THE EFFECT OF NOMINAL GOVERNMENT DEFICITS ON ECONOMIC GROWTH

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ÖZET

Cari hükümet açıkları ve enflasyon arasında pozitif bir ilişkinin varlığı genellikle kabul edilmiş bir olgudur. Hükümet açıkları birçok sebepten dolayı parasal büyüme ile finanse edilebilir; ancak sebep ne olursa olsun sonuç enflasyonda bir artıştır. Bu da kaynak dağılımı, işgücü piyasası ve firma kararlarına ters etkileri nedeniyle reel GSMH'daki büyümeyi negatif olarak etkileyebilir. Bu çalışmanın amacı, cari hükümet açıkları ve enflasyon, enflasyon ve reel GSMH'daki büyüme arasındaki iki bağlantıyı birleştirmek ve Türkiye'de cari hükümet açıklarının ekonomik büyümeye etkisini göstermektir. Eşbütünleşme ve nedensellik testlerini sonuçları, Türkiye'de 1950-2001 yılları arasında cari hükümet açıklarının sadece kısa dönemde parasal tabanda artışlara yol açarak, hem kısa hem de uzun dönemde enflasyona neden olduğunu göstermektedir. Enflasyonun reel GSMH büyümesine etkisi ise zayıf ve ters yöndedir.

ABSTRACT

It is basically accepted by now that there is a positive relationship between the nominal government deficits and inflation. Government deficits may be financed by monetary growth due to several reasons but whatever the reason, the result is an increase in inflation. This in turn may affect the growth of real GNP negatively, due to its adverse effects on the allocation of resources, on the labor market and on the decisions of firms. This paper combines these two links, i.e. nominal government deficits and inflation, and inflation and real GNP growth. It further shows the effect of nominal government deficits on the economic growth for Turkey. Our results from cointegration and causality tests show that for Turkey for the period of 1950-

2001, nominal government deficits led to increases in the monetary base only in the short run, causing inflation both in the short and the long run. The effect of inflation on real GNP growth is weak and in the reverse direction.

INTRODUCTION

The positive relationship between the nominal government deficits and inflation is basically an accepted issue in economic literature (among others see Niskaken, 1978: 601; Allen and Smith, 1983: 613; Ülengin, 1995: 110). In a country where the government deficits are high and the ability to finance the deficit by domestic borrowing is limited, money creation is almost inescapable. As the government deficit persists, so does money creation leading to high inflation. This high inflation and the uncertainty that it creates, may affect the growth in real GNP negatively.

This study makes a contribution to the existing literature on the effects of the government deficits by looking for the effects of nominal government deficits on economic growth through monetary policy. Our aim in this paper is to investigate the hypothesis that in a country where high government deficits cause an increase in the monetary base, which in turn inflates the economy, these high nominal government deficits indirectly affect the economic growth of the country adversely. This indirect effect is through the negative relationship between inflation and real economic activity in a country.

The hypothesis of the paper is examined initially by analyzing the Turkish economy and by estimating contemporaneous correlations in terms of the predicted relationships between the relevant variables. Then, after testing for the unit roots for the variables, Engle-Granger and Johansen cointegration tests and causality tests are performed.

Our results show that for Turkey, which has a history of high government deficits, high money growth and

high inflation, nominal government deficits led to increases in the monetary base only in the short run, yet causing inflation both in the short and the long run. For the effect of inflation on real GNP growth, there is weak and reverse evidence of causality in the short and the long run.

The rest of the paper is organized as follows: the second section summarizes the literature, the third section provides the empirical analysis and the fourth section concludes.

LITERATURE REVIEW

The effect of nominal government deficits on economic growth can be analyzed in many ways. One approach could take the effects of government budget deficits through fiscal policy, while another could be through monetary policy. The first link has been studied in many studies including Cebula (1995), Ludvigson (1996) and Dornbusch, Fischer and Stratz (2001). These studies search for the effects of a budget deficit by estimating a growth model taking into account the fiscal policy of the government.

