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A theoretical investigation on real sector reflection of the change in monetary policy decisions

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Abctract. The aim of this study was to make evaluations on monetary policy transmission channels. A change in monetary policy is reflected on the economy not only through a single channel but also through the functioning of more than one transmission channels together. In this study, the conceptual framework of monetary policy transmission channel was examined through various aspects of the interest channel, credit channel, exchange rate channel, asset price channel and expectation channel, that are among the transmission types, and the reflections of the these transmission channels on the real sector were evaluated.
Keywords. Monetary policy, Monetary transmission channels, Interest channel, Credit channel, Asset price channel, Exchange rate channel, Expectations channel.
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1. Introduction

The decisions taken by the Central Bank through monetary policy instruments affect the real economy. When the practices of the countries are considered, it is observed that the Central Bank uses short-term interest rates in order to affect the real economy. Whenever the Central Bank makes a change in overnight interest rates, the effect of this change on output and inflation takes place through monetary policy.

The aim of this study was to make evaluations regarding monetary policy transmission. The reflection of a change in monetary policy on the economy is achieved not only by one channel but by the cooperation of more than one transmission channel. In the study, the conceptual framework of the monetary policy transmission channel, and the interest channel, the credit channel, the exchange rate channel, the asset price channel and the expectation channel, that are among the transmission types, were examined in various aspects and the real sector reflections of the these transmission channels were evaluated.

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2. Conceptual framework of monetary policy transmission channels

Although many economists in the monetary policy literature acknowledge the neutrality of monetary policy, there is a serious consensus that it affects real economic activity in the short-term. However, there is no consensus on the process that the monetary policy affects the economy. The process that the changes in money market decisions affect the changes in real output and inflation is expressed with the concept of the monetary transmission channel (Boughrara, 2003: 3).

While the monetary transmission mechanism, which explains the effects of monetary policy implementations implemented by the institutions authorized to carry out monetary policies on macroeconomic indicators such as total production, employment and general level of prices, was covering the effects of monetary policies only on aggregate demand and aggregate production in previous implementations, today's implementations also cover its effects on overall price level (Atgür & Altay, 2018: 602).

There are many factors that affect the monetary transmission mechanism. These are as follows (TCMB, 2013; 7-8);

- The decisions and measures that are taken by the authorities regarding the operation of the market; the interest rate controls and the credit facilities,
- The changes in short-term interest rates that the Central Bank is able to affect directly regarding the structure of the financial system and the sensitivity to the interest rates affecting consumer decisions,
- The structure of the financial system and the efficiency of the markets,
- The financial situation of the banking system, which determines the supply and cost of bank loans,
- In an economy, in which there is no capital controls, the capital movement is determined based on the effectiveness of the monetary policy, the exchange rate regime applied in the country and the degree of substitution between domestic and foreign financial assets and the effectiveness of monetary policy depends on the degree of substitution.

The structure of the financial system and the number of instruments in the financial system directly determine the functioning of the monetary transmission channel. The fact that the existence of a few institutions in the financial system provides the institutions in the system monopolist power makes it difficult to present alternative financial instruments. In the event that the financial system is shallow and there is no financial diversity, the asset price channel is difficult to operate (Loayza & Hebbel, 2002: 8).

The size of the economy and openness determine the power of monetary policy to affect interest rates and thus determine directly the monetary transmission process. The process that the monetary policy influences the real economy varies in small economies and open economies (Loayza &

Hebbel, 2002: 9). There are many studies examining the country data of the monetary policy transmission channel. It is possible to see that country conditions are effective in these studies (Anmari & Eyden, 2012).

The monetary policy instruments implemented by the central banks are also important factors affecting the functioning of the monetary transmission mechanism. The general practices regarding the selection of monetary policy instruments have changed over time in compliance with the economic changes and changing conditions, and whereas the central banks in many developed countries chosen the variables such as reserve amount or monetary base as the policy instruments in the 1970s and 1980s, they have preferred the interest rate since the 1990s. Since the 2000s, the diversity of monetary policy instruments has increased and especially after the 2008 global financial crisis, different policy instruments have been introduced. Although the policy decisions implemented by the Central Banks operate through different channels, it is not possible to distinguish the transmission channels from each other with the precise lines because they affect or complement each other indirectly (Sever, 2018: 46).

