

**INFLATION TARGETING FRAMEWORK:  
LEADING INDICATOR VARIABLES OF INFLATION IN TURKEY**

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**ÖZET**

Türkiye’de esnek döviz kuru uygulamasına geçilmesinin ardından, para politikasının ne şekilde uygulanacağı sorusu önemini korumaktadır. Yeni bir para politikası uygulaması olarak enflasyon hedeflemesine geçilmesi diğer bir ifade ile nominal çapa olarak belirlenen enflasyon hedefinin kullanılması, uygulamada güvenilirlik derecesi yüksek enflasyon tahmin modellerinin oluşturulmasını gerektirmektedir.

Bu çalışma, Türkiye’deki enflasyon olgusuna ilişkin gösterge değişkenlerin saptanmasına yöneliktir. Enflasyon hedeflemesine geçilebilmesi için gerekli ön koşulların ortaya konulmasının ardından, enflasyon üzerinde belirleyici (gösterge niteliğinde) olan değişkenler, VAR analiziyle belirlenmiştir.

VAR modeline karşı yapılan eleştirilere rağmen enflasyon modellemesi için VAR analizinin seçilmesinde, bu analiz tekniğinin yapısal model üzerinde herhangi bir kısıtlama gerektirmeksizin dinamik ilişkileri verebilmesi ve hangi değişkenin içsel hangi değişkenin dışsal olduğuna karar verme zorluğunun yaşanmamasıdır. Enflasyon hedefinin geleceğe yönelik olmasından dolayı tahmin modellerinde ileriye dönük belirleyici nitelikteki değişkenlere büyük ağırlık verilmektedir. Bu çerçevede, çalışma diğer politika araçları ve geliştirilecek yeni enflasyon serileri ile genişletilebilecek belirleyici göstergeler bazında bir ön model çalışması olarak değerlendirilmelidir.

**Anahtar Kelimeler:** Enflasyon, Enflasyon hedeflemesi, VAR analizi, Para politikası

**JEL Sınıflaması:** E3, E42, E52

**ABSTRACT**

After the transition to flexible exchange rate regime in Turkey, the question of how to implement the monetary policy still maintains its importance. The transition to inflation targeting as a new monetary policy implementation, that is, the use of determined inflation target as nominal anchor, requires inflation forecasting models with high-level credibility in application.

This study is concerned with putting forth the leading indicator variables of inflation in Turkey. After reviewing the prerequisites for transition to inflation targeting, a set of indicator variables of inflation are determined by using VAR analysis. Whatever the

criticisms against the VAR methodology, in choosing the VAR analysis, various aspects of it played a crucial role such as having no constraints over the structure of the relation presenting dynamic relations and having no difficulty in deciding which variable is internal and which external. Due to the prospective feature of the inflation target, forward looking variables (indicators) are emphasized. To this end, the analysis made should be regarded as a pre-model study on the basis of determinant indicators to be enlarged with policy instruments and new inflation series to be developed.

**Keywords:** Inflation, Inflation targeting, VAR Analysis, Monetary policy

**JEL Classification:** E3, E42, E52

### **Introduction**

In recent years, monetary policy implementation within the framework of inflation-targeting has found a ground of application in some industrialized countries, and the success attained during the implementations has attracted the attention of developing countries. The inefficiency of fixed exchange rate (exchange rate peg) regime in taking inflation under control coupled with the inability to target growth rate of money supply due to the unstable money demand, thus, giving rise to a tendency of those countries to adopting inflation targeting regime. In this context, the implementations in Brazil, Chili and Thailand are worth mentioning.

The adoption of a crawling peg regime (exchange rate anchor) constituting the basis of the disinflation program in Turkey in 1999 was quit in February 2001 and a new policy, that is, flexible exchange rate regime, was adopted. Thus, with the emphasis placed on the role of central bank as providing low-level inflation and establishing price stability, what is put on the agenda is the need to research as to whether the “inflation-targeting” method is a monetary policy implementation alternative suitable for providing a lasting decrease in inflation and bringing about price stability.

