Causality Network between Budget Deficit, Money Supply and Inflation: An Application to Turkey

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Abstract

Although economists have different theories about the inflation, have a common view about the ultimate cause of inflation. Inflation is a monetary phenomenon and the budget deficits can cause inflation, only if it reflected in monetary aggregates. The finance of budget deficit by central bank will cause inflation through increasing liquidity. Reviewed empirical research shows that depending of which methods the budget deficits finance inflationary impact changes. In this study was used the Time-Series approach to investigate the impact of budget deficit and money supply on inflation in Turkey for the period of 1987-2013.

Keywords: Budget Deficit, Monetary Growth, Inflation, Causality, VAR, Turkey

Jel Codes: E31, E42, E63

1. Introduction

Inflation; which has emerged at the midst of 19th century and still shows its effect in our day; is an important problem of not only underdeveloped or developing countries but also developed countries. Inflation, that continues in variable levels, cause damages on the structures of public and economy. High and constant inflation hinders taking long term decisions, adversely affects the social structure and competitiveness of countries. By its structure; while inflation is to the disadvantage of the ones with fixed and small income, it leads to advantageous results for the ones leaning to speculation and indebted. Inflation's distorting the income level to the disadvantage of the ones with fixed income cause significant social disturbance. All these disturbances necessitate fight against inflation. Ensuring price stability, by reducing inflation to an acceptable level, will contribute to economic growth and the elimination of unfair distribution of income. However, it should be also noted that the drop in inflation does not necessarily mean drop in prices, increase in purchasing power, and increase in income. Drop in inflation implies economic stability and prosperity along with the less increase in prices and less decrease in purchasing power.

In the fight against inflation; first of all, the source of inflation should be known. The main factors that trigger the inflation are increase in demand, increase in the costs and inflation forecasts. While the increase in demand is caused by the increase in money supply; cost increases are affected by factors such as cost of wages and raw material prices.

In case the supply of money is increased by Central bank's printing money; the prices will increase as the consumption will increase and the total supply will not meet the total demand. The consumers, who gain more money, will request more goods and services. The companies will need to increase their capacity to meet the growing consumption demand. For this purpose, the number of workers will be increased, overtime work will be done, current tax burden will increase and new machines will be ordered. However, as these measures taken will bring additional costs to suppliers, the firms will raise the prices in order to meet these increasing costs. The increase in the general price level will cause inflation.

In this case, the following question should come to mind. What are the reasons behind the Government's creating a monetary growth which will cause inflation? Accelerated monetary growth has emerged due to three factors.

These are; rapid increases in state spending, policies of the governments aiming to reach full employment and the wrong policies pursued by the Central Bank. Government increases the spending and reduces the taxes to ensure employment. It tries to meet the deficits that are caused as a result, by increasing monetary supply. These policies, albeit not successful in ensuring employment; it has been seen that they cause increase in inflation. (Friedman, 1968)

Another factor that triggers inflation is inflation forecast. As long as the forecasts are towards the increase in inflation; behaviors will be shaped accordingly and inflation will increase. In other words; forecast towards an increase in inflation will cause employee demand for increase in the wages. This increase in the costs will reflect to consumers as with higher prices and inflation will increase.

In developing countries, as the rate of increase in public expenditure overcomes the increase rate in sources of income; budget deficit has become an important issue. Relation between budget deficits, money supply growth and inflation is one of the important subjects of study in developing countries where particularly high rates of inflation are seen. According to the studies; it is put forward that the monetary policy alone is not enough in ensuring price stability and it should be pursued together with a proper fiscal policy. Although it is suggested that the main reason behind inflation is budget deficits; inflationary impact varies depending on the methods which are used for financing budget deficits.

Increase in inflation in developing countries reduces the real value of tax revenues due to the reasons such as delay time in tax collection and flexibility of tax system. Due to inflation, drop in the real value of tax revenues leads to an increase in the budget deficit (Tanzi, 1978).

