MONETARY POLICY AND BANK LENDING CHANNEL

MS Dissertation

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Eskişehir, 2017

MONETARY POLICY AND BANK LENDING CHANNEL

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MS DISSERTATION

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April, 2017

This Thesis was supported under the Project number.....1601E018.....accepted by the BAP Commission

FINAL APPROVAL FOR THESIS

This thesis titled "**Monetary Policy and Bank Lending Chanel**" has been prepared and submitted by **Zafer ADALI** in partial fullfillment of the requirements in "**Anadolu University Directive on Graduate Education and Examination**" for the Master of Arts in **Department of Economics (English)** has been examined and approved on 12/05/2017

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ÖZET

PARA POLİTİKASI VE BANKA KREDİ KANALI

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Anadolu Üniversitesi Sosyal Bilimler Enstitüsü, Nisan, 2017

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Bu tezin temel amacı, banka kredilendirme kanalının var olup olmadığını değerlendirmektir. Bu bağlamda, 2002q1 ve 2016q4 arasındaki dönemler için üçer aylık veriler dikkate alınmıştır. Buna ek olarak, hedefe ulaşmak için VAR modeli kullanılmıştır. Etki tepki fonksiyonunun sonucuna göre, üretici fiyat endeksinin, reel döviz kurunun ve politika faiz oranının etkili belirleyiciler olduğu saptanmıştır. Buna ek olarak, bankaların bilançolarının toplam krediler üzerinde önemli ve olumlu etkisi vardır ancak sanayi üretim endeksi kısmen etkili olduğuna ulaşılmıştır. Bu sonuç dikkate alındığında, bu tezde kullanılan bankalar bilançolarının ve makroekonomik değişkenlerin banka toplam kredisinin ana belirleyicileri olduğu bulunmuştur.

Anahtar Sözcükler: Banka Kredi Kanalı, VAR, Banka Kredileri

ABSTRACT

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The main purpose of this thesis is to evaluate whether the bank lending channel exist or not. Within this context, quarterly data of for the periods between 2002q1 and 2016q4 was taken into the consideration. Additionally, VAR model was used to reach the objective. According to the result of impulse response function, it was reached that producer price index, real exchange rate and policy rate are effective determinants. Additionally, banks balance sheet has important and positive influence on total credits but industrial production index is regarded as partially effective. While considering this result, it was also found that both bank balance and macroeconomic variables used in this thesis is the main determinants of bank total credit.

KeyWords: Bank Lending Channel, VAR, Bank Credits

Acknowledgements

I am extremely grateful to my dear wife Nuray Altındağ Adalı and my family for their all sacrifices, supports, prays and encouragements.

There are definitely missing and wrong in the study. All of these flaws belong to my responsibility.

12./05/2017

Declaration of Conformity to Ethical Doctrines and Rules

I hereby declare that all information in this document has been obtained and presented in accordance with academic rules and ethical conduct. I also declare that I fully cited and referenced all material and results that are not original to this study. This study is controlled by plagiarisation programme that is used by Anadolu University and there is no plagiarisation in this study

In the case of any contrary situation to this declaration, i accept all ethical and judicial results.

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Zafer ADALI

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ABBREVIATIONS

LPPI: Producers Price Index

LREX: Real Exchange Rate

LRIP: Industrial Production Index

LRTCR: Total Credit

LRTD: Total Deposit

LRTSS: Total Security Stock

PR: Policy Rate

1. INTRODUCTION

The 1980s in Turkey is named as the liberalization attempts. After these liberalization attempts, both domestic economy and financial institutions have integrated into global economy at increasing frequent. As result, the performance of economy has confirmed to the international economy especially the outflow-inflow of capital. The times of substantial financial outflow has contagion impact on economy. Indeed, crisis which was experienced by Turkish economy after 1990 were based on reversals of financial flows. The last crisis influencing Turkish economy in 2008 generally resulted from the shock fluctuations the global economy which inflicted a deep wound the economy. The global financial crisis operated through three channels which are made of expectations channel, financial channel and trade channel. The features of the crisis were classified as a severe export fluctuation and sharply stop in financial flows. These two things worsened credit condition and the performance of economy. Thus, the Turkish economy experienced one of the worst economic down. On the other hand, the financial markets did not witness a collapse thanks to previous man structural changes in financial markets under the auspices of the IMF. Before the 2008 financial crisis, the Turkish economy witnessed its economic moderation thanks to the acceleration of privatization, higher foreign direct investment and the structural change in economy especially in banking sectors after the 2001 crisis but the honeymoon was wiped out by the global financial crisis. Investment, export and consumption expenditure sharply decreased after all the Turkish economic growth substantially devolved. The crisis originated in US and began advanced economy quickly spread all world economy and deteriorated GDP growth and raises in unemployment rate in Turkey; indeed, in 2009 The Turkish economy shrank by -4.8 percent. In the vein, annual unemployment rate rose to 14 percent in 2009 (Cömert and Çolak, 2014).

Turkish economy experienced many the series of recession and moderation. In parallel with liberation attempt, Turkish economy is more vulnerable to shocks comes from abroad. However, much deficiency in macroeconomic structural was major culprit for previous economic crisis. The culprits were easily made of populist and unsustainable fiscal and monetary policy, inconsistent exchange rate policy and narrow-minded social policies (Rodrik, 2012, p. 42). Until 2001, macroeconomic instability was

quite familiar for Turkish economy. 2001 crisis was considered as breaking point because the macroeconomic stabilization implemented was putted into force by Turkish policy makers at the IMF helm (OECD 2010). Amendment central bank was promulgated so the central bank has escaped from parliament's clutches. Budget deficit and public deficit as a percentage of GDP were substantially declined. Explicit inflation targeting framework was gradually introduced. Since 2006, short term interest rate has been considered as the primary of monetary policy and this policy has been conducted so properly that inflation rate reduced and chronic high inflation problem has been not on the agenda. This implementation brought interest rate down; hence, two important resilience improved economy (See, Figure 3: Inflation Rate, Figure 4: Interest Rate). Regarding to banking sectors, restricting and supervision was the most importing implementation thus banking sector was improved even 2008 global financial crisis had little severe effect on banking sector thanks to these implementation (See, Figure 5). Business activity boosted by globally-oriented large and medium sized firms were experienced because of decreasing risk premia and capital costs. However, tunable regenerating relation between The European Union and Turkey boosted investor confidence (Macovei, 2009).

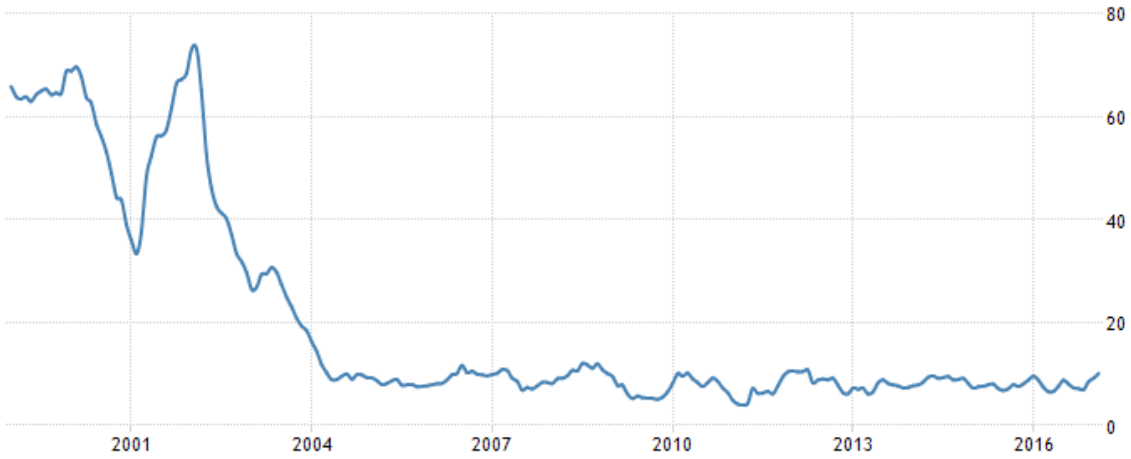


Figure 1: *Inflation Rate*

Sources:www.tradingeconomics.com ,Central Bank of The Republic of Turkey



Figure 2: *Interest rate*

Sources:www.tradingeconomics.com ,Central Bank of The Republic of Turkey

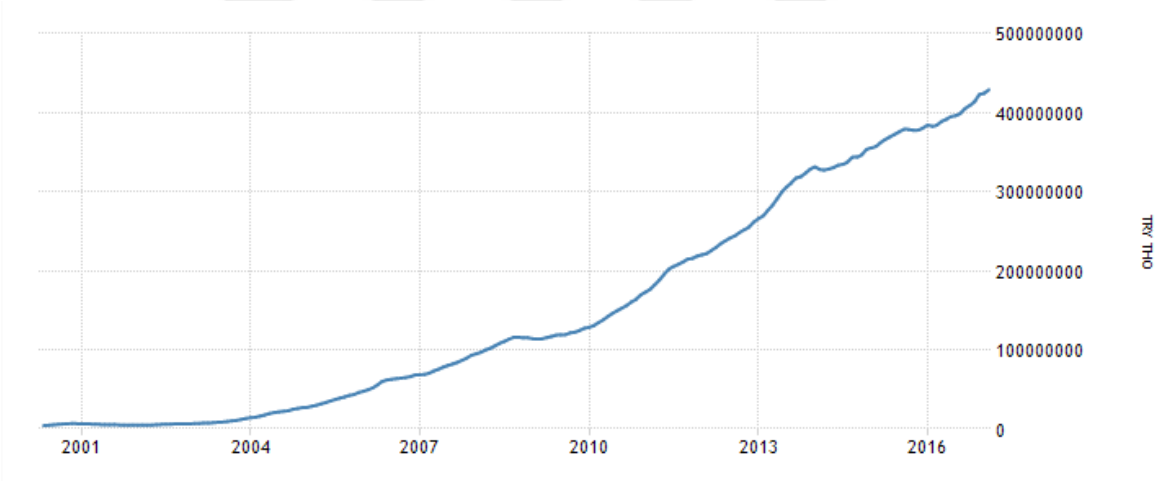


Figure 3: *Consumer Credit*

Sources:www.tradingeconomics.com, Central Bank of The Republic of Turkey

Turkish financial system did not collapse thanks to structural implementing change in banking and financial system. In 2001, 18 banks experienced a bankrupt but no bank bankrupted in the 2008 financial crisis even the financial system in Turkey efficiently recovered in contrast to 1994 and 2001 crisis. Furthermore, capital to asset ratio raised also the profitability in banking sector did not even decrease (Uygur, 2011).

The particularly good performance was observed with the aid of balance of payment and banking reforms. On the other hand, most of firms had have severe balance sheet problems on the grounds that their performance are desperately need of credit from abroad banks. Especially in Europe, many banks and financial system adversely affected financial system and their credit volume sharply decreased. The magnitude of global financial crisis is clearly evaluated through looking at net financial shocks. Beginning with the third quarter of 2008, net flow flows stopped by net flows of GDP 1.7 percent and this event evidently indicates that Turkish financial system experienced a turmoil and faced an extensive sharply stop global funds. (Cömert and Çolak, 2014, p.p. 13-14). In such a bad environment, the deadlock of the companies would encounter damage in the bank balance sheets. As result, the decline in the credits used by big firms would have contagition effects on the supply chain of these firms. In other words, the forms of domino impacts were experienced by all firms.

After brief explanation of the Turkish economy, it can be understood that the since the 2001 crisis when economic measures put into force, the Turkish economy have removed problems that have been notorious for a long time. Inflation and interest rates have fallen sharply with the strong economic transition program. In addition, the financial reforms that have been introduced have strengthened the banking sector, and these reforms have not led to bank failures in the 2008 crisis. The fact that the financial sector gets rid of this crisis is the reason why the economic reforms and Turkish financial structure are not based on securitization. Furthermore, the banking sector is obviously influenced by falling inflation and interest rates. Liquidity from abroad and robust financial environment are other factors affecting the banking sector. On the other hand, with 2008 crisis, Turkish economy is experienced as badly because of declining global trade, capital flow and increase in risk appetite. Beginnings with 2008 financial crisis, both real and financial economy were deteriorated and banking sector tightly moderated lending standart**.** Since banking sector is dominant financial intermediaries and mostly big firms and SME's are desperately need of bank loans. This study will reexamine the bank lending channel that has been on the agenda. Even if it is mentioned that the 2008 crisis have not caused bankruptcy and only affects the real sector in the literature, it is obviously clear that banking sectors has tightly moderated and the deteriorated impact of real economy on financial economy has been clearly discovered

because of this situation, this bank lending channel empirical study will be important for effective economic policies, even for contributing to literature.

The aim of this thesis is to evaluate the bank lending transmission in Turkey and improve knowledge in terms of period after 2001 crisis. Within this concept, transmission mechanism and 2008 global financial crisis will be mentioned. In this section, the evaluation of transmission mechanism will be tried to detailed in order to examine how monetary transmission mechanism impact on real economy. In the third part, previous on studies related to our point will be mentioned and data used in our model will be identified. Later, Vector Auto Regression (VAR), which is generally used in the study of transmission mechanism, will be examined and finally empirical result will be underlined in order to reach our objectives. In fourth chapter, we will be discussed possible result by virtue of VAR model and we will offer political suggestion in order to build strong financial system.

