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Monetary Transmission Mechanism: An Overview Explanation

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Abstract: The monetary transmission mechanism explains the channels and their effects which influence the final objectives of the policy authorities. There is a remarkable theoretical and empirical literature about different channels of monetary transmission mechanism that try to explain each channel and relevant markets and variables for the monetary transmission mechanism. In this paper, different models of monetary transmission channels and how they affect the economy will be explained in detail. Besides, the differences between alternative monetary policies and their characteristics that conduct the economy will be analysed.

Key Words: Monetary Transmission Mechanism, Interest Rate Channel, Credit Channel, Asset Price Channel, Exchange Rate Channel

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Para Aktarım Mekanizması Üzerine Genel Bir Değerlendirme

Öz: Parasal aktarım mekanizması, para otoritelerinin hedef olarak belirledikleri ekonomi politikalarının etkinliğini sağlayacak alternatif uygulamaları açıklar. Bu kanalların özellikleri, çalışma şekilleri ve piyasa etkileri konularında yapılmış çok sayıda ampirik ve teorik çalışma bulunmaktadır. Bu çalışmada, farklı parasal aktarım kanallarının her birine ayrıntılı şekilde değinilerek ekonomiyi nasıl etkiledikleri açıklanmaya çalışılacaktır. Bunun yanında, parasal aktarım kanalları arasındaki farklar ve uygulanma şekilleri de ayrıntılı şekilde anlatılacaktır.

Anahtar Kelimeler: Parasal Aktarım Mekanizması, Faiz Kanalı, Kredi Kanalı, Varlık Fiyatları Kanalı, Döviz Kuru Kanalı

Introduction

How monetary policy is transmitted to real economy and its mechanism are still hot subjects of debate in macroeconomics. Furthermore, the importance of monetary policy instruments such as open market transactions, required reserves, rediscount policy, central bank credits which are used for controlling monetary base and credit volume have been increasing. As global financial structure improving as a result of technological improvements and information technology, there has been an increasing level of financial transactions. This brought deeper and more sophisticated financial markets in the local economies. And also, parallel to the development of financial markets, the importance and effectiveness of monetary policy has been increasing.

Monetary transmission mechanism can be described as the effect of a change on nominal money stock or nominal short-term interest rates on real variables such as aggregate output and employment (Ireland, 2005). To analyse the effects of monetary policy, Brunner and Meltzer (1972) developed a model different from standard IS-LM framework. They rejected Keynesian view of notion that fiscal policy has a direct effect on the economy whereas monetary policy has indirect effects. According to the authors, both monetary and fiscal policies have power to change the relative prices of assets and output. Wealth owners can prefer money, bonds, real capital or expenditure. And these preferences can be effective on monetary policies. According to Bain and Howell (2003:192), monetary transmission mechanism causes changes in the money stock and nominal income level. So, no other assets can substitute money, but money can substitute all other assets. Erdoğan (2011:2) expressed that monetary transmission mechanism starts with a decision about changes in monetary policy. And in order to create changes on aggregate output and the level of prices, monetary authorities need not only direct but also indirect instruments.

The neoclassical model expresses that money is neutral and any change on money supply and interest rates will have only effects on nominal variables but not on real ones such as GDP. Oppositely, Keynesian models express that prices cannot be adjusted systematically and any change in money supply will cause a change on real interest rates and on real economy unless a country does not enter a liquidity trap. In the current models, financial market decisions and decision-making by firms are also included.With all these parameters, alternative channels suggest that interest rates can influence the real economy without resorting to Keynesian price rigidities. According to the theory, changes in interest rates will lead a change on the return on equity relative to the return on bonds. This will cause a change in prices of stocks and bonds which results in changes in Tobin Q and the financial wealth of households. All these changes will affect the output (Poddar, Sab and Khachatryan, 2006:4).

Related to these bases, theoretical and conceptual framework will be explained in the first part of the paper. In the second part, each monetary transmission channel will be explained in detail.

I. Theoretical and Conceptual Framework

In the economy literature, the transmission mechanism of monetary policy tries to explain which and how variables respond to interest rate changes and when, why and how predictable the changes are. These issues bring more responsibility to monetary policy to implement alternative policies in order to offset the negative effects of disturbance on inflation (Mahadeva and Sinclair, 2004:1). However, although monetary policy is a powerful tool on inflation, there are sometimes unexpected or unwanted consequences. To be more successful in implementing monetary policy, the monetary authorities should have accurate timing, accurate policies and mechanisms. At this point, implementing transmission mechanisms become crucial for the

economy. The transmission mechanisms including interest rate transmission mechanism, exchange rate transmission mechanism, asset price and credit channel transmission mechanisms are critical for monetary policy success (Mishkin, 1995:4).

In explaining monetary transmission mechanism, financial market prices are the most important distinguishing characteristic. Instead of financial market quantities such as bank credits, money supply, supply of government bonds or foreign denominated assets, financial market prices include short-term interest rates, exchange rates and bond yields. Besides, three types of prices; exchange rates, long-term and short-term interest rates are used to explain the monetary transmission mechanism. The impact of these three prices on GDP and inflation is a good explanation of success of monetary transmission mechanism (Taylor, 1995:13-14).

The original S-LM mechanism changes in monetary policy are critical as long as they have effect on aggregate output and fluctuations in total investment are crucial because of rate of return is important on new investment projects. As a result of this approach, less profitable projects are not supported and funded. Because of this process, there will be allocations to the most rofitable projects and there will not be an enormous efficiency loss because of distributional aspects of the policy induced interest rate increases. Contrary, "lending" side of view focuses on the distributional effects of monetary activities. This theory insists that different agents in the economy may impact the consequences of monetary policy. Capital market imperfections and portfolio balance effects also influence the effect of the monetary policy. Besides, personal behaviours and preferences should be taken into consideration even though they do not have a direct relation with the creditworthiness of the investment project (Cecchetti, 1994:1).

To reach well defined policy goals, a standard monetary policy has basic instruments, short-term and intermediate term targets and expectations as illustrated in Figure-1.

Figure-1: Monetary Policy Framework: Instruments, Targets and Policy Expectations

Source: Davoodi, Dixit and Pinter (2013:8)

As one of the two different approaches to explain monetary transmission mechanisms to monetary shocks, Keynesian approach gained importance with the Great Depression that stroke the world in 1930's. Keynes expressed that fiscal policies were more effective on economic activities than monetary policies. This approach was accepted and highly applied by policy makers all over the world until the 1970's when Monetarists announced their alternative approach to monetary transmission mechanism. According to Keynes, the most important instrument of monetary policy is interest rates and monetary policies can be successful as far as interest rates are effective on aggregate demand. However, in 1970's, Monetarists criticized the Keynesian approach. Milton Friedman and his friends claimed that the effects of monetary policy on aggregate demand cannot be explained by just the relationship between interest rates and investment expenditures. Besides, there are many other channels than interest rates that monetary policy can affect aggregate demand. They also expressed that contrary to Keynesian approach, there is a weak relationship between nominal interest rates and investment expenditures. Instead, real interest rates are critical on borrowing and investment decisions (TCMB, 2013:2). Furthermore, for a monetarist or a classical economist, long term neutrality of nominal shocks can be defined as a rational behaviour. Nevertheless, relative prices and real output

react to monetary shocks before the shocks are absorbed. The reason behind it is that households and business environment may fail to predict all of the future implications of past and current experiences correctly (Meltzer, 1995:49). Actually, the degree of affection and reactions to a change of monetary policy of households and firms can be different because of the reasons explained below (Erdoğan, 2011:2-3, 6):

- **Changes in Household Behavior**: there is a change in monetary policy, households have two alternatives: Households either prefer depositing their savings or borrowing with new interest rates. So, disposable income level of savers and borrowers will change. This movement will affect the level of consumption and investment decisions. Increasing interest rates will lead an additional cost of borrowing thereby decreasing disposable income level of individuals who make their consumptions by borrowing. Interest rate changes also affect the real wealth of households through changes on asset prices. Increasing interest rates will result in an additional cost for agents who make their consumptions by borrowing. This problem also causes reduction in disposable income. Changes in interest rates cause changes in financial and real wealth through changes in asset prices. As an example, an increase in interest rates will cause a loss in value of assets thereby decrease in the level of wealth and the amount of consumption. An increase in interest rates changes the anticipation for the housing prices. As interest rates increase, housing credit costs increase which leads a decline in housing demand and losses in wealth of housing asset and aggregate demand. And also, fluctuations in exchange rates may affect the economy directly depending on the dollarization level of that economy. The degree of expressing the level of wealth and debt in a foreign currency can show the degree of affection of changes of ex-

change rate fluctuations and changes on net wealth and borrowing.

