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ABSTRACT

Budget deficit statistics is the basic set of indicators used in assessing the fiscal policy stance for developed countries. However, this approach may not be reliable for all countries, as suggested by Polackova (1998). At the extreme, Joulfaian and Marlow (1991) note that the budget deficit statistics are not operational to assess the stance of the fiscal policy due to hidden commitments of governments which appears in budgetary items other than the consolidated government budget. In this paper, we investigate the relationship between consolidated budget deficit and total budget deficit measured by the public sector borrowing requirement in Turkey for the period 1975-2000. The analysis differentiates between the periods for which the consolidated budget is expanding or contracting and reveals that on-budget and off-budget activities are not substitutable as opposed to the case of Joulfaian and Marlow (1991). All in all, information content of the budget deficit statistics is not empty; however, it might be misleading in assessing fiscal stance for Turkey.

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1. INTRODUCTION

Inflation is a monetary phenomenon, but Fischer and Easterly (1990) argue that fiscal expansion is the main motive of monetary expansion; thus, inflation should be a fiscal phenomenon. All the attempts made by Turkey to decrease inflation or to stabilize the economy are also associated with the fiscal tightening. In all these attempts, consolidated budget figures are used to measure the fiscal tightness. However, measuring and monitoring fiscal tightness is problematic. Deficit from consolidated budget does not measure the stance of fiscal policy and its information content for the future economic performance is weak. For example, Polackova (1998) argues that the government's hidden financial commitments and contingent liabilities become a major concern for macroeconomic and fiscal instability in a number of countries. Similar argumentation can be found in Easterly (1999) where it is argued that government can respond to forces which impose contractionary changes in its conventional deficit by lowering its asset accumulation or increasing its hidden liabilities. Clearly, fiscal adjustment is illusory under such circumstances. To be particular, Metin (1998) finds a positive relationship between inflation and the public sector borrowing requirement (PSBR), Özmen and Koru (2000) cannot find a similar relationship between inflation and the consolidated budget deficit for Turkey. Thus, consolidated budget deficit could be a misleading measure to stabilize the economy. Moreover, Joulfaian and Marlow (1991), using U.S. data and employing a Granger causality framework, find sound evidence that the information content of the budget deficit statistics is not conclusive about the stance of the fiscal policy. Their study is motivated

with the hypothesis that controls on on-budget government spending leads to greater off-budget activity. In this study, the analysis by Joulfaian and Marlow (1991) is extended by further investigating for the linkage between the consolidated budget deficit and the total public budget deficit under asymmetric situations in which the on-budget activity goes under expansionary or contractionary changes.

Turkey forms an appropriate example for the mentioned case of on-budget and off-budget relationship. In Turkey, the public sector borrowing requirement (PSBR) consists of a number of items, which are not the consolidated central government; these are losses of state-owned enterprises, subsidies to the social security system, duty-losses of the publicly owned banks, contribution to revolving-fund institutions, budgets of local governments, default payments on guaranteed investment, and project credits by the Treasury. Among those, only the central government budget is subject to the control of the Ministry of Finance. The consolidated budget constitutes around 60 to 80% of the PSBR and this ratio changes from year to year. Therefore, a stable relationship between the figures of the consolidated budget and PSBR does not exist.

Our analysis reveals that the information content of the consolidated budget deficit statistics is not empty, as opposed to the case of Joulfaian and Marlow (1991). Our major result is that the PSBR increases in response to a positive innovation to the consolidated budget deficit, indicating the absence of the substitution effect proposed by Joulfaian and Marlow (1991). In other words, even when the policy-makers induce an expansion of the consolidated budget, it is still possible for the off-budget items to increase. One another

important point that needs to be highlighted is that a decrease in PSBR deficit is actually associated with an increase in budget deficit. This might be due to increased efforts in the past to limit off-consolidated budget deficit, so that total (PSBR) deficit decreases, but we put partly these decreased items to the consolidated budget. This suggests that even if we adopt a tight fiscal policy consolidated budget deficit might be showing loose fiscal policy. Thus, it is worth to mention that the information provided by the consolidated budget deficit might be misleading for judging about the stance of the fiscal policy in Turkey.

The significance of our study is two-folds. First, we provide evidence regarding the low reliability of the consolidated budget deficit statistics in evaluating the stance of fiscal policy in Turkey, hence finding a reason for the dispute between Metin (1998) and Özmen and Koru (2000). Second, we extend the work of Jouffaian and Marlow (1991) by performing the analysis under asymmetric movements of the consolidated government budget, hence accounting for the functional relationship between on-budget and off-budget activities. In Section 2, we describe our data and variables. Section 3 presents the methodology and the empirical results. Finally, Section 4 concludes the paper.

