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TRANSMISSION MECHANISM OF MONETARY POLICY: THE CASE OF TURKEY

Abstract:

Central Banks use monetary policy tools in order to reach such ultimate aims as enabling price stability, stabilizing output gap and increasing employment. The effects of monetary policies applied in accordance with the business cycles on the mentioned macroeconomic variables are realized by means of monetary transmission channels. The analysis of monetary transmission mechanisms indicating the macroeconomic outcomes of the change in the monetary policy tools is of high importance in terms of these policies' efficiency. This study examines the efficiency of monetary transmission mechanism in Turkey for the years between 1995:01-2018:11 by using the Toda-Yamamoto causality test.

Keywords:

Monetary Policy, Monetary Transmission Mechanism, Toda-Yamamoto causality test

JEL Classification: E52, E40, E50

1. Introduction

In recent years, the effect of monetary policy on macroeconomic variables has been researched theoretically and empirically by economists to a great extent. With these monetary policy applications, the transmission mechanisms enabling interaction among such macroeconomic variables as product level and inflation have gained importance in this regard. While the monetary policy has different purposes such as full employment and economic growth, the main purpose of the central banks today is to enable price stability. In this regard, it is possible to mention that monetary policies focus on combatting with inflationary and deflationary gap. In addition, it is required to consider the effect that the combat with inflation will create on the output with regard to the success of the applied policy.

According to Keynesian theory, an expansionary monetary policy in a deflationary process leads to increase only in products while the general price level does not change. Monetary expansion increases total product by increasing consumption and investment expenses through interest channel. After economy reaches total employment, an expansionary policy will only increase inflation and the product level will not change. According to modern theories of money, the expansionary monetary policy may increase price's general level even in the deflationary period. The increase in product level will be relatively less. The previous inflation experienced especially in developing countries, such factors as the reliability of the Central Bank or insufficient depth of the financial market may cause the monetary policy's inflationary effect even in the short term to become more obvious than its effect on product increase (Kamin, Turner, Van't dack, p.8).

This situation is the result of the economic structure that has been changing and getting complex, which requires the transmission mechanism to be analyzed in detail. Depending upon the changing economic structure, the transmission channels of the monetary policy diversify. In order to enable price stability in free market open economies, it is required to manage total demand with different channels. In this study, the efficiency of monetary transmission channels in Turkey has been analyzed by means of Toda-Yamamoto causality test. In the second part of the study, the channels of monetary transmission mechanism have been examined. In the third part, the development process in transmission channels and monetary policies in Turkey has been discussed. Literature review is included in the part four. The fifth part has focused on the obtained data on explanatory variables and Toda-Yamamoto model while the sixth part has focused on the findings of the analysis.

2. Channels of Monetary Transmission Mechanism

The main problem in Monetary Transmission Mechanism is to put forth the relation network between monetary policy actions of the Central Bank and the macroeconomic results it aims to reach (Aslan, 2009:585). ECB defines the monetary transmission