- **Changes in Firm Behavior:** Changes in monetary policy also influence the firm behaviours either directly or indirectly. The firms which cannot find funds from foreign markets and has to finance the investment spending by banking credits are affected directly from the changes in interest rates. Any rise in interest rates will result in an increase in credit interest rates. Increasing credit interest rates will cause an increase in cost of production. So, they prefer to postpone the investment projects. The less production due to increasing credit costs, the less employment. Increasing interest rates is advantageous for the firms which have a great amount of cash balance since higher interest rates will provide higher rates of return for the banking deposits. Increasing interest rates may change the firms' investment plans and they may prefer their cash balances in their deposits to get more revenue. As a result of changes in behaviours of households and firms, there will be changes in aggregate demand and the level of prices.

From a different perspective, according to Monetarists one of the basic reasons for the misperception and wrong anticipation which leads to relative price changes is that time is necessary to discriminate between permanent and transitory shocks and nominal and real shocks. This delay is actually the cost of acquiring information. Monetarists' target is generally decreasing cost of information needed. Without a preannouncement, market participants use the data they have from today and the past and try to anticipate when and how the monetary authorities will respond to macro-parameters such as price, employment, exchange rates etc. If there is preannouncement rule, there will be less uncertainty in the market and eliminate faulty anticipations that lead to fluctuations of relative prices and real wealth (Meltzer, 1995:49-50).

It is a fact that monetary policy significantly affects the course of real economy at least in the short term. Basically, monetary policymakers use their leverage over short-term interest rates to affect the cost of capital, housing, inventories, fixed investments and consumption. Changes in aggregate demand influence the production and output. However, this theoretical perspective does not work for all conditions. For example, interest sensitive side of aggregate demand spending is hard to identify. Besides, monetary policy has a weaker effect on real long-term rates. Actually, there is a discrepancy that monetary policy has deep effects on purchases of durable assets such as housing or investment equipment which are sensitive to interest rates and they should be primarily responsible to long-term rates. These differences are explained as "frictions" or "imperfect information" in credit markets to clarify the effect of monetary policy (Bernanke and Gertler, 1995:1-2). If there is no friction in the economy, an increase in monetary supply will motivate the price and wages to upward position. Since money is neutral according to classical theory, when the monetary shock is persistent, a reduction in interest rates will cause a slight increase in output, consumption and employment. In dynamic general macro models, nominal rigidities of prices, wages and limited participation are considered as the most significant frictions which are used to analyse the transmission mechanisms of monetary policy (Adao, Correia and Teles, 2005:41). Furthermore, according to researchers, monetary policy can induce a stronger and faster decreasing effect on inflation. However, the factor of "expectation" should not be neglected in explaining monetary transmission mechanisms along with the traditional interest rate, exchange rate and credit channels. Ramos-Francia and Garcia (2006) studied the short-term inflation dynamics of Mexico and analysed New Philips curve framework for that country. The authors also analysed the expectation is backward and forward-looking components. The authors figured out that the group of firms those set their prices using a backward-looking rule of thumb has decreased

the inflation and the forward-looking component of inflation process became critical in analysing the process of inflation.

With all these different approaches, which model should be preferred is dependent on the structure of the economy. Some models contain price rigidities (Mankiw, 1985). Mankiw (1985) expressed that price is downwardly rigid but upwardly not. And nominal price level may be too high but never stuck too low. According to Grossman and Weiss (1983) an open market purchase of bond for money will decrease nominal and real interest rates and will cause an increasing price.

Although monetary transmission channels may have remarkable effects on different problems of economies; reactions of an economy to a monetary policy may vary. Bernanke and Gertler (1995:4) emphasized three responses of the economy to monetary policy shocks:

- Despite the fact that there is transitory effect of monetary policy on interest rates, a monetary tightening policy is followed by a sustained decline in price level and real GDP.
- Although there is a monetary tightening policy, the final demand absorbs the early effects of it. Furthermore, production also decreases following demand with a lag and with an increase in inventory stock in the short term. On the other hand, inventories decline gradually and due to inventory disinvestment, there will be a decline in GDP.
- If there is a monetary tightening policy in an economy, there is also a decline in fixed business investment gradually. However, the reason behind of it is mostly because of housing and consumer durables, decline in production and interest rates.

The boundaries affecting the performance of monetary transmission mechanism are as follows (TCMB, 2013:7-8; Erdoğan, 2011:10-16):

a. ***Formal interventions:*** The interventions of formal authorities on monetary policy decisions directly affect the monetary transmission mechanisms.
   i. Direct interventions to financial markets
   ii. Controlling interest rates
   iii. Banking credit limits
   iv. Credit intensives for selected areas
b. ***Pricing mechanism:*** Price stickiness causes a delay in adaptation of price changes. Price stickiness also negatively affects the importance and effectiveness of monetary transmission mechanism.
c. ***The structure of financial system:*** Changes in short-term interest rates that central bank can directly influence and sensitivity to interest rates that may impact debt-saving decisions affect the monetary transmission process. The dept and sophistication of financial markets, existence of alternative financial resources, borrowing constraints, competitiveness in the banking sector, and effectiveness of judiciary system characterize the degree of efficiency and sensitivity of the system.
d. ***Maturity structure of financial contracts:*** There is a strong relationship between the maturity of financial contracts and the effectiveness of monetary transmission mechanism. If the contract is short-term, credit and deposit contracts should be renewed in a shorter period and they can be more updated with the current interest rates. So, a monetary policy change via interest channel can be more effective.
e. ***Financial position of banking system:*** Financial position of banking system is one of the determinants of amount and cost of banking credits. The decreasing rate of risk weighted capital will cause decreasing credit supply thereby tighter credit conditions by increasing credit in-

terest rates. Banking credits are depressed under tightening monetary policy conditions.

f. ***Financial resources and the level of financial improvement:*** The structure and depth of financial system, and the degree of influence of monetary policies on consumption show the effectiveness of monetary policy on the economy. So, a change in monetary policy will have a weaker effect on aggregate demand in the countries where financial intermediation is not sophisticated enough.

g. ***Capital flows:*** If there are no capital controls in an economy, monetary policy efficiency is analysed by the degree of substitution between exchange rate regime and domestic and foreign financial assets. The higher the degree of substitution between domestic and foreign assets, the higher the degree of reaction of exchange rates to changing interest rates as an instrument of monetary policy. The higher the degree of reaction, the more effective exchange rate transmission channel.

h. ***The structure of firms and households:*** The expenditure tendency of households and firms may have different effects on monetary transmission mechanism. For example, in the less developed financial markets, households and firms do not prefer securities for saving. This preference leads a weak and ineffective asset price monetary transmission mechanism.

i. ***Globalization:*** Globalization is one of the most important factors that determine the effectiveness of monetary policy on GDP and inflation. Direct exposure of national economies to external shocks affects macroeconomic indicators. Even though there is no change in macro policies, there may be changes in inflation, revenue, trade balances, exchange rate regimes, and rate of unemployment. All these variables are affected by global financial improvements.

j. ***Dollarization:*** Dollarization is the preference of a foreign currency instead of the national currency in daily

financial transactions. Particularly in the countries which have chronic inflation problem, individuals prefer to do all their businesses by a foreign currency in order to protect themselves from the uncertainty. There are two types of dollarization: asset dollarization and liability dollarization.

k. ***Fiscal Dominance:*** The level of public debt, interest rate and maturity are the parameters that define the degree of fiscal dominance. The effect of fiscal dominance on monetary policy is that it is one of the basic obstacles in front of the monetary transmission mechanism. High level of public debt rate not only threats the monetary policy independency but also limits the effectiveness of the central bank in applying short term interest rates.