2. THE MONETARY TRANSMISSION MECHANISM

The monetary transmission mechanism is a mechanism which indicates an interaction between monetary policy and the real economy. It is hardly possible to understand or solve the mechanism which is operationally complex in terms of theory as well as practice. This is because the transmission mechanism is qualified with long, variable and uncertain time lags; in other words, it is an arduous task to foresee the precise impact of induced monetary policy on the economy and price levels. However, generally the transmission mechanism can be identified as per steps. First, the change in monetary policy specifies a process which affects financial conditions such as asset prices, exchange rates and interest rates. Second, changes in financial market conditions influence the level of output and price levels (Çiçek, 2005, p. 24). The clarification of the transmission mechanism is based on two main assumptions. Initially, monetary policy is the preserve of the central bank. Next, the strategy of the central bank is interest targeting. In the system, money supply is invoked to reach target interest: the monopoly right possessed by the central bank grants the central bank control of the overnight interest rate (Yıldırım, 2007, p. 5).

2.1. The Monetary Transmission Mechanism Theory

There are two approaches in classical monetary theory in order to examine the relationship between the quantity of money and price level. The first of these is named the direct mechanism developed by Cantillon and Hume while the other is the indirect mechanism which was founded by Thornton and developed further by Ricardo (Blaug, 2002). The benchmark of classical macroeconomic theory, long-run money neutrality is an important property of the classical model and the demand for money is predominantly settled by the motive to conduct transactions which have a positive link to the money value of aggregate expenditure. Since the economy is at the full level of employment, excess money balances lead households to purchase goods and services so, excess demand in goods markets pushes up the general price level of the initial increase in the money supply (Snowdon and Vane, 2005). In conventional theory, the substitution system is based on relationship between money and goods, but financial assets are ignored (Paya, 1999).

Thornton criticized the directed transmission mechanism because interest rates were ignored thus monetary theory would be worthless. He developed the indirect transmission mechanism through adding interest rates. In the economy, consisting of money and monetary and non-monetary assets, the interest rate in the credit market must equal the marginal return of capital in the goods market in order that the economy is kept in balance. Regarding the indirect model, banks play an important role because excess money is transferred through the banking sector and the supply of loan able funds increases which leads interest rates to decrease, lower than the return of capital. The volume of credit stimulates credit demand with increasing the investment price. When credit demand is higher than credit supply, the credit interest rate begins to increase again: the new equilibrium is higher than its predecessor (Blaug, 1983).

Academics and policy makers are interested in the effects of monetary policy considering transmission through the real economy. The effect of monetary policy on real economy is generally approached via Keynesian and monetarist frameworks and worldviews (Adanuraklan and Nargeleçekenler, 2008). Keynesian and monetarist views differ in terms of the processes of the mechanism. The monetarist view is based on the direct transmission mechanism as developed by Hume and Cantillon; however, Keynesian adherents to the indirect transmission mechanism draw attention to deficiencies in the direct transmission mechanism (Çakmaklı, 2005, p. 19).

The transmission mechanism is scarcely solvable since it is complex regarding both theory and application; hence why, this mechanism is called black box[1].However, understanding the black box is vital to understand and explain the structural of model in terms of evaluation and development.[2] Evaluating structural model evidence and reduced form evidence vis-a-vis Keynesian and monetarist transmission mechanism worldviews is valid here. Structural model evidence examines whether one variable impacts another by means of using data to build a model explaining the channels through which variables impacts the other; on the other hand, reduced-form evidence examines whether one variable has a impact on another basically by looking directly at the relationship between the two variables (Mishkin, 2007).

[1]Ben S. Bernanke, Mark Gertler, "Inside The Black Box: TheCredit Channel of MonetaryPolicyTransmission", **TheJournal of EconomicPerspectives**, Vol. 9, No. 4, Autumn 1995, ss. 27-48.
[2]Oliver Holtemöller, "Identifying a Credit Channel of Monetary Policy Transmission and Empirical Evidence for Germany", February 2002.

2.1.1. Structural evidence and the Keynesian view

In Keynesian theory, changes in monetary policy can affect real interest rates and the real economy, excepting the liquidity trap. With respect to the conventional monetary view, the transmission mechanism is based on the interest rate channel and bonds and money represent all assets. Indeed, the interest rate channel plays a role as equalizer when monetary policy is conducted by the central bank. The banks are restricted to Money creation. In the active side of banks' balance sheet and under the assumption of perfect substitution in the active side, a credit supply is not identified. In terms of the Keynesian view, the IS-LM model is used in order to explain the monetary transmission mechanism. The change in interest rate is directly tackled through the real economy (Özcan, 2010, p. 6).

The connection between nominal interest rates and real interest rates is provided through price and wage rigidity. The short term interest rate which reflects on the long term interest rate is explained by means of expectation theory. It is a vital point that monetary authorities can change the short term nominal interest though the long run interest rate can impact on firms and consumers expenditure (Sellon, 2002, p. 7).There are two types of rigidity here in order to examine lags of the monetary transmission mechanism. The first is nominal rigidity which is related to the relationship between the changes in wages and price. The second is expectation rigidity which is related to the link between the induced policy and expectation. In case of these rigidity concepts, the changes in monetary policy can affect real variables in the short run, and price levels in the long run. Nominal and expectation rigidity can be summarized as anticipated monetary policy can influence both nominal and real interest rates because of slow price regulation. Thus, changes in interest rated lead interest sensitive expenditure to increase (King, 2003, p.p. 74–75).

Keynesian theory developed "macroeconomic portfolios" which are used to explain monetary transmission mechanism processing. For example, an expansionary monetary policy which leads idle bank reserves to increase cause the security price to decrease; hence, falls in security returns. Moreover, since securities are converted into money by the non-bank public, they need high relative return assets and hence money or capital goods demand will increase. If money is used for purchasing capital goods, the price of capital goes up and producers will desire to produce more output; as a result,

increasing the money supply leads relative rates of return and the component of total wealth (Keyder, 2012).

To sum up, an expansionary monetary policy not only stimulates financial asset purchase but also reduces interest rates. By means of a decreasing interest rate and an increase in the price of financial assets, firms issue new bonds and funds acquired by issued bonds are used for purchasing capital goods. Increases in demand for investment goods causes the price of investment goods and the production of investment to rise and hence leads income and expenditure to increase; as a consequence, an increase in consumption expenditure pushes aggregate demand and output to increase.[3]

A structural model which gives a description of how the economy operates using a collection of equations is built according to the Keynesian view in order to explain the impact of money on economic activity. These equations provide a model which indicates the channels by which monetary policy impacts on aggregate output and spending. The model constitutes a transmission mechanism. For instance, an expansionary monetary policy impacts interest rates, which in turn influence investment spending and thus impact on aggregate output. According to the Keynesian view, the relationship between interest rate and output is examined through looking at empirical evidence. The structural model form has many advantages in order to examine an understanding of how the economy operates. Policy makers and economists can acquire more suitable evidence as to whether money has a substantial impact on economic activity since they can appraise each transmission mechanism individually to figure out whether it is reasonable. Assuming a change in monetary policy on the aggregate economy is reasonably well specified, the model gives us a prediction which is used for understanding the effect of M on Y. By means of knowing how the economy operates, policy makers perfectly understand the policy changes which can affect output. All above mentioned are important advantages but if the model form is mistakenly specified or missing some data or mechanism, structural results can lead to serious adverse economic affects (Mishkin, 2007).

[3]Paya, M. M. (2002). ***Para Teorisive Para Politikası***, 3. Ed.., FilizKitabevi, İstanbul, , p.p.. 84-91.

2.1.2. Reduced evidence and the monetarist view

Regarding the monetarist view, the identified mechanism is not classified in order to explain the connection between money supply and aggregate output. The monetarist view examines the impact of money on output by means of observing whether changes in output are tightly connected to changes in money supply. A black box described by the monetarist economists cannot be seen but it can show a correlation between money supply and output how to operate are difficult to identify for all the transmission mechanism of monetary policy (Mishkin, 2007).

With respect to reduced form evidence, there is an important advantage over structural model evidence; namely, there is no restriction for economists in order to understand and explain the effects of money on the economy. Since the particular channels influencing the money supply which affects output are believed to be and permanently changeable, monetarists approve of reduced-form evidence. However, the most of the criticism for reduced form evidence is that correlation across all disciplines, not just in economics does not signify causation; that is, a change in one variable being relevant to another does not equate that variable causing the other (Miskin, 2007).

2.1.3. Monetary transmission mechanism processes

The processes of the monetary transmission mechanism are dependent on macroeconomic structural, the structural of financial system, monetary credibility; financial deeping and effectiveness (İnan, 2001, p. 4). There are two paramount concepts in order to evaluate the speed of changes in monetary policy through the real economy. The first concept is that the central bank can directly affect the short term interest rate, exchange rate and asset price: this is determined by the structure of the financial system. The second concept is that there is a connection between the household and firm's expenditure and financial circumstances. In terms of this point, the financial situation of firms and banks play an important role (Kamin, 1998).

According to the European Central Bank (2000), there are three stages regarding the process of the monetary transmission mechanism (European Central Bank, 2000, p. 43):

1. Changes in monetary policy which reflect on interest rates, financial assets, exchange rates, liquidity and credit can influence financial markets in the first step thus impact on financial cost occur.
2. Changes in financial cost rebound on households and firms expenditure in the second stage.
3. Changes in expenditure affect price and output.

Monetary Transmission process, through monetary policy, is transmitted to changes in income and inflation (Taylor, 1995). According to Bernanke and Gertler (1995) the effects of monetary policy on the real economy may proceed for two years or more though changes in monetary policy can impact on the course of the real economy without question. Empirical studies have recently verified this process and temporal frame. As consequences, comprehension of the relationship between financial and real variables in the economy is essential because it provides policy makers with substantial information about transmission mechanisms in order to optimize choices (Aktaş, 2006, p. 4).

The rest of this section provides a brief overview of the most pertinent areas of literature to this investigation.

2.2. Traditional Interest Rate Channel

Starting with the interest rate channel to explain the monetary transmission mechanism is the traditional because this channel is the main mechanism in the standart Keynesian model appearing in macroeconomic textbooks mandated by universities and colleges around the world; it is also earliest monetary transmission mechanism. With respect to literature over the last 50 years, the interest rate channel has occupied researchers and policy makers. The interest rate mechanism is based on the Keynesian IS-LM model (Mishkin, 1995, p. 4). According to the interest rate approach, assets are classified as money and bonds; bonds represent all financial assets except money and there is perfect substitution among all assets (Neumann, 1995, p. 139).

Interest rate channels which are examined by the basic IS-LM model are based on four assumptions (Hubbard, 1995, p. 64):

1. The central bank is to control the monetary base

2. The central bank can influence real interest rates and what is more, nominal short run interest rates
3. Policy –exhorted changes in the real short run interest rate have an impact on the long run interest rate that co-determines households and businesses spending decisions.
4. Coherent changes in interest –sensitive spending in response to a monetary policy innovation link logically with output changes.

Considering the Keynesian approach, the traditional interest rate channel can be symbolized by the subsequent showing the influence of monetary tightening:

$$(M\downarrow)\rightarrow(i^r\uparrow)\rightarrow(I\downarrow)\rightarrow(Y\downarrow)$$

Where M↓ indicates monetary tightening causing an increase in the real interest rate ($i^r\uparrow$), as following an increasing real interest rate leads to higher cost of capital which causes a fall in investment spending (I↓), and this stimulates a decrease in aggregate demand and output (Y↓) (Mishkin, 1996, p. 2).

The central banks have three monetary policy means which at their disposal are the interest rate; monetary base and direct control (Bain and Howells, 2009, p. 172).

- The control of interest rates; Central banks can use these means in order to release liquidity squeeze in the monetary system by means of open market
- The control of monetary base: With the expectation of money supply or the expansion rate of money supply, it is the change of monetary base.
- Direct Control: in order to be effective for credit growth it can be explained as regulation toward the banking sector.

Despite the fact that Keynes originally laid emphasis on the interest rate channel as running through business decision about investment spending, later researchers acknowledged that consumer's decision about housing and consumer durable expenditures are regarded as investment decisions. Therefore, the traditional interest rate channel outlined in the schematic above is implemented in the same way for consumer spending where such spending comprises residential housing and consumer durable purchases (Mishkin, 2007).

The efficiency of interest rate channels depends on sticky prices, as a consequence of that increase in money supply which lowers the short run nominal interest rate as well as lowering the short run real interest rate. This claim is very effective even when the nominal interest rate converges toward zero during deflation. The mechanism may be characterized by the following schematic showing the effects of monetary expansion;

$$(M\uparrow)\rightarrow(P^{e}\uparrow)\rightarrow(\Pi^{e}\uparrow)\rightarrow(i^{r}\downarrow)\rightarrow(I\uparrow)\rightarrow(Y\uparrow)$$

With zero level of interest rate, an increase in money supply $(M\uparrow)$ can raise the expected price level $(P^{e}\uparrow)$ and thus expected inflation $(\Pi^{e}\uparrow)$,as a consequence lowering the real interest rate $(i^{r}\downarrow)$ even when the nominal interest rate is at zero and boosting spending through the interest rate channel (Mishkin, 1996, p. 2-3).

What is more, the Modigliani-Miller theorem (1958) is pertinent here in order to examine the feature of interest rate channel. According to their tenets, there are no credit frictions. As above, under the view of perfect substitution between bank loans and bonds, banks are significant only by virtue of creating money by issuing demand deposits. Banks play a minor role on the asset side of their balance sheet because monetary policy is transferred through change in bank liabilities. Regarding the Modigliani- Miller theory, the banking sector is not able to impact on affecting real economic activity because banks do not impact on the investment decisions of firms and the capital structure of the firm is most particularly off-topic; namely, the financial system is, in the simple terms, a veil in the two assets framework (Özşuca, 2012, p. 46).