This study investigates the second way of the relationship between of nominal government budget deficit and economic growth by concentrating on the sustained government deficits that have to be financed by monetization. It has been shown that budget deficits, through their relationship with inflation tend to deter growth in long run (Gyflason and Herbertsson, 2001: 407). This study assumes that high and persistent deficits lead to increases in the monetary base and inflation, and this affects the growth of the economy negatively.

Several studies have shown that high nominal government deficits are generally financed by either increases in money supply through selling bonds to the Central Bank or by selling bonds to the private sector (Niskaken, 1978: 601; Aghevli and Khan, 1978: 394; Hamburger and Zwick, 1981: 148; Allen and Smith, 1983: 613; Ahking and Miller, 1985: 460; Sönmez, 1994: 589; Ülengin, 1995: 110). Among the several reasons for financing of the government deficit by monetary expansion, one is the decrease in real government revenue because of collection lags and where the tax structure's not being fully indexed (Canavese and Heymann, 1992: 100).

In addition, the Central Bank may encourage money supply growth to reduce the real value of outstanding government debt. The Central Bank may also encourage money supply growth to ease credit controls to mitigate the pressure exerted by private capital markets by the increased government borrowing typically associated with deficits (Hamburger and Zwick, 1981: 141; and Hoffman, Low and Reineberg, 1983: 223). Such a policy mainly aims interest rate stability but as higher inflation means higher interest rates, it does not work.

This positive relationship between inflation and interest rates stems basically from the inflationary expectations created by high and prolonged inflation in an economy. In such an economic environment, interest rates increase due to the inflationary premium needed to compensate investors for the costs of inflation (Fisher effect). Recent research has found that this positive relationship between inflation and interest rates holds especially in the long run (Mishkin, 1990a: 78; Mishkin, 1990b: 820; Mishkin, 1991: 11; Atkins and Coe, 2002: 259; Fahmy and Kandil, 2002: 525).

The Central Bank tends to interpret the desires of the public as demanding price stability or low inflation rates, whereas the government interpret the desires of the public as wanting public expenditures. This difference in motives makes the Treasury seek as much as seigniorage as possible from the monetary authorities. The greater the power of the fiscal authorities over monetary authorities the greater the degree of monetization and therefore the greater the inflation rate (Fratianni and Spinelli, 2001: 269).

Whatever the reason, when government deficits are financed by monetary expansion, the result is usually an increase in inflation. Despite their different data samples, Aghevli and Khan (1978: 383), Allen and Smith (1983: 605), Ahking and Miller (1985: 447), Darrat (1986: 87), Ülengin (1995: 101) show that government deficits lead to an increase in the monetary base which in turn causes an increase in inflation.

High and sustained inflation has a definite negative effect on the economic conditions of a country. First of all, when inflation is expected to prevail in the economy, it causes shoe leather costs; which are the costs incurred due to making more trips to the banks or ATMs and due to expending resources to reduce money holdings and to increase the amount of interest bearing assets (Fischer and Modigliani, 1978: 810, Loungani and Sheets, 1997: 381; Pakko, 1998: 37). It also leads to menu costs, the costs of changing prices such as printing menus, catalogues, etc. (Fischer and Modigliani, 1978: 810, Loungani and Sheets, 1997: 381; Pakko, 1998: 37).

The effective tax rate paid on capital income is increased through the interaction of existing tax rules with inflation which reduces the real net rate of return

for the suppliers of capital and the incentives to save and invest and therefore economic growth (Fischer and Modigliani, 1978: 810). In countries with a strong preference to maintain fixed exchange rates, anticipated inflation causes exchange rate overvaluation and balance of payments difficulties leading to increased protectionist policies and devaluation. This may reduce the willingness of foreign and domestic investors to invest in that country. However, this is not true if the exchange rate is flexible and the purchasing power parity holds.

When inflation turns out to be higher than expected and it is highly variable, this raises uncertainty about the rate of inflation and economic efficiency, which in return distorts relative prices and causes misallocation of resources arising from the need to search for relative price information. (Lucas, 1973: 326; Ball, 1992: 371; Fischer, 1993: 485). In addition, the willingness to enter contractual arrangements is reduced as unexpected inflation causes a redistribution from lenders to borrowers and from workers to employers (Ball and Cecchetti, 1990: 215).