This study aims to theoretically and empirically set forth the causality network between budget deficit and increase in monetary supply. For this purpose; principally the relation between inflation, budget deficit and monetary supply should be discussed theoretically. In the following chapter; the studies on the subject are given. In the last chapter; based on the data of Turkey for the term 1987:1-2013: 4, the relation between budget deficit, growth in monetary supply and inflation is tested econometrically with time series VAR model.

2. Theoretical Approaches towards the Relation between Budget Deficits, Increase in Monetary Supply and Inflation

In ensuring price stability; there are several theories that try to explain the relation between budget deficits and price level. From the mentioned theories; Classical, Keynesian, Monetarist and Structural is tap preaches are discussed briefly below.

The classical approach bases the inflation on the money quantity theory. Changes in the quantity of money directly and at the same rate lead to price changes. Classics see inflation as a monetary phenomenon and argue that the basic factor that determines the general level of prices is money (Kibritçioğlu et al., 2002). Real and monetary sectors operate independently from each other. When the real wages are determined in real sector; nominal wages are shaped by the changes in money supply. Therefore; while an increase in the money supply does not have any effect on real output, it will increase the general price level.

According to Keynesian approach; the cause of the inflation is the excessive demand oppressions, which emerge under the assumption that the economy is at full employment. Excess demand at the level of full employment will lead to more profit for the firms while nominal wages are fixed. On the other hand; in order to meet the growing demand, the labor demand of the firms will increase and the wages will rise. This will increase the general level of prices and will lead to inflation (Kotwal, 1987; Frisch, 1989).

According to monetarist approach; an increase in the budget deficit cause an increase in monetary supply, and hence an increase in inflation (Serban, 2002). Monetarists argue that the main factor determining the aggregate demand and hence production, employment and inflation is the changes occurring in money supply. Friedman (1968) suggests that inflation could be reduced especially with long-term control of the money supply.

Monetarist approach suggests that financing the budget deficits by obtaining seignior age income, which is called as inflation tax, will increase the general level of prices and will lead to inflation. Inflation is a kind of a tax and is the easiest way to finance the government deficit. This tax is imposed on the money retained by individuals and the real value of money is constantly reduced (Oktayer, 2010). In order to achieve some of its objectives; State creates an unexpected inflation and obtains seigniorage venue.

Thus; even if the unemployment rate and production level decreases at the beginning, it ensures contributions such as promoting the new investments as the income distribution changes through inflation. However, as these real returns will disappear in the long term will disappear, seignior age income will only lead to an increase in the inflation.

On the other hand; monetary policy practices, which are shown among the most important reason for the price increases, have begun to be questioned in 1980s. In this context, Sargent and Wallace (1981) have criticized the standard monetarist view in their study. It is noted that this view may be misleading as the governments ignore the fact that they will be limited with inter their period budgets. Sargent and Wallace (1981) put forward the importance of the relation between monetary and fiscal policies in ensuring price stability; and reviewed the inflation according to the priority of monetary and fiscal policies to each other. The relationship between fiscal and monetary policy to ensure price stability in terms of the importance of putting forth; inflation, monetary and fiscal policies are examined according to the priority to each other. In this context, inflation is a financial-driven monetary phenomenon.

According to Sargent and Wallace (1981); under certain circumstances, Central Bank does not have full control over the inflation rate. While tight monetary policy reduces inflation in the short term; it will lead to a further rise in inflation in the long-term. Especially, financing persistent budget deficits through domestic borrowing will lead to much more inflationary results sequences than monetary financing in the long term. Because; as the budget deficits will be financed by borrowing or printing money, monetary policy will be under the oppression of budget deficits (Oktayer, 2010).

Structural approach emerged as a response to monetarist approach on the grounds that inflation in underdeveloped and developing countries cannot be eliminated with monetarist measures. On the contrary to monetarists; structuralism approach has a different approach to inflation and states that inflation is caused by goods and labor sectors. According to the structuralisms; in under developed and developing countries, monetary and fiscal authorities accept the inflationist oppressions and go for increasing money supply instead of meeting the deficits in unemployment, consumption and investment. Therefore, the increase in the money supply is a result of structural inflation (Pinga and Nelson, 2001).