Many researchers point out that there is quite strong empirical evidence for the interest rate channel which is believed to have an important impact on business and consumer investment spending (Romer and Romer, 1990; Ramey, 1993; Taylor, 1995). However, this view is rather controversial because other researchers such as Bernanke and Gertler (1995) shed light on some substantial inconsistencies considering the interest rate channel and empirical studies conducted by them show weak cost of capital influences on spending. Indeed, they indicate that there is poor correspondence in timing between interest rate inducements and dynamic of inventories and non-residential investment. After all, the failure of interest rates empirically has provided the impetus to searching for other transmission mechanisms (Mishkin, 1996, p. 4).

First and last, there are some critical view against traditional interest rate channels (Meltzer, 1995, p. 52; Brunner and Meltzer, 1988, p. 446; Bernanke, 1993, p. 55-56);

1. In the interest rate channels, as money and bond, there are two options; notwithstanding, credit process is ignored.
2. They state that interest rate maturity is problematic and only one interest rate is valid.
3. Bank sector plays a minor role in the monetary transmission mechanism.

2.3. The Other Asset Price Channel

The Keynesian views just focus on interest rates besides many assets prices in the their analysis used to examine the effect of monetary policy on the economy; however, the monetarist view maintains that other relative assets price and real wealth are affected by means of monetary policy (Mishkin, 2007). Asset prices deliberate different varied assets and changes in monetary policy influence domestic and foreign assets by current and expected price inducements (Meltzer, 1995, p. 51).

2.3.1. The exchange rate channel

The exchange rate is one of the most effective monetary policy variables through which monetary policy can influence various economic variables which are comprised of the value of domestic currency, domestic inflation, capital flow and financial stability etc. With respect to growing internationalization of economics around the world, flexible exchange rates have been taken into account by policy makers for many years in order to obtain economic benefit. Consequently, inducing changes with respect to exchange rates may stimulate changes in the relative prices of goods and services. The growing importance and influence of the exchange rate channel is testified, this in core textbooks in macroeconomics, money and banking (Mishkin, 1996, p. 5). Generally, this model is based on a flexible exchange system and the Mundel-Flemming model (Koca, 1997, p. 41-91); however, resulting from open economy. According to these models, monetary policy can affect domestic investment decisions alongside foreign investment decisions with aid of exchange rate.

There are two predominant mechanisms that run through exchange rate contexts (Mishkin, 2001, p. 7):

1. Exchange rate impacts on net exports
2. Exchange rate impacts on the balance sheet

2.3.1.1. Exchange rate impact on net export

Monetary transmission mechanisms vis-a-vis the exchange rate channel influence net exports(X-M) through the impact of interest rate on exchange rates. Exports are positive the function of the exchange rate:

$$X: \times_1 Y^f + \times_2 E \qquad (1)$$

This equation explains that exports are positive the function of both foreign income (Y^f, and $\times_1$ denotes elasticity of exports with respect to foreign income) and positively exchange rate (E, and $\times_2$ denotes elasticity of export with respect to the exchange rate)

$$M: m_0 + m_1 Y - m_2 E \quad (2)$$

Moving on this explains that imports are positive function of domestic income and a negative function of the exchange rate. (Blanchard et. al., 2013).

To schematically examine the monetary transmission mechanism running through the exchange rate, we have:

$$(M\uparrow)\rightarrow(i^r\downarrow)\rightarrow(E\uparrow)\rightarrow(NX\uparrow)\rightarrow(Y\uparrow)$$

Assuming that increase in the money supply by monetary authorities' leads to fall in real interest rates, if domestic real interest rates fall against foreign real interest rates, domestic currency becomes less attractive relative to foreign currency. Ergo, the value of foreign currency rise and domestic currency is subject to depreciation. Hence, rising exchange rates make domestic goods cheaper than foreign goods leading to an increase in NX in the above equation and in aggregate output (Mishkin, 2001, p. 7).

The monetary transmission mechanism of exchange rates has been studied by researcher such as Bryant, Hooper and Mann (1993) and Taylor (1999). They state that this mechanism plays an essential role in how monetary policy impacts the domestic economy according to contemporary evidence (Mishkin, 1996, p. 5). Beyond this, according to Peersma and Smets (2001), it is important that these mechanisms are not able to run if a country exhibits exchange rates, the more open an economy is, the superior this channel; however, this mechanism is more important in emerging economies rather than developed country contexts.

2.3.1.2. Exchange rate effects on the balance sheet

By contrast with exchange rate effects on net exports, monetary expansion generally has an adverse effect on the economy if a considerable amount of domestic debt is constituted by foreign currency which is by far the most common possibility in emerging economies (Mishkin, 2001, p. 7).

Indeed, inducing changes in the exchange rate leads to increases in the price of goods which are either consumption goods imported or inputs used for production and hence the cost of production and the consumer price index may increase because of the expansionary monetary policy (Smets and Wouters, 1999, p.p. 489-490)

$$(M\uparrow)\rightarrow(E\uparrow)\rightarrow(NW\downarrow)\rightarrow(L\downarrow)\rightarrow(I\downarrow)\rightarrow(Y\downarrow)$$

Assumed that debt contracts currency connected to foreign currency, expansionary monetary policy (M↑) that causes to decrease the value of domestic currency (E↑) is concluded in the debt burden of domestic nonfinancial firms to rise. A resulting decrease in net worth (NW↓) for why assets are frequently connected in domestic currency and here with do not rise in value. This deterioration in balance sheet lead to increasing moral hazard and adverse selection and therefore shrinking in lending (L↓) is observed and hence economic activity is hampered (Y↓) (Mishkin, 2001, p.8).

2.4. Equity Price Channels

2.4.1. Tobin's q theory

The change in interest rates induced by monetary policy is able to influence the quantity of assets such as stocks, bonds and estates (Dovciak, 1999, p. 33). As such, we initially examine Tobin's q- theory (see Tobin, 1969). Tobin's q theory constitutes a fundamental mechanism which explain a relationship between fluctuation in stock prices and the economy. To expand, Tobin's q is defined as the market value of firms divided by the replacement cost of capital (Mishkin, 1996, p.6). In other words, q - theory is a mechanism which impacts on the value of assets via monetary policy and the Q index indicates both market value form in the stock market and the replacement cost of capital. (Tobin, 1969). Assuming that q is suitably high, the market price of firms is more than the replacement cost of capital and hence this situation leads companies to issue stock which give a high price compared to the cost of the facilities and equipment they are buying. As a consequence, only a small issue of stock provides firms an opportunity to increase their investment spending (Mishkin, 2001, p. 1). On the other hand, companies are willing to buy another firm cheaply and acquire old capital instead when q is low because the market value of firms is low compared to the cost of capital(Mishkin, 2007, p.60).

Blanchard provides a mechanism which is based on the standard IS-LM model and the price of assets is superseded besides interest rate. Considering this model, Blanchard posits that anticipated policy in the short or long term causes the stock market to change due to expected profit and the change in real interest rates. With these change the induced monetary policy changes the rate of expenditure and output in the course of time. Indeed, this model is different from anticipated and unanticipated monetary policy (Blanchard, 1981, p.p. 132-143).

Monetarist views militate against a link between Tobin's q and investment. In the monetarist view, some economic agents try to reduce their money and others can raise their equities demand which increases their price when the money supply increase in which economic agents can avail of more money than required. With respect to the Keynesian view, the same scenario is observed because the bond market is less attractive than the equity market, therefore leading the price of equities to increase when

monetary expansion policy is invoked. This mechanism can be characterized by the following in terms of monetary expansion:

$$(M\uparrow)\rightarrow(P^{e}\uparrow)\rightarrow(q\uparrow)\rightarrow(I\uparrow)\rightarrow(Y\uparrow)$$

Provided that increases in the money supply by monetary authorities leads to raising the stock price, if increases in the stock price leads the market value of firms to increase in the stock market, q increases and thus higher investment causes higher output (Mishkin, 1995, p.7).

As similar mechanism can be operated when the cost of capital is replacement to q by recognizing that firms finance investment through bonds as well as common stock:

$$(M\uparrow)\rightarrow(P^{e}\uparrow)\rightarrow(c\downarrow)\rightarrow(I\uparrow)\rightarrow(Y\uparrow)$$

Each share issued generates more funds so that firms finance their investment cheaply when the stock price increases. As a result, an increase in the stock price provides firms with increased investment . In other words , expansionary monetary policy that raises stock prices ($P^{e}\uparrow$) shrinks the cost of capital ($c\downarrow$) and hence lead investment output to increase $(I\uparrow)\rightarrow(Y\uparrow)$ (Mishkin ,2001, p. 2).

2.4.2. Wealth effect

First of all, the wealth effect channel is considered as an automatic stabilizers, because these mechanisms operate by changed consumption expenditure through the change in money stock when economic agents encounter inflationary or deflationary pressures (Ludvigson and Lettau, 2002, p. 117). The components of wealth are contentious in the economic literature but capital stock and monetary base are the best known elements regarding wealth; therefore, the value of wealth can be affected by the fluctuation of money; also, these events are called the Pigou effect (Özdemir, 2012, p. 90). A number of studies have been conducted by many researchers such as Modigliani (1963), Lange (1942) and Patinkin (1956). Lange pointed out the classical dichotomy is null and void; additionally, Patinkin tried to link the between real and nominal sectors.

Generally speaking, the transmission mechanism of wealth channel based on the MPS model Modigliani (1971). This alternative mechanism by way of equity prices operates through wealth impacts on consumption (Mishkin, 1995, p.6). According to Modigliani's life-cycle model, the life time resources of consumer designating consumption spending is comprised of human capital and real capital as well as financial wealth, which is mostly common stock (Mishkin ,1996, p.7).

Assume that contractionary monetary policy decreases stock prices, decreases the value of household wealth, and as a result, shrinking the lifetime resources of consumers, which thus impedes consumption: this mechanism operates as follows:

$$(M\downarrow)\rightarrow(P^{e}\downarrow)\rightarrow(W\downarrow)\rightarrow(C\downarrow)\rightarrow(Y\downarrow)$$

This mechanism is somewhat contradictory because extant researches suggest that this mechanism is quite strong in the United States, but the size of the wealth effect is uncertain[4].

2.4.3. Real estate prices

Real estate is the most important asset for households and is quite different from illiquid assets. Each durable good impacts on both the function durables consumer goods and nondurable goods. The consumption expenditure is affected by the price of house apart from house[5].According to Meltzer's in this respect contribution, actualized conducted monetary policy have a significant effect on land and property values. For instance, Meltzer observed the Japanese experience in the 1980s and 1990s then Tobin's q theory which is used through land and house price support for this land and house channel (Mishkin, 1995, p.7).

Life-cycle income is controversial because this theory posits that all wealth, regardless of type has the same effect on consumption expenditure. Arguably, the respondes of consumption expenditure differs according to asset types. For example,

[4]SeeLettau,LudvigsonandSteindel(2001).
[5]S. Sgherri, "Monetary Transmission Channels, Monetary RegimesandConsumptionBehaviour",**De Nederlandsche Bank EconomicResearchand Special StudiesDepartment**, ResearchMemorandum WO & E, No: 602, December 1999, ss. 5-6.

changes in the value of houses especially compared to stocks have either large or small impacts on consumption.[6]

Real estate prices can influence the economy in three principal ways (Mishkin, 2001, p. 5):

1. Direct impact on housing expenditure
2. Household wealth
3. Bank balance

2.4.4. Direct impact on housing expenditure

Contractionary monetary policy (M↓) lowering interest rates, increase the cost of financing housing and hence decreases their price(P ↓).Regarding the lower price of housing compared to its construction cost, building homes is believed to cost-minimizing from the point of view of construction firms and therefore housing expenditure will go up and so output will raise (Mishkin, 2001, p. 5).

$$(M\downarrow)\rightarrow(P\ \downarrow)\rightarrow(H\downarrow)\rightarrow(Y\downarrow)$$

In other words, contractionary monetary policy leads house and land prices to increase and so aggregate demand rises through Tobin's q theory and the financial assets channel. [7]

2.4.5. Household wealth effects

Housing is assumed to be an important component of household wealth influencing consumption spending. For example, contractionary monetary policy (M↓) decreasing housing price (P ↓) ,however increases household wealth (W↓), which decreases consumption spending (C↓) and output (Y↓) (Mishkin,2001, p. 6):

$$(M\downarrow)\rightarrow(P\ \downarrow)\rightarrow(W\downarrow)\rightarrow(C\ \downarrow)\rightarrow(Y\downarrow)$$

[6]Mishkin (2007: 10), Altissimo vd, (2005: 8 - 9).
[7]MISHKIN, **TheEconomicsOf Money, Bankingand Financial Markets,** p.p.. 653-654.

2.4.6. Bank balance sheets

Regarding the monetarist view, the banks play a major role in the financial market because they have special tools which solve asymmetric information. Besides, the banks have substantial amount of real estate lending power. Provided contractionary monetary policy which leads the price of real estate to fall is conducted by monetary authorities their bank capitals shrink because of decreasing bank's loans. Lower capital, pressures banks to take on less lending then investment and output will decrease. The bank balance sheet mechanism can be characterized as follows (Mishkin, 2001, p.6):

$$(M\downarrow)\rightarrow(P^{fi}\downarrow)\rightarrow(NW\downarrow)\rightarrow(L\downarrow)\rightarrow(I\downarrow)\rightarrow(Y\downarrow)$$

2.5. Credit Channels

Since conventional monetary policy theory based on the interest rate channel, which explains the effect of monetary policy on long term expenditure, is both quite controversial and unsustaining, credit view made of asymmetric information is used through two channels (Cambazoğlu and Karaalp, 2012):

1. Bank Lending Channel
2. Balance-Sheet Channels

2.5.1. Bank lending channel

Since banks are suited to militate against asymmetric information in credit markets, banks are very important especially for small firm which are dependent on banks loans. Under the assumption of no perfect substitutability of retail bank deposits with other funds, the bank lending channel of monetary transmission runs, schematically as follow (Mishkin, 1995, p.7):

$$(M\uparrow)\rightarrow(\text{ bank deposits }\uparrow)\rightarrow(\text{ banks loans}\uparrow)\rightarrow(I\uparrow)\rightarrow(Y\uparrow)$$

Expansionary monetary policy increasing bank reserves and bank deposits raises the quantity of bank loans available and so this increase in loans will lead investment or

probable consumer increase spending because banks possess a special role as lenders to classes of bank borrowers (Mishkin, 1996).