The Structural Properties of Economies Affecting the Effectiveness of Transmission Mechanism (Loayza and Schmidt-Hebbel, 2002:7-9):

- ***Equivalence of different transmission channels:*** In a complete flexible economy, an applied monetary shock will cause an impact on all nominal aggregates (money and credit), asset prices, factor prices, good prices and exchange rate. Here, aggregate demand increases but aggregate supply stays the same. In this situation, all transmission mechanisms have the equivalent effect and reflect the same transmission of money to prices in such a flexible economy. Different transmission mechanisms may be used if it provides a relative dominance to the others.
- ***Structural properties and transmission mechanism:*** Each economy is unique and gives different reactions to a change in monetary policy. The effectiveness of transmission mechanism is dependent on the specific properties of the economy. Monetary transmission has two parts: the first part is that policy instruments impact different asset markets and

prices. The second part is that they impact the spending decisions of individuals and firms. Both parts have different outcomes related to specific features of the economy such as the degree of openness to international trade and capital, and degree of financial development. And also, the expected changes of monetary policy on market prices can be observed by the change in aggregate demand. Aggregate demand reactions also can vary for different economies depending on the solvency and liquidity of firms and individuals.

- ***Financial system structure:*** Financial structure of an economy is also critical in success of monetary policy changes. Is the financial system mostly based on banks or is the financial system deep enough to have alternative financial mediators? Is the financial system mostly controlled by the government or is there private financial intermediation dominating financial system? Answers to these questions directly affect the effectiveness of monetary policy. If the financial system is deep and well diversified, monetary policy changes can be transmitted easily and quickly. Oppositely if there are a few financial instruments dominating financial system, these institutions will determine market rates and prices to some extent. Also, households and firms have quick reactions to prices and market rates. If financial system is not deep enough, asset price channel cannot work properly because of poor capitalization of the stock market. Similarly, interest rate channel also works poor because of monopolistic power of banks. For the credit channel, there will be moral hazard and adverse selection problems because of poorly developed financial system. The exchange rate channel is not preferred by financially underdeveloped countries because of controls on foreign exchange transactions of international trade

or capital flows. As financial system gets deeper, all these channels start working better and become more effective in the economy.

- ***The level of openness and the size of the economy:*** size and openness of the economy are important for exchange rate channel and for determining domestic interest rates.

II. The Position of Central Bank in the Transmission Mechanism

Both in credit and money points, the transmission process starts with the action of the central bank. The central bank changes the ability of commercial banks by manipulating either reserve requirements or the reserve level. Two components of monetary base, currency and bank reserves are considered as central bank liabilities. So, central bank actually controls the monetary base and plays the crucial role in monetary transmission process. All of the monetary policy actions are taken by central bank through open market operations such as purchasing/selling government bonds and other securities in order to increase/decrease the monetary base. To have an extreme effect of these policies, other agents should not have any ability to offset these policies by changing the quantity or composition of their liabilities. So, it should be underlined that all models of monetary transmission mechanism need to accept that there are no private-issued securities which have ability to substitute the components of monetary base. And also, to have effective nominal monetary base, nominal prices must not be able to respond immediately in order not to leave the real value of the monetary base unchanged. Monetary transmission mechanism also assumes that some frictions in the economic activities may prevent nominal prices from quick adjustment to any changes in the monetary base (Ireland, 2005:1). Since it takes a period of time for monetary policy to create its maximum effect on inflation, a central bank should follow the processes of transmission mechanism. Actually, a central bank has to arrange the position of interest rate properly in order to keep inflation as close as

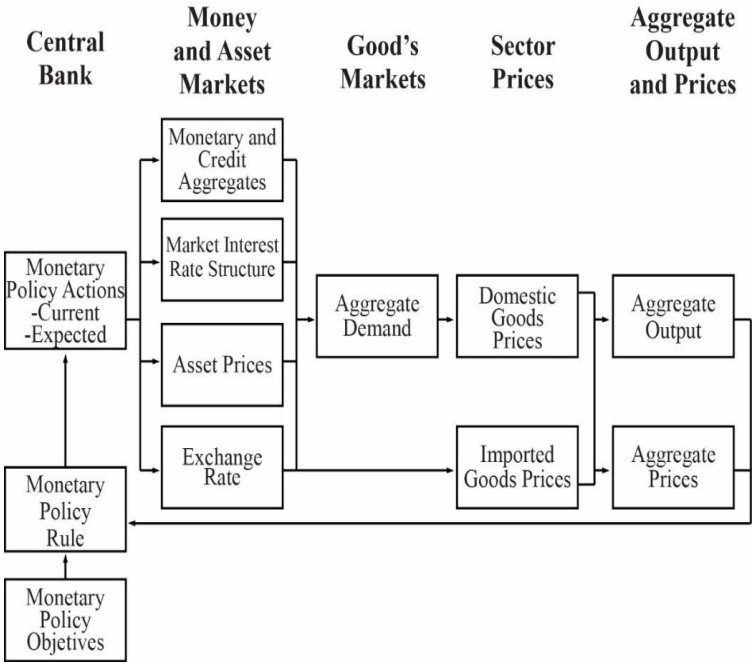
possible to its target rate. While watching the process, it also needs to keep destabilisation factors of output under control. In other words, a central bank also has to control its interest rate today to keep inflation rate in the future. In this period, it has to monitor inflation and output. By using data, the central bank may revise and provide with quantitative picture of the transmission mechanism of monetary policy for the near future, say, one or two years. A central bank also suggests a set of models of the transmission mechanism and explains how each model can be consistent with the others. Also, it can provide with a set of values not only just exogenous variables but also the parameters to endogenous variables for the underlying process. Besides, it can make assumption about the policy reaction function. For example, what are the public expectations of the new monetary policy? Finally, if prediction of the central bank is wrong, the bank should explain the reasons of wrong prediction and what kind of policy reactions should be implemented. Indeed, not only inflation targeting central banks, but others too, implement their policies related to what will happen over this horizon explicit. To reach these targets, credibility of the central bank is crucial through the provision of transparent declarations such as publishing inflation reports, or forecasting next quarters and following years. Besides, a central bank should inform the public about the improvements and explain the reasons and the expectations for the future (Mahadeva and Sinclair, 2004:1-2).