3. Theoretical framework of monetary policy transmission channels

According to the Classical Quantity Theory, monetary changes affect only the price level, not the real sector of the economy in the long run. This interaction is also described as a direct transmission mechanism. The fact that only the amount of money has been used as the transmission variable and that the interest explaining the real effects is not taken into consideration constitutes the criticized aspects of the direct transmission mechanism. According to the Keynesian view, the most important instrument of monetary policy is interest rates. The monetary policy implementations are effective on the demand to the extent that it can affect interest rates, and the transmission mechanism operates through the interest Channel. According to this view, monetary policy changes first the interest rates, and the changes in interest affect the investments. Since the transmission mechanism operates indirectly through interest, this view is also referred to as the indirect transmission mechanism. In the Monetarist view, the transmission mechanism operates in such a way that the increases in the money supply affect the real economy and prices by changing the composition of the assets in the portfolio (Cengiz, 2009: 227).

In the economic literature, the transmission mechanism of monetary policy tries to explain which variables are affected and to what extent they are affected upon the changes in interest rates. The effectiveness of monetary policy implementations is possible with the implementation of the right policies at the right time by the monetary policy practitioners. At this point, the implementation of monetary transmission mechanisms becomes very important for the economy. The transmission mechanisms, which include different transmission channels, are critical to the success of

monetary policy and in order to achieve policy goals defined by monetary authorities, a standard monetary policy has basic tools, short-term and medium-term goals and expectations (Gedikli, 2017: 475-476).

4. Main monetary policy transmission channels

The process in which a change in monetary policy decisions affects the level of output is expressed by the concept of monetary transmission. The interest channel, credit channel, asset prices channel, exchange rate channel and expectations channel are the main monetary transmission channels. Monetary policy transmission channels will be dealt with by considering the processes adopted by the relevant studies.

4.1. The interest channel

The interest channel, which is the most traditional monetary policy transmission channel in monetary transmission mechanisms, is also referred to as the Keynesian standard monetary transmission channel. The monetary authority is effective on the total demand in the economy by changing the marginal cost of borrowing money through the interest channel, which refers to the process of a change in monetary policy decisions affecting interest rates and, thus, total demand, by having effect on (TCMB, 2013: 5);

- The cash flows and consumption preferences of consumers,
- The investment and spending decisions of the producers.

The interest channel of monetary policy has been on the agenda of economic literature for more than fifty years. It is possible to reach the explanations about the interest process in the explanations about basic Keynesian. Assuming a contractionary monetary policy exists, the effects of this policy implementation on the real economy can be expressed in the framework of the traditional Keynesian model as follows (Mishkin,1995: 4):

$$\mathbf{M\downarrow \rightarrow i\uparrow \rightarrow\ I\downarrow\ \rightarrow Y\downarrow}$$

Here, the variable M represents a contractionary monetary policy i represents the real interest rates, while I shows the investment expenditures and Y the output. In this model, an increase in real interest rates happens due to the implementation of a contractionary monetary policy. This increase will raise the cost of capital, and thus, since the increase in capital cost will decrease investment expenditures, which is a component of total demand, reducing total demand. The contraction in total demand will lead to a decrease in output.

The interest channel includes the IS-LM model based on the Keynesian view. The IS-LM model was first expanded by Hicks and then by other economists to compare Keynes' views with those of traditional economists. For example, when the money supply expands, interest rates fall, while the falling interest rates stimulate consumption expenditures as well as the

investments. According to the Keynesian view, only investments are stimulated (Güney & Alacahan, 2012: 4).

Since the changes in monetary policy channels will affect the consumption channels by changing the cost of capital, it will directly affect the demand for credit and other financial resources (Boughrara, 2009: 3). The change in the short-term interest rate made by the monetary authority and the expansionary or contractionary monetary policies implemented in interaction with other transmission channels affect the real markets. Thus, the monetary authority directs the spending, saving and investment behaviors by influencing the decisions of the economic units through the interest channel and, consequently, the consumption and investment expenditures determine the mobility of the economic activity and the demand.

4.2. The credit channel

In recent studies, the classical Keynesian transmission mechanism has been criticized for the credit channel of the monetary transmission mechanism; because this channel completes the conventional money channel. The credit channel stimulates the standard interest effects of monetary policy on real economic activities. A well-functioning credit channel affects not only general interest rates but also the size of external financing premiums (Gedikli, 2017: 475-476). There are two basic monetary transmission mechanisms in the credit market. These are the bank lending channel and the bank balance sheet channel.