2. DATA AND VARIABLES

The data on the *consolidated budget deficit*, the *public sector borrowing requirement*, and *gross domestic product* are provided by the Undersecretariat of Treasury and the State Institute of Statistics¹, all measured in current billion TL. Then, our variables *BD* and *PSBR* are defined as the ratios of the nominal consolidated budget deficit and nominal

public sector borrowing requirement to nominal *GDP*, respectively. A positive value of *BD* indicates a consolidated budget deficit, by definition, and vice versa. The data set is annual from 1975, the official start of data series, to 2000. Although data exist for 2001, we exclude this year in our data set since the huge transfers to public sector banks largely distorted the public sector borrowing requirement figure for 2001. The time plots of our variables of interest are given in Figure 1 which suggests an association between our variables of interest on the surface.

3. EMPIRICAL ANALYSIS

Symmetric Effects

We analyze the linkage between the ratio of the consolidated budget deficit to GDP (*BD*) and the ratio of the total public budget deficit, measured by the public sector borrowing requirement, to GDP (*PSBR*), using Vector Auto Regression (VAR) models. We define our basic VAR model as follows:

Specification 1:

$$\begin{bmatrix} PSBR_t \\ BD_t \end{bmatrix} = \begin{bmatrix} \alpha_{01} \\ \alpha_{02} \end{bmatrix} + \begin{bmatrix} \alpha_{11} & \beta_{11} \\ \alpha_{12} & \beta_{12} \end{bmatrix} \begin{bmatrix} PSBR_{t-1} \\ BD_{t-1} \end{bmatrix} + \begin{bmatrix} \varepsilon_{1t} \\ \varepsilon_{2t} \end{bmatrix}$$

Using Specification 1, we seek for the baseline relationship between *PSBR* and *BD*. We obtain the impulse response functions from Specification 1², using a Monte Carlo procedure with 500 replications. In our VAR specification, the ordering of the variables is such that the consolidated budget deficit is affected first and then the impact of any possible shock is transmitted to our second variable, namely the total government budget

¹ All data series can be reached at the data delivery system of the Central Bank of the Republic of Turkey, <http://tcmbf40.tcmb.gov.tr/cbt.html>

² The lag length of 1 is determined by using Schwarz Information Criterion.

deficit contemporaneously. This ordering is important in the sense that we introduce a shock to our variable over which more control can be exercised. In other words, we first let the government take expansionary or contractionary actions over its consolidated budget; then we observe the incidence of such action on other items of the public budget. Hence, we follow the basic hypothesis structure offered by Joulfaian and Marlow (1991). The graphs of these impulse response functions can be seen in Figure 2.³ The figure suggests that the consolidated budget deficit gives a negative response to a one-standard-deviation innovation to the total public budget deficit, yet this relationship is not statistically significant. On the other hand, as we introduce a one standard deviation positive innovation to the consolidated budget deficit, the total public budget deficit increases, and this is statistically significant at least for two years. This result differs from that of Joulfaian and Marlow (1991) in the sense that no substitution exists between the on-budget and off-budget activities in our study.

A Contraction in the Consolidated Budget

It is worth to mention that the relationship that is presented in the previous subsection provides only a basic understanding of the linkage between the budget deficit and the public sector borrowing requirement. Moreover, the reader may notice that the process presented by Specification 1 does not account for any asymmetric effects; yet we extend our analysis in order to capture possible asymmetric effects of the size of the consolidated budget deficit on the public sector borrowing requirement. It may be quite possible that a contraction of the

consolidated budget affects the total public budget differently than an expansion of the consolidated budget does. Under a contraction of on-budget activity we can expect an increase in off-budget activity due to the resource constraints faced by policy makers other than the central government. On the other hand, such distortion of the constraint on financial resources will not be seen in the case of an expansion of the consolidated budget. Following Specification 1, the consolidated budget is modeled as:

$$BD_t = \alpha_0 + \sum_{i=1}^n \alpha_i BD_{t-i} + \sum_{i=1}^n \beta_i PSBR_{t-i} + \varepsilon_t \quad (1)$$