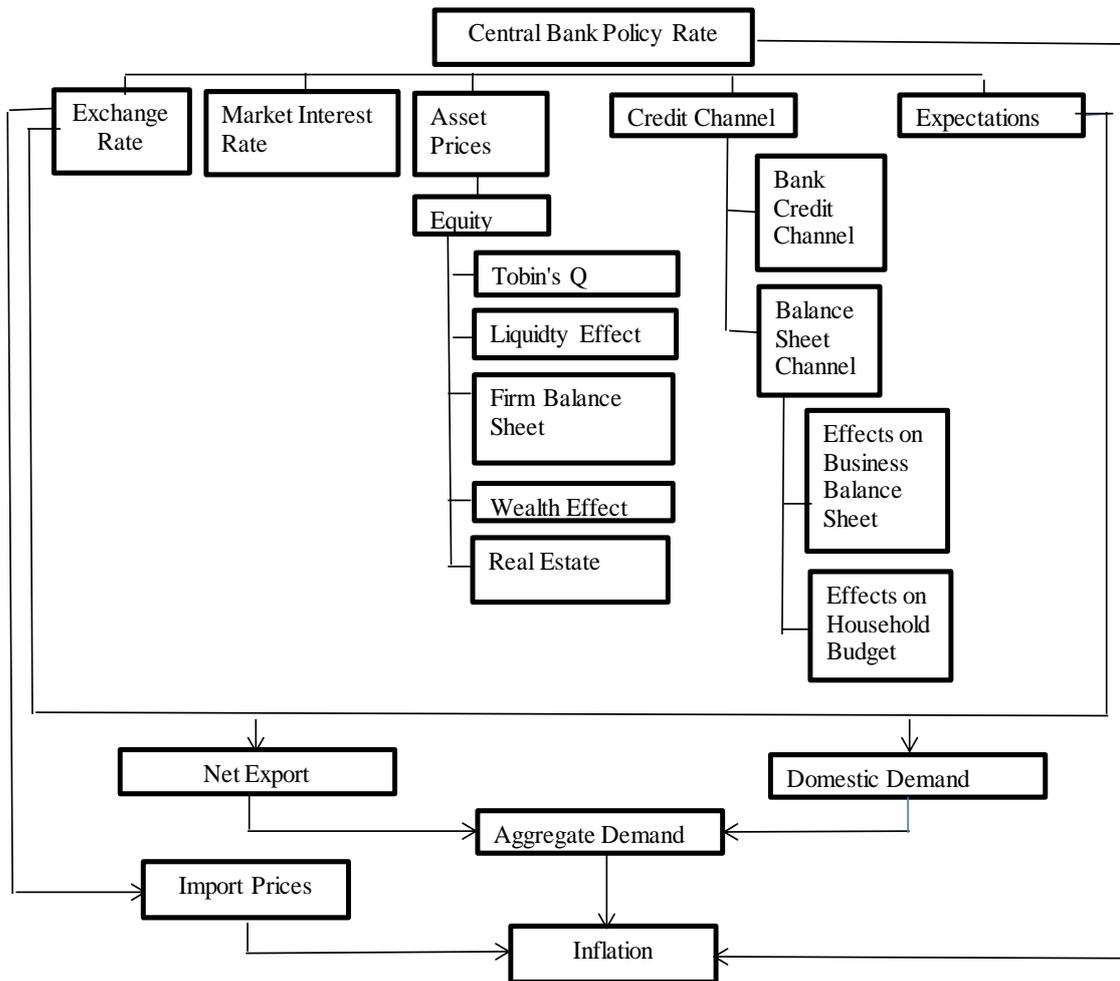
mechanism as the process in which monetary policy decisions affect economy generally and price level specifically. In today's open economies, the transmission mechanism involves long and indefinite delays. External shocks, risk premium, bank's capital sufficiency, monetary policy and changes in commodity prices refer to external factors that affect the process. For this reason, it is difficult to predicate the exact effect of the monetary policy actions on the economy and price.

The aims and efficiency of the monetary policies to be applied show heterogeneity, depending upon the growth levels of countries. While the aim of the monetary policy is to decrease fragility against internal and external shocks in the developing countries that have limited product range and insufficient financial market depth, it sometimes aims to balance the deficits in the payment balance sheet or provide credit to the sectors that will lead the development (Kamin, Turner Van't dack, p.8). For this reason, it is especially important in the developing countries to select a transmission channel that is appropriate for the aim, and to find out how these transmission channels work efficiently.

Monetary Transmission mainly includes three steps. In the first step, interest rates of monetary policies, assets prices, expectations and its effect on currency is apparent while the effects of monetary policy on total demand through these changes come to the forefront. In the third step, the effect of the changes in total demand on inflation becomes evident (TCMB, 2013:2). For this reason, monetary transmission is defined as the mechanism that shows how monetary changes affect total demand and real product (Alkan, 2016:153).

In order to test the functionality of the monetary transmission mechanism, it is significant to know the characteristics of the transmission channels and their interaction with monetary policies. In Figure 1 shows five main monetary transmission channels (market interest rate channel, exchange rate channel, asset prices channel, credit channel and expectations channel) as well as their sub-categories.

Figure 1: Monetary Transmission Channels



Source: Created by the author.

Exchange rate has a significant place in the monetary policy transmission mechanism. According to interest rate parity, the balance of interest rates between two countries is equal to the rate of change expected between the currencies of these two countries (Taylor, 1995: 15). While interest rate increases, in other words, when the return of foreign assets is more than those of local ones, the demand for local currency increases and hence local currency rises in value. On the contrary, an expansionary monetary policy decreases interest rates, and the return of assets decreases in terms of local currency and hence the local currency loses value (Yalta, 2011: 193-195). Loss in the value of local currency means price decrease in local goods compared to the foreign ones, and net import increases. With this channel, total output amount increases.

$$M_s \uparrow \quad i \downarrow \quad E \uparrow \quad NX \uparrow \quad Y \uparrow$$

In economies that experience inflationary deficit for a long time, changes in interest rates are the main determinants. Fluctuations in interest rates interact with inflation through both import output expenses and expectations. For this reason, interest rate transivity affects the success of monetary policy applications (Özatay, 2011: 233).