4.2.1.The bank lending channel

Among the channels influencing economic activities of the monetary authority by making changes in monetary policy decisions, directing the relationship between short-term interest rates and bank interest rates is one of the issues that have attracted the attention of monetary policy experts. The level of reflection of changes in short-term interest rates that can be directed by the central bank on the credit and deposit rates of banks reveals the degree of impact of monetary policy on total demand (Gedikli, 2017a: 25). The impact capacity of short-term interests on bank interests determines the monetary authority's power to drive the demand level.

Monetary policy channels affect the credit supply of the commercial banks. The effect of the credit supply of commercial banks by affecting the external financing premium of the Central Bank is expressed as the concept of bank lending channel (Bernanke & Gertler, 1995: 40).

The effective functioning of the bank lending channel on the markets depends on the existence of two basic conditions (Erdoğan & Beşballı, 2009: 29-30);

- *Lack of perfect substitution possibility between bank credit and securities:*

In case of perfect substitution between these two variables, which exist within the asset side of the bank balance sheets, the functioning of the lending channel is not possible. The banks, in case of a monetary policy implementation by the central bank that will affect the credit volumes, may

react to that by adjusting the amount of their securities in their balance sheets. Therefore, the effective functioning of a contractionary monetary policy implemented by the monetary authorities depends on the fact that the banks decrease the credit supply and that the perfect substitution between the bank loan and the securities in the portfolio does not exist. In case of perfect substitution, banks may prevent the implementation of a contractionary monetary policy to reduce the credit supply by selling the securities in their assets.

- *Lack of perfect substitution between the bank loan and non-bank financial resources:* The firms operating in the real sector mostly meet their financing needs from bank credits or by borrowing from the capital markets. The effective functioning of the lending channel as a result of the policies implemented by the monetary authorities is possible by the fact that the companies have used the bank credit as the main source of external financing. On the other hand, if the bank loans have a low share in external financing sources and alternative financing opportunities are available effective functioning of the lending channel is not possible.

As is seen, in order for the monetary policy to affect the real economy through the bank lending channel, the opportunity of firms to access alternative financial resources is determinant. When they have external funding opportunities in capital markets instead of bank credits, the functioning of the bank lending channel will be affected (Egert & Macdonald, 2006: 18).

4.2.2. The bank balance sheet channel

The Bank Balance Sheet Channel, which is one of the effects of the monetary policy implementations of the Central Bank on the economic units, expresses the potential impact of the change in monetary policy decisions on their balance sheets and income statements that include net wealth, cash flow and liquid assets expressing the financial worthiness of the borrow requesters (Bernanke & Gertler, 1995: 29).

The balance sheet channel of the monetary policy arises from the fact that the change in the monetary authority's decisions affects both the market interest rates and the financial position of the borrow requesters both directly and indirectly. When it is assumed that a contractionary monetary policy is followed, the impact on the balance sheets of borrow requesters will arise in two ways. First, if the economic units have short-term or floating-rate debt stock, an application that will raise interest rates reduces the firm's cash flow while directly increasing its interest burden. Therefore, the interest rate shock will lead to declining in the projected sales in the future and weakening of the financial position of the economic units. The second effect is that the increase in interest rates will contract the value of the collateral of the borrow requesters by reducing the asset values. Decreasing the creditworthiness of financial and non-financial firms will trigger contractionary tendencies in the economy (Erdoğan, 2011: 24-25).

4.3. The exchange rate channel

Since the real interest rates are the determinant of the capital flows to a country, the interest rate changes made by the monetary authorities affect aggregate demand by playing an effective role also in the exchange rate within the monetary transmission mechanism.

Contractionary or expansionary monetary policies implemented by monetary policy authorities have effects on exchange rates through monetary transmission mechanism and have consequences on real markets.

This is the basic idea behind the exchange rate channel: The implementation of a contractionary monetary policy has the effects of decreasing exports and lowering inflationary pressures by leading to appreciation of the national currency. The reduction in inflationary pressures happens due to relatively low import prices. The point should be emphasized is that the functioning of the exchange rate channel, which is one of the main channels of monetary policy, depends on the fact that the economy is an open economy. In other words, as the level of openness of the economy increases, the functioning of the exchange rate channel becomes simpler (Boughrara, 2003: 5-6).