Another question about the relationship between central bank and the market may be how monetary policy impacts short term interest rates. Effectiveness of the impact starts with a stable money demand. At this point, central bank can affect interest rates by arranging money supply. For example, increasing money supply by the central bank will have lowering effect on short term interest rates. Although the process seems practical, actually there are some problematic situations. First, the money demand equations may be too unstable to have a reliable impact of a change in the money supply. Second, central

bank reactions can be inaccurate in one-time change in the money supply. Contrary, most of the central banks take position to guide the short-term interest rates in money markets. In other words, central banks prefer to adjust the supply of high-powered money instead of changing the money supply by a given amount and waiting short-term interest rates take a position (Taylor, 1995:15).

Below, in Figure-2, monetary transmission mechanisms and the position of central bank, goods markets, sector prices and aggregate output are illustrated in detail.

Figure-2: Monetary Policy and Transmission Mechanisms



Source: Loayza and Schmidt-Hebbel (2002:2)

As expressed in Figure-2, any policy action, either current or expected, are transmitted to money and asset markets. Impacts on these markets will affect production and employment, thereby aggregate output and prices. And then movements in

current and expected output and inflation will give feedback to monetary policy rules. Those rules are central bank's aim and strategies to achieve its policy objectives (Loayza and Schmidt-Hebbel, 2002:2).

In the next part of the article, different channels of monetary transmission mechanism are explained elaborately.

III. Interest Rate Channel

Among macro models, the interest rate channel is the primary mechanism. Interest rate channel basically motivates the higher or lower real interest rates on consumption and investment depending on the structural position of the economy. If the central bank decided to increase short term nominal interest rates, real interest rates are expected to increase, firms may change their plan for investment, consumers' spending on housing and durable goods will decrease and thereby output growth and inflation rates decrease (Erdoğan and Yıldırım, 2010:248).

80 years passed since Hicks introduced the IS-LM model which explains the relationship between money and the interest rate to aggregate income/output. In this model, monetary policy is transmitted by changes in the interest rates. According to the model, a fall in the monetary policy increases the cost of borrowing. As cost of borrowing increases, entrepreneurs have to reduce investment spending on inventories and capital goods. It is the same for consumers and they need to reduce spending on durable goods. So, aggregate demand falls because of monetary contraction. Aggregate demand starts to increase right after a monetary expansion policy. This simple model of IS-LM cannot explain if it is a model of real output with fixed prices or a model of nominal output which cannot discriminate real and nominal values. To solve this problem, the Phillips curve was put forward for an understandable explanation by introducing a dynamic relationship between inflation and ag-

gregate excessive demand for output. In this model, a positive monetary impulse increases the stock of real monetary balances and decreases the interest rate. This is substantially opportunity cost of holding money. On the other hand, at the lower interest rate levels, the equilibrium rate will be higher for investment. As the monetary impulse is not well understood, the price will not increase so much as the monetary impulse. However, spending increases. Shortly, Phillips curve explains the distribution of increased spending between the prices (inflation) and output. If there is a higher rise in prices (inflation), there will be smaller rise in the output and the real money balances. In fact, this evaluation of transmission process is considered as too mechanical and restrictive for a monetarist economist. According to a monetarist economist, A monetary impulse changes the nominal and real inventory of money. It changes not only for the short-term interest rates or borrowing but also actual and predicted prices on domestic and foreign assets. Different parameters in the economy such as structure of borrowing, lending and interest rates, intermediation and exchange rates are affected by this impulse. Besides, IS-LM model neglects some important points of transmission process. Basically, in capital accumulation, the model omits the adjustment of asset stocks as new investment. Also, it is not clear in this model that the single rate of interest rate is short-term relevant for the demand of money, or a long-term rate relevant for investment and capital accumulation. Additionally, financial intermediation is omitted. Instead, money is only monetary base or proportional to monetary base. Furthermore, it is not clear that if money is substituted for just bonds or for a range of assets combination of bonds and real capital. Finally, changes in short term interest rates create provisional disturbances which do not affect spending decisions. IS-LM model does not make an acceptable distinction between provisional movements and persistent changes (Meltzer, 1995:51-52). IS-LM model also expresses that sticky-price arrangement is related to money supply shocks; monetary authority tries to control the nominal money supply by arranging reserves and money and bonds are used instead of each other

because of their perfect substitution (Çavuşoğlu, 2002:5). This explanation recalls the same specifications of the IS curve. In other words, interest rate channel is considered as a primary mechanism of conventional macroeconomic models and the basic approach is that an increase in nominal interest rates under a specific level of price stickiness will result in an increase in the real interest rates and increase in cost of capital. Under a certain level of price stickiness, an increase in nominal interest rates induces the real interest rates and the user cost of capital. The change in real and nominal interest rates will also cause a postponement of consumption and reduction of spending (Kuttner and Mosser, 2002:16-17).

The interest rate transmission mechanism has been a standard feature for a long time in the economics literature. The interest rate transmission mechanism is one of the basic models in Keynesian view. Keynesians try to analyse the effect of money on economic activities by building a structural model which explains the behaviours of consumers and firms. According to traditional Keynesian view, how a monetary contractionary policy is transmitted to the real economy can be explained as follows (Mishkin, 2004:604):

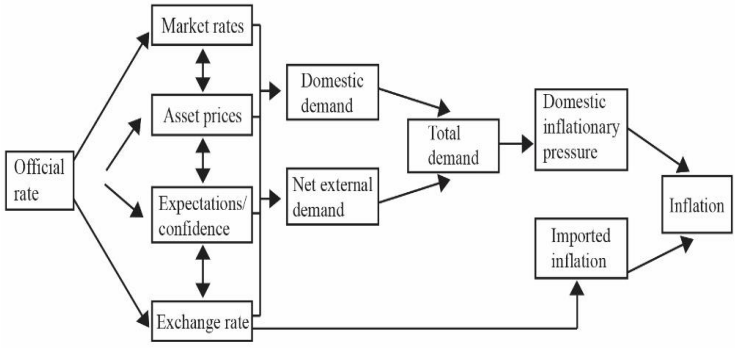
According to the diagram, a tightening monetary policy ($M\downarrow$) will cause an increase in real interest rates ($i\uparrow$). This increase will result in a rise in the cost of capital and a decline in investments ($I\downarrow$). This process will end with a decline in aggregate demand and output $Y\downarrow$. Despite the fact that Keynes explained interest channel operates through businesses' preferences about investment spending, in the later studies, it was figured out that consumers' decisions about housing and consumer durable expenditures are also considered as investment decisions. The only difference is that consumer spending on I represents residential housing and consumer durable expenditures (Mishkin,

1995:4). On the other hand, monetarists do not try to explain the ways how the money supply affects aggregate demand. Instead, they analyse the effect of money on economic activities by checking the relation between output *(Y)* and money *(M)*. Monetarists also analyse the effect of *M* on *Y* in the economy where it is like a black box and inside of it cannot be seen (Mishkin, 2004:604).

If there is tightening monetary policy application, there will be an increase in short-term nominal interest rates which will result in an increase in longer-term nominal interest rates. The reason behind this action is that investors try to arbitrage away differences in risk-adjusted expected returns on debt instruments of different instruments. As nominal prices adjust themselves slowly, movements in nominal interest rates are transferred into movements in real interest rates. Parallel to these impacts, firms prefer to decrease their investment expenditures because of rising real cost of borrowing. Similarly, individuals also cut back their spending on durable goods because of rising higher real borrowing costs. And finally, related to all these changes employment and aggregate output decline (Ireland, 2005:3). And also any change in short term interest rates will lead a change in real interest rates on both short and long term bonds owing to nominal price rigidities. As an example, an expansionary monetary policy will cause a decrease not only in short term nominal interest rates but also in short term real interest rates which is parallel with rational expectations. Lower interest rates will result in increase in business investments, housing investments, inventory investments and consumption on durable goods which will cause an increase in aggregate output (Poddar, Sab and Khachatryan, 2006:4). Below, in Figure-3 the relationship between interest rates and inflation relationship is illustrated. According to Figure-3, market rates, asset prices, expectations and exchange rates are the basic factor

those are affected by interest rate changes. Changes on these factors motivate domestic and external demand. A decrease in interest rates will motivate both external and domestic demand. Increasing demand will cause an inflation pressure as shown if Figure-3.

