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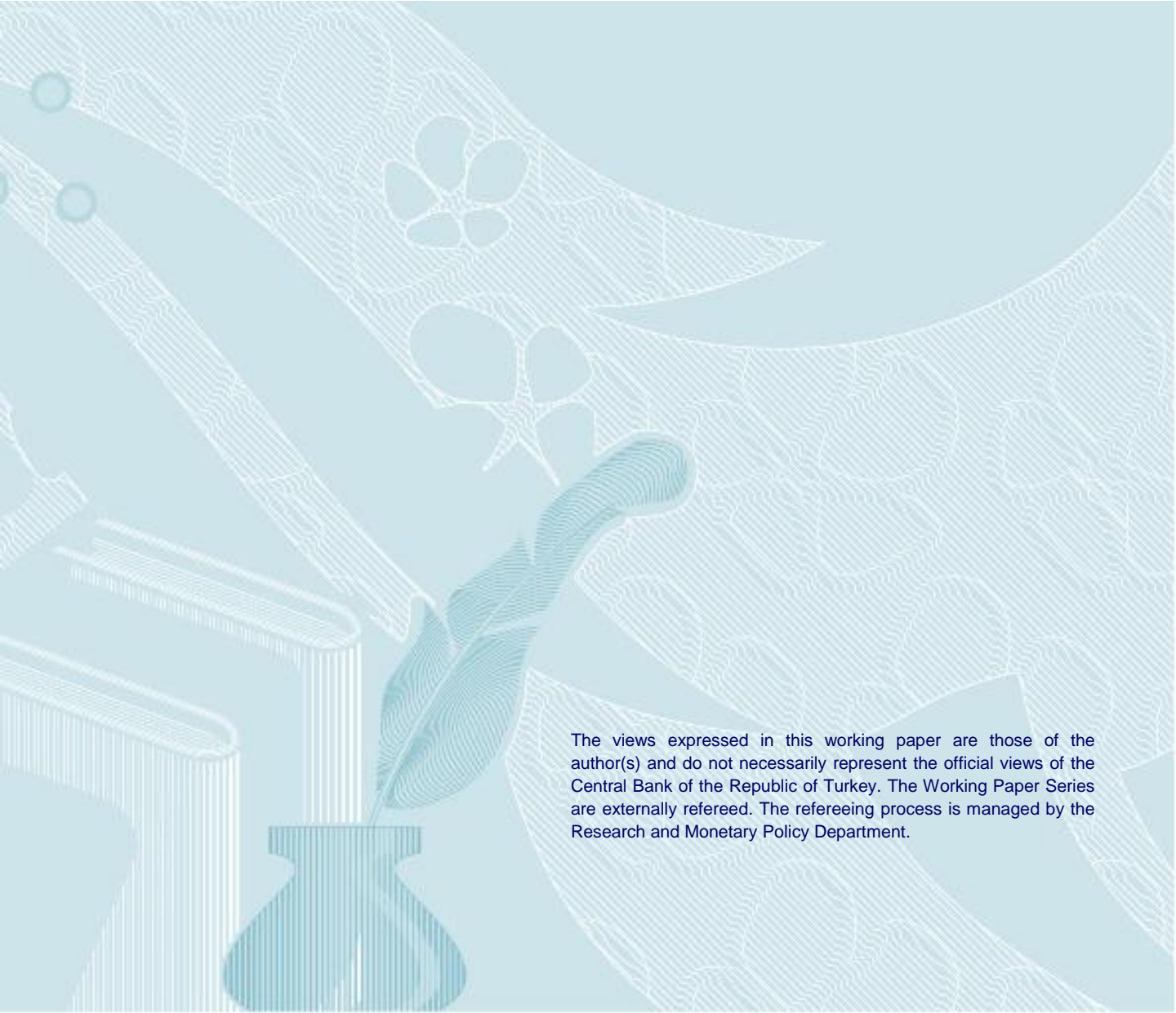
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The Effects of Government Spending Shocks on the Real Exchange Rate and Trade Balance in Turkey*

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Abstract

This study aims to investigate the effects of government spending shocks on the real exchange rate and foreign trade balance in Turkey for the period of 2002.I - 2012.IV within a structural VAR framework. The analysis shows that a positive shock to government spending tends to induce real exchange rate appreciation and deterioration in trade balance. We also find that composition of the government spending matters. While shocks to government non-wage consumption generate an appreciation in the real exchange rate and worsening of the trade balance, effects of government investment shocks remain insignificant. Furthermore, the analysis demonstrates that shocks to government spending are associated with a rise in taxes, which points to the existence of a spending-driven tax adjustment process in Turkey.