According to the structural is approach; the phenomenon of inflation is explained based on the structural characteristics of the economy in underdeveloped and developing countries. Structuralism views, that attribute the causes of inflation to economic and social structure in the process of economic growth, emphasize that the structural deficiencies lead to supply-demand imbalances and price increases
According to proponents of the structural is approach; the source of inflation is not monetary reasons. For example, the expansion in the supply of money due to various reasons such as low elasticity of supply in agricultural production, increasing export, low and unstable import, weakness of the tax system is not the cause but the result of the inflation.

The causes of inflation in developing countries are often based on monetarist and structural is approaches. While the impact of monetary developments are not ignored; it can be told that as a general approach, inflation in Turkey can be explained with structural is approach.

Another theory studying the causes of inflation is "Fiscal Theory of the Price Level" (FTPL) which has been put forward by Woodford (1994, 1995 and 1996), Sims (1994, 1998) and Canzoneri et al. (2001). On the basis of FTPL approach, called as financier approach, there is continuous budget deficits and their financing methods. Woodford (1996) suggests that budget deficits may be the most important source of macroeconomic instability of budget deficits. It has been expressed that the supply of money is not the main element that determines the inflation, but also budget deficit has a significant impact on inflation. According to FTPL approach; monetary and fiscal policies should be conducted consistent with each other for the implementation of an effective economic policy.

Similar problems are experienced in our country, which is still in developing countries class, despite the importance given to the growth and development efforts; there are difficulties in achieving price stability. Due to structural reasons such as fragile markets, foreign-dependent economy and political instability; policy instruments are limited and they cannot be used effectively. In these kind of countries, income distribution and macro balances of which are not sound; policies, that are applied up to a limited level and cannot be applied effective enough, cause the continuity of inflationary environment.

3. Literature

Form any developed and developing countries; empirical studies, which examined the relationship between budget deficit, money supply and inflation, have been made but here is not any consensus reached about the existence and direction of the relation between these variables. In the possible relation between budget deficit, supply of money and inflation; it has been observed that different results were obtained based on the observation term, development level of the country and econometric methods used.

Using annual data between 1957-1993 of budget deficit and inflation, in Greece; Hondroyiannis and Papapetra (1997) tested the impact of budget deficits on inflation and reached the conclusion that there is bi-directional causality.

In his study; Dwyer (1982) reviewed the correlation between budget deficits and macroeconomic variables and could not find a significant relation between them. According to Dwyer; budget deficits does not have any effect on the general price level.

In their studies to see the possible effects of budget deficits on inflation; Abizadeh and Yousefi (1998) and Eisner (1989) have concluded that there is no effect of budget deficits on inflation. In the same way; by using the data of 32 countries, Karras (1994) reviewed the effects of budget deficits on the macroeconomic variables such as supply of money, inflation, investment and generation; and reached to the conclusion that the budget deficits do not lead to inflation.

Darrat (2000) reviewed the inflationist results of budget deficits in Greece for the period 1957-1993 period by using error correction method and reached to a conclusion that budget deficit has an effect on inflation. Vymyatnina (2006) concluded that in Russia for the period 1995-2004 there was a causality from inflation to supply of money.

Catao and Terrones (2003) emphasized in their study covering 107 countries for the period 1960-2001 that the relationship between inflation and budget deficits varies according to the development level of the country. In this study it is concluded that while it is seen that there is a strong positive relation between budget deficit and inflation, this relation is weak in developed countries.

Alavirad (2003) studied the relationship between inflation and money supply in Iran during the period 1981-1997 with equation system and stated that the increase in budget deficit stimulates the money supply and causes inflation.