The primary objective of this paper is to determine a set of indicator variables of inflation in Turkey. To that end the paper is organized as follows. The first section deals with prerequisites for transition to inflation-targeting in Turkey, along with the discussion regarding the risks for developing countries especially in implementing inflation-targeting. By taking into consideration and emphasizing the advantages and risks provided with inflation-targeting approach, the variables with high predictive content in inflation have been determined on the basis of Granger causality tests, variance decompositions and impulse responses in section two. Section three concludes by assessing the empirical findings in terms of the policy to be applied.

## **1. Inflation-Targeting Approach**

### **A. The Advantages and Constraints of Inflation Targeting Approach**

Inflation targeting is a monetary policy implementation based on, in principle, focusing on a specific nominal inflation target (or a target range) for a certain period of time during which the central bank aims at providing its ultimate goal, that is, price stability. The process of determining an inflation target involves a variety of elements such as; central bank's nominally determining the "price stability", planning a calendar in line with the determined target and forming other policy targets in accordance with each other. Given the advantages provided with the process, which could be theoretically defined as obvious and certain, it is observed that many problems arise in application. The approach in question also spurs a number of debates in terms of its results. Two crucial points to be emphasized in this context are: first, the necessity in monetary policy, based on price stability, to include economic growth, and second, the outcomes to occur as a result of the difference between "price level" and "inflation", which will also, beyond mere definitional differences, bring about economic ones.

The basic advantages to be obtained in case of realizing monetary policies focusing of inflation-targeting are listed as follows; Fisher (1996), Debelle (1997)

- i) Inflation-targeting increases the transparency of monetary policy and is regarded as a clear implementation in comparison with the alternative monetary policy applications.
- ii) In adjusting and controlling the instruments of monetary policy, central banks attain a degree of independence.
- iii) Determined inflation target has a quality of adjusting inflation expectations, at the same time, it comprises a criterion for measuring the performances of central banks, increasing their credibility.
- iv) In order to increase the effectiveness of monetary policy within the context of inflation-targeting, it is a must to previously inform policy changes and clearly put them forth. In this sense, as "transparency" increases the effects of changes in monetary policy on prices and wages, the policy lag length is also decreased.

The advantages provided over inflation-targeting regime should not be taken as an absolute implication as targeting inflation is the most suitable method in order to realize a low-level inflation. Especially, in countries depriving of necessary structural developments required for implementing inflation targeting, this approach has no noteworthy chance of success. Risks and disadvantages inherent to inflation-targeting in terms of implementing are as follows;

- i) It is a policy necessitating a strict implementation.
- ii) Although reaching the targeted inflation rate bears importance also in terms of realizing full employment in the long run, may cause a trade-off at both targets in the short run.
- iii) In inflation-targeting implementation, it is observed that there exists an indirect relation between monetary and fiscal policies, requiring the implemented fiscal policy to support inflation-targeting.
- iv) Flexible exchange rate necessary to put the regime into practice increases financial fragility in countries with underdeveloped financial markets, bringing about instability.
- v) Inflation targeting requiring, theoretically, a “prospective” approach, in other words, the pre-emptive reaction of central bank to the expected inflation in short-run in order to prevent price increase, triggers a successive process of inflation expectation, causing instability. Although they have no effects on economic variables the events affecting those variables, due only to expectations, termed as “sunspots” in the literature comprise the feedback process in prospective policies, preventing the chance of success of the implemented policy. For this very reason, the *price level targeting* taking the deviation in previous inflation targets “retrospectively” into consideration can constitute an alternative for the *inflation targeting* approach. (Carlstrom and Fuerst (1999))

#### **B. The Prerequisites for Transition to Inflation-Targeting**

There exists a close relationship between the structure of monetary policy and that of money demand. In addition, the main column of the Monetarist view that foresees a parallel and stable increase between money supply and growth rate is the stability of money demand. In 1980s and especially 1990s, the increase in the variety of financial assets and financial liberalization caused the situation in question cease to exist, thus, altering the definition of money and raising the necessity to re-evaluate the approach put forth in 1950s and 60s, defending the view that monetary policy should be designed over monetary aggregates.