JEL Classification: E62, H30

Keywords: Government Spending Shocks, Real Exchange Rate, Trade Balance, SVAR

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1 Introduction

The macroeconomic effects of fiscal policy shocks have been one of the most extensively analysed topics in the empirical literature recently. There exist four categories in the VAR literature which differ in terms of the identification methodology, one of which is the renowned Blanchard and Perotti (2002) that identifies fiscal policy shocks by taking into account decision lags in fiscal policy and institutional information about the automatic response of fiscal variables to macroeconomic variables. The second category, namely “the narrative event study approach”, represented by Ramey and Shapiro (1998), Edelberg et al. (1999) and Burnside et al. (2004), traces the effects of a dummy variable representing exogenous, unanticipated and sharp fiscal events, such as high military spending, on the economy. The third category is the “sign restriction” of Mountford and Uhlig (2009), which imposes sign restrictions directly on the impulse responses rather than imposing linear restrictions on the contemporaneous relations between reduced form residuals and structural innovations. The last category, “the recursive approach” represented by Fatas and Mihov (2001) and Favero (2003) achieves the identification of fiscal policy shocks by relying on Cholesky ordering.

While the majority of the existing literature mainly focuses on assessing the effects of fiscal policy shocks on output, recently an increasing number of empirical studies have been devoted to examining the consequences of government spending shocks on real exchange rates and foreign trade balance. Nevertheless, the economic theory concerning the relationship between fiscal shocks and the real exchange rate suggests more than one prediction. Neoclassical models predict a depreciation of the real exchange rate and an increase in output following a rise in government spending. The forward looking consumer in the neoclassical models realises that the current increase in the public spending will have to be financed by future taxes, which in turn leads to a surge in the current labour supply and a reduction in real wages (negative wealth effect). As a result, private consumption decreases and real exchange rate depreciates whereas output increases. Neo-Keynesian models, on the other hand, predict that a positive shock to government spending leads to an appreciation of the real exchange rate. In this setup, output increases along with the rise in public spending, which in turn raises the demand for labour and causes an increase in real wages. Consequently, private consumption increases and real exchange rate appreciates¹.

Similar to the economic theory, the empirical literature offers two predictions regarding the effects of government spending shocks on the real exchange rate. On the one hand, Monacelli and Perotti (2010), Ravn et al. (2007), Kim and Roubini (2008), Enders et al. (2008) and Corsetti et al. (2009) suggest that shocks to government spending lead to real exchange rate depreciation. On the other hand, Beetsma et al. (2008), Bénétrix and Lane (2009a, b) and de Castro and Fernandez (2013) find that an increase in the government spending causes appreciation of the real exchange rate. Moreover, de Castro and Garrote (2012), argue that higher government spending leads to real exchange rate

¹See Hebous (2011) for a comprehensive review of the related theoretical and empirical literature.

appreciation in the Euro Area, but depreciation in the US. Some other studies, such as Galstyan and Lane (2009a, b) show that composition of the government spending have differential effects on the real exchange rate. They empirically find that real exchange rate depreciates in response to an increase in government investment whereas government consumption shocks are associated with real appreciation. The existing empirical literature, however, appears to be in a broad agreement concerning the effects of government spending shocks on foreign trade balance. Monacelli and Perotti (2010), Ravn et al. (2007), Beetsma et al. (2008), de Castro and Fernandez (2013), de Castro and Garrote (2012) and Corsetti and Müller (2006) find that an increase in government spending deteriorates trade balance. In contrast, Kim and Roubini (2008) argue that an expansionary fiscal policy shock contributes to the improvement of the trade balance.