Figure-3: Monetary Transmission Mechanism Interest Rate to Inflation



Source: Westaway, 2004:160

In the money view, reduction in the quality of outside money leads increases in rates of return. So, there will be less investment and there will be fewer projects with higher required rates of return. This process will result in a fixed marginal efficiency of investment. And also, the interest rate differentiations will be greater, and the result will be problems in sustainability in outside money for other assets. In the traditional view of transmission mechanism, since there is no market imperfection or externalities, just socially productive projects will not be funded. This approach expresses the measure of monetary transmission focusing on M2 which is considered as more appropriate (Cecchetti, 1994:5).

IV. The Credit Channel

In the recent studies, classical Keynesian transmission mechanism has been criticised because of credit channel of monetary transmission mechanism since this channel complements the conventional money channel. Credit channel also motivates the standard interest rate effects of monetary policy on real economic activities. And related to imperfection of credit markets and information asymmetries between lenders and borrowers, there will be hesitation between a higher level of cost of external funds and greater opportunity cost of internal funds. A good operating credit channel affects not only the general level of interest rates but also the magnitude of external finance premium (Fountas and Papgapitos, 2001:399). Similarly, in his study Bernanke (1986:1) studied the credit view that focusing on financial markets imperfection instead of real/nominal confusion explanation. And also, the author studied the real business cycle that explains money-income relationship. He explained that monetary shocks on credit markets have effects on real output. The parallel movement of money and credit shows that there is a relationship between output and monetary policies. In their early study Bernanke and Blinder (1988:435) developed a simple IS-LM model of money and credit. In the model, LM curve represented an optional portfolio-balance condition between money and bonds for asset holders. If there is a IS shock, both money and credit will increase if bank reserves are stable. The authors also concluded that if money demand shocks are more important than credit demand shocks, then credit targeting policy is preferable instead of money targeting policy. They also concluded that according to credit channel, monetary policy impacts the economy by affecting bank assets such as loans and bank liabilities (deposits).

Because of changes in market interest rates, there will be change in the cost of capital that influences the investment. Particularly, changes in market interest rates will affect the net cash flow (cash after the interest payment) available for a firm. In an imperfect capital market, it will be a great motivation for

an investor to find net cash flow to induce investment. This process is called "broad credit channel" (Chatelain et al, 133). The credit view of monetary transmission policy can be analysed in two distinct views: The balance sheet channel and the banking lending channel. The balance sheet channel of monetary transmission policy anticipates the changes in monetary policy that affect the real economy by their financial positions that impacting the borrowers. The second mechanism of credit channel is the bank lending channel which anticipates the changes in monetary policy that affect bank loans supply, loan borrowers and private investment (Fountas and Papagapitos, 2001:399) Although bank lending perspective is limited with bank lending behaviour, balance sheet channel combines firm investment decisions with bank lending behaviours and covers all credit market imperfections (Çavuşoğlu, 2002:3). As one of the most important financial intermediary institutions, in the real economy, banks play a crucial role in the process of output by supplying funds for investments. For most of the investment decisions of the firms, banks loans are critical. So, economic activities are sensitive to fluctuations and shocks on bank lending processes since any monetary policy change will have an impact on bank reserves. And also, changes in bank reserves will cause reallocation of assets in the bank balance sheets. If reallocation process cannot be fulfilled, the effect of monetary shock is absorbed by other assets but not loans. This will directly affect the bank-dependent firms' investment decisions. This process is considered as supply effect of changes in credit channel than demand effect of changes in the interest rates (Çavuşoğlu, 2002:3).

In the next part, the bank lending channel and balance sheet channel are explained in detail.

A. Bank Lending Channel Perspective

Bank lending channel has basically two parts; one of them requires assets such as bank loans the other one that does not. The

first type is generally called as "broad lending channel, or financial accelerator". And it focuses on the effects of policy changes on the balance sheets of borrowers. This model also involves the impacts of changes in the real interest rate on investment. In this model, there are credit market imperfections which cause complexities on marginal efficiency calculations. Because of market imperfections, bankruptcy laws, information asymmetries and moral hazards, applying external finance becomes both necessary and risky. Besides, because of reasoning reduction on expected future sales, and increasing the real value of denominated debt, induced increases in real and nominal interest rates can result in deterioration in the firm's net worth. Deterioration in the firm's net worth leads the firm to be less creditworthy. So, potential lender will have a higher risk premium when the firm needs loan. On the other hand, the asymmetric information will cause cheaper internal finance of new investment than external finance. Also, the balance sheet effects express that marginal efficiency of investment curve is influenced by monetary policy and the shape of marginal efficiency of investment curve is a function of the debt-equity ratio. Theoretically, monetary policy moves both the IS and LM curves. If there is a change in the rate of return on outside money, even though this change is a riskless rate, lenders will be less enthusiastic to finance their investment with more debt. This implies two differences between the money and the lending views: Lending view focuses the distributional effect of monetary policy. Lending view also tries to explain how small changes in interest rates may have a great impact on investment (Cecchetti, 1994:5).

In the traditional monetary theory, the role of bank equity is mostly ignored. More specifically, how monetary policy affects the real economy mainly focuses on the role of reserves in determining the amount of demand deposits. Besides, the bank lending channel maintains that the supply of bank loans can be changed by monetary policy via changing bank reserves. In this side of view, reserve requirements play the crucial role

whereas bank capital and capital regulations are thought as secondary. Actually, bank capital is the basic factor in bank asset and liability management related to the risk-based capital requirements of the 1988 Basle Accord. And also, cost of loans depends on bank capital. And also, capital adequacy is critical in the monetary transmission since banks can issue nonreservable liabilities. Basically, banks can change their loan supply in reaction to shocks to their reserves. In other words, the effect of monetary policy via bank-credit channel can be explained by the supply of bank credit. If banks are able to issue nonreservable liabilities, the bank lending channel disappears. According to Van den Heuvel (2007), whenever banks confront with a shock to the value of their equity, if banks sufficiently close to the capital-adequacy, they prefer to contract potentially profitable lending (Van den Heuveli 2007:1-2). Furthermore, since banks hold short term liabilities and long-term assets, monetary policy changes will cause movement in bank equity. And also, the bank capital channel works under a non-linear situation and the potential for asymmetries in monetary transmission. So, according to bank-lending channel theory, by changing the quantity of base money, the central bank can affect the supply of credit from financial intermediaries. And cost of capital increases for bank-dependent borrowers. Besides, changing the official interest rate that is operating by the interest rate channel may deepen the effect. It is clear that there has to be dependent borrowers on banks for their external finance. For such dependent borrowers, fixed costs to direct financial market participation has a higher priority in applying bank-lending. Furthermore, banks have a higher motivation to lend when their capital is close to minimum regulation. It should be emphasized that the quantitative performance of bank lending channel partly depends on the size of the contraction in deposits for a given monetary shock. Deposits and loans with more elastic money demand will show a higher degree of variation in response to a policy shock. In this vein, a greater pool of bank dependent borrower will have a higher influence of the lending contractions on the real economy (Bean, Larsen and Nikolov, 2003:111).

