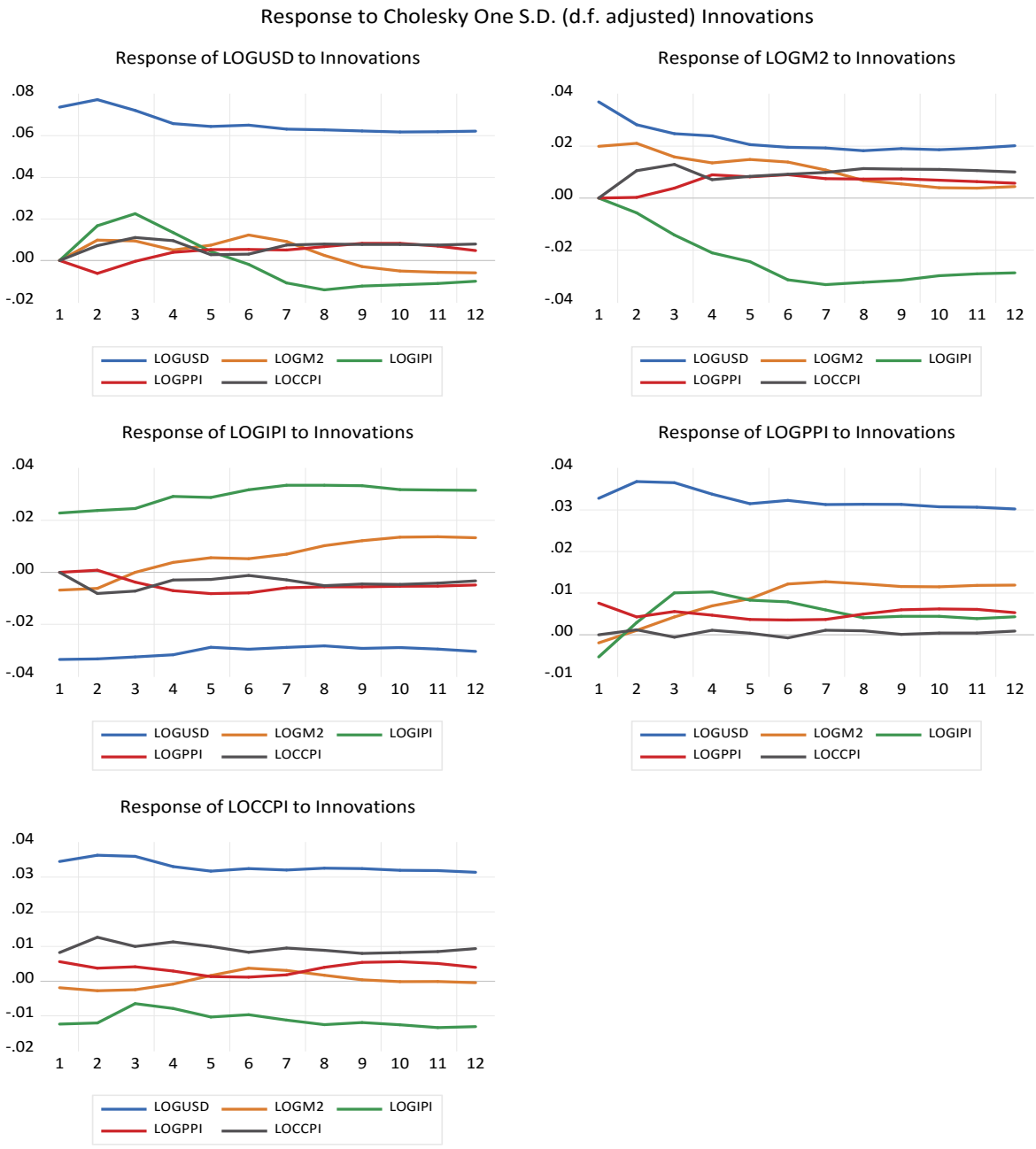

Figure 3.13 : *Impulse Response 2 (2011:01-2020:12)*

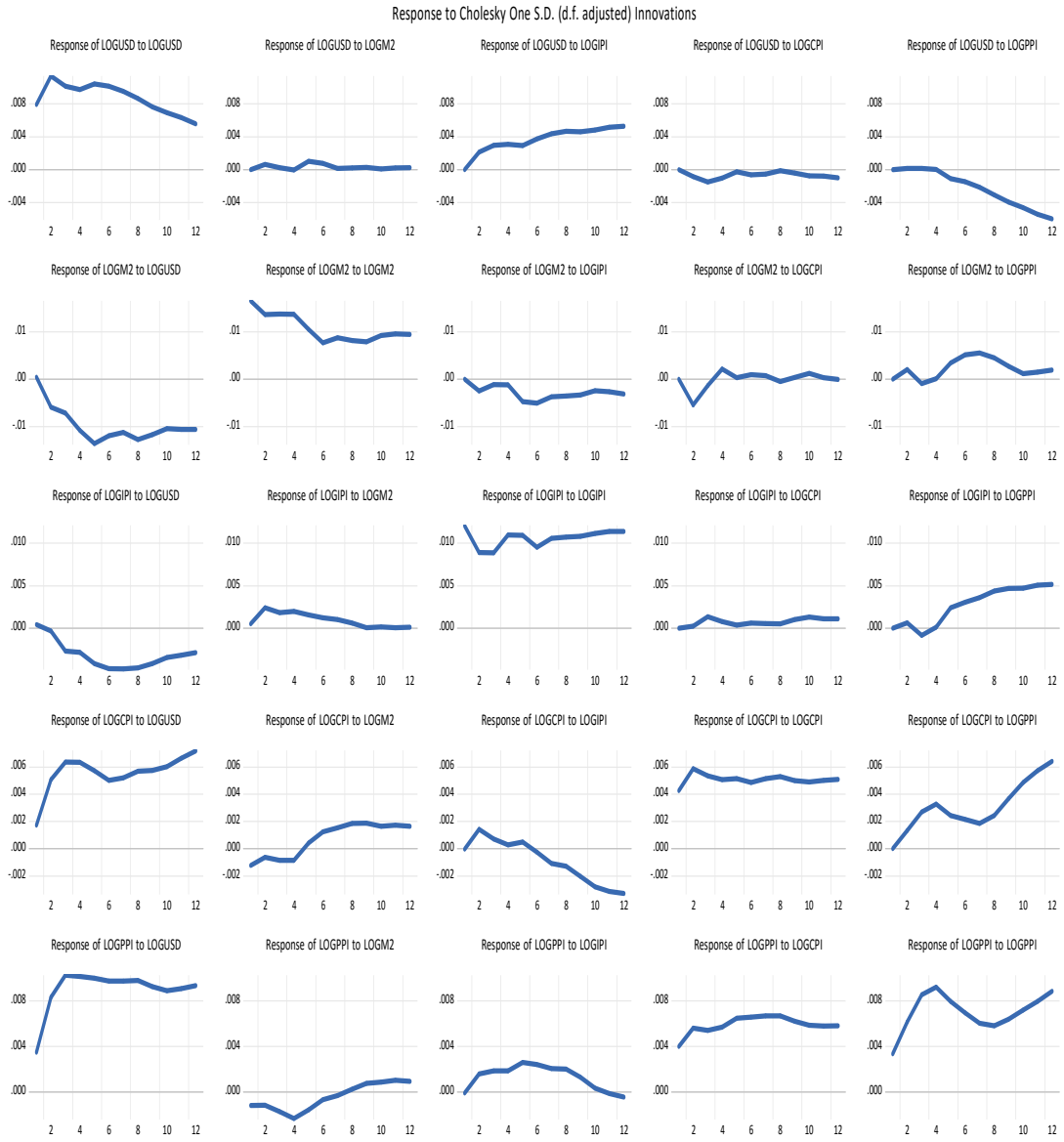

Figure 3.14 : *Impulse Response 1 (1994:01-2001:12)*

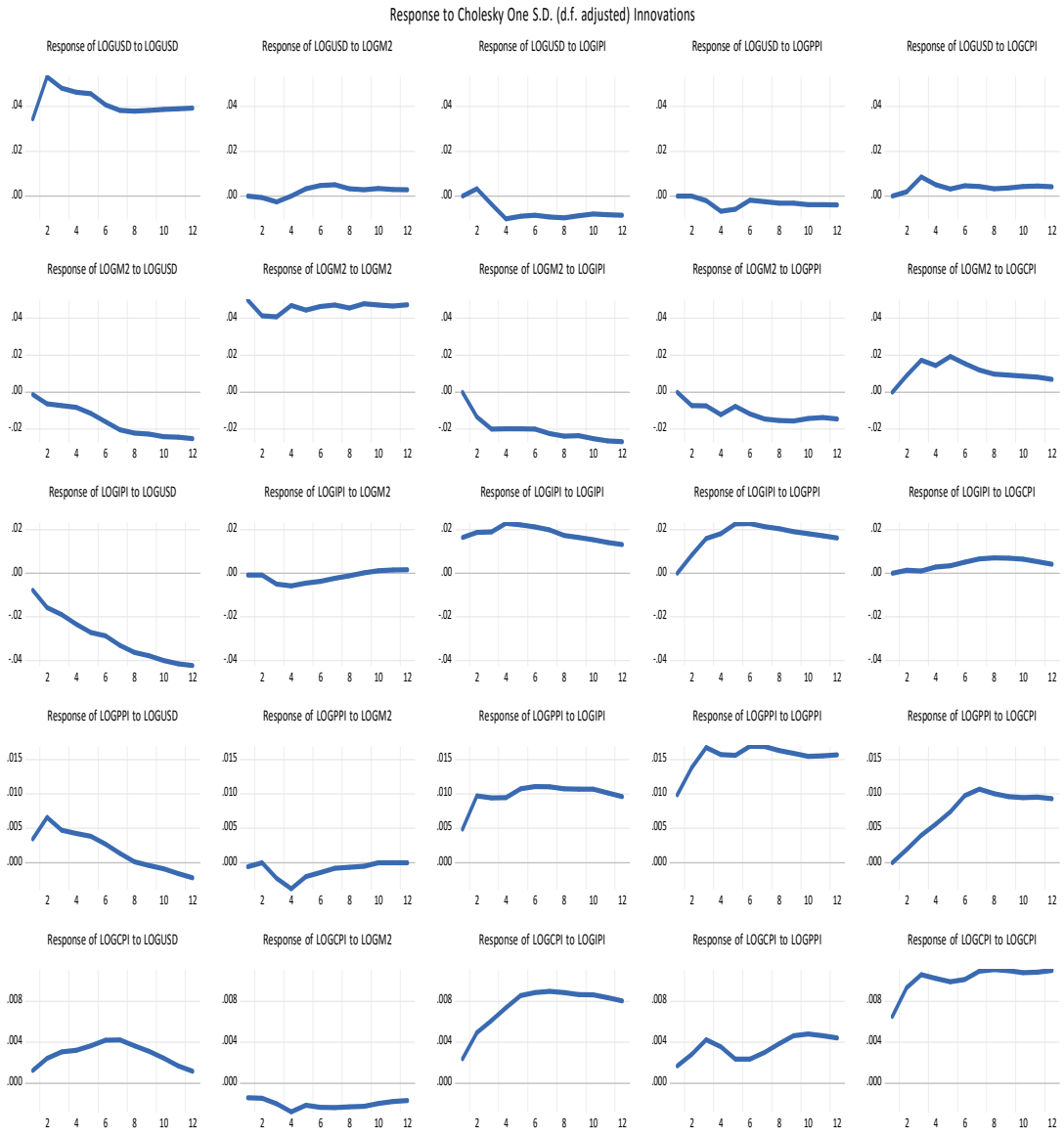

Figure 3.15 : *Impulse Response 1 (2002:01-2010:12)*

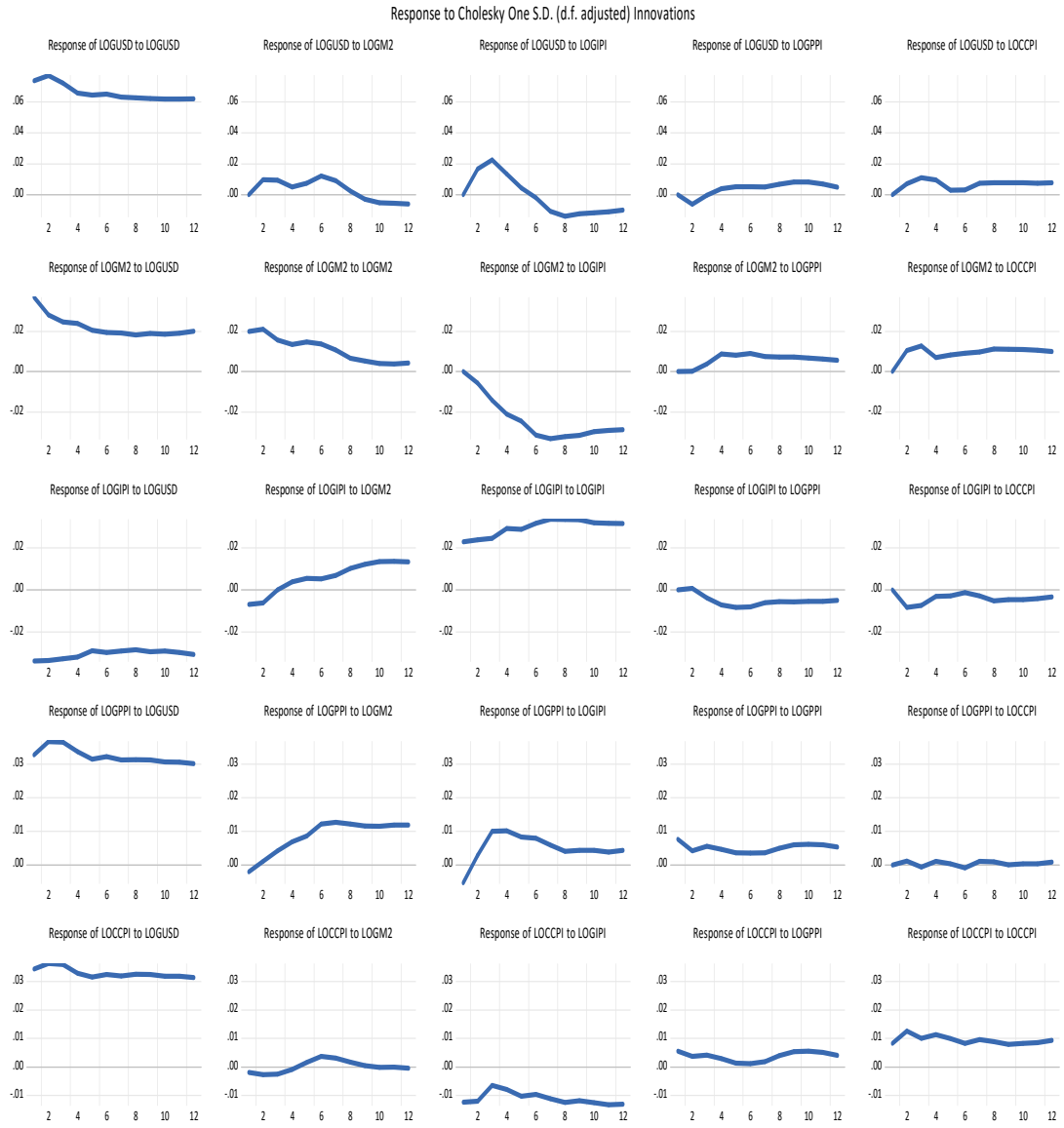

Figure 3.13 : *Impulse Response 1 (2011:01-2020:12)*

Conclusion

The changes in the domestic prices of imported goods caused by the change in the nominal exchange rate are called the exchange rate pass-through effect. In general, the exchange rate pass-through is how the change in exchange rates is reflected in the domestic prices of imported goods. The exchange rate pass-through effect occurs through different channels. The direct channel is the increase in the prices of imported goods. The depreciating national currency (appreciated foreign currency) increases the price of imported goods and thus contributes to the increase in price indices. The second channel is the cost or indirect channel. This channel is related to the imported input rate of production. If the imported input ratio of the