EMPIRICAL ANALYSIS

Our analysis in this study investigates the relationship between nominal government deficits and growth of real GNP for Turkey for the period 1950-2001, focusing on the positive relationship between nominal government deficits and inflation and the negative effect of inflation on growth. Our variables are nominal government deficits, the monetary base, inflation and real GNP. The data for these variables are obtained from the State Planning Organization and State Institute of Statistics of Turkey and they are annual.

Nominal government deficits (GDEF) are measured as positive numbers throughout the analysis. In order to investigate the relationship between the nominal government deficit and inflation, we use the link from government deficits to monetary base and from monetary base to inflation. We assume that to finance the budget deficit, the government increases the

monetary base, and these increases in the monetary base result in inflation. For the former link between nominal budget deficits (GDEF) and monetary base, we use the absolute change in monetary base (CMON) because the financing of the nominal government deficits by monetary expansion can be calculated by the difference in the total monetary base each year. For the latter link between monetary base and inflation, we use the percentage change in monetary base (PMON) so that the scale of this variable is consistent with that of inflation (INF).

Real GNP (RGNP) is measured in 1987 prices in billions of Turkish Liras. To test the relationship between inflation and growth (GRW), we use the percentage changes in real GNP for the growth variable and the percentage changes in the GNP Deflator in 1987 prices for the inflation variable.

We first analyze the Turkish economy in terms of the assertions of our paper and provide correlations whose significance are tested by t-test. Then, the time series properties of the variables are provided by the results of the unit root tests. These enable us to choose the correct forms and combinations of the variables for the cointegration and causality tests which are reported in the last part.

An Outlook to the Turkish Economy

The situation of the Turkish economy in the period 1950-2001 in terms of the monetization of the government deficit and the relationship between inflation and economic growth is given in Table 1 and Figures 1 and 2. Table 1 provides the ten-year averages of the variables in question, which are also graphed in the following figures.

As it can be seen from the table, after the 1950's, monetary base and especially the amount currency in circulation has increased. Government revenues did not meet budget spendings, and this caused the Central Bank to print excess money. In 1951, commercial bank interest rates were decreased from 12% to 8.5%, causing a credit expansion. The existing gap in the general budget widened as money sources were transferred by spending more than the income.

Table 1. Budget Deficit, Monetary Base, Inflation and Growth in Turkey: 1950-2001

	1951-60	1961-70	1971-80	1981-90	1991-2001
Government budget deficit (gdef) (billion TL)	0.018	0.304	35.68	3003.3	5628305.8
Absolute Change in the monetary base (cmon) (billion TL)	0.481	1.3	24.2	2268.3	718970
Percentage Change in the monetary base (pmon)	17.94	12.39	31.79	58.69	71.44
Inflation (inf)	10.31	5.88	35.15	47.20	71.25
Growth of real GDP (grw)	6.39	5.67	4.04	5.25	2.43