Bernanke and Blinder (1992:901) added that bank loan channel is supplementary but not an alternative to the other monetary channels. They also concluded that when central bank decreases the reserve volume i.e. loans, bank credits will decline because of fall in consumer spending that leads a remarkable decline in aggregate demand. This provides with an alternative transmission channel for a central bank to affect real economy since decline in bank loans may impact real economic activities by either rationing of loans or market clearing increases on bank loans. In this process the key condition is that monetary policy impacts the level of bank loans and supply of deposits. Besides, in some models this process is controlled through aggregate supply. In both cases there are two conditions needed to be explained for lending channel: a. Banks cannot protect their loan portfolio from monetary policy changes, and b. Borrowers cannot spend independently from availability of bank credits (Ramey, 1993:3).

Related to the theoretical explanation, the operation of bank lending channel is explained under a tightening monetary policy (Erdoğan and Beşballı, 2009:29):

As expressed above, this channel is important since there are many bank dependent borrowers in the economy who try to do business with a limited source since they do not have other alternative resource than bank loans. If there is a friction in the asset-liability management, this problem immediately reflects negative influences on real economic activities through the affection of bank dependent producers. A contractionary monetary policy will cause decreasing reserves in the banking system which is supplied as loans to borrowers. This leads an increase

in risk premium of the bank dependent borrowers. This process has even more negative impact on smaller firms as they are more dependent on the bank loans than their larger counterparts and the larger firms have a greater power to reach alternative loan sources in different credit markets. So, it can be said that, the output fluctuations are the outcomes of not only interest rate changes but also external financial premium risks. A good functioning bank lending channel can be used for reverse effects of policy shocks (Çavuşoğlu, 2002:7).

Related to the cyclical terms of economies, amplification effects of monetary policy are the highest at recession terms especially when increasing interest rates impact aggregate investment through a reduction in bank lending capacity. Besides, banks cannot raise new equities, but they can increase their capital stocks by their retained earnings. So, the amplification effect of monetary policy may be also effective on banks' capital stocks through their retained earnings. (Bolton and Freixas, 2006:832-833). Actually, the degree of effectiveness of bank lending channel is dependent two factors (Erdoğan and Beşballı, 2009:29-30):

- There must not be a full substitution between bank lending and securities. Otherwise it is impossible to operate the bank lending channel since banks may prefer adjusting the amount of securities in case there is an active monetary policy that may affect their credit volume.
- There must not be a full substitution between banking lending and external financial resources. When firms need external finance, they prefer either bank lending or lending from capital markets. In order to make bank lending channel work properly, firms must prefer bank lending for their external finance. If there are alternative financial resources, the effectiveness of bank lending channel will be weaker.

B. Balance Sheet Channel Perspective

In the literature, Bernanke and Gertler (1995) explained the broader credit channel as "the balance sheet channel". Balance sheet channel perspective explains the relations between a firm's investment decisions with monetary shocks through firm's financial situation. And balance sheet channel addresses mostly borrowers' balance sheets instead of lenders'. A change in interest rates will have influences by two alternative changes on the net worth of a borrower firm: the first expected change is by affecting interest payments on debt that is not paid yet, and the second change is by affecting asset prices. While the first one affects the net profit and net cash flow of the borrower firm, the second one affects the value of assets of the firm. And even the firm's customers' spending attitudes are affected indirectly as a consequence of a monetary shock. Because of these direct and indirect effects, firm's credit worthiness, net worth and its borrowing capacity are deeply influenced (Çavuşoğlu, 2002:6).

According to broad credit channel, not only in bank credit markets but also in all credit markets credit market imperfections can be seen. So, in this channel, financial market imperfection plays the crucial role. Imperfection is the existence of the external finance premium that is the difference between cost of external finance and internal finance. As macro level, real economy is affected depending on the degree of external risk premium (Markovic, 2006:9). The borrower has full information about his position. However, lender does not have enough information about debt payment capability of borrower. This asymmetry raises the risk premium for external financing. The lender-borrower relationship is determined by a principal agent problem. Here, lender is the principal and borrower is the agent. The term "adverse selection" and "moral hazard" are the problems of asymmetric information and results in an increase in the cost of external and internal funds (Bernanke and Gertler, 1995). In this context, external funds are more expensive than internal funds because of asymmetric information and impossibility of monitoring borrowers for lenders costless.

Bernanke and Gertler (1995) also emphasized that under the financial market imperfection, credit cost for a firm increases if the firm's balance sheet deteriorates. Here, the source of the credit is not important; it can be handled from any external sources. The direct effect of monetary policy can be observed when an increase in interest rates increases the payments of the floating rate debt of the firm. The indirect impacts are observed when an increase in interest rates reduces the capitalized value of the long-lived assets of the firm. It should be underlined that lenders may look for alternative solutions to get rid of asymmetric information problem. They can apply rationing credit instead of raising credit interest particularly when they think higher interest rates will attract the poor credit risk (Zurlinden, 2005:6; Ireland, 2005:5-6).

According to credit channel theory, endogenous changes in external financial premium increases the effects of monetary policy on interest rates. Financial premium can be described as the cost difference between externally generated funds and internally generated funds. External funds are raised by issuing equity or external debt whereas internal funds are created by retaining earnings. Actually, the higher the amount of external finance premium, the greater the imperfection in the credit market. From credit point of view, a change in monetary policy results in either a raise or a lowering effect on open-market interest rates. Besides, monetary policy changes external finance premium in the same way. This effect of monetary policy on external finance premium affects the cost of borrowing and real spending and as a result activity is magnified (Bernanke and Gertler, 1995:3). However, the premium is basically related to the borrower's position. If borrower's net worth is lower, he can offer less security with a higher premium on the external funding. Decreasing cash flow will bring a smaller investment capability for the firm. At this point, monetary policy of the central bank has a crucial role in defining the worthiness of the firm and cash flow towards the firm. As an example, under a contractionary monetary policy, collateralizable assets

lose their values and this reduces the borrower's net worth, and thereby ability to invest. Micro actions of the firms turn into macro level and there will be weakening aggregate demand with lower cash flow (Zurlinden, 2005:6).

In money and credit view, process starts with the central bank. Related to the policy of manipulating either reserve requirement of the real level of reserves, the central bank alters the ability of commercial banks. Manipulating reserve requirements can be done by price rigidities, or by limited participation in financial markets. However, although the central bank distinguishes the money and the credit, these methods do not have significant effect on real reserves. From the transaction perspective, money and the all other assets are considered as assets. Reserves represent a certain amount of value since they are held for transaction deposits. If there is a decline in reserves, this process ends with decline in transaction deposits. This decline leads a raise in nominal interest rates. A rise in nominal interest rates will have many effects on the economy. In standard IS-LM model, a rise in nominal interest rates leads to rise in real interest rates which have negative impact on aggregate demand. Decreasing aggregate demand will affect real activity in the short-term thereby output declines (Ramey, 1993:2).

Banks play a special role in financial system since they deal with different types of borrower, especially the smaller firms which have higher risk of asymmetric information. Larger firms do not need banks for credit, instead they may directly access to credit markets via stock and markets. Thus, tightening monetary policy that decreases bank reserves and bank deposits will affect the system through the borrowers (Mishkin, 1995:7). A change in monetary policy can impact firm's balance sheets. Under an expansionary monetary policy *(M↑)*, there will be an increase in stock prices *(Ps↑)* which causes an increase in net worth of firms. This results in higher investment spending *(I↑)* and rising aggregate demand *(Y↑)* as a consequence of decreasing adverse selection and moral hazards like as follows (Mishkin, 2004:622):

One of the most effective imperfections that affects the lending behaviour of banks are their asymmetric cost structures in supplying external finance and evaluating and monitoring loan contracts. These differences are mostly related to size of banks. Particularly asset size brings the cost advantage/disadvantage in the banks' raising external finance. If banks do not prepare themselves to monetary shocks by their adequate liquid assets, asymmetry may cause unplanned lending responses of banks to monetary shocks. In an economy, particularly producer companies need external finance such as bank loans. Because of monetary shocks and their effect on supply of funds which are used for financing investment projects, real output is affected (Çavuşoğlu, 2002:4). As expressed below chart, contractionary monetary policy has negative effect on financial conditions with an amplification impact of monetary policy. As credit market conditions decline, investment spending and production also decline although that amplification is considered as financial accelerator effect (Georgopoulos and Hejazi, 2009:4).