Interest rate channel is also known as Keynesian IS-LM model. In the model, increase in real money supply decreases nominal interest rate and triggers consumption spending and increases investment spending based on marginal efficiency of capital. The increase in investments, on the other hand, affects total product with multiplier effect. The strength of this effect depends upon interest flexibility of money and capital demand (Öztürk, 2011:290).

$$M_S \uparrow \quad i \downarrow \quad C \uparrow \quad I \uparrow \quad Y \uparrow$$

Expenditures fulfill the monetary policy according to their sensitivity to interest rate. In the interest rate channel, long-term real interest rate is the determining factor on consumption and investment expenditures. This is the result of rational expectations and rigidity realized in the compliance process of charges and prices. The Central Bank's attempt to decrease short-term nominal interests decreases long-term real interests within the scope of real interests and expectations hypothesis. Over-fluctuation in inflation decreases the efficiency of interest channel by creating an inflation premium. Under the conditions when the inflation premium is high, the low rate of real interest does not always imply a tight monetary policy. On the contrary, low progress of inflation increases the efficiency of the interest channel (Eroğlu, Aydın, Kesbiç, 2016: 167-169).

Changes in money supply and interest rate affect balance sheet of household and firms by creating relative changes in the prices of other assets such as bonds, stocks and houses. The decrease in asset prices may cause the households and firms to have difficulty in paying their debts, which subsequently affects output level and inflation (Yıldırım, Mirasedoğlu, 2015:109). Equity channel is another element of the asset prices channel. Short-term interest rates resulting from monetary expansion increase equity prices and consumers' wealth. As a result, expenditures increase. In Keynesian approach, the decrease in short-term interest makes the stock market attractive. The investors who have securities at their disposal create borrowing facilities by using their increasing stock prices as guarantee and hence investment expenditures increase. This flow affects total product positively (Eroğlu, Aydın, Kesbiç, 2016: 171) .

$$M_S \uparrow \quad i \downarrow \quad P_e \uparrow \quad I \uparrow \quad Y \uparrow$$

The effect of equity prices on economy is realized in five channels, namely investment expenditures, firms balance sheets, household liquidity, wealth and real estate. Monetary policy becomes decisive on investment decisions by affecting the equity prices. The equity prices have been correlated with investment expenditures within the

scope of q model developed by James Tobin, and q values refers to the ratio of market value of firms to capital's renewal cost. If q value is high, the cost of making physical investments decreases. In other words, the firms can purchase more investment goods in return for less stock (Parasız, 1999: 302)

$$M_S \uparrow \quad i \downarrow \quad P_e \uparrow \quad Q \uparrow \quad I \uparrow \quad Y \uparrow$$

Another sub-channel where the effect of equity prices on economy is realized is liquidity effect. An expansionary monetary policy causes interest rates to decrease and share prices to increase. As a result, the households whose financial assets have gained more value become less likely to experience financial danger and their demand for consumption goods increases. The increase in demand for consumer durables, on the other hand, brings total demand and hence increases total production (Mishkin, 1996: 36).

$$M_S \uparrow \quad i \downarrow \quad P_e \uparrow \quad \text{Value of Financial Assets} \uparrow \quad \text{Financial Hazard Probability} \downarrow \quad C \uparrow \quad Y \uparrow$$

Equity channel affects total production through firms' balance sheets. As a result of raise in interest rates, the value of stocks in the balance sheets of the firms decreases. This situation decreases firms' both net worth and collateral value. The credit supply for the companies whose value has decreased will be limited. Especially the companies whose equity interest is low in their balance sheets have fewer opportunities to create credits because of asymmetric information and adverse selection. The firms whose probability to find credit has decreased make less investment expenditures, which creates a narrowing effect on total production (Cesur, 2016: 160).

$$M_S \downarrow \quad P_e \downarrow \quad \text{Firm's Net Value} \downarrow \quad \text{Credit Finding Opportunities} \downarrow \quad I \downarrow \quad Y \downarrow$$