Although inflation targeting has been adopted by central banks of almost every developed and developing country, the main point in countries implementing “inflation-targeting” is that inflation-targeting functions as determinant in terms of monetary policy, in other words, when there exists a contradiction among growth, employment target and inflation target, monetary policy is implemented in line with inflation target. The relative success attained with inflation targeting in developing countries pave the way for this approach to be put on agenda in developing countries as an alternative policy. Especially, in the wake of the financial crisis in 1990, many developing countries quit applying the fixed exchange rate regime that was utilized for the purpose of taking inflation under control and switched to flexible exchange rate regime. However, it is a must to determine the structural differences between the economies of developing and developed countries and take them

into consideration in order to be successful in the exchange rate regime of developing countries.

Fundamental differences between the economies of developing and developed countries can be categorized in three headlines; Kasa (2001)

- i) Openness
- ii) Credibility
- iii) Financial fragility

### **Openness**

Though inflation targeting sets a target for the central bank, it enables the central bank to gear freely the instruments to be applied for the purpose of attaining the target. In that case, the question of how to balance other targets while satisfying the inflation target gains importance.

In analyses conducted within this context, the approach termed as the “Taylor rule” and based on central bank’s adjusting of interest rates comes to the fore. When inflation surpasses the targeted level, the central bank increases the interest rate, otherwise bringing it down. However, that the Taylor rule does not take changes in exchange rate into consideration may be misleading for developing countries.

The Taylor rule was enlarged to also cover exchange rates in analyses conducted by Ball (1999) and Svensson (2000). In terms of inflation targeting, exchange rates affect the economy in two aspects. Firstly, exchange rates change the prices of imported goods, thus being directly effective over inflation rate. Secondly, exchange rate is effective over the competitiveness of domestically produced goods in world markets, consequently affecting the total demand in the market. As a result, total demand is effective over inflation within the framework of “Philips curve”. Empirical data put forth that the first effect becomes effective in a relatively short time (within some months) and the second one in a comparatively longer period.

The effects in question have varying times of effectiveness, in other words lag discrepancy which may cause fluctuations in production due to frequent changes in exchange rate even if the inflation target is satisfied when the central bank completely focuses on inflation target. To this end, a thorough implementation of inflation-targeting in open economies may create instability in terms of growth and employment.

The studies realized by Ball and Svensson indicate that the Taylor rule requires to be developed in two aspects. Primarily, inflation-targeting must be determined for “long-run”, thus neutralizing the effects of temporary fluctuations in exchange rate. Secondly, it is suggested that “monetary conditions index” comprising from the average of current interest rate and exchange rate be targeted instead of short-run nominal interest rate. By means of these adjustments the effects of temporary changes in exchange rate (stemming from being overvalued or undervalued) are eliminated, also the fluctuations likely to occur as a result of interactions between interest rate and exchange rate are prevented.

### **Credibility**

Credibility is especially important for the economies of developing countries, where from time to time political and economic instability is experienced provoking lack of confidence and doubt in public opinion against prospective policies. Consequently, the inability to establish an aura of trust in the inflation targeting approach diminishes incredibly the chance of success. In the study conducted by Kumhof (2000), it is indicated that if inflation-targeting, especially in the presence of price stickiness, is perceived as a temporary phase, it will affect especially imported goods, causing a process of instability in the economy.

### **Financial Fragility**

The financial crisis in 1990s brought the “balance sheet effect” forward, which emerged especially as a result of devaluation. Devaluations that are expected to be expansionary due to presenting advantage in competitiveness give rise to an erosion of net worth of both firms and banks for having open positions in domestic market and create a contraction in the economy. In countries where there exists no fully developed financial markets or there is inefficient supervision, providing financial support through foreign sources increases the exchange rate risk.

## **2. Leading Indicator Variables of Inflation in Turkey: VAR Analysis**

There is a large literature focusing on the different aspects of post 1979 inflation in Turkey. A detailed comparison of selected empirical studies on the sources sustained inflation from 1980 to today can be found in Kibritçioğlu (2002).