2.5.2. Balance-sheet channels

Balance sheet channels stem from asymmetric information which results in adverse selection and moral hazard in credit markets. The net worth of firm's results from adverse selection and moral hazard. Since firms have lower net worth, lenders have less collateral for their loans: as a consequence, firms face difficulties in borrowing because of increased adverse selection, concomitantly, the lower net worth of firms leads those firms to engage in risky projects due to a lower equity stake in their firms. It is possible that lenders are not able to pay back because of riskier projects, thus leading to a reduction in lending and in investment spending .This mechanism can be illustrated via the following monetary expansion schematic (Mishkin, 1996):

$$(M\uparrow)\rightarrow(P^{e}\uparrow)\rightarrow(\text{adverse selection and moral hazard}\downarrow)\rightarrow(L\uparrow)\rightarrow(I\uparrow)\rightarrow(Y\uparrow)$$

Expansionary monetary policy which enhances equity price along with raising the net worth of firms and thus leads to higher investment and aggregate demand because the increased lending activity results from lower adverse selection and moral hazard.

Regarding balance-sheet channels, monetary policy can impact in several ways:

1. Cash flow channel
2. Unanticipated Price Level Channel
3. Household Balance-Sheet Effects

2.5.3. Cash flow channel

With respect to the cash flow channel, the nominal interest rate is rather important than real interest and the effect of interest rates differs from the foregoing because interest payments in the short-run depend on nominal interest rate rather than the long run real interest rate. Short term interest rates have a substantive effect on firm cash flow (Mishkin, 1996).

The monetary tightening can indirectly decrease net cash flow and security deposit. For instance, when monetary tightening is applied in policy contexts, a company producing the amount of goods for consumer linked to low income quartiles encounter a decreasing in company profit because this policy leads consumer expenditure to decrease as well as unadjusted fixed and variable cost in the short run: this increasing financial deficit wipes out the net worth and credibility of firms over time (Bernanke and Gertler, 1995).

This mechanism can be delineated as follows (Mishkin, 1995, p.11):

(M↑)→(i ↓)→(cash flow↑)→ (adverse selection and moral hazard↓)→(L↑)→(I↑)→(Y↑)

The expansionary monetary policy which leads nominal interest to decrease has a positive effect on firms' balance sheets through increasing firm cash flow because firms have confidence about solvency laws and they are able to demand more credit. Thus, the discussion of adverse selection and moral hazard substantially decreases and so credit volume and economic activity are pushed up (Mishkin, 2007).

2.5.4. Unanticipated price level channel

According to Mishkin (2007), the unanticipated price level channel is effectively operated in industrialized economies because debt payment is determined at fixed ration regarding to the change of anticipated price level. Ergo, unanticipated increases in price levels cause real debt value of debt to fall because of debt payments fixed in nominal terms; however, the real value of assets remain stable (Kuşakçıoğlu, 2010, p.16).

Monetary tightening that causes an anticipated decrease in price level (P↓) thus decreases real net worth, which increases adverse selection and moral hazard, therefore making investment and aggregate output increase. This mechanism is illustrated thus (Mishkin, 1996):

(M↓)→(unanticipated P↓)→ (adverse selection and moral hazard↑)→(L↓)→(I↓)→(Y↓)

It is also noted that according to Irving Fisher (1933), unanticipated fluctuations in price levels is the key feature in order to explain debt deflation in the Great Depression. In other words, this channel has substantial impact on aggregate demand.[8]

2.5.5. Household balance-sheet effects

The credit channel can operate evenly through consumer spending, especially on consumer durables and housing though the literature is mostly interested in spending by firms. For example, increasing in bank lending because of monetary expansion leads consumers who do not possess sources of credit without banks to raise durable and housing purchases; however, identically decreases in interest rate cause appreciation in household balance-sheets due to the fact that cash flow is positively affected (Mishkin, 1996, p.13).With respect to household balance-sheet effects, there are two important concepts which are used to understand and explore the operation of this channel. The first is the liquidity effect which operates through influence on consumers' willingness to spend rather than lenders' willing to lend (Mishkin, 2007). Consumer durables and housing are considered as very illiquid assets because substantial asymmetric information exists about their quality. With respect to lemons problem constituted by Akerloff (1970)[9], provided that consumers need to sell either their consumer durables or housing to increase money owing to an adverse income shock, they most probably observe a substantive loss because they are not able to obtain the full value of these assets. Consequently, consumers would hold more liquid financial assets when consumers forecast a higher probability of finding themselves in financial distress. Second is the likelihood of suffering financial stress which is higher when consumers have a small amount of financial assets compared to their debts. In this situation, consumers will not desire to purchase consumer durables or housing. Taking into consideration both liquidity and financial distress in the monetary tightening scenario, this mechanism can be characterized in the schematic below (Mishkin, 1996):

$$(M\downarrow)\rightarrow(P^{e}\downarrow)\rightarrow(\text{financial assets}\uparrow)\rightarrow(\text{likelihood of financial distress}\uparrow)\rightarrow(\text{consumer durables and housing expenditure}\downarrow)\rightarrow(Y\downarrow)$$

[8]See Irving Fisher (1933).
[9]See Akerloff (1970).

In this model, a contractionary monetary policy which decreases the value of equity prices leads the value of financial assets to shrink, thus since consumers fall into an insecure situation, they will expect financial distress which causes them to hold liquid assets. In times of financial distress, consumers will invest in liquid assets because illiquid assets will be sold with large losses and so durables and housing expenditure fall and thus aggregate output declines. This effect is considered to have important explanatory value for understanding the Great Depression (Kuşakçıoğlu, 2010, p.15).

2.6. The Expectation Channel

Expectations have been implicated in economic models for the last 50 years by means of the adaptive expectation model in which economic agents generate expectations by invoking priors (Yılmaz, 2012, p.5). The expectation channel operates as economic agents forecast changes in the economic system in future times (İnan, 2001, p. 4).

The first studies concerning the expectations channel were conducted by Kydland and Prescott (1977) and Barro- Gordon (1983).These studies emphasized that this channel is a very important means for policy makers in order to smoothly instigate and maintain economic policies, confirming expectations based assumptions and reasoning. Expectation can be selected as target variables and play a major role in the monetary transmission mechanism. In addition, the responsiveness and transparency of alternative monetary policy plays a significant role so as to catch the target of economic policy because when uncertainty and inconsistent anticipation are observed in the economy, asymmetric information become apparent and moral hazard and adverse selection which lead to shrinkages in financial markets and credit volume become more distinct.

With respect to theory, there are three major approaches relevant here. The first concern is stable expectation which is based on expectations used by economic agents by means of invoking previous information. For example, later inflation rates can be expected via knowledge of prior inflation rates. The second approach is adaptive expectation; here, economic agents use all past information in order to forecast the next economic case; nevertheless, ongoing data are ignored. For instance, provided that governments pursue monetary policy interventions which aim to stimulate the economy

during times of recession, economic agents constitute view which based on just these interventions and rule out other economic policies such as taxation policy. Thus, in the later time the expectation based on the previous monetary policy can be invalid when government use fiscal policy or taxes policy and hence economic agents are not able to observe the economy or make requisite decision about. Rational expectations, which constitute the third approach, assume that economic agents possess all information about the economic situation and unanticipated policies or decisions based on the past experience encountered by economic agents (Eğilmez and Kumcu, 2010, p.p. 293-298).

Besides the monetary transmission mechanism, the expectations channel plays a major role for central banks in order to obtain and maintain price stability. The central bank with high credibility gives confidence to the economy about price stability; to earn this credibility the central bank needs to give valid information, transparent information about inflation and policy interventions. Within this context, the long term interest rates link to the market expectation which relevant to the short term interest rate.

Regarding the expectation channel, the mechanism may be characterized by the following schematic showing the influence of monetary expansion;

$$(M\uparrow)\rightarrow(i^{r}\downarrow)\rightarrow(\ (P^{e}\ \uparrow)\rightarrow(\text{financial assets}\uparrow(\rightarrow\ (\text{confidence in financial system}\uparrow)\rightarrow$$
$$(I\uparrow)\rightarrow(Y\uparrow)$$

Expansionary monetary policy leads to a decrease in interest rates and causes stock price hikes as following an increase in the stock price leads to higher financial assets and confidence in the financial system; this is conducive to investment spending as well as output (Özdemir, 2015, p.86).

2.7. The Risk-Taking Channel

2.7.1. The road to 2007-2008 financial crises

The “Internet-dotcom” issue is very important regarding pre-financial crisis conditions. Dotcom stocks dramatically increased because unprecedented innovations were observed with respect to information and internet technologies. The dotcom bubble continued until March 2000 and economic recession was observed. The Federal

Reserve was afraid of deflation and permanent unemployment like Japan experienced as a result the unusual expansionary monetary policies conducted by Fed (Kliman,2011;28). However, the terrorist attack on World Traded Center and the subsequent Iraq war stimulated further expansionary monetary interventions: the Bush administration covered bad management with excess liquidity. Hence the system was awash with easy money; market interest rates were circa up to one percent. Government used this policy because construction and real estate was believed to be prime in order to ameliorate economic recession. Due to this expansionary monetary policy, leading to low interest rates, people exhibited greater propensities to buy property. Low permanent interest rates stimulated increases in mortgage demand and, with expectations of future increases in real estate price, resulted in a mortgage bubble. As a consequence, Greenspan and Bernanke fostered unsustainable economic growth and the mortgage bubble grew like a snow slide. The mortgage crisis must be examined holistically on the grounds that both the United States and economies worldwide generated adverse affected impacts; we cannot crudely simplify and couch the origin of these substantial problems solely within the United States. The mortgage system is a kindle of long term credit equipped with financial technique. The mortgage crisis gradually evolved to become a global financial crisis which resulted in economic stagnation around the world. Important in this respect is research by Taylor (2009) who posited that the mortgage crisis stemmed from risk-taking and deterioration in adjustable rate mortgage loans. The prolonged low interest rate which stimulated extreme risk-taking has empirical support. The mortgage market became the biggest market in the world and reached 12 trillion dollars; it is the major factor which resulted in the financial crisis. In the beginning, mortgage loans were given to highly secure consumers who exhibit high loan repayment likelihoods; their credit history was considerable positive. These credit agreements are denoted as prime mortgages. However, gradually less secure people started to increasingly be able to obtain mortgages. Some of these people were even classified as Ninja (No income, No job or Asset). Such credit agreements are denoted as sub-prime mortgages. Under normal conditions, such agreements would have been precluded; high commission and high speculation made sub-prime mortgages acquirable. Sub-prime mortgages are based on adjustable interest rates because prolonged interest rates both increase the value of real estate and decrease default risk. Many considered such mortgages as investment and

increases in real estate prices stimulated non-optimal increases in consumer expenditure. However, with gradual increases in interest rate, the sub-prime mortgage system collapsed because of the decrease in real estate prices and the increase in default risk (Egilmez, 2011, p. 66). The default interest and foreclosure interest rate have adverse links with real estate inflation. These interest rates decreased acutely because of the increase in real estate prices, throwing the mortgage system off track and surprising many people. For example, most of the people lend houses on security for using mortgage loan when people observed the increase in real estate prices and believed these increments progressing every year at the twenty percent. As a result, most of the people tended to engage in many speculation motives for profit gain. The same speculation was used by shadow banking, insurance agents and investment banks. The mortgages owed in total reached a trillion dollars and led many people to consume beyond their economic situation (Roubini and Mihn, 2012, p. 26). Credit rating agencies played a major role in the financial crisis because they were not able to rank security risks owing to deficiencies in transparency, competition and moral hazard. Taking into consideration credit rating agencies, conflict of interest is by far the most important issue in order to explain and understand their causative role in the financial crisis. Credit rating agencies which assign a score to regarding banks and other financial institutions were financed by banks and other financial institutions. Under these circumstances, the ability of credit rating agencies to make objective decisions is, at best, questionable. However, these agencies are not able to easily determine financial problem associated with firms; there is some moral hazard problems because these agencies have little information on financial assets other than respect to banks or financial institutions. Innovation in financial goods and complicated derivative financial instruments may shadow risk because credit agents just rank default risk. Liquidity risk should have been graded but credit rating agencies have little information on derivative financial goods and securitization (Narin and Ozer, 2010).

Security funds based on mortgage loans is a convertible system and able to convert illiquid mortgage loans into liquid; hence, the risk could by distributed and dissipated all around actors in the system and increase profits. The most important feature of the mortgage system is securitization. Securitization is a type of process taking an illiquid asset (mortgage loan) and by virtue of financial engineering,

converting them in to a security. The most well-known securities are mortgage-backed securities (MBS). Generally, all individual mortgages are bundled together into a mortgage pool which is named an MBS. The MBS could be issued by a third party financial company. This process provides an amount of liquidity and transfers risks to investors and obtains credit based on profit from the MBS (Ozsoylu et al, 2010, p. 46). The main problem is that risk changed hands many times due to derivative products such as forward, swap and opsiyon. Default risk transfer third part and economic agents transferring risk take on more risk and hence derivative products snowball. In the beginning, derivative products operated as insurance goods but in time these products evolved like risk factors (Egilmez, 2011, p. 68). To sum up, increasing interest rate in 2006 operated like a spark; all the word was challenged by the global financial crisis.