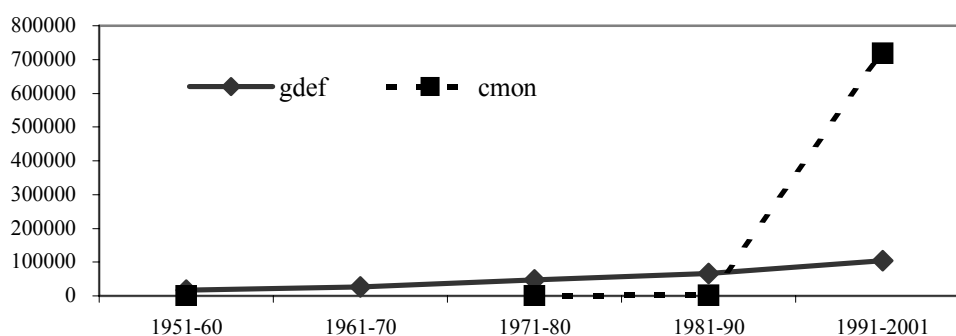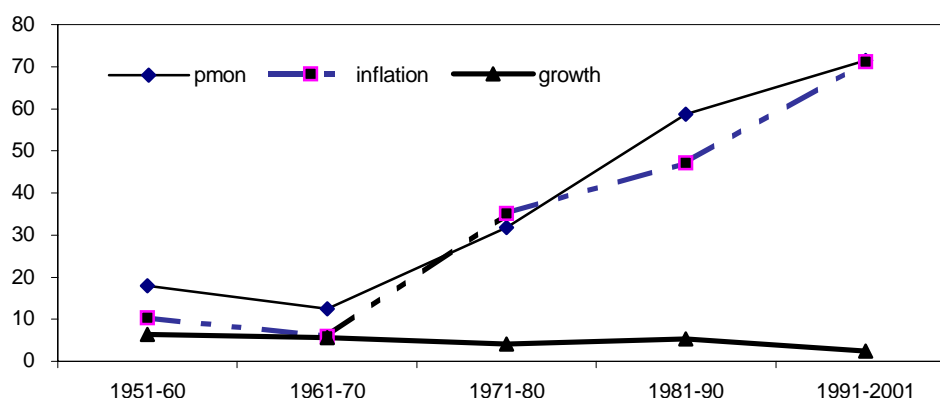**Figure 1. Government deficit (gdef) and the absolute change in monetary base (cmon)**

Figure 2. The percentage change in monetary based (pmon), inflation a nd growth

The 1963–1983 period is the planned period of Turkey where five-year development plans were prepared by the government agencies. Money in circulation was increased about 93.3% in the 1st development plan (1963-67), 83.9% in the 2nd development plan (1968-72), 294% in the 3rd development plan (1973-77). This unfortunately was not parallel to the amount of production and related activities in the economy.

In 1970s, when compared with the previous periods, the amount of credit supplied to the public sector was greater than that to the private sector. Public sector and the economy were dependent on the Central Bank for credits intensely and this increased the demand for Central Bank sources. The credits to the public sector were mainly short term advances to the treasury for the budget needs and the credits for the financing of state economic enterprises.

During the planned period, while currency emission has increased continuously, prices also increased rapidly. Central Bank resources were not used accordingly with a decisive monetary policy principle and were transferred to unproductive fields. Government revenues could not be increased efficiently. The need for additional financing increased because of the increased government spending. Central Bank's being insufficient in resource provision caused the growth of domestic and external borrowing. The rapid rise of public sector borrowing requirement ratio caused the domestic and external debt, while increasing the inflation and interest rates. Re-borrowing requirement at higher interest rates in order to meet the accumulated debt and interest on them did not only increase the budget gap, but also made the gap bigger and permanent.

Monetary policy, before 1986, was used to meet public sector borrowing requirement through the use of Central Bank resources directly. After 1986, the decisions were taken so as to sell the Treasury bills and bonds, establish interbank money market and İstanbul Stock Exchange. Treasury and the Central Bank had limited the short-term advances. After 1990, Central Bank began to announce the monetary program to public opinion so that it would be possible to meet the cash demand through keeping the internal and external price of money, foreign exchange rate, and the interest rate stable with the help of monetary policy. However, the sources to be used by the Central Bank and the Treasury were limited and Central Bank monetary policy could not be conducted as a result of the public sector's borrowing process.

In 1990s, the difference between the government revenue and the government spending has increased. In the beginning of the 1994, the public sector's domestic borrowing mechanism collapsed and the devaluation expectations were increased because of the external deficit. Tight monetary policy was followed during this period. The inability of the Central Bank to conduct an independent monetary policy and the financial liberalization in 1989 and the effects of the economic crises in the world (1997 East Asia Crisis, 1998 Russian Crisis) were transmitted to the Turkish economy, which increased the borrowing requirements of the government, leading to high interest rates and inflation. These adverse developments in the Turkish economy prevailed until 2001, consuming two stability programs in the last two years.