When contractionary monetary policy is implemented, the increase in real interest rates encourages capital inflow by creating an appreciation trend in the national currency. The appreciation of the national currency leads to a decrease in foreign prices resulting in, however, relatively high prices in domestic goods and services, and thus, the increase in imports and the decrease in exports. The decline in net exports means a decrease in total demand. The change in relative prices due to the appreciation of the national currency causes the imports made with low prices, domestic prices lower, thus, shrinking total demand total and decreasing output. On the other hand, the decline in production costs due to the appreciation of the national currency promotes the increase in production in the economies whose production is mainly based on imported intermediate goods (Erdoğan & Yıldırım, 2008: 96-97).

When an expansionary monetary policy is implemented, since the real interest rates will decrease in an economy with monetary expansion and, in this situation, the profitability rate will be low for portfolio investors, capital outflow from the country will be observed. Capital outflow and a decline in the value of the national currency will result in an increase in net exports and, therefore, an increase in aggregate demand.

The main reason why interest changes as a result of contractionary or expansionary monetary policy practices affect the aggregate demand by playing an effective role also in the exchange rate within the transmission mechanism is that real interest rates are the main determinant of portfolio investments made in the country.

The effectiveness of the exchange rate channel depends primarily on the sensitivity of the exchange rate to monetary policy. The magnitude of the response of the exchange rate to monetary policy decisions will also increase the degree of how much export, production, and prices are

affected by the exchange rate. The degree of openness and size of the economy is another factor determining the importance of the exchange rate channel (Cengiz, 2009: 234-235).

4.4. The asset price channel

The main parameter in the functioning of asset price channel is that individuals' wealth is considered to be the main variable that determines the consumption. The effect of a change in interest rates on investment decisions of capital owners by affecting the value of long-term investment instruments is expressed as the asset price channel (Kuttner & Mosser, 2002: 16).

The changes in the interest rates made by the central banks also affect the prices of different types of assets. The asset price channel operates as a transmission channel that plays a role in asset prices because of the reflection of increases and decreases of real and financial asset prices reshaped due to the changes in interest rates to the expenditures in the economy, thus, leading the changes in production.

The effects of monetary policies implemented by the central banks on aggregate demand can be further strengthened by economic units' response to changes in the prices of financial assets and the changes in balance sheets. The changes in interest rates and a decrease in asset prices cause households and firms to find it difficult to pay their debts or to think that it will be difficult to pay their debts, resulting in a decrease in the total production level and therefore in total income. As a result of this situation happening in economic activities, the cash flows of households and firms weaken, which makes them more vulnerable to financial difficulties. As a consequence of this, economic units may reduce their borrowing and expenditures and strengthen their balance sheets. This situation leads to a decrease in the aggregate consumption tendency (Yıldırım & Mirasedoğlu, 2015: 109-110).As is seen, due to the changes in interest rates, asset prices are affected and this situation is effective on aggregate demand and production. The impact created by the asset price channel can be monitored through the Stock Channel and the Housing Prices channel.

4.4.1. The stock exchange price channel

There are two important asset price channels in the monetary transmission mechanism. These are: Tobin Q Theory, which is accepted within the stock exchange price channel and is an important transmission mechanism, and the Wealth Effect on Consumption. Tobin's Q theory is a mechanism that creates an impact on the value of assets through monetary policy. While suggesting that the changes in the market value of firms due to changes in stock exchange prices may affect the investment level, in the theory, the relationship between monetary policy and investments is established based on stock exchange prices. If Tobin Q value, which is defined as the division of the market value of firms by the cost of capital, is high this indicates that the market value of firms is higher than capital cost. In this case, the firms can set higher prices above the cost of investment

goods that they will buy with the income they made with the equity issuance. Thus, the investment expenditures will increase as the firms will buy more investment goods with less equity issuance. Because of these developments, investment and production will increase as the market value of the firms will increase compared to the cost of the firm (Örnek, 2009:106-107).

The mainstay of the wealth effect on consumption channel, which involves the change in consumption expenditures because of the stock exchange prices affecting the level of wealth, in the monetary transmission mechanism is Modigliani's life-cycle income hypothesis. The hypothesis suggests that the consumption expenditures are determined by lifelong resources consisting of human capital, real capital and financial wealth. In financial wealth, the stocks exchange have an important place. The changes in stock exchange prices due to the monetary policy implementations affect consumption expenditures. When stock exchange prices rise, there is an increase in the value of financial wealth and lifelong incomes of the consumers and, thus, consumption expenditures increase (Cengiz, 2009: 232).