Stock channel is correlated with total production through wealth effect. The wealth effect is called real balance effect or Pigou effect. Real wealth effect channel shows that consumption expenditures are sensitive to both income and wealth. According to Pigou, consumption is not a function of usable income, but of wealth. An increase in money supply indicates the wealth effect by means of increasing the price of real estate that is the main source of real wealth. The consumption expenditures that increase with the demand resulting from wealth increase total product and provide full employment (Öztürk, 2011:291).

$$M_S \uparrow \quad P_e \uparrow \quad W \uparrow \quad C \uparrow \quad Y \uparrow$$

Within the component of wealth, housing and field prices occupy a significant place. An increase in housing prices increases residential construction by decreasing the cost of residential renovation ($q_{Real Estate}$). In other words, increasing prices of real estate that

has been caused by monetary expansion affects consumption expenditures and total product positively by increasing the wealth value (Eroğlu, Aydın, Kesbiç, 2016: 174).

$$M_S \uparrow P_{Real Estate} \uparrow q_{Real Estate} \uparrow W \uparrow C \uparrow Y \uparrow$$

In bank's credit channel, on the other hand, an expansionary monetary policy increases banks' reserves and deposits. This also leads to increase in bank credits. As a result, total product will increase with investment and consumption expenditures (Mishkin, 1996: 9).

$$M_S \uparrow \text{Bank Deposits} \uparrow \text{Bank Loans} \uparrow I \uparrow Y \uparrow$$

Balance sheet channel is a result of increasing asymmetric information in the credit market. As a result of tightening in money supply, net value of firms decreases. As net value decreases, the problem of adverse selection and moral hazard increases. Generally, the firms and households that tend towards the riskiest projects are the ones who accept the highest interest. Even though these kinds of firms accept high interest, banks reject their credit requests. As Stiglitz and Weiss (1981) mention, banks resort to credit rationing instead of reflecting high interest to risky clients. An expansionary monetary policy, on the other hand, affect credit amount and total demand positively as it increases net value of firms (Mishkin, 1996: 11-12).

$$M_S \uparrow P_e \uparrow \text{Adverse Selection} \downarrow \text{Moral Hazard} \downarrow \text{Lending} \uparrow I \uparrow Y \uparrow$$

Bank's credit channel is also decisive on household consumer durables and housing demand. When bank credits decrease, it decreases households' demand for such assets. The other effect is realized through liquidity. When the rate of non-financial assets like housing and field is high in the balance sheet of households, disposing these assets costs in the case of liquidity need. On the other hand, when the rate of financial assets is higher than their liabilities, the rate of financial difficulty decreases, which triggers consumption and housing expenditures (Mishkin 1996: 14-15).

$$M_S \uparrow P_e \uparrow \text{Financial Assets} \uparrow \text{Financial Difficulty Probability} \uparrow \text{Consumer Durables and Housing Expenditures} \uparrow Y \uparrow$$

The Central Bank's decisions on monetary policy have an effect on expectations. When the Central Bank's credibility is high, the decisions taken in the market are shaped in accordance with the Bank's goals. Compliance between the Bank's statements and monetary policy applications increase the efficiency of the policies. An expansionary monetary policy under this condition creates an expectation that is in compliance with

the Central Bank's goals in terms of economic agents. As a result, investment expenditures and total product increase (Öztürk, 2011:291).

$M_S \uparrow$ $i \downarrow$ Positive expectation on $P_e \uparrow$ Consumer and Producer expectations in compliance with the Central Bank \rightarrow $I \uparrow$ $Y \uparrow$

3. Monetary Policy Applications in Turkey and Transmission Mechanism

During the period until 1980's, exchange and interest rate was controlled in a strict manner. With the decision of 24th January 1980, Turkey adopted an open growth model and entered into a monetary liberalization process. However, international capital movements made the developing monetary system more fragile, and the adopted low interest policy turned the demand from Government Debt Securities to the currency (TCMB, 2006:17-22). In 1986, a transformation was observed in monetary policy applications. In this period, CBRT opened interbank money market and initiated open market transactions. In 1989, the protocol that enabled the Treasury to benefit from the Central Bank's resources in the financing of public deficits. The monetary expansion of 1989 came up to the expansion in currency assets that were brought to the bank. In the same year, capital movements were liberalized within the scope of the Law on Protection of the Value of Turkish Currency, which narrowed the activity area of the Central Bank for monetary aggregates. In 1990, CBRT entered into monetary planning program. The main aim of this program was to take bank balance sheets under control (Orhan, Erdoğan, 2008: 357-363). The monetary planning programs of 1990 and 1992 did not manage to attain the goals (Günel, 2007: 358-359).