Having obtained the residuals from Equation 1, we define our dummy variables which are designated as indicators of the situations in which the actual consolidated budget deficit figure is above and below the estimate of it obtained from Equation 1 to account for unanticipated fiscal easiness and tightness as measured with the consolidated budget. We call these variables P_t and N_t , respectively; and define them in terms of residuals from Equation 1 as follows:

$$P_t = \begin{cases} 1, & \text{if } \varepsilon_t \geq 0 \\ 0, & \text{otherwise} \end{cases} \quad (2)$$

$$N_t = \begin{cases} 1, & \text{if } \varepsilon_t < 0 \\ 0, & \text{otherwise} \end{cases} \quad (3)$$

In our next specification, we add P_t and its interactions with BD_{t-i} and $PSBR_{t-i}$ to our basic VAR model. In this way, we intend to control for the observations at which the actual budget deficit figure is larger than the estimated one; hence, we distill the relationship under the case of the contraction of the consolidated budget. We estimate the following VAR model:

³ The estimates of the impulse response coefficients are plotted with 90% confidence bounds unless otherwise specified.

Specification 2:

$$\begin{bmatrix} PSBR_t \\ BD_t \end{bmatrix} = \begin{bmatrix} \alpha_{01} \\ \alpha_{02} \end{bmatrix} + \begin{bmatrix} \alpha_{11} & \beta_{11} \\ \alpha_{12} & \beta_{12} \end{bmatrix} \begin{bmatrix} PSBR_{t-1} \\ BD_{t-1} \end{bmatrix} + P_t \begin{bmatrix} \gamma_{11} \\ \gamma_{12} \end{bmatrix} + P_t \begin{bmatrix} \lambda_{11}^P & \theta_{11}^P \\ \lambda_{12}^P & \theta_{12}^P \end{bmatrix} \begin{bmatrix} PSBR_{t-1} \\ BD_{t-1} \end{bmatrix} + \begin{bmatrix} \eta_{1t} \\ \eta_{2t} \end{bmatrix}$$

Our use of interaction terms in Specification 2 is due to Ellis and Thoma (1991). These terms are designated to handle the asymmetric effects when the consolidated budget deficit exceeds its value-estimated by

consolidated budget deficit figure is smaller than the figure estimated with Equation 1, we replace P_t with N_t in Specification 2. Then, we can present our last model as described by the following VAR setup:

Specification 3:

$$\begin{bmatrix} PSBR_t \\ BD_t \end{bmatrix} = \begin{bmatrix} \alpha_{01} \\ \alpha_{02} \end{bmatrix} + \begin{bmatrix} \alpha_{11} & \beta_{11} \\ \alpha_{12} & \beta_{12} \end{bmatrix} \begin{bmatrix} PSBR_{t-1} \\ BD_{t-1} \end{bmatrix} + N_t \begin{bmatrix} \gamma_{11} \\ \gamma_{12} \end{bmatrix} + N_t \begin{bmatrix} \lambda_{11}^N & \theta_{11}^N \\ \lambda_{12}^N & \theta_{12}^N \end{bmatrix} \begin{bmatrix} PSBR_{t-1} \\ BD_{t-1} \end{bmatrix} + \begin{bmatrix} \eta_{1t} \\ \eta_{2t} \end{bmatrix}$$

Equation 1. We estimate the VAR model and obtain the impulse response functions using a Monte Carlo procedure with 500 replications, which are presented in Figure 3.

Figure 3 suggests that a one-standard-deviation negative shock to the total public budget deficit, namely a movement of PSBR in surplus direction, increases the consolidated budget deficit. However, the total public budget deficit decreases after a one-standard-deviation negative shock to the consolidated budget deficit. Both relationships are statistically significant. In comparison with the results presented in Figure 2, it is observed that the response of the consolidated budget to total public budget becomes significant. The response of the total public budget to the consolidated budget remains significant. Furthermore, the directions of change do not differ between Figure 2 and Figure 3.⁴ The difference between the response coefficients in the two figures is sizable.

An Expansion in the Consolidated Budget

In the last stage of our analysis, in order to control for the observations at which the actual

Having controlled for the observations at which the consolidated budget deficit falls short of its value estimated by Equation 1, we can figure out the relationship between the consolidated budget deficit and the total public budget deficit for the case of the expansion of the consolidated budget. This is again through a Monte Carlo procedure with 500 replications upon the estimates of the model described by Specification 3. The impulse responses for our last model are provided in Figure 4, which suggests that a one-standard-deviation positive shock to the total public budget induces a decrease of the consolidated budget deficit; yet, this relationship is not statistically significant. When we introduce a one-standard-deviation positive shock to the consolidated budget deficit, it is observed that the total public sector borrowing requirement increases in a statistically significant manner.