The methodology employed in this paper owes to Debelle and Lim (1998) who investigated the dynamics of inflation in Philippines. Contrary to applications that target monetary aggregates or rates of exchange and that track current values, inflation targeting brings a long-term approach. This is due to the relatively long period of time between the changes in the instruments of monetary policy and the effect on inflation.

### **A. A Model of Inflation and Leading Indicator variables**

In the inflation model forming the theoretical base of this study, the inflation in consumer prices is assumed to have two components resulting from the domestic market ( $\pi^d$ ) and imported from abroad ( $\pi^m$ ). Accordingly, the inflation related to the period,  $t$  would be;

$$\pi_t = (1 - \alpha) \pi_t^d + \alpha \pi_t^m \quad (1)$$

where  $\alpha$  represents the rate of imported goods in consumer price index (CPI). Since the prices of imported goods are the products of the rate of exchange and external price level, imported inflation equals the sum of change in the exchange rate and the rate of external inflation.

$$\pi_t^m = \Delta e_t + \pi_t^f \quad (2)$$

and according to standard Philips curve analysis augmented by expectations, the internal inflation would be;

$$\pi_t^d = \pi_t^e + \beta (y_t - y_t^*) + u_t \quad (3)$$

where  $y$  represents total output level,  $y^*$  represents potential output level, and  $\pi^e$  represents the expected inflation rate. The output gap in turn is determined by lags of interest rates and real exchange rates. When equations (2) and (3) are placed in equation (1);

$$y_t - y_t^* = C + A(L) i_t + B(L)(\Delta e_t - \pi_t) + u_t \quad (4) \quad ((L) \text{ lag operator})$$

Inflation is expressed as a function of the output gap, exchange rate changes and external inflation rate. The influence of monetary policy on the inflation occurs with the influence of interest rates on the output gap, and the impact of the exchange rate on inflation and output gap.

Hence the inflation rate;

$$\pi_t = c_0 + c_1(y_t - y_t^*) + a(L)\pi_t + b(L)\pi_t^f + d(L)e_t + u_t \quad (5)$$

However, while this model is taken as base for inflation estimation, the set of variables which will be used taking into consideration the structural relations in Turkish economy and the process of structural transformation were determined more comprehensively.

The descriptions of the variables are presented in detail in Table 1.

**Table 1: Descriptions of the Data and the Statistical Sources<sup>1</sup>**

<b>Variables</b>	<b>Description of Data</b>	<b>Source</b>
<b>Output Gap</b>	Deviation of potential output from actual output <sup>2</sup>	CBRT <sup>4</sup>
<b>Real Exchange Rate</b>	Turkish Lira/U.S. Dollar <sup>3</sup>	CBRT
<b>Treasury Bill Rate</b>	Three-month Treasury bill rate (simple, compound)	CBRT, Turkish Treasury
<b>Inflation Rate</b>	Change in level of Turkish CPI (1987=100)	CBRT
<b>M2</b>	M1+ Time deposits	CBRT
<b>M2Y</b>	M2 + Foreign exchange (FX) deposits	CBRT
<b>Base Money</b>	Central Bank (CB) notes outstanding + Bank deposits in CB	CBRT
<b>U.S. Inflation</b>	Change in level of U.S. CPI (1990=100)	IMF <sup>5</sup>

**Notes:** <sup>1</sup>All the variables considered in the model are quarterly and expressed in natural logarithms.

<sup>2</sup>Potential output is derived from the Hodrick-Presscott filter.

<sup>3</sup> CPI-deflated TL value of dollar

<sup>4</sup> Central Bank of the Republic of Turkey

<sup>5</sup> IMF, International Finance Statistics

The stationary tests of the variables to be analyzed have been conducted to determine the maximum order of integration of each series as the first step after determining variables.

According to the tests results we concluded that each variable is integrated of order one, zero i.e. I(0)-I(1). Besides graphic analysis were also performed for all the variables and their stationarity were assured. The stationary test results are presented in Table 2.