CBRT followed different monetary indicators for monetary planning by years. In 1990, the followed size was Internal assets and Internal liabilities. Because of Gulf Crisis in 1991, the monetary program was not announced, but Reserve Money size was tried to be taken under control. In 1992, the aim was put on the Central Bank's money. During 1993-1994, no monetary plan was made (Keyder, 2008: 290).

At the beginning of 1994, such reasons as lack of monetary discipline and liberalized capital movements triggered economic crisis. Increase in interest rates and liberalization of capital movements during the mentioned period caused the banks' open positions to increase. On the other hand, financing public deficit through GDDS brought about increase in interest (Günel, 2007: 358-359). In 1994, overnight interests increased to 700% and the resulting liquidity crisis tried to be overcome with the stability packet of 5th April (TCMB, 2006:17-22).

The monetary indicator followed by CBTR was Net Internal Assets in 1995. In the first period of 1996, 1997 and 1998, Reserve Money was determined as the goal. As of the

second half of 1998, the monetary aim was determined as Net Internal Assets. In 1999, a base was specified for Net Internal Assets and Net International Reserves (Keyder, 2008: 290). November 2000 and February 2001 crises, on the other hand, emerged on the grounds of a stability program in which currency anchor and tight monetary policies were applied. The intention letter signed with IMF in 2001 in Mai became determinative on the monetary policy of the period. Accordingly, by the time prerequisites of inflation are met, money base aim was accepted as nominal anchor. In 2002, within the framework of Transition to the Strong Economy Program, short-term interests were used as the main tool for combating with inflation (TCMB, 2006:17-22).

During the period before 2001, the functioning of the monetary transmission mechanism in Turkey was similar with that of developing countries. In order to control inflation and enable financial stability, nominal exchange rate was taken as the main policy tool. During this period, pricing behaviors were indexed to the exchange rate. Following the crisis of 2001, amendments were made in CBRT Law on 25th April 2001. The main aim of CBRT was determined as ensuring price stability. 2002-2005 was implicit inflation targeting period and 2006-2007 was explicit inflation targeting period. The inflation was decreased to digits. Short-term interest rates were started to be used as a political tool. As the exchange rate lost its property to be a variant that was taken as a reference because of inflation, the efficiency of interest channel in the monetary transmission mechanism started to become visible. The evidence of transition from short-term interest to long-term interests had also an effect to increase the efficiency of the interest channel (TCMB, 2013: 10).

A study carried out by CBRT showed that changes in policy interest affect government debt securities interests with 7, 12 and 24-month maturities. Another study made by CBRT for the period between 2001-2005 indicates that banks' credit interest rates are susceptible to policy interest rate. In Turkey, exchange rate channel is also effective on prices general level and domestic goods demand. In a study completed by CBRT in 2008, it was shown that 1% change in exchange rate before the period of fluctuating exchange rate increased inflation by 0.6 point. After February 2001, when the regime of fluctuating exchange rate was started to be applied, the effect of exchange rate on inflation decreased by 0.3 point. Mehtap Kesriyeli et.al., put forth that company liabilities in Turkey were mostly realized in foreign currencies, and that an increase in exchange rate may affect profitability and investment negatively through the firm's balance sheets.

That the debt dollarization in Turkey is still at high levels causes especially manufacturing industrial firms to get vulnerable against currency fluctuations. Increase in exchange rate has a destructing affect on company balance sheets. On the other hand, it is possible to mention that the increase in exchange rate also increases the demand for local goods by increasing export and decreasing import. However, it is important to consider the increasing input costs and balance sheet wear effect in this situation (Özatay, 2011: 232-233).

After 2001 crisis, increase was observed in the functioning of credit channel. In the past, because of budget deficits and real interest rates, the banking sector resorted to credit limitations and avoided providing long-term credit especially to small and medium scale enterprises. After making some structural reforms and taking public spending under control, the banks returned to their financial brokerage operations. As a result, the credit amount that the banks allowed increased (TCMB, 2013: 11).