In general, a contraction of the consolidated budget is expected to induce an expansion of the off-budget activities, hence an expansion of the total public budget. However, an expansion of the consolidated budget is not expected to cause a contraction of the total public budget despite an expected fall in the off-budget expenses. When we

⁴ The impulse response coefficients are plotted with the reversed sign in Figure 3 for better visualization and understanding. The reader can interpret the plotted response coefficients upon one-standard-deviation negative shocks to the variables of concern.

interpret our findings in comparison to these conjectures, we can say that the consolidated budget and the total public budget moves together whenever the innovation is introduced to the first one; and they move in opposite directions if the innovation is introduced to the total public budget, in all three cases that we have analyzed. Then, it is clear that the information content of the budget deficit statistics of Turkey is not empty. However, the conclusions driven by the budget deficit statistics might be misleading while assessing whether the fiscal policy in action is expansionary or contractionary.

Further Remarks

We have presented our basic findings in the previous subsections. In this subsection, we elaborate on the structure of budget statistics in Turkey, as well as the general attitudes of public decision-making entities toward budgetary operations. Turkish Constitution requires all state expenditures to have an official record in the budget owing to the parliamentary characteristic of the Republic of Turkey. In other words, all decision-making bodies must be accountable for their responsibilities. However, Financial Report of the Turkish Court of Accounts (2000) introduces and employs a new term "off-record"⁵ budget to denote the operations, which, in fact, do not relate to the official budget although they actually must be. These operations are actually related to several public expenses, but they are recorded in a way that hides them from the auditing function of the Turkish Grand National Assembly.

⁵ The reader will distinguish our use of the terms on-budget versus off-budget from the Court of Accounts' use of the terms on-record versus off-record budget. While we distinguish between central government budget and the remaining part of public budget, the Court of Accounts puts the emphasis whether a given public expense has a record in the budget amended by the Turkish Grand National Assembly or not.

According to the Treasury Operations Report of the Turkish Court of Accounts (2001), off-record budget expenses have three major negative implications for the economy. First, actual budget deficit is under-reported. This hides crucial information regarding the central government activities. Moreover, the importance and power of impact of the budget decreases. Second, while reporting the sources and uses of national budget, part of the newly created debt is hidden. Finally, since off-record budget is not in reach of the audit power of the Turkish Grand National Assembly, effective monitoring of public expenses becomes nearly impossible and accountability of decision makers is not well-established.

To shed some light on the actual budgetary position and financing activities, the Turkish Court of Accounts employs a different measure in assessing the Public Sector Borrowing Requirement, which is called "Net Debt Revenue". Net Debt Revenue (*NDR*) is defined as the total amount of newly created debt minus all debt repayments by the Treasury in a given year. In this way, the Court monitors the actual path of public debt creation process instead of taking into account the reported *PSBR* figures. Given the definition of *NDR*, whenever there is a difference between *NDR* and *PSBR*, the quantity $NDR-PSBR$ shows the off-record public expenses. *NDR* series has stronger local trends than the reported *PSBR* series has, i.e. it has higher variation yet a smaller number of turning points as depicted by Figure 1.

The definition of *NDR* as proposed by the Turkish Court of Accounts has a couple of drawbacks, as well. For example, *NDR* is sensitive to the maturity structure of the public debt. The reader may try to construct

an imaginary series assuming, *ceteris paribus*, that the maturity of the public debt increases over time. In such a case, *NDR* will understate the actual picture. Furthermore, as far as the data generating process underlying the *NDR* series is considered, it is apparent that *NDR* series is associated with two error terms, namely the ones belonging to the *PSBR* series and to series of the off-record expenses. However, for sake of completeness, we regenerated our previous exercise using the *NDR*⁶ series instead of the *PSBR*, yet the estimates were far from being statistically significant though having the similar impulses as before. The final experiment of ours, in which we used *NDR-PSBR* instead of *PSBR* did not result in statistically significant findings, either. The lack of significance in these two exercises is probably due to the more complicated data generating processes, reminding us the *Type II error*, e.g. not rejecting the null hypothesis when it is false.