**Table 2: Stationarity Test Results**

	ADF	DFGLS	Ng-Perron (MZa)	Ng-Perron (MZt)	Ng-Perron (MSB)	Ng-Perron (MPT)
	AIC	AIC	AIC	AIC	AIC	AIC
CPI	-9,4800 <sup>1,5,10</sup> I(0)	-8,6102 <sup>1,5,10</sup> (0)	34,6014	4,1255	0,1192	4,8225
EXRATE	5,4855 <sup>1,5,10</sup> I(0)	-4,6362 <sup>1,5,10</sup> I(0)	25,8130 I(0)	3,5131I(0)	0,1761	1,3074
M2	7,4286 <sup>1,5,10</sup> I(2)	-2,1598 <sup>5,10</sup> I(2)	-26,5146 <sup>0</sup> I(4)	3,52796 <sup>1,5,10</sup>	0,13306	1,2893
M2Y	-9,1912 <sup>1,5,10</sup> I(2)	-9,9340 <sup>1,5,10</sup> I(1)	48,2060 <sup>1</sup> I(1)	4,9094 <sup>1,5,10</sup>	0,1018	0,5083
TBILLRS	-9,5921 <sup>1,5,10</sup> I(0)	-9,4654 <sup>1,5,10</sup> I(0)	32,5381 <sup>1</sup> I(0)	4,0141 <sup>1,5,10</sup>	0,12337 <sup>1</sup>	2,9104
TBILLRC	-5,5700 <sup>1,5,10</sup> I(0)	-9,8388 <sup>1,5,10</sup> I(0)	29,4323 <sup>1</sup> I(0)	3,8360 <sup>1,5,10</sup>	0,1303	0,8326
BASEM	12,6525 <sup>5,10</sup> I(2)	-1,9529 <sup>5,10</sup> I(3)	21,7005 <sup>5</sup> I (4)	3,2264 <sup>5,10</sup>	0,1486 <sup>1</sup>	4,6085 <sup>1,5</sup>
GDP_HP	-7,4689 <sup>5,10</sup> I(2)	-1,9656 <sup>1,5,10</sup> I(2)	10,4564 <sup>5</sup> I(11)	2,0064 <sup>5,10</sup>	0,1971 <sup>1,5,10</sup>	3,3961 <sup>1,5</sup>
USINFRATE	3,5598 <sup>1,5,10</sup> I(10)	9,3645 <sup>1,5,10</sup> I(10)	15,090 <sup>1</sup> I(10)	2,5927 <sup>1,5,10</sup>	0,1724 <sup>1</sup>	2,1872 <sup>1</sup>
	<b>PP</b>	<b>KPSS</b>	<b>ERS</b>			
	<b>NeweyWest (Bartlett-Kernel)</b>					
CPI	-9,4783 <sup>1,5,10</sup> I(0)	0,1927 <sup>5,10</sup> B(2)	13,4207 I (1)			
EXRATE	-5,5085 <sup>1,5,10</sup> I(0)	0,192787 <sup>5,10</sup> B(2)	776,2857I(1)			
M2	-5,1508 <sup>1,5,10</sup> I(2)	1,07349 <sup>1,5,10</sup> B(6)	3,059 <sup>1 0</sup> I(2)			
M2Y	18,2146 <sup>1,5,10</sup> I(2)	1,0716 <sup>1,5,10</sup> B(6)	6,9345 <sup>0</sup> I(1)			
TBILLRS	11,1956 <sup>1,5,10</sup> I(0)	0,2733 <sup>1,5,10</sup> B(4)	3,2689 <sup>10</sup> I(0)			
TBILLRC	13,1778 <sup>1,5,10</sup> I(1)	0,241 <sup>1,5,10</sup> B(5)	5,876834I(0)			
BASEM	7,8969 <sup>1,5,10</sup> I(2)	0,2503 B(0)	0,2503 I (0)			
GDP_HP	-9,1685 <sup>1,5,10</sup> I(2)	0,9298 <sup>1,5,10</sup> B(6)	40,5098 I(1)			
USINFRATE	-7,9098 <sup>1,5,10</sup> I(6)	0,8925 <sup>1,5,10</sup> B(4)	6,7131 <sup>1</sup> I(10)			

**Notes:** According to the tests results, we select the variables are integrated of order 0 and 1 at 1, 5, 10 % significance levels.