This process continued until the crisis of 2008. During the global crisis period, banks' credit supply decreased. It is known that credit expansion is important for financial stability and economic growth. Özlü and Cihan, showed that the tight monetary policy applied during the period of 1996-2008 caused small and medium scale enterprises to have difficulty in reaching credit. They also indicated that the big firms operating in the manufacturing industry was more able to reach the credit. Özlü and Yalçın's studies suggest that the credit channel works in Turkey (Özatay, 2011: 232-233).

4. Literature Review

Akbaş, Zeren, Özekicioğlu (2013)	Yapısal VAR analiz	Interest and exchange rate shocks is effective on industrial production in the short run in Turkey.
Sever (2018)	Cointegration test	Long-term relationship exist between the variables: M3 Money Supply, Inflation Rate, Industrial Production, Nominal Exchange Rate, Interbank Short Run Interest Rate.
Erdoğan, Yıldırım (2009)	VAR analysis	The interest rate channel plays an important role in the monetary transmission process in the period of 1995:01-2007:09.
Büyükakın, Bozkurt, Cengiz (2009)	Toda Yamamoto	The change in interest rates primarily affects the investments and then the income.
Uğur, Sancar, Polat (2016)	VAR analysis	Money supply, interest rate, exchange rate, stock prices and bank loans are effective on the industrial production index and inflation between 1998:Q1-2015:Q1
Altınöz (2013)	Toda Yamamoto	Credit rationing hinders the effective working of the credit channel in Turkey.
Aydemir, Demirhan (2009)	Toda Yamamoto	In this study, bidirectional relationship between exchange rate and asset

		prices was found for the years of 2001 and 2008.
Duman (2016)	VAR analysis	It is concluded that the exchange rate channel is effective in Turkey for the years of 2003-2015.
Büyükakın, Cengiz, Türk (2009)	VAR analysis	Exchange rate is an important indicator in terms of changes in inflation between 1990:1-2007:9
Doğan (2012)	VAR analysis	Findings indicate that the traditional transmission mechanism works between the years of 2000:1-2011:3 in Turkey
Örnek (2009)	VAR analysis	The traditional interest rate and exchange rate channels are effective in Turkey. Equity price and bank credit channels are not statistically significant
Duman (2016)	VAR analysis	Exchange rate channel is effective in Turkey for the period of 2003-2015.
Kaygısız (2018)	VAR analysis	Industrial production index has almost no effect on inflation in the short term. In the long run, it affects inflation rate by 8.32%. Exchange rate affects inflation both in the short and long term at the same rate.

5. Data, Method and Empirical Findings

In order to examine the monetary transmission mechanism in Turkey, Inflation (INF), Index of the Real Effective Exchange Rate (RER), (O/N) Weighted Average Simple Interest Rate (IR), Industrial Production Index (PIN), Banking Sector Domestic Credit Volume (CR) and M2 Money Supply (M2) variables were used. The series were reached through CBRT's Electronic Data Distribution System. The period 1995:01-2018:11 was analyzed, and natural logarithm of all variables except the inflation rate. In the study, e-views 10.0 was used.

For this study, Toda-Yamamoto's causality test, developed by Toda and Yamamoto in 1995, was found to be suitable to examine the causality relationship between inflation and Index of the Real Effective Exchange Rate (RER), (O/N) Weighted Average Simple Interest Rate (IR), Industrial Production Index (PIN), Banking Sector Domestic Credit Volume (CR) and Money Supply (M2) variables. Compared to the causality test of Granger, this test provides more advantageous aspects and simpler approaches for the

prediction of VAR model, which has been developed in order to research Granger's causality tests.

Another advantage results from the fact that it allows for causality inferences based on VAR model without requiring a co-integrated relation between the series. In addition, that it is not compulsory to use pre-test to test the level of stationarity provides another advantage.

Toda-Yamamoto test adopts an improved Wald test (MWALD) that applies restriction tests to the parameters of k-lagged VAR model in the process that can be applied to the order values of the series. In this process constituting two steps, optimal k lag length and maximum order of integration is determined for the first instance. In determining optimal lag length for VAR model, criteria such as Akaike and Hannan-Quinn can be used. As a result, with the identification of optimal lag length (k) and maximal integration order (dmax), augmented VAR model with k+dmax lag total length is predicted. In the second step, Walt test are applied to the VAR coefficient matrices that have the obtained k lag length so that inferences based on Granger causality can be made.