4. CONCLUSION

In this paper, we elaborated on the question of whether the size of the budget deficit is an appropriate and adequate measure of the stance of fiscal policy in Turkey by analyzing the relationship between the consolidated budget deficit and the total public budget deficit due to Joulfaian and Marlow (1991). Having

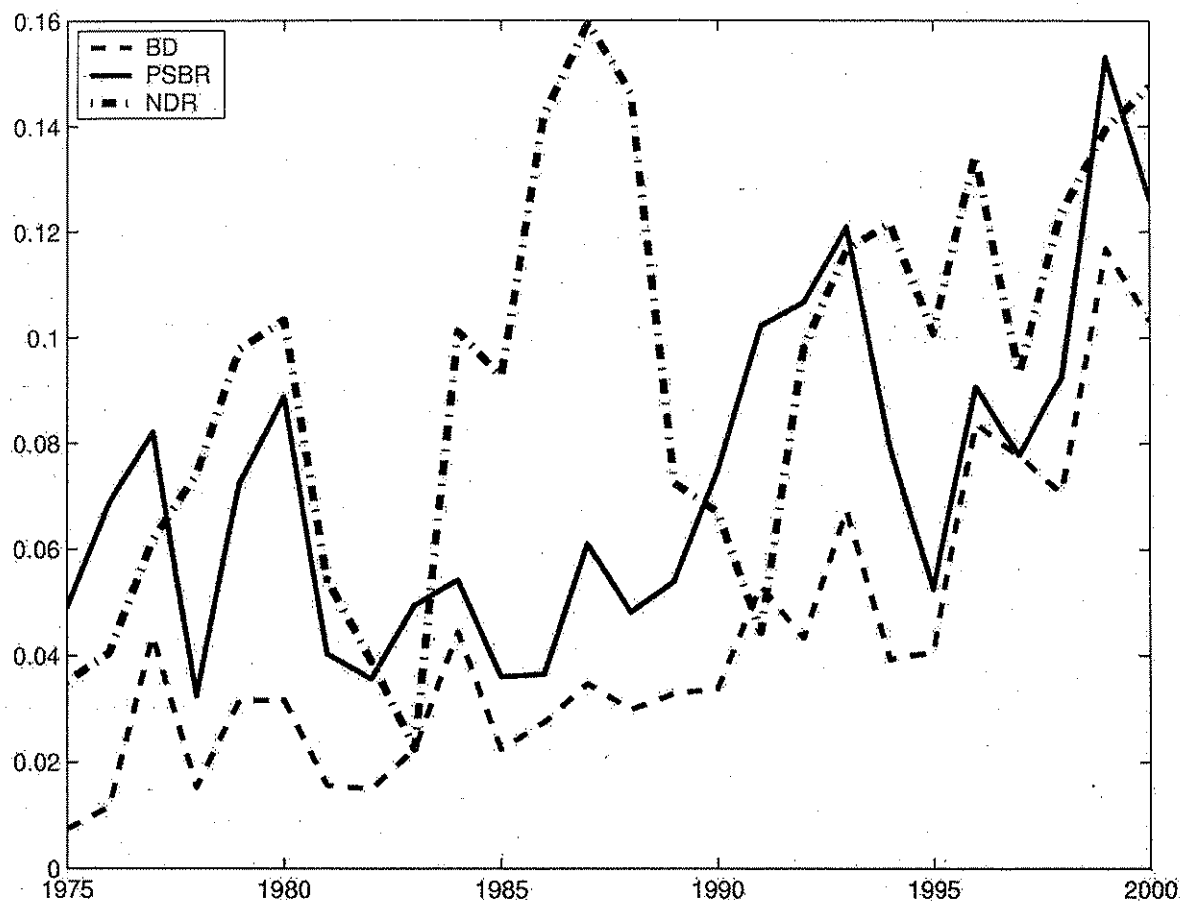
observed the opposite findings by Metin (1998) and Özmen and Koru (2000)⁷ regarding the relationship between inflation and budget deficit in Turkey, we raised the question of whether the consolidated budget deficit and the total public budget deficit behave similarly, yet the paper does not argue about who the winner of the dispute is.

In our analysis, using VAR specifications, the relationship between the consolidated budget deficit and the total public budget deficit in Turkey was figured out for the period of 1975-2000. The analysis was performed for three cases; namely for the overall sample, controlling for the observations with a contraction in the consolidated budget and controlling for the observations with an expansion in the consolidated budget. In the first case, total public budget deficit responds positively to a positive innovation to the consolidated budget. In either of the second and third cases the directions of change of the total public budget and the consolidated budget are the same. These three cases provide us with enough evidence to conclude that the consolidated budget deficit statistics have some informational value; yet the provided information may be misleading for assessing the fiscal stance of the government. Therefore, there apparently exists a need to find a more appropriate and adequate measure.