There are studies that examine the relationship between budget deficit, money supply and inflation in Turkey example. Çetintaş (2005) estimated the relationship between budget deficits and inflation using bivariate and multivariate models with the data for the period 1985 to 2003 in Turkey. He has concluded that in both models; there is a bi-directional causality between the models and the inflation in Turkey can be only dropped by reducing budget deficits. The results supporting Çetintaş (2005)'s findings were also obtained by Özgün (2000). In his study using data for the period 1950-1998 in Turkey; Özgün (2000) reviewed the long-term relation of budget deficits and velocity of money on inflation. As a conclusion of his study; he has reached to a positive linear relationship between variables and also a bi-directional causality between budget deficits and inflation.

In his study analyzing the inflationary process in Turkey; Met in (1995) stated that the main determinant of inflation is fiscal expansion. So; inflation will be able to be dropped by reducing budget deficits.

In their studies reviewing the relationship between budget deficits, money supply and inflation in Turkey for the period of 1983 to 1999; Koru and Özmen (2003) concluded that there is a positive relationship between the increase in money supply and inflation; however this relation does not make any sense.

Altıntaş et al. (2008) tested the relation between the budget deficit, money supply and inflation in Turkey in the period 1992-2006 with the ARDL approach. According to the results obtained; positive and significant relationship has been found between increase in money supply and inflation both in short and long term; but, no relationship was found between budget deficit and inflation either in long or in short term.

Oktayer (2010) reviewed the relationship between budget deficit, supply of money and inflation in Turkey by using co-integration analysis. The findings showed that Turkey's economy supports fiscal theory of the price level (FTPL) approach in the long term.

Kesbiç et al. (2004) studied the effect of domestic borrowing, as a means of financing the budget deficit, on inflation in Turkey by using 1989-2003 period annual data and simultaneous equation systems. According to this study; the use of short-term advances in budget financing causes inflation by increasing the money supply.

In their study that reviewed the long-term relationship between budget deficits and inflation; Akçay et al. (2001) worked on the period 1970-2000. As a result of the study; it has been identified that the changes in the public sector borrowing requirement have lasting effects on inflation, but the budget deficit does not have a lasting effect on inflation in the long term.

4. Data Set and Analysis Results

In this study where the existence and direction of the relation between budget deficit, money supply and inflation is reviewed; the model that consists of budget deficit and supply of money, as the determinants of inflation, is defined as follows.

$$inf_t = \alpha_0 + \alpha_1\, budget_t + \alpha_2\, m2_t + u_t$$

In the model; ***inf***, indicates consumer price index; ***m2***, indicates broadly defined money supply; ***budget*** indicates budget deficit and u indicates error term. The α_1 and α_2 coefficients in the model are the parameters which shows respectively the relation between budget deficit and money supply and inflation.

The variables used in the study consist of quarterly data for the period 1987:1-2013: 4. The number of observations that can be used for each variables 108. All variables used in the model were obtained from Central Bank of the Republic of Turkey Electronic Data Distribution System (CBRT-EDDS). Econometric tests were performed using Eviews 7 software package.

Table 1: Definitions of Variables

Variables	**Definition**
inf	Consumer Price Index (2003=100)
budget	Budget Deficit / GDP
m2	Money Supply / GDP

m2 variable indicates the money supply ratio to gross domestic product. ***budget*** variable is calculated by taking the ratio of budget balance against gross domestic product. CPI (2003= 100) values have been taken as a representative of ***inf*** variable. As the budget deficit variable contains negative values; logarithm of all variables, except for the budget deficit, has been taken. In addition, as our variables consist of quarterly data, it has been seasonally adjusted with Tramo /Seats method.

4.1 Unit Root Test

To ensure the regression analysis, made with time series, are meaningful in econometric terms; the series must be static. The presence of a unit root in a time series means that the series is not static (Gujarati, 1999). According to Granger and Newbold (1974); spurious regression is seen in analyzes conducted with non-static series and as a result unreliable contradictory results are achieved. Hence; the regression analysis made with non-static series does not reflect the exact relationship between the variables. Therefore, first of all it should be found out whether the variables are static or not. In this study, ADF and PP unit root tests have been applied to test the stability of the series and to define the rank of its stability.