We must examine the causes and effects of the financial crisis in order to understand the risk taking channel and its dynamics.

The discussion of how monetary policy impacts on bank' risk-taking is the recent controversial and favorite topic among economists who have tried to form fundamental theory for both the understanding of the recent financial crisis and the risk-taking channel. The risk-taking channel is the brand-new monetary transmission mechanism. Briefly stated, regarding the risk-taking channel, accommodative monetary policy has an effect on risk perceptions or attitudes of banks. To put it another way, too low interest rate persuade banks to undertake more risk in their portfolio. Since the conventional transmission mechanisms have no inherent answers in this respect, researchers have to contribute a new argument considering the risk-taking channel.

2.7.2. The risk-taking channel and financial crisis

The international financial market could have a devastating impact on the real global economy; even the most developed financial systems could not respond effectively to the crisis which near collapsed the financial system. Major credit expansion and the burst of a series asset bubbles in the property market is considered as the major culprit. The turmoil in the financial markets gave rise to a controversial discussion vis-a-vis the reasons for the crisis; a degree of consensus was reached among

policy makers and researchers as to some likely determinants of the financial crisis. For instance, poor governance practices, bank competition, the deficit in either regulatory or supervisory domains are the main considerations which help policy makers to solve the puzzle. Furthermore, monetary policy which is too accommodating is also a polemical factor which stimulated debate. The last argument is new determinant because easy monetary conditions which lower interest rates may promote excessive expansion of credit and thus boost business fluctuations regarding classical components of financial crises (Gambacorta, 2009, p.43). This argument indicates that unusually prolonged low levels of short term interest rates and lax liquidity provoke financial institutions to undertake more risk (Taylor, 2009; Adrian and Shin, 2009; Borio and Zhu,2008). This view strongly supports the notion that monetary policy which lowers interest rates is the main force resulting in the recent financial crisis.

During the pre-crisis period, maintaining price stability was considered as the best tool to maintain economic stability and most of the economy disregarded financial stability because development in credit transfer techniques associate with financial innovations were often considered to bolster financial stability (Duffie, 2008; Altunbaş et al., 2010). Furthermore, monetary policy may have impacts on financial stability because the existing monetary policy had consequences in terms of causing macro imbalances the global crisis. This argument is based on recent empirical experiences; many central banks in a number of developed countries presided over misguided monetary policy, which leading to low interest rate (Taylor, 2009).

In what follows, a brief overview of the risk taking channel in the literature is offered.

2.7.3. The risk-taking channel

There are some well-known researchers who have indicated features of the theory of the risk-taking channel such as; Keeley (1990), Rajan (2006), Matsuyama (2007) and Allen and Gale (2000), Borio and Zhu (2008) make public that there is potentially a relationship between looser monetary conditions (persistently low interest rates) and increased bank level risk-taking. Bario and Zhu (2008) try to examine how changes in monetary policy impact on the risk tolerance of banks (Ozsuca, 2012, p.7). According to the the risk-taking channel say that below the levels of monetary may conduce toward

financial by way of decrease in risk aversion of banks and other investors. Indeed, if we look back at history we attest that easy monetary conditions have been viewed as a classical element of the boom-bust type of business fluctuations (Fisher, 1933). The literature shows an adverse relationship the policy rate and risk; nevertheless, monetary easing promotes risk taking (Gambacorta, 2009, p. 43).

The financial crisis of 2007-09 pushed many researchers to revive the question of whether economic agents are willing to take on more risk when interest rate remains low for a prolonged time period. An increased willingness for risk that makes economic agents look for higher investment returns has been called the risk-taking channel of monetary policy (Paligorava and Sierra, 2012, p.23).

The risk-taking channel could run in many different ways. First, is through raised search for yield; that is, with low prolonged nominal interest rates raising incentives for bank to take on more risks (Rajan, 2005). By and large, bank or asset managers encounter a decreasing margin between the lending and deposit rates when persistent low interest rates can be observed; hence increasing their incentives to alter to riskier assets with higher expected yields. This mechanism overwhelmingly operates through the relationship between the low levels of short-term interest rates and sticky target rate of returns. There are a great variety of reasons which stimulate economic agents to take on more risks because of prolonged low interest rates: contractual, behavioral or institutional reasons can be named. Behavioral or psychological reasons include the money illusion which economic agents may pay regardless of whether nominal interest rates fall to compensate for lower inflation. Apart from behavioral or psychological reasons, institutional or regulatory constraints are also important factors especially in order to understand the behavior of life insurance or pension funds. Both of these generally operate their assets in relation to their liabilities. Either a minimum guaranteed nominal rate of return or returns reflecting long term actuarial assumptions effect on liabilities by contrast with the current level of yield. For instance, in Switzerland statute is the main determinant to minimum returns; contrast this with, some scenarios in Japan and the United Kingdom in the recent past. In other words, their nominal liabilities linked to long-term fixed rates, results in lower assets if they do not shift to riskier assets with higher yields. For example, investing highly-rated government bonds which are defined as safe assets is not able to generate the necessary

returns in a low interest rate environment. Therefore, when these institutions encounter a period of falling interest rates, they probably fudge the yields available on highly rated government bonds and they invest in either higher yielding or higher-risk instruments because of the resulting gap. Mostly private investors attach importance to short term returns in order to judge manager competence; thus, when they see poor performance, they withdraw funds. The compensation for managers is also an important factor because lower yields on safe assets results in lower compensation for managers that invest in lower yields on safe assets. In order to get high compensation, managers are willing to invest in more risky assets (Shleifer and Vishny, 1997; Brunnermeier and Nagel, 2004).

Low interest rates which impact on valuations, income and cash flow are considered the second way. According to Bernanke et. al. (1996), a low interest rate is regarded as a financial accelerator because an increase in collateral values fail borrowing constraint; on the other hand, Adrian and Shin (2009) argue that the risk taking channel varies from and strengthens the financial accelerator since it is interest in amplification by the reason of financing frictions in the lending sector[10]. A decrease in the policy rate may modify bank estimates of probabilities of default, loss-given-default and volatilities because an accommodative monetary policy leads asset and collateral values to increase. A low interest rate which sharply increases sharply stock prices, decreases corporate leverage and thus reduces the risk of holding stock due to the fact that a higher stock price boosts the value of equity relative to the corporate rate. The leverage effect is considered as the relationship between asset price and asset price volatility.[11]There is widespread use of value-at-risk methodologies for economic and regulatory capital purposes in which Danielsson et al (2004) is used as an example for this event. Volatility releases risk budgets of financial firms which stimulates banks to encourage position-taking. Adrian and Shin (2009) claim similarly that modified measured risk determines an adjustment in bank balance and leverage conditions enlarges the business cycle.

Central banks' communication policies and the attitude of policymakers' are also significant in order to examine and understand the risk-taking channel. For instance, market uncertainty can be reduced by virtue of central banks with credibility

[10] See also Borio and Zhu (2012).
[11]See eg Pagan and Schwert (1990)

and plausible predictability considering future policies which leads banks to undertake more risks. When expansionary monetary policy is conducted by the central banks in context of adverse economic event, this policy can reduce the probability of large downside risks; as a result, generating an insurance effect. By reason of this issue, Diamond and Rajan (2009) claim that monetary policy should be kept tighter than strictly necessary according to prevailing current economic conditions so as to reduce banks' willingness to undertake liquidity risk (Gambocarta 2009: 45).

Habit formation can be regarded as at factor of risk taking through the impact of monetary policy. According to Campell and Cochrane (1999), an expansionary monetary policy which lowers the monetary policy rate can boost real economic activity by means of increasing consumption compared to normal levels and hence may cause a decrease in the degree of investors risk aversion. Long term persistent interest rate which leads asset prices to increase and foresee higher credit spreads produces a similar mechanism (Longstaff and Schwartz, 1995; Dufresne et al. 2001; Altunbaş et al., 2010). Furthermore, economic agents feel confident because the future can be optimistic with respect to a prolonged period of low interest rate which reduces risk Yellen(2011) claims that economic agent's possessing assets with greater credit risk exposure may not appraise compensation for probable losses in such an environment. A similar habit formation argument can be postulated with respect to the institution1al memory hypothesis described by Berger and Udell (2003). Banks disregard the credit standards and loan problems linked to consumer with bad loan histories since banks may take on more risk in the good economic conditions in consequence of the deterioration in the capacity of bank loan officers to recognize, formalize and internalize potential loan issues (Özsuca, 2012, p.10.9).

3. EMPRICAL ANALYSIS

3.1. Empirical Evidence for the Bank Lending Channel

The bank lending channel is so popular subject in the literature that it attracted the attention of many different researchers. Some of these studies were detailed on Table 1.

Table 1: *Literature Review*

Author	Scope	Method	Result
Aklan and Nargeleçekenler (2008)	Turkey	GMM	It was defined that banks lending is valid in spite of its deficiency.
Örnek (2009)	Turkey	VAR	Bank lending channel is found as a significant.
İnan (2001)	Turkey	Descriptive Statistic Analysis	Bank lending channel is discovered as a result of results.
Erdoğan and Beşballı (2009)	Turkey	VAR	They indicated that the credit channel partially exists.
Peker and Cambazoğlu (2011)	Turkey	VAR	It was identified that bank lending channel is strong and valid.
Altunbas et. al. (2002)	EU Countries	GMM	The bank lending is dominant for banks associated with low capitalization.
Angeloni et. al. (2003)	7 EU Countries	VAR	They found a controversial results that bank lending channel does not exist.
Hernando and Martinez (2001)	Spain	GMM	It was emphasized that the bank lending channel is not proven
Farinha and Marguez (2001)	Portugese	Regression	It was underlined that bank lending is found as significant.
Brissimis et. al. (2001)	Greece	Regression	It was found that the bank lending channel is valid
Haan (2001)	Netherland	GMM	The bank lending channel is sensitive to monetary policy.
Alfaro (2003)	Chile	VAR	It was defined that the bank lending channel is strength.
Vundi and	Kenya	ARDL	Real GDP, money supply and interest

Olweny (2016)			rates spur bank credit whereas inflation rate and exchange rate have negative impact on bank credit.
Chakanyuka and Serumaga-Zake (2016)	South Africa	The ANOVA	It was found that economic growth, money supply and collateral value have direct and positive influence on bank credit.
Chang et. al. (2016)	Emerging Markets	Calibration Analysis	It was underlined that bank credits benefit from low interest rates.
Boadi et. al. (2016)	Ghana	GMM System	High inflation has deteriorated effect on bank credit whereas GDP growth stimulates bank credit.
Imran and Nishat (2013)	Pakistan	ARDL	Inflation is not importance factor for bank credit but economic growth and exchange rate have substantial effect on bank credit.
Sharma and Gounder (2012)	Six Pacific Island Countries	Regression	Inflation hampers credit growth while economic growth has stronger effect on credit growth.
Elekdag and Han (2015)	Asian Countries	SVAR	It was identified that monetary policy plays is priority determinants of credit growth.
Constant and Ngomsi (2012)	Central African	Regression	It was concluded that bank credit growth depends on GDP growth.
Awdeh (2016)	Lebanon	Regression	Bank credit is positively dependent on GDP growth, inflation, and money supply but public borrowing and lending interest rate hamper bank credit.
Stepanyan and Guo (2011)	38 Countries	Regression	Economic growth is beneficial factor but high inflation is detrimental factor.
Aydin (2008)	CEE Countries	Regression	Interest rate margin and economic growth are considered as main drive force of bank credit.
Cottarelli et. al. (2005)	CEE and Balkan Countries	Regression	Bank credit is positively associated with GDP per capita but negatively public debt.
Célérier et. al. (2016)	Germany, Italy and Belgium	Regression	Tax reform on credit is driven force factor of bank credit.
Vithessonthi (2016)	Japan	Regression	The supply bank credit is sensitive to NPL.
Moussa and Chedia (2016)	Tunisia	Regression	ROA, liquidity, net interest margin and inflation has important influence on bank loans.
Nalin and Tasdelen (2016)	Turkey	Regression	It was defined that consumer credit interest rate have deteriorated impact on bank credit.
Tunç (2012)	Turkey	Survey	Lending standard play important role in the decision of credit supply.
Seyhan et. al. (2012)	Turkey	VAR	Interest rate has detrimental effect on bank credit.
Hofmann (2004)	Industrialized Countries	VAR	Result is revealed that Property price has persistent and important effect bank credit.

Aisen and Franken (2010)	80 Countries	Cross country analysis	Lower GDP has detracted effect on bank credit.
Ewert et. al. (2000)	Germany	Descriptive Statistic	It was emphasized that rating act is regarded as a priority factor in the supply of bank credit.
Francis and Osborne (2009)	UK	GMM	Bank lending is dependent on bank regulation policy.
Cornett et. al. (2011)	US	Regression	Liquidity crisis leads to hinder bank credit.
Shahbaz et. al. (2010)	Pakistan	Regression	The domestic and foreign funding, economic growth and monetary policy spur bank credit while higher inflation lessens bank credit.
Taiwo and Adesola (2013)	Nigeria	Regression	They reached a conclusion that exchange rate and loan policy are priority to the decision of bank credit supply.
Kashyap and Stein (2000)	US	Regression	The influence on monetary policy on lending is more important for banks with less liquid balance sheet.
Blaes (2011)	Germany	Survey	Bank's capital, market financing conditions and the bank's liquidity position are priority determinant of bank lending.

3.2. Data

So as to analyze the bank lending channel, quarterly data for period between 2002q1 and 2016q4 were taken into consideration. All of the data; except for policy rates taken from IMF, was obtained from EVDS.