6 Nominal Net Debt Revenue data was compiled from the Financial Report (2000) and the Treasury Operations Report (2000) of the Turkish Court of Accounts. Then, *NDR* is computed as the ratio of nominal net debt revenue to the Gross Domestic Product.

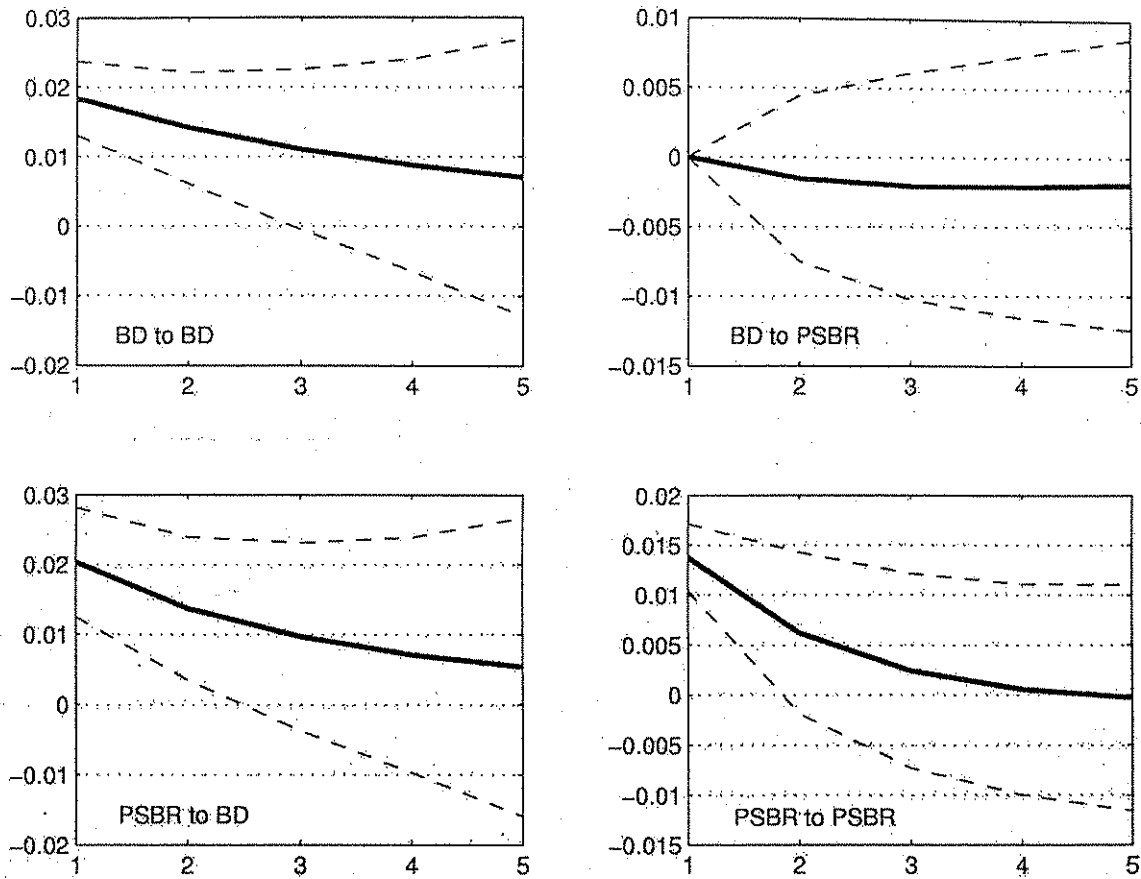
7 Özmen and Koru (2000) do not find the positive association between inflation and budget deficit for Turkey that is revealed by Metin (1998). Recall that the former performs analysis employing the consolidated budget deficit while the latter uses the public sector borrowing requirement.