With this mechanism called the wealth effect, rising asset values stimulate aggregate demand by creating an upward trend in expenditures in the economy. Otherwise, a slowdown may be experienced in aggregate demand.

4.4.2. The housing price channel

The Central Bank's interest rate decisions also have an impact on house prices. When a change in monetary policy decisions is made by the monetary authority by evaluating the economic conditions, the reflection of this policy change on house prices is expressed by the concept of house prices channel (Erdoğan *et al.*, 2017: 856).

As a result of the expansionary monetary policy implementations, increasing the housing prices compared to housing prices replacement costs, the increase in Tobin Q value will stimulate housing construction. When Q is greater than one, the market value of the company will be relatively higher than the replacement cost of capital. Thus new investments become cheaper for the company's data market value. Investment expenditures and aggregate demand will increase as the company will buy investment goods by selling stocks at higher prices. Another effect of expansionary monetary policy arises through household wealth. Increasing housing prices will increase household wealth, thus, consumption expenditures. Increasing investment expenditures, on the one hand, and increasing consumption expenditures, on the other hand, will increase the aggregate demand and, ultimately, the output (Erdoğan & Yıldırım, 2014: 20-21).

The direct and indirect effects of short-term interest rates on the housing market and economic activity can be analyzed in four different ways (Erdoğan *et al.*, 2018: 359-360):

- *Direct Effects on Housing Expenditures*: Since long-term interest rates relate to short-term interest rates, long-term interest rates tend to increase when short-term interest rates increase. The decrease in capital asset demand causes a decrease in investment expenditures for these assets and this leads to a decrease in aggregate expenditure and demand.
- *Expected Value Increase of House Prices and Interest Rate Effects:* Interest rates increase after a contractionary monetary policy. This leads to an increase in the cost of capital utilization through the transition mechanism and housing prices fall due to the decrease in housing demand. Since the expected real appreciation of housing prices has decreased due to future contractionary monetary policy expectations, the cost of capital utilization will increase and the demand for housing and housing construction will decrease.
- *Effects of Interest Rate on Housing Supply:* The low short-term interest rate leads to a fall in mortgage interest rates; housing prices increase to maintain supply and demand balance. As a result of this process, since the transaction costs of housing collaterals increased the lenders allow credit-restricted consumers to borrow more.
- *Wealth Effect of Housing Prices on Consumption:* Major housing price movements have significant macroeconomic impacts, affecting net wealth and borrowing and household spending capacity.

4.5. The expectations channel

The expectations channel is the transmission channel that operates through the changes expected to be experienced in the economic conditions by the economic units in future periods. As long as the confidence that the central bank will create regarding the price stability in the economy provides economic units with an idea on future inflation, it will affect the developments that may arise in the prices. In order for the Central Bank to create the positive impact it aims at the markets by sharing the policies it will implement in line with the principle of transparency, the economic units should believe that the policies to be implemented will be successful. The expectations of short-term interest rates of the monetary policy decisions to be implemented and the transfer of these developments to the market are effective in determining the medium and long-term interest rates as well (TCMB, 2013: 6-7).

The impact of the monetary policy, which has the power to influence the expectations and confidence regarding the future of the economy, in the markets through the expectations depends on the overall conjuncture of the economy, the credibility of the Central Bank and, most importantly, the effective implementation of the principles of independence, transparency and reliability of the Central Bank. It is important that the Central Bank establishes confidence in the economic units in order that the implemented monetary policy does not create undesirable effects on the expectations.

5. Conclusion

It is seen that the change in money market channels affects macroeconomic indicators through different channels. The functioning of these channels is related to the effectiveness of monetary policy decisions. The power of monetary authority to affect the real economy decreases depending on the parameters such as political instability in the economy, inadequate development of the financial system, weak macroeconomic fundamentals, and unreliability of monetary authority.

The main prerequisite for the Central Bank to influence the real economy through monetary policy instruments is the elimination of the uncertainty regarding macroeconomic indicators, strengthening of the sectorial predictability, and improving the institutional quality of monetary authority within the framework of transparency and accountability principles. On the other hand, the strengthening of the banking system and the elimination of public imbalances that trigger financial dominance will increase the power of monetary authority to influence the real economy and the power of managing the expectations of economic actors by increasing its credibility.

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