Table 2: ADF Unit Root Test Results

Variables	Test Statistics	Critical Values (%1)	Probability	Result
Linf_sa	-0.486 (3)	-4.047	0.983	-
ΔLinf_sa	-6.137 (0)	-4.047	0.000	I(1)
budget_sa	-1.997 (1)	-4.047	0.596	-
Δbudget_sa	-14.435 (0)	-4.047	0.000	I(1)
Lm2_sa	-0.508 (1)	-4.047	0.999	-
ΔLm2_sa	-6.455 (0)	-4.047	0.000	I(1)

- The value in parentheses gives the optimal lag length.
- Autocorrelation between the errors resolves the optimal lag length determined by the SIC-Shcwarz Info Criterion and the maximum delay is taken as 11. Accordingly, the delay that the smallest SIC value, is determined as appropriate delay.
- MacKinnon critical values were used.
- Δ symbol indicates the first difference operator.

Table 3: PP Unit Root Test Results

Variables	Test Statistics	Critical Values (%1)	Probability	Result
Linf_sa	-0.733 (7)	-4.046	0.999	-
ΔLinf_sa	-6.389 (6)	-4.047	0.000	I(1)
budget_sa	-2.647 (4)	-4.046	0.261	-
Δbudget_sa	-14.435 (0)	-4.047	0.000	I(1)
Lm2_sa	-3.365 (6)	-3.493	0.014	-
ΔLm2_sa	-5.048 (3)	-3.493	0.000	I(1)

- Values in parentheses indicate the bandwidth.
- For determining bandwidth is used Newey-West criteria.
- MacKinnon critical values were used.
- Δ symbol indicates the first difference operator.

According to ADF and PP unit root test results in Tables 2 and 3; it has been seen that the series are not stable in their level values and they become stable when their first difference is taken. All the series are on the same order, stable on I(1) level. This result shows that there may be a long-term relation between budget deficits, inflation and money supply and indicates the possibility of cointegration analysis.

4.2. Cointegration Test

After it is defined that the variables are on the same stability level as a result of unit root tests results; long-term relationship between variables were investigated by Johansen cointegration tests (Johansen and Juselius, 1990).

Table 4: Johansen Cointegration Test Results

H_0	λ_{trace}	%5	λ_{max}	%5	Eigenvalue
r = 0	35.28090	42.91525	22.46967	25.82321	0.195997
r ≤ 1	12.81123	25.87211	7.675725	19.38704	0.071813
r ≤ 2	5.135508	12.51798	5.135508	12.51798	0.048637

Trace test indicates and Max-Eigen value test indicates no co integration at the 0.05 level

When Trace and maximum Eigen value test results in Table 4 are taken into consideration; as the 5% significance level Trace test and maximum Eigen value test static values are lower than table critical values; it has been concluded that there is not co integration between the series.

4.3. VAR Model

An important point to be considered when estimating the VAR model is the length of the delay to be used. When the delays are defined longer than their exact values; the variables will have higher values than their exact values; thus excess parameterization problem will occur as a result. (Katos et al., 2000).

In cases where monthly and quarterly data is studied, autocorrelation problem may occur. Autocorrelation problem, usually arises when the observations for a time period are moved to other time periods in the future. Therefore, when the number of delays are determined; it is necessary that the number of delays, where there is not any autocorrelation issue, should be selected (Vogelvang, 2003).

Table 5: The Determination of the Appropriate Lag Length

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-367.8109	NA	0.359695	7.491130	7.569770	7.522948
1	-302.5104	125.3242	0.115354	6.353746	6.668306*	6.481017
2	-286.0060	30.67494*	0.099184*	6.202141*	6.752621	6.424866*
3	-280.0667	10.67875	0.105654	6.263973	7.050373	6.582151
4	-270.8981	15.92916	0.105559	6.260568	7.282888	6.674200
5	-267.8527	5.106412	0.119530	6.380863	7.639103	6.889949
6	-259.1118	14.12675	0.120866	6.386097	7.880257	6.990637
7	-255.6754	5.345454	0.136352	6.498494	8.228574	7.198487
8	-252.3623	4.953006	0.154625	6.613380	8.579379	7.408826

* indicates lag order selected by the criterion
FPE (Final Prediction Error),
AIC (Akaike Information Criterion),
SC (Schwarz Information Criterion),
HQ (HannanQuin Information Criterion).