Correlations

The contemporaneous correlations between the relevant variables indicated by our analysis are given in Table 2. We expect a positive relationship between the nominal government deficit and the absolute change in monetary base and between the percentage change in monetary base and inflation.

The contemporaneous correlations between these variables are 0.86 and 0.72 respectively and theyare significant at 1%. Inflation is assumed to have a negative effect on the growth of real GNP. The contemporaneous correlation between inflation and the growth of real GNP is -0.34 and significant at 1%. So we can conclude that the preliminary empirical results are consistent with the assertions of the analysis about the predicted directions of the relationships between the relevant variables.

Unit root tests

We use Augmented Dickey-Fuller (ADF) test for unit roots on all the variables with and without a trend term to determine the time series properties of the variables. The results reported in Table 3, show that all of our variables except the growth rate of real GNP are integrated of the first order with one unit root. We have investigated for the stationarity of real GNP also and found that it is I(1). Therefore, in the analysis that follows real GNP will be used to search for the relationship between inflation and the growth in the economy.

Cointegration and causality tests

If two or more non-stationary variables are integrated of the same order, there may be a linear relationship between them that is stationary. If this is correct, these variables are said to be cointegrated and the linear combination is called the cointegrating vector. The variables may also have causality relationship. Causality testing is necessary to check the cointegrating properties of the variables under consideration since standard tests for causality are not valid if there exists cointegration.As the previous section has shown that all of our variables have one unit root, cointegration tests could be performed. The cointegration procedures provided by Engle-Granger (1987) and Johansen (1988) are performed on the relationship on the following pairs of variables: i) the nominal government deficit and the absolute change in the monetary base, ii) the percentage change in nominal monetary base and inflation and iii) inflation and real GNP. For the latter one, real GNP has to be used due to the growth rate being I (1).

Table 2. Contemporaneous Correlations

Variables	1951-2001
GDEF & CMON	0,86[1] (11,74)
PMON & INF	0.72[1] (7,28)
INF & GRW	-0.34[1] (-3,01)

[1] : significant at the 1% level
Numbers in parenthesis are t-statistics.

Table 3. ADF Unit Root Test Results

Variable	ADF (F)	Critical values @ 95%	ADF (T)	Critical values @ 95%
GDEF				
Levels	-2.814 (8)	-2.93	-2.189 (8)	-2.93
First Differences	-2.824 (8)[*]	-3.51	3.982 (8)[**]	-3.51
CMON				
Levels	2.894 (8)	-2.93	-1.546 (8)	-2.93
First Differences	3.528 (8)[**]	-3.51	4.305(8)[**]	-3.51
PMON				
Levels	-0.863 (3)	-2.93	-2.327 (3)	-2.93
First Differences	-9.213 (2)[**]	-3.51	-9.092 (2)[**]	-3.51
INF				
Levels	-1.192 (2)	-2.93	-4.828 (1)[**]	-2.93
First Differences	-6.639 (1)[**]	-3.51	-6.561 (1)[**]	-3.51
GRW				
Levels	-6.158 (0)[**]	-2.93	-6.535 (0)[**]	-2.93
First Differences	-8.639 (1)[**]	-3.51	-8.720 (1)[**]	-3.51
RGNP				
Levels	0.610 (1)	-2.93	-2.361 (0)	-2.93
First Differences	-7.052 (0)[**]	-3.51	-6.999 (0)[**]	-3.51

Notes: 1.ADF (F) is estimated ADF value without trend and ADF (T) is the one with trend.

2.Numbers in parentheses denote the number of lags in the augmented term and are determined by Akaike's Information, Schwartz and Hanna Quinn Criterions.

3. ** and * denote that the nonstationary hypothesis is rejected at the %5 and %10 respectively.

4. Critical values are provided by MacKinnon (1991).

The detailed information about Engle-Granger test and the Johansen likelihood procedure for the test of cointegration can be found in Enders (1995: 374, 385) The results of the Engle-Granger cointegration test in Table 4 imply that there is no long run relationship between the nominal government deficit and the change in the nominal monetary base in any direction but we have included the estimated relationships in the table.