While Çebi (2010) studies the dynamic effects of fiscal policy shocks on economic activity for the Turkish case by using a structural VAR methodology, there are only a few studies which assess the effects of government spending shocks on real exchange rates in Turkey. For example, by using a structural VAR, Agénor et al. (1997) and by using a Cholesky decomposition Yörükoğlu and Kılınç (2012) show that an increase in government spending leads to a real appreciation in the Turkish lira. Although there are several studies that tend to investigate the validity of “twin deficits” hypothesis for Turkey², there exist, to our knowledge, no empirical studies which examine the effects of government spending shocks on foreign trade balance for Turkey.

The aim of this paper is to empirically assess the effects of government spending shocks on the real exchange rate and foreign trade balance in Turkey for the post-crisis period (2002q1 - 2012q4). The reason why we focus on the post-crisis period can be attributed to the main characteristics of the economy during the period of 2002-2012. Having experienced a deep financial crisis in February 2001, Turkey started to implement a new economic programme, called "Strengthening the Turkish Economy". The new economic programme was conducted under the floating exchange rate and an informal (implicit) inflation targeting regime, supported by a monetary and fiscal policy mix. After the initial success of the stabilisation programme, Turkey has started to implement an explicit inflation target since January 2006. Therefore, these macroeconomic policies make the Turkish Economy more stable in the post-crisis period compared to the pre-crisis period, which explains the reason why we focus on the last decade (post-crisis period) for the estimation of the model parameters and so impulse responses.

The motivation behind this paper can be summarised as follows: We observe an upward trend in the primary government spending to GDP ratio after 2004. This ratio reached its peak value in 2009, when the global financial crises negatively affected the Turkish economy. Although the primary government spending to GDP ratio started to decline following 2009, it remained at a high level in the period of 2010-2012 compared to the period of 2002-2008. It seems that a decrease in the interest

²For example, while Akbostanci and Tunc (2002) argue that twin deficits hypothesis holds for Turkey, Kiran (2011) finds only little evidence for the validity of twin deficits.

payments to GDP ratio during the period of 2002-2012 and a rise in tax to GDP ratio especially after 2009 created fiscal space for primary government spending. Primary government spending's upward trend arises several questions that need to be answered: What is the relationship between government spending and growth? What happens to real exchange rate following a positive government spending shock? Does it appreciate or depreciate? Does net export fall or increase? How do taxes respond to an increase in government spending? Impulse response analysis obtained from this study shows that real exchange rate appreciates, net export falls and output increases following a positive government spending shock in Turkey. We also find that an expansionary fiscal policy via government spending is accompanied by a contractionary fiscal policy via tax.

This paper is structured in the following way. Section 2 describes the data, Section 3 outlines the structural VAR model and discusses the estimation methodology. Section 4 presents the impulse response analysis. Finally, Section 5 concludes.

2 Data

The baseline VAR includes five variables, namely government primary spending (g_t), tax revenues (t_t), output (y_t), net export to GDP ratio (nx_t) and CPI-based real effective exchange rate (q_t) (an increase in the real effective exchange rate indicates appreciation of Turkish lira). Budget figures are obtained from Ministry of Finance of Turkey, GDP and its components (net export and private consumption) are collected from Turkish Statistical Institute and CPI-based real effective exchange rate are taken from Central Bank of Turkey. Due to the fact that quarterly General Government budget data are unavailable, we use Central Government budget data, which comprises the most important part of General Government budget, as a proxy for fiscal stance in Turkey³. Government spending covers total expenditures excluding interest payments. In other words, government spending used in this analysis consists of government consumption expenditures, investment expenditures and current transfers⁴. All data are seasonally adjusted⁵, except real exchange rate, in real and natural logarithmic form. To obtain variables in real terms GDP deflator is used.

³Turkey has started to publish monthly data on central government budget, which covers the general, the special and the regulatory and supervisory institutions' budgets, since January 2006. Ministry of Finance of Turkey also published yearly data for the central government budget for the period of 2000 - 2005. In order to obtain quarterly data for the central government budget for the period of 2002 - 2005 we calculate the shares of quarterly primary expenditures in total expenditures and the shares of quarterly taxes in total taxes for each year by using general budget (on the base of 2007) figures for 2004 and 2005 and consolidated budget (programme budget) figures for 2002 and 2003. Then, we apply these quarterly ratios to the corresponding yearly central government budget figures in order to get quarterly data.