(*) sign in Table 5; where the optimal delay length is defined by using criteria such as AIC, SC, HQ and FPE etc.; indicates that the related delay is appropriate. Accordingly; it is seen that LR, FPE, AIC and HQ values are on the same direction and it gives minimum value for 2 delays.

In order to investigate the appropriateness of the estimated VAR model; autocorrelation and stability tests were performed. Lagrange Multiplier test was used for auto correlation test and Autoregressive Unit Root test was used to test the stability of the model.

Table 6: Lagrange Multiplier Test

Lags	LM Statistics	Probability
1	9.192687	0.4197
2	15.39313	0.0807
3	1.379385	0.9979
4	11.61113	0.1011
5	3.488334	0.9418
6	4.390275	0.8839
7	2.216318	0.9876
8	2.794230	0.9719
9	2.960587	0.9658
10	3.770859	0.9258
11	5.797804	0.7600
12	7.808347	0.5536

In order to determine whether the residual terms bear autocorrelation problem or not; as the probability value in Table 6 takes values, significance value of which are higher than 5% till the 12^{th} delay, it has been found out that there is not any autocorrelation issue in residual terms of the model estimated for all delays.

According to autoregressive unit root test, which is made to test stability of the model; the inverse roots of the AR characteristics polynomial of the model must take place within the unit circle. Accordingly, if all AR inverse roots are within the unit circle, system is either stable or steady; if at least one of them is on or outside the unit circle, system cannot be stable. All the reverse roots in Figure 1 taking place in the unit circle implies that the VAR model meets stability condition.

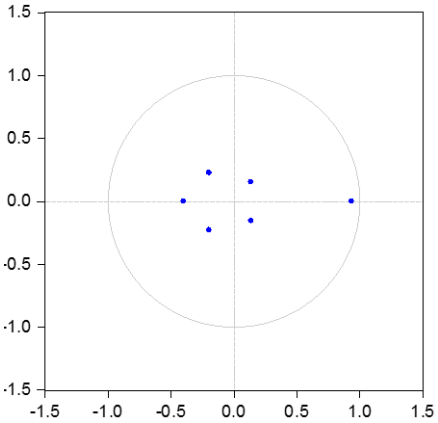

Figure 1: Inverse Roots of AR Characteristic Polynomial

Tests, which are made for the suitability and stability of the model, reveal that impulse response and variance decomposition analysis will be consistent.

4.3.1. Causality Test

The results of co-integration reveal the existence of long-term relation between the variables; but they do not imply anything about the direction of the relation. The direction of the relationship between the variables will be determined with the help of Granger causality test (Granger, 1969). These are important findings for the policy-makers to know the existence and direction of the long term relationship between the variables based on the results of Granger causality test. In order to analyze cause and effect relationships between the series; applied Granger causality test results are shown in Table 7.

Table 7: Granger Causality Test Results

Null Hypothesis (H_0)	Probability	Result
Δbudget_sa does not Granger Cause ΔLinf_sa	0.0165*	**Δbudget_sa→ΔLinf_sa**
ΔLinf_sa does not Granger Cause Δbudget_sa	0.0165*	**ΔLinf_sa→Δbudget_sa**
ΔLm2_sa does not Granger Cause ΔLinf_sa	0.0096*	**ΔLm2_sa →ΔLinf_sa**
ΔLinf_sa does not Granger Cause ΔLm2_sa	0.3460	
ΔLm2_sa does not Granger Cause Δbudget_sa	0.6469	
Δbudget_sa does not Granger Cause ΔLm2_sa	0.0756*	**Δbudget_sa→ ΔLm2_sa**