However, there is evidence of a bilateral long run relationship between the percentage change in nominal monetary base and inflation; and between inflation and real GNP. The positive relationship between the percentage change in nominal monetary base and inflation is an expected one but

the positive relationship between inflation and real GNP is against the hypothesis of this paper.

In order to investigate the results further, in the next step the error correction models (ECM) for each of the relationships are estimated. According to the Granger Representation Theorem, even though the Engle-Granger test does not find cointegration, if the error correction model works, we can argue that there is cointegration between the variables (Engle and Granger, 1987: 252). The estimated ECM are as follows:

$$\Delta GDEF = 301529.1 - 3.062 \, (\Delta CMON) - 1.56 e_t(-1)$$

$$(-1.413) \qquad (-6.697)^{***}$$

$$\Delta CMON = 43.029 - 0.015\ (\Delta GDEF) + 0.456\ e_t(-1)$$

$$(-1.441) \qquad\qquad (-3.241)^{***}$$

$$\Delta INF = 0.942 + 0.137\ (\Delta PMON) - 0.265\ e_t(-1)$$

$$(1.658)^{*} \qquad\qquad (-2.173)^{**}$$

$$\Delta PMON = 0.575 + 0.222\ (\Delta INF) - 1.061\ e_t(-1)$$

$$(1.139) \qquad\qquad (-7.676)^{***}$$

$$\Delta RGNP = 1992.1 - 75.55\ (\Delta INF) - 0.012\ e_t(-1)$$

$$(-2.098)^{**} \qquad\qquad (-0.415)$$

$$\Delta INF = 3.082 - 0.968*10^{-3}\ (\Delta RGNP) - 0.354\ e_t(-1)$$

$$(-1.800)^{**} \qquad\qquad (-3.075)^{***}$$

For the monetization of the government deficit, although no cointegration is found by the Engle-Granger test, the ECM mechanism finds a reverse relationship from the absolute change in the monetary base to the government deficit. The coefficient of government deficit in the ECM for the absolute change in the monetary base is negative and insignificant, but the error term, which represents the long run relationship, is significant but has the wrong sign.

The ECM confirms the two-way relationship between percentage change in the monetary base and inflation but finds again reverse relationship from the real GNP to inflation. The coefficient of inflation in the ECM for real GNP is negative and significant, but the error term is not significant.

Overall, the Engle-Granger cointegration results indicate that changes in the monetary base have a positive effect on the government deficit in the long run. Inflation and the percentage change in monetary base also have a bilateral positive relationship. The results on the relationship between real GNP and inflation are ambiguous.

Although Johansen cointegration test is most appropriate and efficient in the multivariate models, it is generally used in univariate analysis to see whether the results found in the Engle-Granger test are verified or not (Charemza and Deadman, 1992: 201). Therefore, we apply Johansen cointegration test for this aim.

The Johansen cointegration test results shown in Table 5 indicate evidence of one cointegrating vector for all of the three relationships in question. The normalized cointegrating relationships are 7consistent with the results of the Engle-Granger test with respect to the sign of the coefficients but the size of the coefficients are considerably different.

Finally, causality tests are run taking the Engle-Granger tests' and ECM results into consideration. In the results shown in Table 6, long run refers to the coefficient of the error correction term. Short run, on the other hand, refers to the coefficients of the lagged values of the independent variable. The number of lags is determined according to Akaike Information Criterion and Schwarz Bayesian Criterion.

The results show that the absolute change in the monetary base and the government deficit cause each other in the short but not in the long run. The percentage change in the monetary base and inflation have a bi-directional causality in the long run, also the percentage change in the monetary base causes inflation in the short run. Inflation and real GNP are found to cause each other both in the short run and the long run.

The cointegration and causality test results as a total approve our hypothesis that increases in the nominal government deficit cause increase in the monetary base in the short run leading to inflation both in the short and the long run but the latter, against our hypothesis, leads to increases in the real GNP.