FIGURE 1: CONSOLIDATED BUDGET DEFICIT, PUBLIC SECTOR BORROWING REQUIREMENT AND NET DEBT REVENUE: 1975-2001



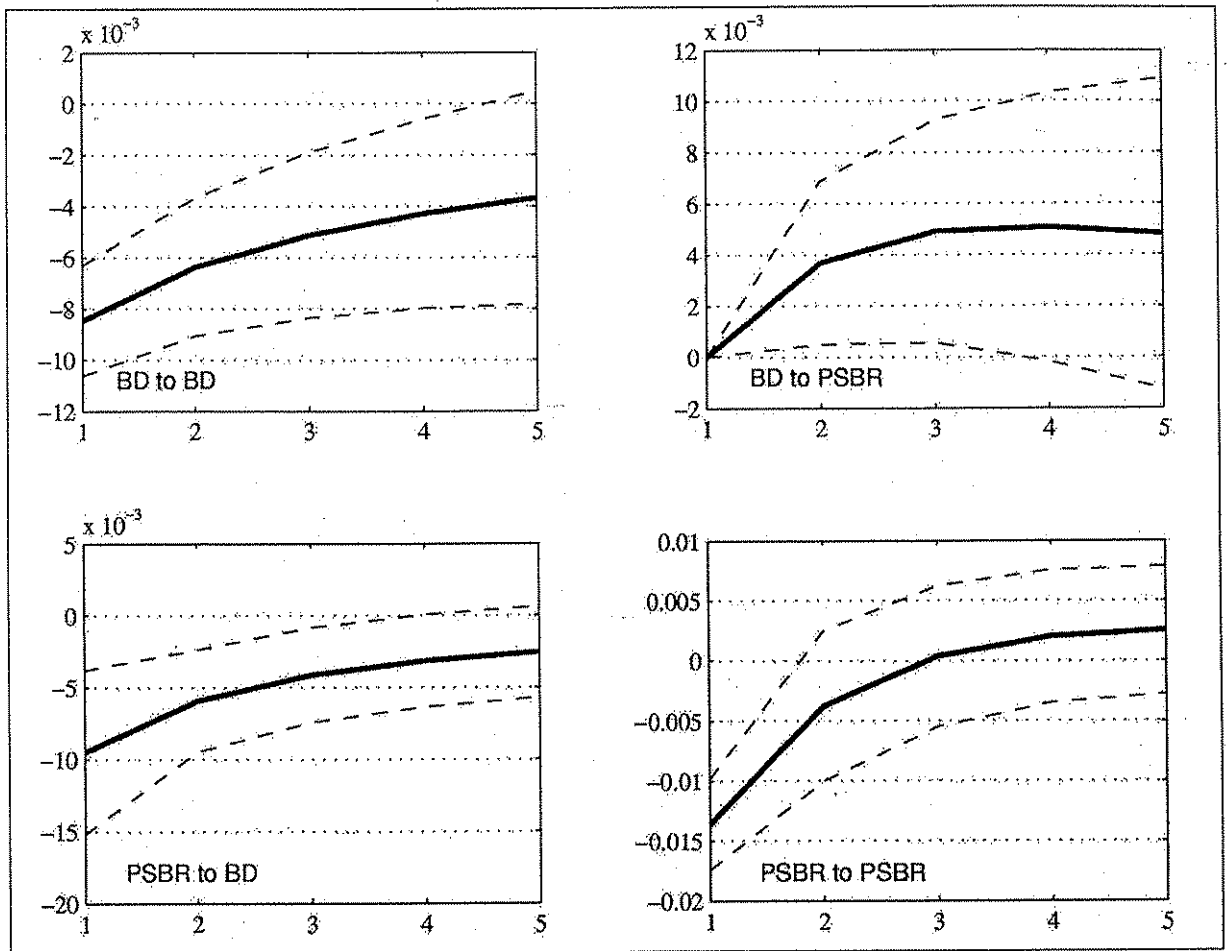
This figure shows the time paths of the Consolidated Budget Deficit (*BD*), the Public Sector Borrowing Requirement (*PSBR*) and the Net Debt Revenue (*NDR*) from 1975 to 2000. The variables are defined as proportions of the Gross Domestic Product (*GDP*). A rough association between the variables is what an initial look yields. This may point out the missing substitution between the on-budget and off-budget activities. Ertuğrul and Selçuk (2001) can be visited for the behaviours of our variables of interest in retrospect.