According to the results of causality; it is seen that there is a bi-directional relationship between budget deficit and inflation. Besides; budget deficit is the cause of increase in money supply. Central Bank's printing money to finance the budget deficit will lead to an increase in the money supply. In case of increase of the money supply; consumption will increase and the prices will rise as the aggregate supply will not be able to meet the aggregate demand. It is seen that budget deficit leads to an increase in inflation both directly and indirectly by increasing the supply of money. As the real values of the tax revenues will decrease in the inflationary environment; the real value of tax revenues will reduce, the budget deficits will increase. According to these results, it can be said that changes in budget deficits and supply of money cause inflationary effects.

Table 8: The Variance Decomposition of ΔLinf_sa

Variance Period	S.E.	ΔLinf_sa	Δbudget_sa	ΔLm2_sa
1	0.034766	100.0000	0.000000	0.000000
2	0.038445	99.54946	0.236053	0.214484
3	0.044328	99.32323	0.406098	0.270671
4	0.047891	99.31634	0.431418	0.252242
5	0.051127	99.23820	0.506342	0.255455
6	0.053659	99.21385	0.534024	0.252127
7	0.055811	99.18777	0.560995	0.251231
8	0.057599	99.17061	0.579437	0.249956
9	0.059116	99.15654	0.594266	0.249189
10	0.060402	99.14570	0.605800	0.248501
11	0.061499	99.13688	0.615140	0.247978
12	0.062436	99.12975	0.622709	0.247542

According to Granger causality test; direct and indirect relationships between the variables are shown in Figure 2.

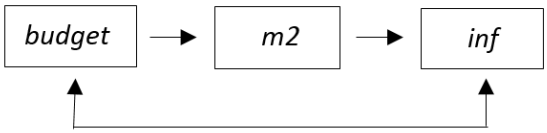

Figure 2: Causal Relationships between Variables

As shown in Figure 2; there is direct or indirect relationship between all variables in the model. According to the results obtained; money supply is a critical variable affecting inflation. A steady increase in the money supply will lead to an increase in inflation at the same rate. Chronic budget deficits, which cannot be closed, mean the state's to be indebted permanently and increasingly. On the other hand; two-way causal relationship can be seen between budget deficits and inflation. Increase in inflation raises the cost of public spending, but decreases revenue. Thus, the budget deficits will be continuous. State debts to the Central Bank will grow and this will lead to budget deficits. Growing budget deficits are financed by printing money and growing money supply leads to inflation. Thus, a vicious cycle emerges as inflation causes budget deficits and budget deficits support the inflation

4.3.2. Impulse - Response Functions

Impulse-response functions show the effect of a standard deviation shock, which occurs in one of the variables in the system, on the current and future values of endogenous variables.

In Figure 3; impulse-response functions are given which show the effect of standard deviation shock, which may occur on each variable, on the other variables in the 95% confidence interval. Dashed lines show the confidence intervals for +/- 2 standard error; straight lines show the reaction given in time by the dependent variable against standard deviation shock occurring in the error term of the model. If impulse-response coefficients are within the confidence limits; it indicates that the impulse-response functions are statistically significant. Shock effects approaching zero in time once more confirms the system stability tested before by using unit root test; and it also shows again that the model is stable (Erden and Turan Koyuncu, 2014).