V. The Exchange Rate Channel

As one of the important models of conventional open-market macroeconomic models, the chain of exchange rate channel monetary transmission runs between interest rate and exchange rates through the uncovered interest rate parity position related to interest rate differentials to exchange rate changes. An increase in local interest rates relative to foreign interest rates will cause a stronger currency (Kuttner and Mosser, 2002:17). The

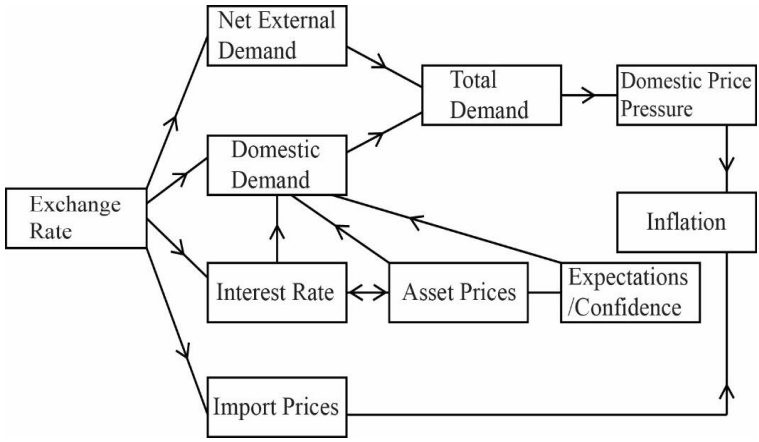
exchange rate channel also affects real output and the level of prices by changing the value of national currency and thereby net export. The level of performance of exchange rate channel is highly dependent on the degree of the openness of the economies. Besides, floating exchange rate regime increases the effectiveness of the exchange rate channel. Any change in monetary policy decisions will cause a movement on output and import goods' prices through exchange rates (Erdoğan and Yıldırım, 2008:96). When domestic interest rates increase, domestic currency deposits become more profitable relative to deposits in foreign currencies. So, there will be a rise and appreciation in local currency deposits comparing to other currency deposits. As the value of domestic currency rises, domestic goods become more expensive than foreign goods which causes a fall in net export *(NX)* and in aggregate output *(Y)* (Mishkin, 1995:5).

For example, if monetary policy has an impact on short term interest rate, short-term interest rate will have effect both on exchange rate and the long-term interest rate. These impacts will cause changes in nominal exchange rates and interest rates that in turn affect real exchange rates, real interest rates and GDP. And also, after a while wages and goods prices adjust themselves and real GDP turns to normal level. In the long term however, real interest rates and real exchange rates turn to their first levels. In short, process is from short term interest rates to exchange rates and then long-term interest rates, and finally to inflation and real GDP. Exchange rate monetary transmission process is not liner but circular. When a monetary transmission process ends with change in GDP and inflation, the process goes back to the beginning to the short-term interest rate by a reaction function (Taylor, 1995:13-14).

Below, in Figure-4, exchange rate channel is explained. As a result of changes in the relative price of domestic and foreign currency, there will be change in exchange rate. As a circu-

lar process, change in exchange rate will result in changes in the relative prices of domestic and foreign goods. These changes are perceived as price fluctuations and they can create an impact on amount and pattern of spending in the local economy (Chow, 2004:7).

Figure-4: Exchange Rate Transmission Channel Process



Source: Chaw, 2004:7

If there is an exchange rate appreciation, this movement will cause a decline in the prices of imports which results in losing the competitiveness power of domestic goods. This change leads increasing consumption and expenditure of foreign products. Besides, an appreciation of the local currency will also negatively affect the competitiveness of domestic products of exports as the prices of local goods will be more than their foreign counterparts. Continuing decline in export may lead to the deterioration in the trade balance. Moreover, if the economy has a remarkable level of debt which is denominated in foreign currency, an exchange rate appreciation will cause a raise of debt. If the monetary authority cannot make complete sterilization of its interventions in the foreign exchange market, any change in the exchange rate related to policies will cause a change in the supply of local currency which will induce the

movements in the interest rates. For instance, if monetary authority sells foreign currency and buys local currency for exchange rate appreciation, there will be a shortage of local currency in the market. This will result in increasing interest rates. Since the interest rate shows the opportunity cost of preference of postponement of expenditures, depositors must postpone current consumption and investment spending to a later date. Actually, the higher the interest rate, the less profitable the investment projects because of increasing credit costs increasing return of savings (Chow, 2004:7-8).

Mundell (1963:490) researched the effect of a market purchase of domestic securities under a flexible exchange rate system. Such a transaction leads an increase in bank reserves, a multiple expansion of money and credit level, and decreasing pressure on interest rates. However, interest rate level does not fall too much because of an outflow of capital. This outflow causes a deficit in the balance of payments and a decline of exchange rate. Depreciation on exchange rate increases trade volume and by multiplier effect stimulates income and employment. When income level increases enough to induce domestic people to hold the expended stock of money created by the banking system, there will be a new equilibrium point in the market. In the new equilibrium point, private savings and taxes will increase as a result of increase in income. Equilibrium in the capital market also requires equilibrium between the rate of capital exports and the sum of net private lending and debt requirement. This equilibrium will bring a balance of trade surplus. So, it is clear that monetary policy has a strong effect on income and employment. The reason behind it is not only altering rates of interest but also because of inducing capital outflow, depreciation of exchange rate thereby causing an export surplus. Furthermore, capital mobility has a strong effect on short-term interest rates and the exchange rate which is called the interest rate parity relationship. This parity expresses that the interest rate differential between two countries equals to the expected rate of change in the exchange rate between

these countries. According to this equation, if central bank increases the short-term interest rate, the exchange rate has to rise in order to satisfy the expectation of an exchange rate decline can be equal at home and abroad (Taylor, 1995:16).

VI. Asset Price Channel

One of the basics of transmission mechanisms of monetary impulses is the asset market. Mishkin (2005) pointed six channels that a monetary policy change directly and indirectly affects the housing markets: User cost of capital, expectations about the changes of house prices, housing supply, wealth effects related to house prices, balance sheet credit channel effects on consumer expenditures and balance sheet credit channel effects on housing demand. Related to these alternative factors, it can be said that asset price channel describes the affection process of central banks by monetary policies on target parameters of asset prices. There are two sub-channels of asset price channel: Stock price channel, and housing price channel. Under housing price channel, there are land price and housing price channel (Yıldırım and Erdoğan, 2014:20).