FIGURE 2: IMPULSE RESPONSES: SYMMETRIC EFFECTS



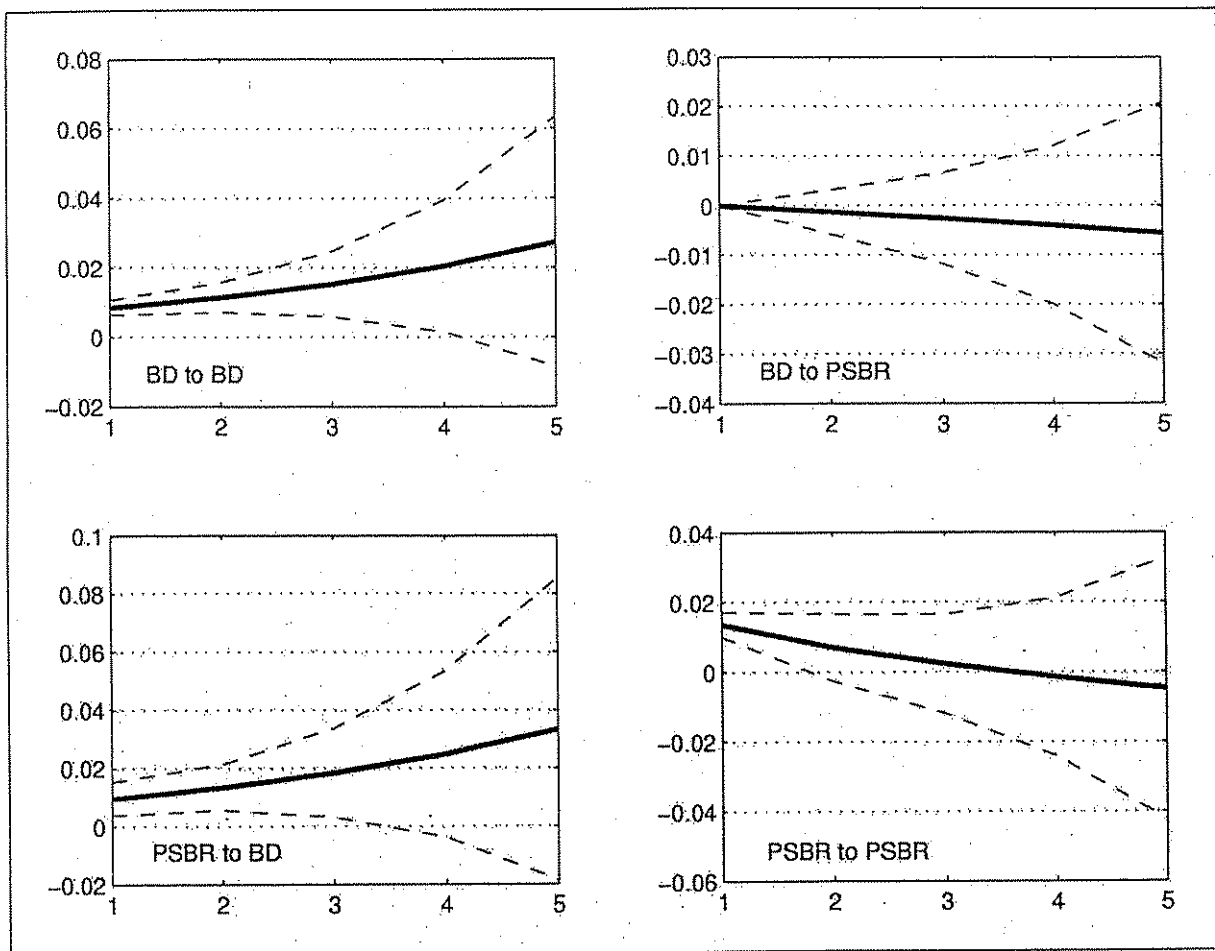
The impulse responses are displayed in the four panels of the figure. In each panel, the horizontal axis shows the time periods and the magnitudes of the response coefficients are given on the vertical axis. The impulse responses are for positive one-standard-deviation innovations in the affecting variable. "*BD to PSBR*" should read "response of *BD* to a one-standard-deviation positive innovation in *PSBR*". The dashed curves are the 90% confidence bounds.

FIGURE 3: IMPULSE RESPONSES: CONTRACTION IN THE CONSOLIDATED BUDGET



The impulse responses are displayed in the four panels of the figure. In each panel, the horizontal axis shows the time periods and the magnitudes of the response coefficients are given on the vertical axis. The impulse responses are for negative one-standard-deviation innovations in the affecting variable. "BD to PSBR" should read "response of BD to a one-standard-deviation negative innovation in PSBR". The dashed curves are the 90% confidence bounds.

**FIGURE 4: IMPULSE RESPONSES:
EXPANSION IN THE CONSOLIDATED BUDGET**



The impulse responses are displayed in the four panels of the figure. In each panel, the horizontal axis shows the time periods and the magnitudes of the response coefficients are given on the vertical axis. The impulse responses are for positive one-standard-deviation innovations in the affecting variable. "BD to PSBR" should read "response of BD to a one-standard-deviation positive innovation in PSBR". The dashed curves are the 90% confidence bounds.

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