production is high, the increase in the exchange rate increases the costs significantly. For example, if there is a dependency on imported energy and intermediate goods, such as in Turkey, costs increase in all industries due to the exchange rate increase. Firms increase their prices accordingly. The third channel is the expectations channel. An increase in the exchange rate causes inflation expectations to rise. Firms increase their prices due to high inflation expectations.

Studies to determine the exchange rate pass-through are essential for the central bank in inflation and exchange rate regime selection. It also shapes the future decisions and expectations of the economic decision units and affects the real economy. This study examines the inflation dynamics in the Turkish economy in the context of exchange rate pass-through, import price pass-through, and monetary policy regimes for the period 1994-2020. Within this framework, the research analyzes the period by dividing it into three sub-periods. In the first period of high inflation (1994:01-2001:12), a fixed exchange rate regime was applied. In the second period (2002:01-2020:12), when relative stability was achieved in exchange rates and inflation, a flexible exchange rate and inflation targeting regime were implemented. In the third period (2011:01-2020:12), inflation targets were also moved away when the exchange rate was in an upward trend. In this context, the exchange rate pass-through effect and the import price pass-through effect are analyzed for each sub-period using the Vector Error Correction Model (VECM). Forecast results point to different dynamics for each sub-period. In the first period, the exchange rate pass-through effect is stronger than the import price pass-through. Unlike the first period, the import price pass-through is ahead of the exchange rate pass-through in the second period. In the third period, the exchange rate pass-through

effect is very strong. The effect of the exchange rate on inflation has indirect effects on imported inputs and intermediate goods and directly affects imported consumption goods. In addition, it affects the price expectations and pricing behavior of economic agents through the indexing channel. This strong pass-through effect also weakens the effectiveness of the monetary policy. For this reason, it is vital to solve the structural problems first and implement an economic policy that will ensure stability in the exchange rate. The sudden and high rate increase in exchange rates due to capital flows is an important element of the increase in inflation rates. In the inflation targeting regime, knowing the duration and rate of the exchange rate pass-through effect is important for central banks. In this context, the effectiveness of short-term interest rates, which is the most important monetary policy tool used by the central bank, can be achieved. Thus, the most effective monetary policy to be applied against the change in the exchange rate can be determined. The high rate of the pass-through effect of exchange rates causes the central bank to respond to interest rates according to the exchange rate change while implementing monetary policy. Conversely, in cases where the pass-through effect of exchange rates is limited, the central bank's range of action in monetary policy expands.

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