In this study, since bank balance sheet must be taken into consideration, total credits, total security stocks and total bank deposits were used. Within real factor, industrial production index and producer price index are used. Policy rate is important because it is leading interest indicators. However, real effective rate is also significant variables because financial crisis had hampered effect on capital flow and liquidty from abroad was impaired. All of these factors must be taken into consideration in order to analyze the performance of bank lending channel (Erdoğan and Beşballı, 2009; Seyhan et. al., 2012; Peker and Cambazoğlu, 2017). While considering theory, we use total credit as explained variable. VAR model is popular analysis method in order to investigate whether bank lending channel exists or not because of this situation VAR model will be used. Before operating VAR model, some applications are required (See,

Table 2). As a result, we try to identify how an unexpected change coming from one variable over time impact total credit.

Table 2: *Data*

Varibles	**Process**	**Abbreviation**
Total Credit (Dependent Variable)	Reel+Log	LRTCR
Industrial Production Index	Reel+Log+Seasonal adjustment	LRIP
Total Deposit	Reel+Log	LRTD
Producers Price Index	Log	LPPI
Real Exchange Rate	Log	LREX
Policy Rate	-	PR
Total Security Stock	Reel+Log	LRTSS

3.3. The Vector Autoregressive Model (VAR)

Economic relations are so complicated and sophisticated. As a result of this situation, simultaneous equations system is more useful and preferable than single equation model. Since macroeconomic variables in the economic system have feedback each other, defining variables as internal or external is operationally difficult. Some team restrictions are required to eliminate this determination problem. Sims (1980) has not supported these restrictions and all variables are not distinguished as internal or external in terms of Sims methodology. According to Sims, all variables are to be equally treated. The Vector Autoregressive model developed by Sims is used to destroy these problems and properly examine relation between variables. The VAR is defined as a multidimensional linear model in which each variable is identified in terms of its own value. Within the monetary policy analysis, VAR model is regarding as superiority over other models. Determine which of the variables are internal or external is not mandatory. Although the VAR model is simplest method, this model provides better results on contrary to more complicated simultaneous model (Tari, 2008).

A simple VAR model with respect to two variables, Yt and Xt (Katı, 2014):

$$Y_t = \beta_{10} + \beta_{11}Y_{t-1} + \cdots + \beta_{1k}Y_{t-k} + \alpha_{11}X_{t-1} + \cdots + \alpha_{1k}X_{t-k} + \quad u_{1t}$$

$$X_t = \beta_{20} + \beta_{21}X_{t-1} + \cdots + \beta_{2k}X_{t-k} + \alpha_{21}X_{t-1} + \cdots + \alpha_{2k}X_{t-k} + \quad u_{2t}$$

Equations mentioned above, β and α represent as unknown coefficient; however, u1t and u2t are error terms.

Besides, the VAR model is generally symbolized in addition to two dimensional;

$$y_t = c + A_1 y_{t-1} + A_2 y_{t-2} + \cdots + A_p y_{t-p} + u_t$$

All in all, considering the number of delays p of the VAR, VAR (p) is stated. All variables is identified as intrinsic and VAR model has some deficiency because the direct interpretation of the parameters is not significant. Impulse- response function and variance decomposition are analyzed in order to interpret parameters (Tari, 2008).

3.3.1. Augmented dickey fuller test

The stationary test is irreplaceable required to process VAR model because whether the variables are stationary influences on consistency of analyzes. In order to process an efficient and consistent analysis, the variables used in the model must be stationary. When stationary is emphasized, average, variance and covariance in the time series are not changeable with time (Cengiz, 2007). Mainly, the impact of economic shocks on variables and trend or seasonality is important cause to create non-stationary among variables. The Augmented Dickey Fuller-ADF (Dickey and Fuller, 1981) is one of the most commonly applied tests to identify if series are stationary. The equation of ADF test is symbolized as follows (Çoban et. al., 2016):

$$\Delta Y_t = \infty_0 + \infty_1 Y_{t-1} + \sum_{i=1}^{k} \beta_i \Delta Y_{t-1} + \varepsilon_t$$

$$\Delta Y_t = \infty_0 + \infty_1 trend + \infty_2 Y_{t-1} + \sum_{i=1}^{k} \beta_i \Delta Y_{t-1} + \varepsilon_t$$

With respect to the equation above, the Y states that the variable is stationary ΔTest: the first difference operator and Ɛ: the error terms.

H_o : γ=0

H_1: γ<0

When H_o : γ=0is rejected, it means that Y is stationary. Rejection of H_o hypothesis means that the Y is stationary; additionally, alternative hypothesis expresses that the series have not unit root. With concept of non-stationary, Taking first difference is remedy when non-stationary variables are converted into stationary. Furthermore, process for taking differences has deteriorated impact on variables; in other words, loss information is observed. Within this concept, the co-integration method is one option to prevented data loss. In the co-integration test, the existence of co-integration between variables in the long term can be identified. In terms of stationary process, possible long run relation between variables is not defined. Due to stationary with first differences, co-integration between variables can be examined.

3.3.2. Impulse response function

After obtained the VAR model, evaluating the relationships between variables in the model is indispensable but the clearly interpretation of the coefficient is strenuous. For this reason, Impulse response function is advised. Generally, impulse response functions are one of the most significant methods processed to describe the dynamic interaction and symmetric relation (Pindyck and Rubinfeld, 1991).

3.3.3. Variance decomposition

With considering interpretation of variables, the VAR model is not sufficient model. Owing to this situation, some methods must be used to remove these obstacles. Variance decomposition is one of the methods in which the dynamic structure of the system and the change in some intrinsic variables shocking on all intrinsic is individually evaluated. With the help of variance decomposition, how an unexpected change coming from one variable over time impact other variable is easily interpreted (Lütkepohl and Saikkonen, 1997).

3.4. Empirical Results

With respect to VAR model, the first stage of analysis is Augmented Dickey Fuller Unit Root Test. When accepting H_o : γ=0, variable is non-stationary in other words variable has unit root. On the other hand, H_1: γ<0 is represented as stationary series. Above mentioned in the ADF methodology, there are three options in order to investigate whether variable is stationary or not. In this study, all of them are scrutinized and t-statistic and p value is detailed. Moreover, since series have trend, we use constant and linear version within ADF test; however, other versions are detailed in appendix. After performed ADF test, the results of these tests were given on table.

Considering all version of ADF Test,H_o is rejected; that is, first difference must be used to convert variable into stationary. Thus, this situation explains that all variables are stationary on their first differences values.

Table3 :*Augmented Dickey Fuller Unit Root*

Augmented Dickey Fuller Unit Root (Constant, Linear Trend)				
Variables	**Level**		**First Differences**	
	t statistic	**p value**	**t statistic**	**p value**
LRIP	-3.495919	0.0497	-3.408225	0.0607

LRTCR	-0.500586	0.9808	-5.606790	0.0001
LRTD	-2.708107	0.2373	-6.928099	0.0000
LRTSS	-2.385594	0.3822	-4.575133	0.0031
LPPI	-4.975390	0.0008	-6.493339	0.0000
LREX	-2.642128	0.2640	-6.558726	0.0000
PR	-2.386290	0.3826	-5.461242	0.0002

The second stage of VAR Model is lag selection. In this situation, optimal lag is to be selected as minimum value which ensures all diagnostic tests. Lag 2 is regarded as optimal lag since diagnostic test values (See, appendix) are desirable and hence our model is trustworthy and applicable.

Table 4: *Optimal Lag Criteria*

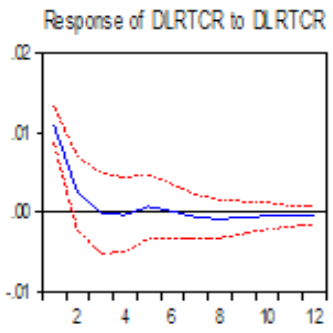
Optimal Lag Criteria

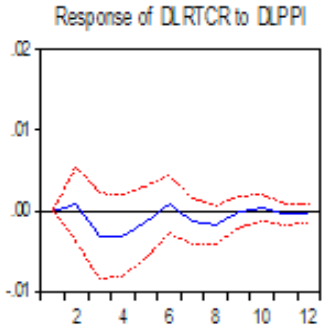
Lag	LogL	LR	FPE	AIC	SC	HQ
0	705.6791	NA	7.71e-23	-31.05240	-30.77137*	-30.94764
1	777.4160	117.9674	2.88e-23	-32.06293	-29.81464	-31.22479*
2	835.0008	76.77970*	2.31e-23*	-32.44448	-28.22893	-30.87297
3	891.4047	57.65731	2.61e-23	-32.77354	-26.59074	-30.46865
4	961.5729	49.89743	2.94e-23	-33.71435*	-25.56430	-30.67609

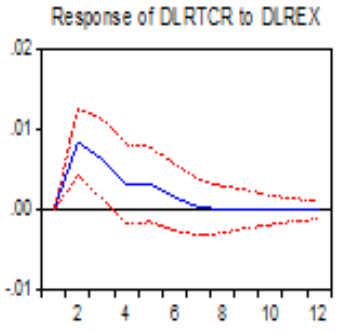
Impact-response analysis which is improved to interpret the response of the variables to the shocks to the system of equations must be applied due to fact that the coefficients obtained from the estimation as a results of the VAR, model is not easy to interpret. Within this scope, there actions of other variables can be easily interpreted in

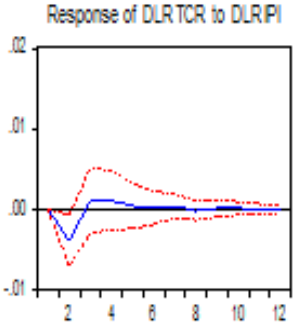
the face of future shock policies (Lütkepohl ve Saikkonen, 1997). Cholesky method is used in our analysis and Variance Decomposition of DLRTC (See appendix) is applied in order to check results of impulse response function. After operated impulse response function, the results of these tests were given on Figure 4.

With thanks to impulse response function, the shock come from other variables on total credit can be observed. Shock comes from production price index on total credit is shown on graph. It can be understood that PPI is highly effective factor and the increase in PPI reduces total credit. Furthermore, real effective exchange creates upward positive impact on total credit. Reaction from industrial production index on total credit is effective in very short period. Graph indicated that positive shock from IPI on total credit negatively impact but partially. It can be observed that policy rates (PR) is obviously effective on total credit. It means that increase in policy rate leads credit to shrink. Moreover, it can be understood that total security (TSS) and total deposits (TD) is positively correlated to total credit. It is obviously proven that when banks obtain liquidity, liquidity and assets is used as credit.









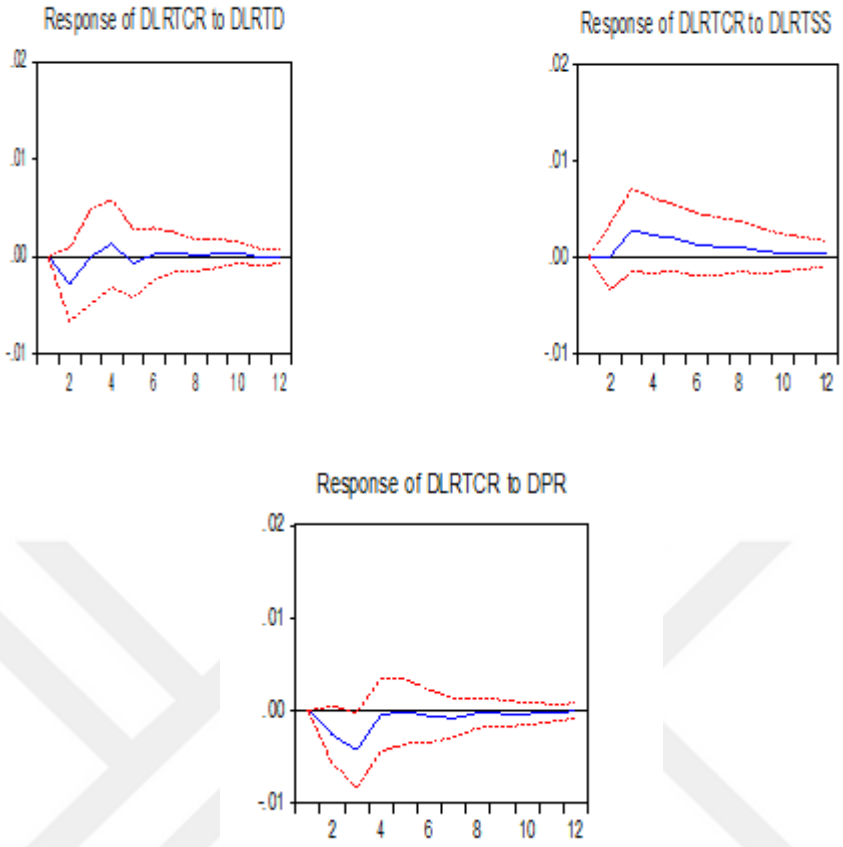


Figure 4 :*Impulse Response Function*

4. CONCLUSION

The 1980s in Turkey is named as the liberalization attempts. After these liberalization attempts, both domestic economy and financial institutions have integrated into global economy at increasing frequent. As result, the performance of economy has confirmed to the international economy especially the outflow-inflow of capital. The times of substantial financial outflow has contagion impact on economy. Indeed, crisis which was experienced by Turkish economy after 1990 were based on reversals of financial flows. The last crisis influencing Turkish economy in 2008 generally resulted from the shock fluctuations the global economy which inflicted a deep wound the economy. The global financial crisis operated through three channels which are made of expectations channel, financial channel and trade channel. The features of the crisis were classified as a severe export fluctuation and sharply stop in financial flows. These two things worsened credit condition and the performance of economy. Thus, the Turkish economy experienced one of the worst economic down. On the other hand, the financial markets did not witness a collapse thanks to previous man structural changes in financial markets under the auspices of the IMF. Before the 2008 financial crisis, the Turkish economy witnessed its economic moderation thanks to the acceleration of privatization, higher foreign direct investment and the structural change in economy especially in banking sectors after the 2001 crisis but the honeymoon was wiped out by the global financial crisis. Investment, export and consumption expenditure sharply decreased after all the Turkish economic growth substantially devolved. The crisis originated in US and began advanced economy quickly spread all world economy and deteriorated GDP growth and raises in unemployment rate in Turkey; indeed, in 2009 The Turkish economy shrank by -4.8 percent. In the vein, annual unemployment rate rose to 14 percent in 2009 (Cömert and Çolak, 2014).