The multiple indicator approach used in this investigation depends on the estimation of a series of vector autoregressions (VARs) that has predictive information on inflation on the basis of Granger-causality, variance decomposition and impulse response tests. The bivariate Granger-causality tests provide information on the leading indicator properties of the variable tested; the forecast error variance decompositions measure the proportion of the variance of inflation that is explained by the variance of the indicator variable and the impulse responses assess whether the indicator variable contain information about inflation sufficiently far in to the future to be operationally meaningful.

The estimated bivariate VAR and equations are of the form:

$$\begin{aligned}\Delta CPI_t &= \alpha(L)\Delta CPI_{t-1} + \beta(L)\Delta Ind_{t-1} + sd1 + sd2 + sd3 + \varepsilon_{t-1} \\ \Delta Ind_{t-1} &= \alpha(L)\Delta Ind_{t-1} + \beta(L)\Delta CPI_{t-1} + sd1 + sd2 + sd3 + \eta_{t-1} \quad (6)\end{aligned}$$

where CPI is the price index and Ind is the indicator variable and sd1, sd2 and sd3 are saeasonal dummies included to take account of seasonality effects. in the bivariate VAR equations.

The VAR analysis covers the period between 1987.I-2003.IV. Pairwise Granger-causality test results (with max.-6 lag, suitable for the conditions in Turkey) and lag order selection obtained by bivariate VAR analysis are given in Table 3 and 4 in details.

**Table 3: Leading Indicators: Bivariate Granger-Causality Tests**

Indicators Variables	Lag of VAR					
	1	2	3	4	5	6
<b>EXRATE</b>	0,002	0,002	0,002	0,001	0,003	0,007
<b>M2</b>	0.340	0.741	0.603	0.692	0.755	0.801
<b>M2Y</b>	0,258	0,554	0,628	0,777	0,886	0,049
<b>TBILLRS</b>	0,020	0,012	0,03	0,073	0,061	0,081
<b>TBILLRC</b>	0,055	0,026	0,056	0,117	0,051	0,072
<b>BASEM</b>	0,024	0,464	0,679	0,595	0,634	0,075
<b>GDP_HP</b>	0,008	0,039	0,026	0,068	0,111	0,115
<b>USINFRATE</b>	0.070	0.155	0.459	0.292	0.277	0.419

**Notes:** P-values shown for the likelihood ratio tests of the null hypothesis ( $H_0$ : The indicator does not Granger-cause inflation.) All equations were estimated from 1987.1-2003.4.

**Table 4: VAR Lag Order Selection Criteria**

Lg	LogL	LR	FPE	AIC	SC	HQ
0	-120.4603	NA	3.27E-05	3.860318	4.027578	3.926313
1	179.0518	543.7298	7.03E-09*	-4.586210*	-3.582647*	-4.190240*
2	201.9973	38.12476*	7.59E-09	-4.522993	-2.683127	-3.797048

\* indicates lag order selected by the criterion, we do not show other values.

LR: sequential modified LR test statistic (each test at 5% level)

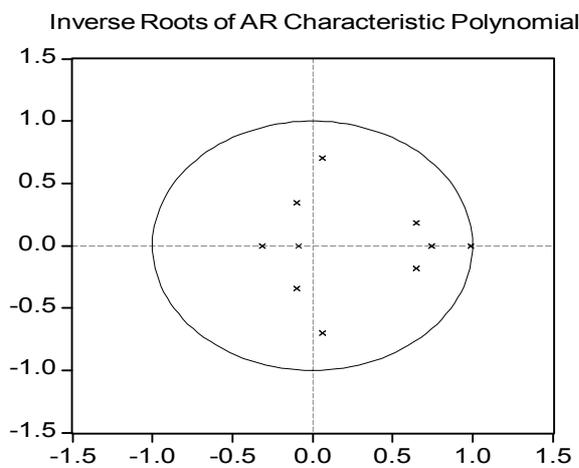
FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

According to the Granger Causality and Lag Selection Criteria results, the analysis was conducted taking as basis the model with 1-lag.