The inability to find a long run relationship from the government deficit to the monetary base is thought to stem from the series themselves. In the period of the study (52 years), as can be seen from Table 1, these two series have experienced dramatic increases, which probably caused the inability to detect a long run cointegration. For the inflation and real GNP relationship, growth in real GNP is the relevant variable theoretically but because of the time series properties we had to use real GNP itself, we think this is also a problem affecting the results

Table 4. Engle-Granger Cointegration tests

variables	dependent variable	ADF on residuals (# of lags)	Critical values @ 95%
GDEF & CMON	GDEF	-0.867 (8)	-3.484
	CMON	-0.553 (7)	-3.484

GDEF = 162326.1 + 8.853 (CHMON)

$\qquad$ (11.738)***

CHMON =54323.2 +0.083 (GDEF)

$\qquad$ (11.748)***

PMON & INF	INF	-4.841** (0)	-3.484
	PMON	-6,916** (0)	-3.484

INF = 7.159 + 0.704 (PMON)

$\qquad$ (7.297)***

PMON = 13.50 + 0.737 (INF)

$\qquad$ (7.280)***

INF & RGNP	RGNP	-3.727** (1)	-3.484
	INF	-4,364** (1)	-3.484

INF = -4.790 + 0.7405*10^{-3} (RGNP)

$\qquad$ (10.369)***

RGNP = 21135.5 + 927.65 (INF)

$\qquad$ (10.359)***

*** and ** denote significance at %1 and %5 respectively.

Table 5. Johansen Cointegration Tests

	trace and max tests	estimated values	critical values @ 95%
GDEF & CMON	$\lambda_{trace} (r = 0)$	200.96**	15.41
(2 lags)	$\lambda_{max} (r = 0)$	186.33**	14.07
Normalized cointegrating vector: GDEF = 0.26 (CMON)			
PMON & INF	$\lambda_{trace} (r = 0)$	52.77**	15.41
(2 lags)	$\lambda_{max} (r = 0)$	36.19**	14.07
Normalized cointegrating vectors INF = 1.92 (PMON)			
INF & RGNP	$\lambda_{trace} (r = 0)$	24.94**	15.41
(2 lags)	$\lambda_{max} (r = 0)$	19.64**	14.07
Normalized cointegrating vector: INF = 0.31 (RGNP)			

* : significant at the 5% level

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Table 6. Causality Tests

Dependent variable	Independent variable	# of lags	F-test for short run	t-test for long run
Δ (GDEF)	Δ (CMON)	(3)	1258,6[***]	-1,23
Δ (CMON)	Δ (GDEF)	(6)	7811,3[***]	–
Δ (INF)	Δ (PMON)	(2)	5,799[***]	-3,087[***]
Δ (PMON)	Δ (INF)	(1)	1,809	-3,927[***]
Δ (GNPREAL)	Δ (INF)	(1)	6,539[***]	-2,378[**]
Δ (INF)	Δ (GNPREAL)	(1)	5,661[***]	-4,388[***]

[***] : significant at the 1% level
[**] : significant at the 5% level

CONCLUSION

The positive relationship between the nominal government deficits and inflation is a widely accepted phenomenon in the literature. When sustained government deficits are financed by increases in the monetary base, inflation becomes an undeniable outcome. This outcome, especially for prolonged periods, may affect adversely the economic activity and therefore the growth of real GNP.

The aim of the paper is to combine these two links, i.e. nominal government deficits and inflation, and inflation and real GNP growth; and investigate the effect of nominal government deficits on the economic growth for Turkey. In order to test this hypothesis, Engle-Granger and Johansen cointegration analysis and causality tests were performed on the links in question.

Estimated results indicate that for Turkey for the 1950-2001 period, nominal government deficits led to increases in the monetary base only in the short run. However, this short run monetization of the government deficit caused inflation both in the short and the long run. For the effect of inflation on real GNP growth, there is evidence of causality in the short and the long run but the effect is found to be from the reverse way of increased inflation due to real GNP increases. This latter finding has to be explored further as growth rate of real GNP could not be used due to its time series properties.

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