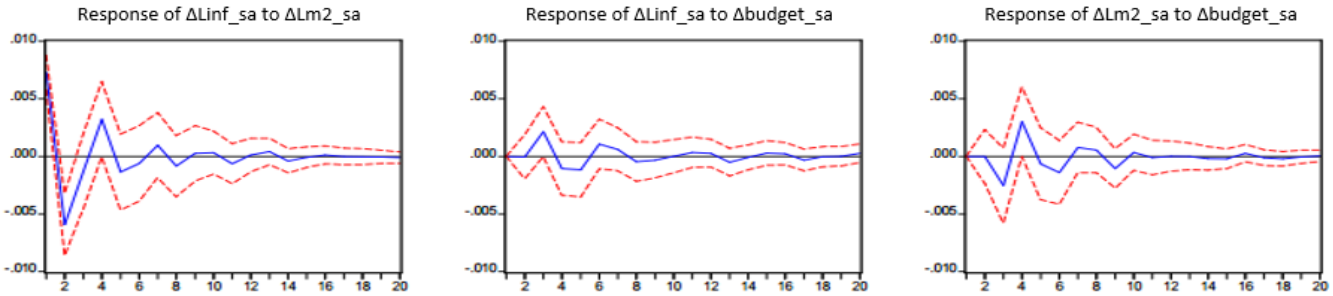

Figure 3: Response to One Standard Deviation Shock

In Figure 3 are included, the impulse response functions of the variables only among the causal relationship. Accordingly, the increase in the money supply and budget deficit occurred in one standard deviation shock, to have a significant effect on the inflation change, obtained from Granger causality test supports the relationship.

5. Conclusions

Inflation problem is the most serious problem in developing countries. Solving this problem will lead to the removal of the biggest obstacle on the path of development and growth. One of the main results of inflation is monetary income's reducing purchasing power and deteriorating standard of living. Continuous decrease in living standards has a lowering effect on the growth rate.

Ensuring price stability is one of the main economic goals of today's economy. The realization of a sustainable growth in the medium term, to increase the welfare of the community, increasing employment and accelerating industrialization depend on success in fighting inflation.

Therefore; examining the causes of inflation and its relation with the other macroeconomic variables is important for monitoring economic activity of that country, planning economic policies for the future. As the cause of inflation is the increase in the money supply; the solution is to reduce the rate of monetary growth. If the amount of money increases as much as the increase in goods and services, which can be purchased; prices will best able.

In this context; for policy makers to ensure the financial stability required for low inflation and a sustainable economic growth, it is of utmost importance that the policies for the fight against inflation are made with a stable approach. However; the policies, applied so far, could not achieve the expected success for the solution inflation problem.

In order to ensure stability in the general level of prices; medium and long-term uncertainties, caused by high and volatile inflation, should be eliminated. The Stated has two basic policy tools, namely as monetary and fiscal policy. However, there are a variety of approaches about the effectiveness of these policy tools. Within the framework of monetarist approach; it is expressed that the increase in the money supply has a direct effect on inflation; while, according to the constructivist approach; expansion in the money supply is not the cause of inflation but the result of it. Besides; in FTPL approach, which is called as financier approach, it is referred that amount of money is not the only basic component affecting the inflation, but also the budget deficit has a significant impact on inflation.

In this study, the relationship between the budget deficit in Turkey, money supply growth and inflation have been tried to be defined. First-degree difference I(1) of all variables used in the model is static. It has been examined whether there is a long-term relation between the variables with the same level of stability. Causality test was performed in order to determine the direction of the long-term relationship between the variables in the model. According to the finding so brained in the period examined; it is seen that there is a bi-directional causality towards the budget deficits to inflation and vice versa. This result emphasizes the importance of budget deficits experienced in Turkey in inflation process. Bi-directional causality between budget deficits and inflation indicates that inflation can only be dropped by reducing the budget deficits. In addition, while there is not any relation from inflation towards the money supply; it has been found that there is causality from money supply towards inflation. A continuous increase in the supply of money will lead to an increase in inflation at the same rate.

As a conclusion; as Turkey is a country which has deficit in both budget and payment balances, it is possible to say that inflation does not emerge directly as a result of the increases in the supply of money, but it also emerges because of budget deficits. Increase in the supply of money through the increasing budget deficits and the rise in exchange rates are seen as the main factors causing inflation. Therefore; in the fight again stagflation in terms of costs, the relevant policy recommendations should be made for reduction of the budget deficit and keeping the exchange rates low; and if the fight is about demand, the policies recommended should be relevant to keeping the supply of money low. The findings show that the economy in Turkey supports fiscal theory of the price level (FTPL) and monetarist approach; hence, the increase in the budget deficit and supply of money may be the cause of inflation.

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