Since the 2001 crisis when economic measures put into force, the Turkish economy have removed problems that have been notorious for a long time. Inflation and interest rates have fallen sharply with the strong economic transition program. In addition, the financial reforms that have been introduced have strengthened the banking sector, and these reforms have not led to bank failures in the 2008 crisis. The fact that the financial sector gets rid of this crisis is the reason why the economic reforms and Turkish financial structure are not based on securitization. Furthermore, the banking

sector is obviously influenced by falling inflation and interest rates. Liquidity from abroad and robust financial environment are other factors affecting the banking sector. On the other hand, with 2008 crisis, Turkish economy is experienced as badly because of declining global trade, capital flow and increase in risk appetite. Beginnings with 2008 financial crisis, both real and financial economy were deteriorated and banking sector tightly moderated lending standart**.** Since banking sector is dominant financial intermediaries and mostly big firms and SME's are desperately need of bank loans. This study will reexamine the bank lending channel that has been on the agenda. Even if it is mentioned that the 2008 crisis have not caused bankruptcy and only affects the real sector in the literature, it is obviously clear that banking sectors has tightly moderated and the deteriorated impact of real economy on financial economy has been clearly discovered because of this situation, this bank lending channel empirical study will be important for effective economic policies, even for contributing to literature.

So as to analyze the bank lending channel, quarterly data for period between 2002q1 and 2016q4 were taken into consideration. All of the data; except for policy rates taken from IMF, was obtained from EVDS.

In this study, since bank balance sheet must be taken into consideration, total credits, total security stocks and total bank deposits were used. Within real factor, industrial production index and producer price index are used. Policy rate is important because it is leading interest indicators. However, real effective rate is also significant variables because financial crisis had hampered effect on capital flow and liquidty from abroad was impaired. All of these factors must be taken into consideration in order to analyze the performance of bank lending channel (Erdoğan and Beşballı, 2009; Seyhan et. al., 2012; Peker and Cambazoğlu, 2007). While considering theory, we use total credit as explained variable. VAR model is popular analysis method in order to investigate whether bank lending channel exists or not because of this situation VAR model will be used.

With thanks to impulse response function, the shock come from other variables on total credit can be observed. Shock comes from production price index on total credit is shown on graph. It can be understood that PPI is highly effective factor and the increase in PPI reduces total credit. Furthermore, real effective exchange creates upward positive impact on total credit. Reaction form industrial production index on total credit

is effective in very short period. Graph indicated that positive shock from IPI on total credit negatively impact but partially. It can be observed that policy rates (PR) is obviously effective on total credit. It means that increase in policy rate leads credit to shrink. Moreover, it can be understood that total security (TSS) and total deposits (TD) is positively correlated to total credit. It is obviously proven that when banks obtain liquidity, liquidity and assets is used as credit.

All in all, it was reached that producer price index, real exchange rate and policy rate are effective determinants. Additionally, banks balance sheet has important and positive influence on total credits but industrial production index is regarded as partially effective. While considering this result, it was also found that both bank balance and macroeconomic variables used in this thesis is the main determinants of bank total credit.

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APPENDIX

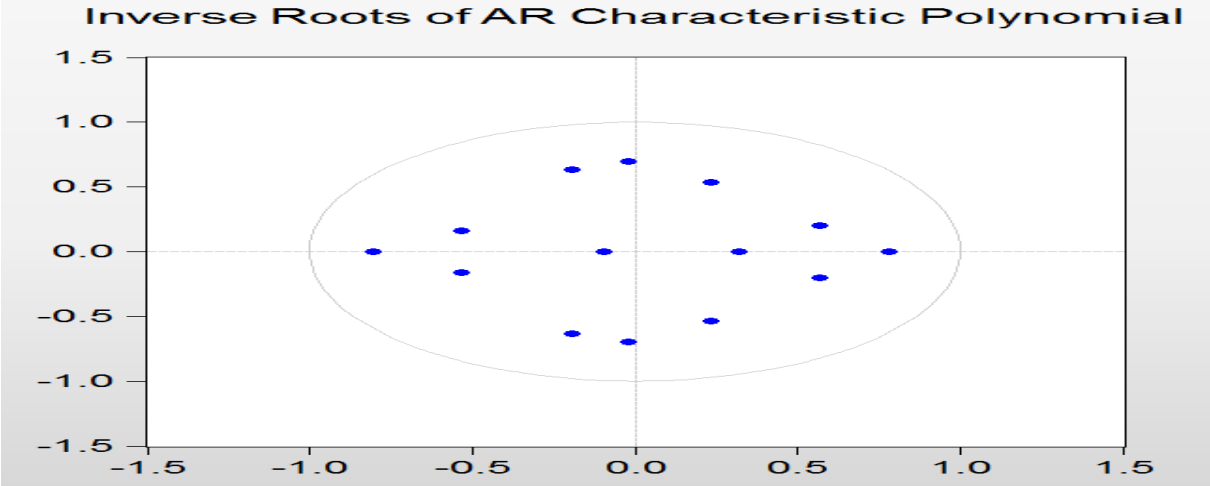
Appendix 1: *Augmented Dickey Fuller Unit Root (Constant)*

Augmented Dickey Fuller Unit Root (Constant)				
Variables	**Level**		**First Differences**	
	t statistic	**p value**	**t statistic**	**p value**
LRIP	-0.368803	0.9069	-3.408681	0.0148
LRTCR	-1.510164	0.5214	-5.263980	0.0000
LRTD	-0.273000	0.9221	-6.977940	0.0000
LRTSS	-2.378938	0.1528	-4.518047	0.0006
: LPPI	-2.279920	0.1818	-6.197653	0.0000
: LREX	-2.613025	0.0961	-8.824618	0.0000
PR	-3.169143	0.0270	-5.002923	0.0001

Appendix 2: *Augmented Dickey Fuller Unit Root(None)*

Augmented Dickey Fuller Unit Root (None)				
Variables	**Level**		**First Differences**	
	t statistic	**p value**	**t statistic**	**p value**
LRIP	0.995337	0.9137	-3.206585	0.0018
LRTCR	3.431801	0.9998	-2.066526	0.0382
LRTD	4.679666	1.0000	-5.566768	0.0000
LRTSS	-0.033309	0.6669	-4.564889	0.0000
LPPI	4.097112	1.0000	-2.871312	0.0048
LREX	-0.303976	0.5720	-8.904092	0.0000
PR	-3.175011	0.0020	-4.815094	0.0000

Appendix 3: *Inverse Roots of AR Characteristic Polnomial*



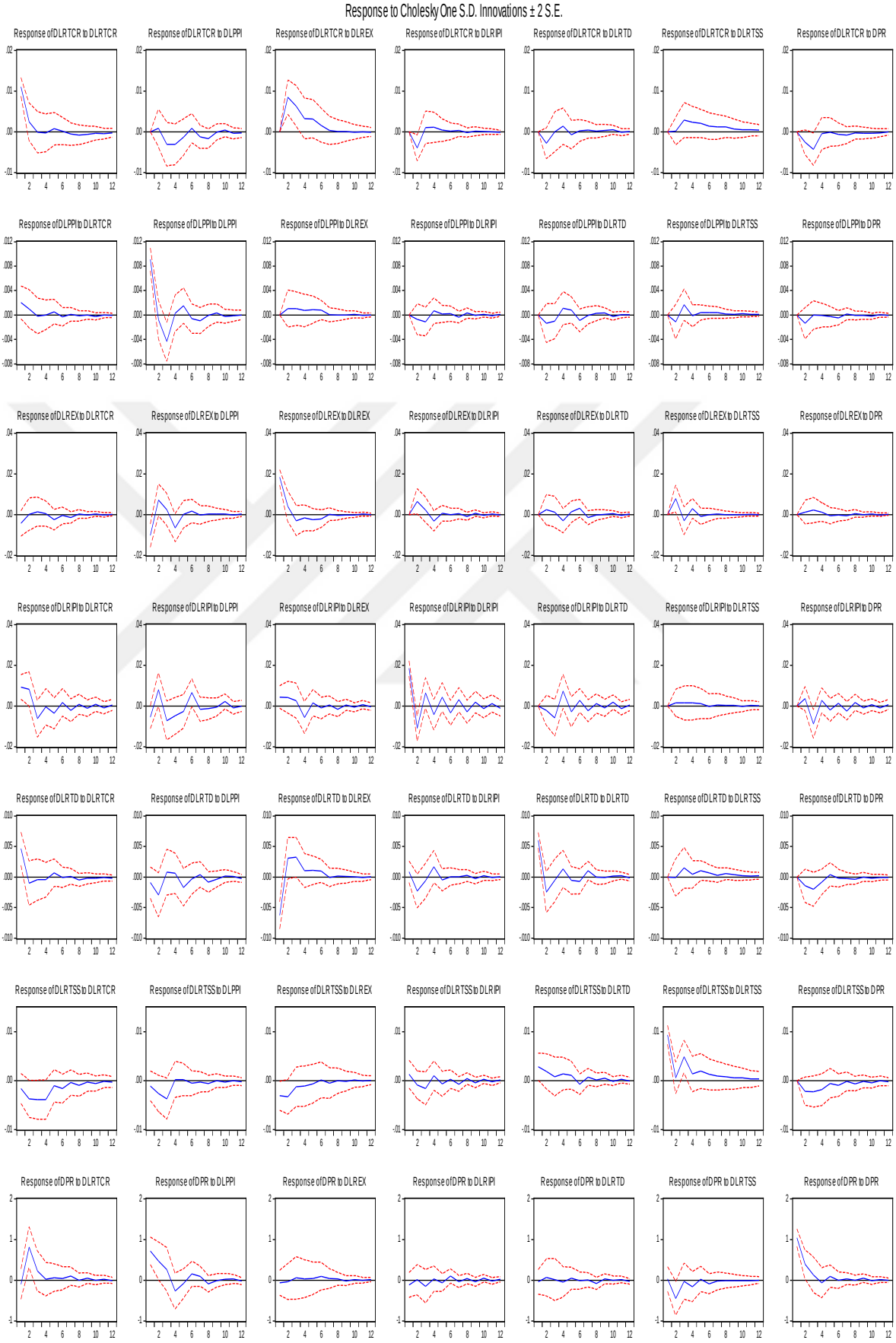
Appendix 4:*Residual Serial Correlation LM Tests*