**Graph 1: Lag Structure with AR Root :**

According to the *inverse* roots of the characteristic AR polynomial result, the selected VAR model with 1 lag is stationary. The estimated VAR is stable (stationary) if all roots have modulus less than one and lie inside the unit circle. If the VAR is not stable, certain results (such as impulse response standard errors) are not valid (Lütkepohl (1991)).

The changes in the exchange rate, base money growth, output gap and simple Treasury bill rate have high predictive content in inflation. The results of variance decomposition are consistent with granger causality findings. The variance of changes in exchange rate explains a significant proportion of the variance in inflation, rising from 24 percent in the first quarter to 58 percent by the end of one year. Changes in the base money, output gap and simple Treasury bill rate are also good predictors, accounting for 54 percent, 24 percent and 18 percent of the forecast variance of inflation respectively.

**Table 5: Forecast Error Variance of Inflation Explained by Indicator Variable (In percent)**

Indicator Variables	Horizon (inquarters)					
	1	2	3	4	6	10
EXRATE	23,78	36,73	48,43	57,95	70,93	83,15
M2	0,02	0,45	0,75	1,00	1,30	1,55
M2Y	3,39	6,85	8,13	8,77	9,439	9,96
TBILLRS	2,53	7,71	13,08	17,92	25,44	34,15
TBILLRC	4,59	9,95	14,71	18,59	24,07	29,75
BASEM	13,05	30,55	44,16	53,62	64,73	74,00
GDP_HP	4,57	8,99	18,87	24,14	26,1	28,47
USINFRATE	1,80	4,18	3,75	3,55	2,92	2,45

The impulse response functions show that movements in variables like exchange rate, base money, the output gap, and simple Treasury bill rate contain information on inflation sufficiently far into the future to be operationally useful for policy makers. In addition, impulse response function for the consumer price index peaks around third period. A shock of one unit in the error terms of the variable CPI (consumer price index), rapidly got weaker due to the differences between periods and moved together with the other variables at value “0” in the third period. A one unit shock in the variable, EXRATE (exchange rate) affected the variable CPI in the same direction, and the variables M2Y and TBILLRS (Treasury bill rate simple) on the opposite direction, and all variables tended to move together in the sixth period. While one unit shock in the variable M2Y, affected other variables in the positive direction until the second period, all variables tended to move together by the fourth period. While one unit shock that may occur in the error terms of the variable TBILLRS led to a collective decrease until the second period, all variables tended to move together by the fifth period. One unit shock in GDP\_HP (Output-gap) affects all variables in the same direction but without the tendency to move together.

### 3. Concluding Remarks

Inflation targeting found a field of application in the recent years in developed countries and yielded successful results in terms of decreasing inflation and maintaining stability. Two important prerequisites for inflation targeting are the operational independence of monetary policy and the absence of other variables as targets. However, these prerequisites cannot be provided in many developing countries.

In the past, Central Bank of Turkey first applied money growth targeting and then in 2000 the strategy of exchange rate targeting. But with the crisis in 2001 this was abandoned and fluctuating exchange rate regime was adopted and the central bank announced that inflation targeting was planned for a future date. But high inflation rate and interests makes it compulsory to experience a process of disinflation. In this study, we tried to show the structure of inflation in Turkey and to determine the indicator variables of inflation. The results show that movement in exchange rate, base money, the output gap and simple treasury bill rates contain information on inflation sufficiently far into the future to be operationally useful for policy makers. In this framework, this study may be evaluated as a pre-modeling work in terms of determining indicators which may be extended by other policy instruments and new inflation series to be developed.

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