During the process when the relation between the variables are studied with the causality analysis developed by Toda and Yamamoto (1995), Augmented Dickey-Fuller (ADF) unit test was used in order to identify stationarity ranks of the variables. ADF Unit root test results belonging to orders and differences of the variables are given below.

Table 1. ADF Unit Root Tests Belonging to Orders and Differences of the Variables

Augmented Dickey-Fuller (ADF) Unit Root Test		
Variables	Lag Length	t-Statistics
LNINF	15	0.524380
LNRER	12	-0.188637
LNIR	9	-0.794088
LNPIN	13	-3.147030
LNCR	12	-2.270213
LNМ2	1	-4.844274*
ΔLNINF	14	-5.152990*
ΔLNRER	11	-7.227777*
ΔLNIR	8	-7.495912*
ΔLNPIN	12	-3.951398*
ΔLNCR	11	-3.133132**

*, ** shows the rejection of the existence of unit root test that has null hypothesis at the significance levels of *5%, ** 10%. Lag lengths have been determined with Akaike Information Criteria (AIC). It mentions that 1st difference of "Δ" series have been taken.

When the table given above is examined, it is seen that the analyzed variables are generally first differenced stationary I (1). Only M2 Money Supply variable was found out to be order stationary.

The adapted versions of the models used in Toda and Yamamoto's (1995) causality analysis and created with order values are shown below:

$$\begin{aligned}
 LNINF_t = & \alpha_1 + \sum_{i=1}^{k+d \max} \beta_{1i} LN RER_{t-i} + \sum_{i=1}^{k+d \max} \theta_{1i} LN IR_{t-i} + \sum_{i=1}^{k+d \max} \theta_{1i} LN PIN_{t-i} \\
 & + \sum_{i=1}^{k+d \max} \theta_{1i} LN CR_{t-i} + \sum_{i=1}^{k+d \max} \theta_{1i} LN M2_{t-i} + \sum_{i=1}^{k+d \max} \theta_{1i} LN INF_{t-i} \\
 & + \varepsilon_{1t}
 \end{aligned}$$

In this system, k refers to lag length in VAR model while $dmax$ refers to the highest rank of integration of the variables in the system. After predicting $VAR(k + dmax)$ model, in order to discover a causality relationship from the variables Index of the Real Effective Exchange Rate (RER), (O/N) Weighted Average Simple Interest Rate (IR), Industrial Production Index (PIN), Banking Sector Domestic Credit Volume (CR) and M2 Money Supply (M2) to Inflation (INF) variable, the hypothesis mentioning no causality relation ($H_0: \theta_{1i} = 0$) was tested with the modified WALD test. On condition that the measured MWALD test statistics is higher than the value of χ^2 table with k fix order, null hypotheses are rejected.

Accordingly, with the help of VAR model, k was determined as "4" and $dmax$ was determined as "1", and augmented VAR (5) was predicted by means of seemingly unrelated regression method. The causality analysis results obtained with this model are given below.

Table 2: Toda-Yamamoto Causality Analysis Results

Null Hypothesis	Lag Length	MWALD Statistics
$LN RER \nrightarrow LN INF$	5	13.74*
$LN IR \nrightarrow LN INF$	5	16.46*
$LN PIN \nrightarrow LN INF$	5	3.55
$LN CR \nrightarrow LN INF$	5	1.98
$LN M2 \nrightarrow LN INF$	5	18.87*

*shows the rejection of null hypothesis at significance level %5.

According to the results given in Table 2, short-term causality relation from the variables RER, IR and M2 to INF variable has been observed. No causality relation from the variables PIN and CR to INF variable has been observed.

6. Conclusion

In recent years, the main objective of the central banks is to maintain the price stability. Monetary policies conducted by the central banks affect the inflation rate through the monetary transmission mechanisms. The research on monetary transmission mechanisms is of high importance in terms of these policies' efficiency. Monetary transmission mechanism consists of interest, exchange rate, asset prices, credit and expectations channels. This study examines the efficiency of monetary transmission mechanism in Turkey for the years between 1995:01-2018:11 by using the Toda-Yamamoto causality test. In the study, a causal relationship from money supply, interest rate and the foreign exchange to inflation has been observed in the short run. On the contrary, no causality relation from the Credits and Industrial Production Index to Inflation variable has been observed.

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