Lags	LM-Stat	Prob
1	54.98724	0.2583
2	45.82838	0.6025
3	61.42246	0.1097

Appendix 5: *Residual Heteroskedasticity Tests: No Cross Terms*

Chi-sq	df	Prob.
802.9354	784	0.3116
802.9354	784	0.3116

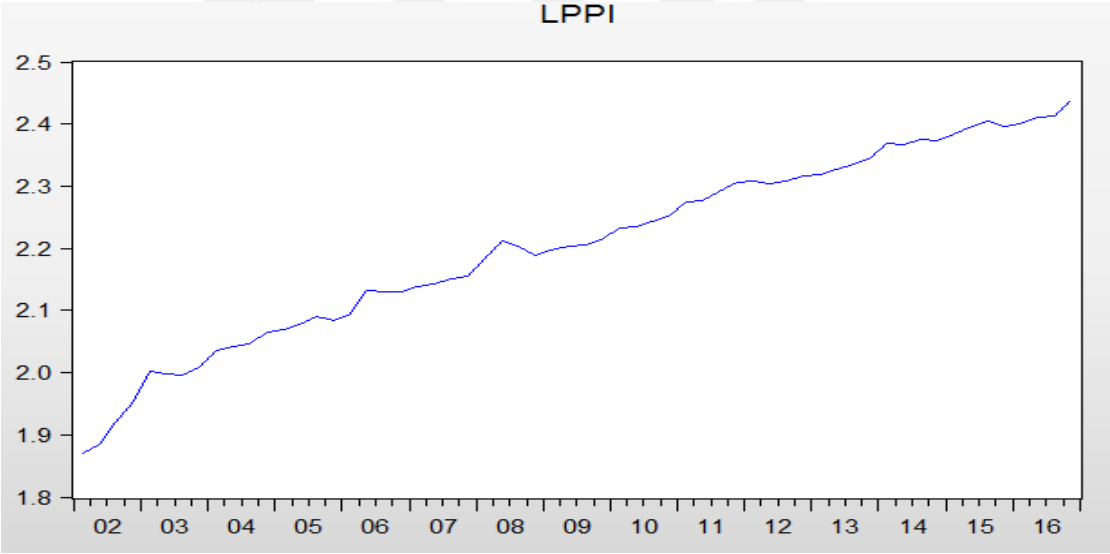
Appendix 6: *Impulse Response Function*

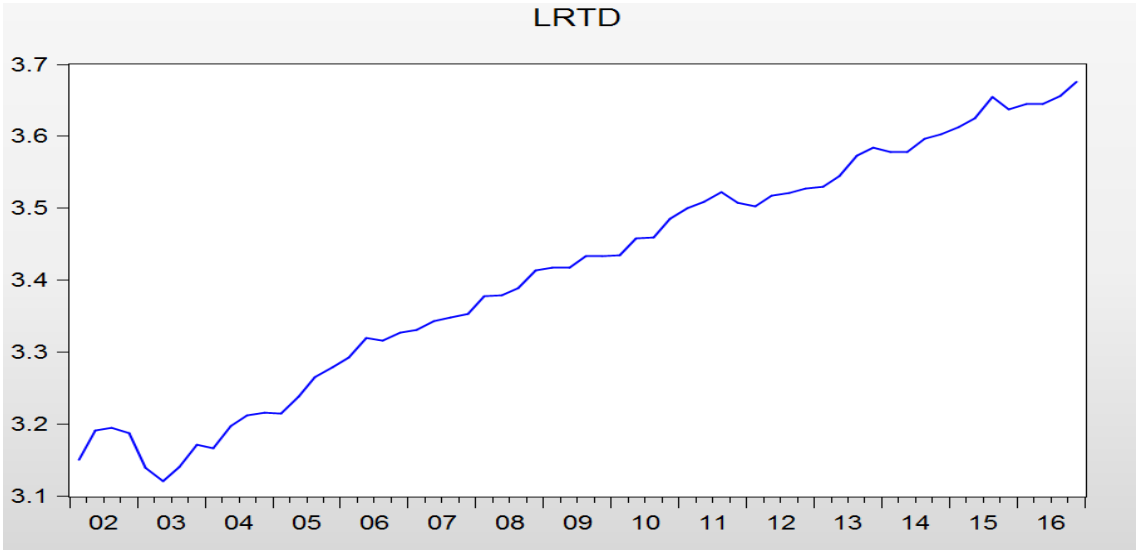


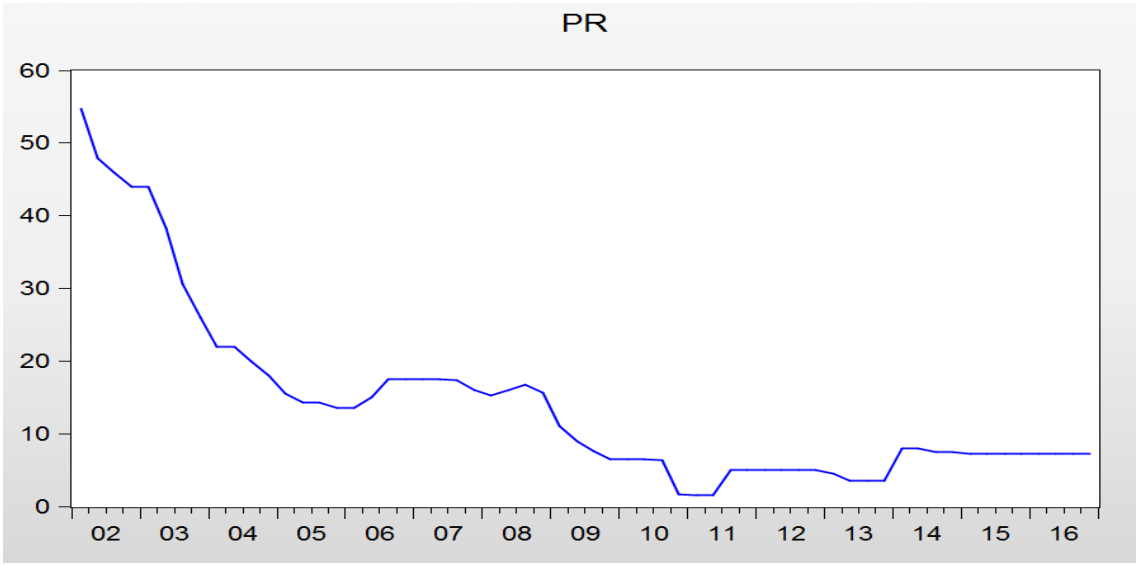
Appendix 7:*Variance Decomposition of DLRTC*

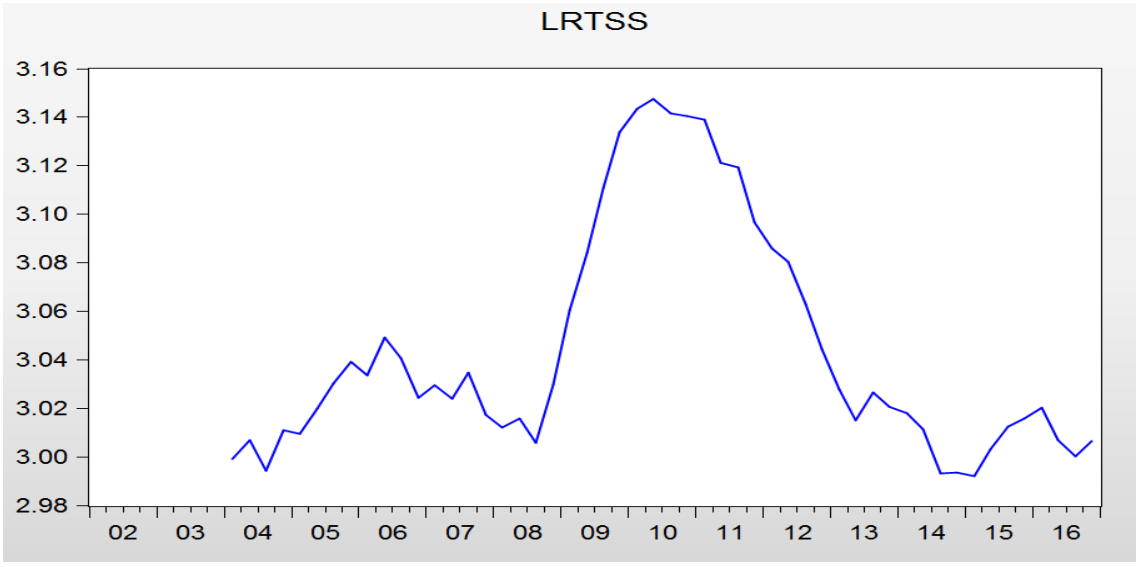
Period	S.E.	DLRTCR	DLPPI	DLREX	DLRIPI	DLRTD	DLRTSS	DPR
1	0.011015	100.0000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
2	0.015179	55.23622	0.307885	30.97827	6.916411	3.553425	0.006541	3.001254
3	0.017532	41.40976	3.336528	36.13250	5.528024	2.663765	2.616410	8.313014
4	0.018322	37.94021	5.917676	36.09966	5.392975	2.982368	3.985829	7.681274
5	0.018780	36.26051	6.155295	37.16228	5.168438	2.986732	4.948256	7.318487
6	0.018924	35.71708	6.253600	37.27968	5.093640	2.957544	5.377971	7.320487
7	0.019044	35.37204	6.652170	36.83386	5.062220	2.970971	5.672126	7.436608
8	0.019177	35.05444	7.366241	36.32398	5.007492	2.932367	5.961964	7.353511
9	0.019206	35.05937	7.347169	36.21596	4.995003	2.949758	6.066013	7.366726
10	0.019229	35.02432	7.365565	36.13081	4.983992	2.995013	6.113641	7.386661
11	0.019248	35.01662	7.401148	36.05945	4.974079	2.991907	6.160602	7.396193
12	0.019258	35.00411	7.426769	36.02621	4.974939	2.988967	6.188728	7.390276

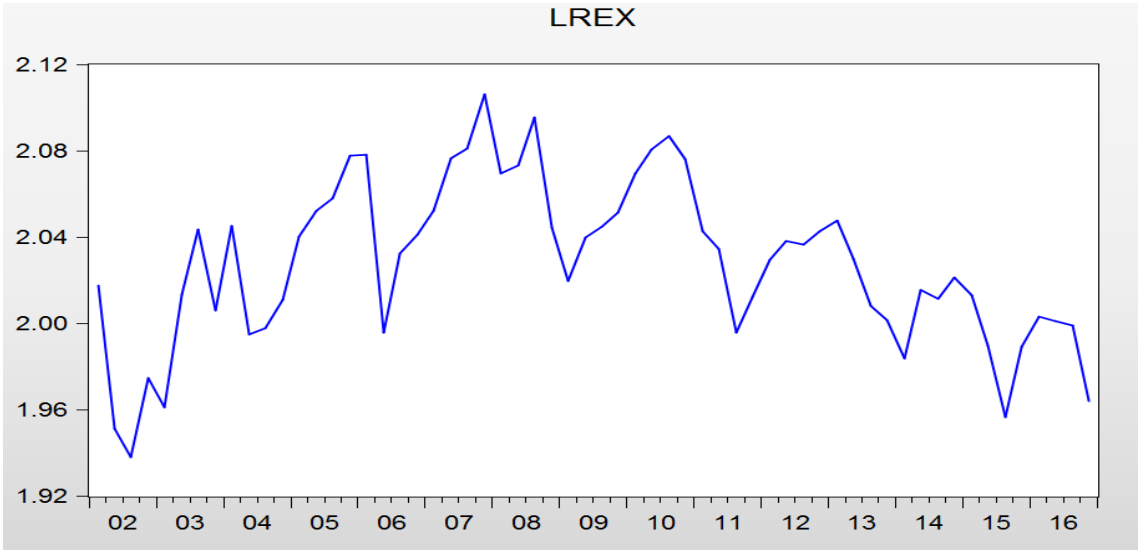
Appendix 8: *Data-Log Graph*

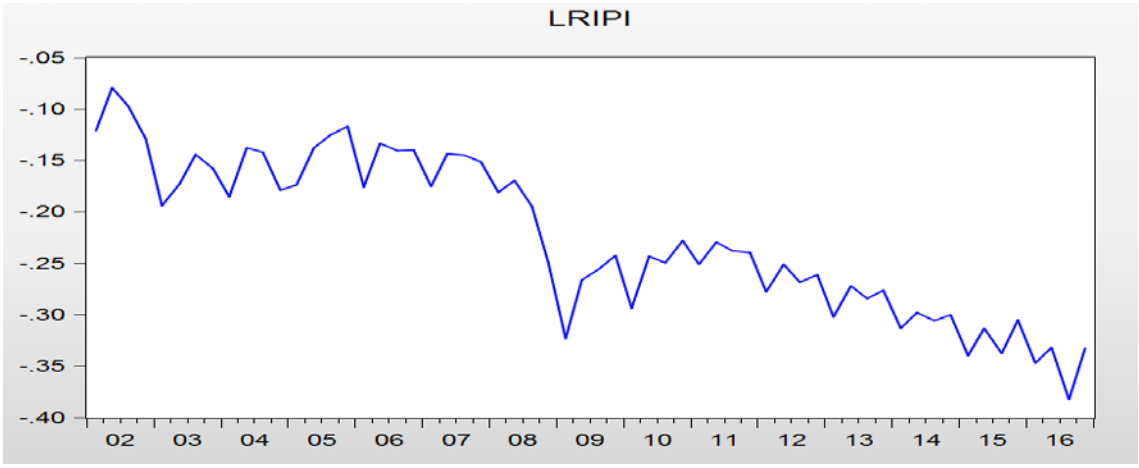


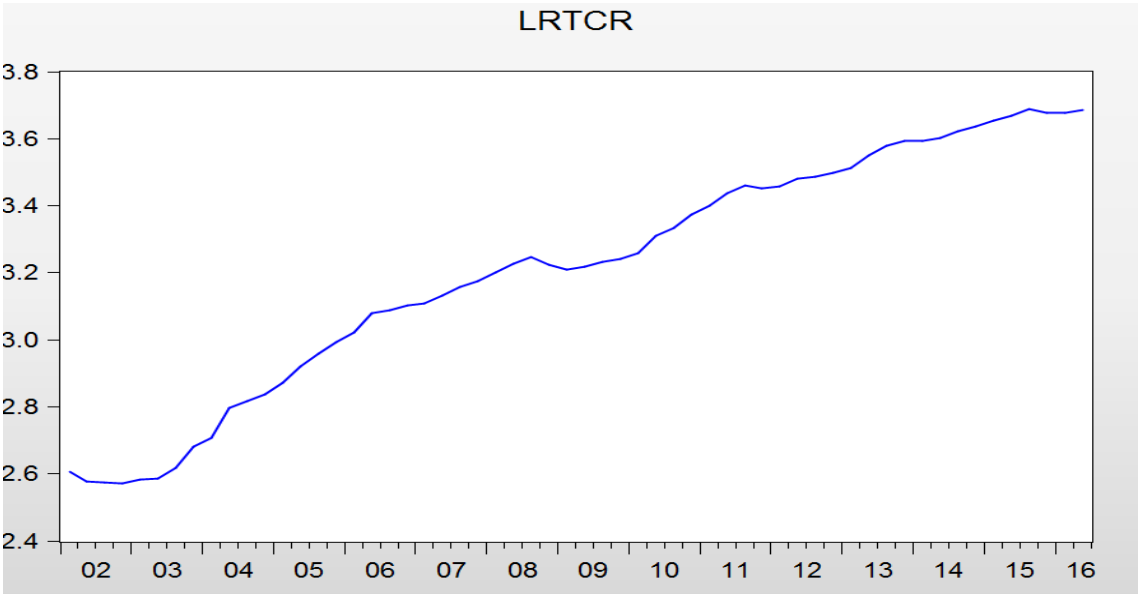

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ÖZGEÇMİŞ

AdıveSoyadı: Zafer ADALI

DoğumTarihiveYeri: 22/01/1990, Konya

MedeniDurumu: Evli

Eğitim

Lise: Konya EreğliAnadoluLisesi

Lisans: AnadoluÜniversitesiİngilizceİktisatBölümü

Yabancı Diller: İngilizce

İşDeneyimi

Görev: AraştırmaGörevlisi

ÇalıştığıKurum: ArtvinÇoruhÜniversitesiHopa İİBF

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