Similarly, Meltzer (1995) expressed that as one of the transmission models asset price changes play a critical role in monetarist description of the transmission mechanism. Keynesian model basically takes its roots from movements in the short-term nominal interest rates whereas monetarists claim that monetary policy changes affect prices of a wide range of markets such as durable goods, equities and real estate. These asset price changes also result in great wealth effects that impact spending, aggregate output and employment (Ireland, 2005:4-5). In explaining monetary transmission mechanism and asset price channel, Tobin has a crucial role. Tobin q theory of investment and wealth effects of consumption are important in explaining monetary transmission mechanism. In the monetary transmission mechanism, Tobin q theory brings a monetary policy mechanism that impacts the economy through its effects on the

valuation of equities. In the theory, q stands for the market price of firms / the replacement cost of capital. (Tobin, 1969). Tobin q theory explains a mechanism that monetary policy influences the economy by its investment and wealth effect on consumption. It is clear from the equation that as q increases, market value of the firm increases relative to cost of capital. In other words, if q (the rate) is high, the market price of the firm is high relative to the market value of firms. This rise leads companies to issue equity and get higher price for their company relative to the cost of the firm and equipment they buy. Thus, firms can issue equity and they can get higher prices for them with respect to the cost of the plant and investment goods they have to pay. This will bring more investment spending since firms will be able to buy more investment goods with a small issue of equity. Since smaller issue of equity will bring higher return, firms have a budget for investment spending. Contrary, if q is low, firms will have a limited budget to spend on new investment goods since the market price of firms will be low relative to cost of capital.

Consequently, investment spending will be lower. In certain cases, firms prefer to get capital even though q is low. In this case they can buy another cheap firm and acquire old capital so that investment spending will be lower. It is clear that there is a relation between Tobin q and investment spending. If central bank reduces interest rates, the expected profit level will be higher for the firms. Also, fixed income alternatives will be less profitable for them. Under this condition, the demand for equities rises. Increasing demand also brings rise in prices of equities. In order to combine Tobin q, investment spending and equity price, it will be a good start to analyse how monetary policy can affect equity prices. When there is a tightening monetary policy, there will be less amount of money in the market than needed. So, to compensate the in equilibrium, they prefer to spend less. Spending less in stock market will bring decline in demand to equities and as a result their prices will decline. This is a monetarist perspective. A more Keynesian

perspective also reaches to the same result since there will be a higher interest rate because of tightening monetary policy *(M↓)* which makes bonds more attractive comparing to equities. This preference leads falls on equity prices *(Pe↓)*. As a conclusion, under a contractionary monetary policy, equity prices will be lower which leads a lower level of q and thus a lower level of investment spending *(q↓, I↓)*. As a conclusion, q directly affects the investment decisions which stimulate investment expenditures and output (Poddar, Sab and Khachatryan, 2006:6; Mishkin, 1995:6).

Equity prices cause an alternative channel for monetary transmission channel through wealth effect on consumption. This approach takes its roots from Modigliani's life-cycle model. According to Ando and Modigliani (1963), households' total wealth is the basic determinant of consumption tendency. The authors explained this approach by life-cycle consumption model. According to life-cycle model, consumers decide their consumption spending by their lifetime resources which are the combination of human capital, real capital and financial wealth, mostly common stocks. At this point, the relationship between wealth and monetary is as follows: If there is a change in interest rates because of monetary policy, it will reflect to also the asset prices. The prices of long-lived assets such as stocks, bonds and real estates will decrease because of an increase in policy-induced interest rates. the value loss of assets of households will lead reduction in consumption (Kuttner and Mosser, 2002:16). Higher interest rates will affect the demand of bonds since they will be more attractive relative to equities. Increasing demand towards bonds will bring decreasing equity prices. This decrease will affect Tobin's q negatively and firms will be discouraged of new investments. Besides, the decline in stock prices will lead reduction in individuals' financial wealth. And

also, it will increase financial distress which will result in a decline in consumption spending.

Furthermore, increasing interest rates also cause a decline in asset values. This will deprive the individuals from borrowing particularly when assets such as houses, and land are used as collaterals for loans. Firms also have the same problem as bank loans to firms are secured on assets. A fall in asset prices will cause a reduction of net worth of the firm which discourages the firms from borrowing for investment spending (Chow, 2004:8-9). Related to this theory, when policymakers start to implement a contractionary monetary policy *(M↓)*, stock prices decrease *(Pe↓)*, the value of financial wealth fall *(W↓)*, thereby lifetime resources decrease. This leads decrease in consumption (↓), and output will decrease *(Y↓)* (Mishkin, 1995:6).

Transaction and information costs are cheaper than cost of changing consumption or investment in durables. In other words, if there is uncertainty whether impulses are permanent or transitory, asset markets react quickly. In an open market, as an impulse, central bank operation may have a contrary effect on the stocks of base money and securities. Purchases in the open market leads an increase in the base and reduces the stock of debt that belongs to banks or the public. Contrary, sales in the open market decreases the base and increases the public's debt holding. However, changing the base and the stock of securities have different effects on asset price levels and interest rates. These effects are reflected to the output market. And even short-term markets respond depending on the deficit finance. According to standard IS-LM analysis, controlling the interest rates will lead central bank to offset random changes in the money demand. So, by providing the monetary base respond to the changes in money demanded, interest rate targeting omits portfolio and output market. This approach is not accepted by

monetarists. If there is an increase in money demanded, the attitude of the central bank is critical. If the central bank fixes the interest rate to initial value of interest rate, money stock increases as a response to increase in money demanded (Meltzer, 1995:54). Monetary policy also has a clear effect on industry. The changes in the financial parameters of firms at a certain industrial sector as a whole will lead impact on the industry's output. In other words, in an industry, financial characteristics of firms have an enormous power on the level of impact of monetary policy (Georopoulos and Hejazi (2009:3).

VII. Expectation Channel

As monetary transmission mechanism analysis consists of both forward-looking and rational economic attitudes, the expectation channel is considered as one of the fundamental channels for a good-working monetary transmission mechanism. This channel is mostly applied in developed countries which have deep and well-functioning financial systems. Any change in expectation directly affects the medium term and long-term interest rates. Inflation expectation has effects on two factors: the first one is that inflation expectation affects the real interest rates and on nominal interest rates. The second one is that inflation expectation may affect prices and wages. Because of inflation expectation, prices and wages move upward. And also, a change in monetary policy may also affect inflation expectations and future course of real economic activities (Davoodi, Dixit and Pinter, 2013:15-16).

Conclusion

It is a fact that different monetary policy transmission mechanisms have power to affect real variables of an economy. Interest rate channel, credit channel, bank lending, asset price channel, exchange rate channel are the different alternatives of monetary transmission mechanism. However, the level of effectiveness may be different in different economies depending on the level of openness, degree of financial debt and frictions in the

economy. In this context, there may be some critical inference for monetary policy (Mishkin, 2004:626-627):

1. ***For tightening or expansionary monetary policies, it is not suggestible to always apply short-term nominal interest rates.*** Whenever necessary, most of the central banks prefer to rise or fall short-term nominal interest rates, mostly interbank rate, as the basic instrument of monetary policy. At this point, short-term nominal interest rates become the most important indicators for central banks. Actually, this is a problematic situation since changes in nominal interest rates do not always need to be related to real interest rates.
2. ***Not only short-term debt instruments but also other asset prices may give information about the performance of monetary policy.*** Other assets prices such as foreign exchange rates, stock prices, and housing and land prices have strong power on the effectiveness of monetary transmission mechanism both for Keynesians and monetarists. Furthermore, exchange rate channel, Tobin q and wealth effects explain why other assets have that importance in the performance of monetary transmission mechanism.
3. ***Although short-term interest rates are almost zero, monetary policy still can be highly effective for a weak economy.*** Even though short-term interest rates are almost zero, expansionary monetary policy can be operated by open market purchases. As an example, just like purchases of government bonds, purchases of foreign currencies will lead an increase in the monetary base and cause an increase in money supply. Increase in liquidity may raise general price level expectations. Parallel to this process, by increasing the prices of other assets the system can stimulate aggregate demand.
4. ***A good monetary policy should have an objective of avoiding unpredictable price fluctuations.*** So, price stability should be the primary long-term goal for good monetary policy.

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