⁴In fact, the definition of government spending includes compensation of employees and social security contributions, good and service purchase, capital expenditures and capital transfers, current transfers and lending.

⁵Seasonally adjusted time series are obtained by using Tramo/Seats method.

3 Estimation Methodology: SVAR

We use a structural VAR technique to study the effects of fiscal policy shocks on real exchange rate, trade balance and output. We use an extended version of Blanchard and Perotti (2002) with real exchange rate and trade balance following Corsetti and Müller (2006) and Monacelli and Perotti (2010). The reduced-form VAR can be written as follows:

$$X_t = A(L)X_{t-1} + U_t$$

where $X_t \equiv (g_t, t_t, y_t, nx_t, q_t)$ is the vector of endogenous variables, $A(L)$ is an autoregressive lag-polynomial, $U_t \equiv (u_t^g, u_t^t, u_t^y, u_t^{nx}, u_t^q)$ corresponds to the vector of reduced form residuals, which are generally correlated with each other. The relationship between the reduced form residuals and structural shocks can be shown as follows:

$$\begin{aligned} u_t^g &= \alpha_{gy}u_t^y + \alpha_{gnx}u_t^{nx} + \alpha_{gq}u_t^q + \beta_{gt}\varepsilon_t^t + \varepsilon_t^g \\ u_t^t &= \alpha_{ty}u_t^y + \alpha_{tnx}u_t^{nx} + \alpha_{tq}u_t^q + \beta_{tg}\varepsilon_t^g + \varepsilon_t^t \\ u_t^y &= \alpha_{yg}u_t^g + \alpha_{yt}u_t^t + \alpha_{ynx}u_t^{nx} + \alpha_{yq}u_t^q + \varepsilon_t^y \\ u_t^{nx} &= \alpha_{nxg}u_t^g + \alpha_{nxt}u_t^t + \alpha_{nxy}u_t^y + \alpha_{nxq}u_t^q + \varepsilon_t^{nx} \\ u_t^q &= \alpha_{qg}u_t^g + \alpha_{qt}u_t^t + \alpha_{qy}u_t^y + \alpha_{qnx}u_t^{nx} + \varepsilon_t^q \end{aligned}$$

Consider the matrix notation:

$$\begin{bmatrix} u_t^g \\ u_t^t \\ u_t^y \\ u_t^{nx} \\ u_t^q \end{bmatrix} = \begin{bmatrix} 1 & 0 & -\alpha_{gy} & -\alpha_{gnx} & -\alpha_{gq} \\ 0 & 1 & -\alpha_{ty} & -\alpha_{tnx} & -\alpha_{tq} \\ -\alpha_{yg} & -\alpha_{yt} & 1 & 0 & 0 \\ -\alpha_{nxg} & -\alpha_{nxt} & -\alpha_{nxy} & 1 & 0 \\ -\alpha_{qg} & -\alpha_{qt} & -\alpha_{qy} & -\alpha_{qnx} & 1 \end{bmatrix}^{-1} \begin{bmatrix} 1 & \beta_{gt} & 0 & 0 & 0 \\ \beta_{tg} & 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 1 \end{bmatrix} \begin{bmatrix} \varepsilon_t^g \\ \varepsilon_t^t \\ \varepsilon_t^y \\ \varepsilon_t^{nx} \\ \varepsilon_t^q \end{bmatrix}$$

where $\varepsilon_t = (\varepsilon_t^g, \varepsilon_t^t, \varepsilon_t^y, \varepsilon_t^{nx}, \varepsilon_t^q)$ represents the orthogonal structural innovations. The model implies that government spending and tax do not affect each other contemporaneously (within the same quarter). However, government spending shocks and tax shocks are allowed to affect tax and government spending contemporaneously. As explained in Blanchard and Perotti (2002), the coefficients on output in government spending and tax equations (α_{gy}, α_{ty}) theoretically contain both automatic response of fiscal variables to output innovations and systematic discretionary responses of fiscal variables to output innovations. The identification of fiscal policy shocks is achieved by exploiting decision lags in fiscal policy, which implies that the coefficients on output in government spending and tax equations only reflect the automatic stabilisers effect. Therefore, using quarterly data, which is a very short

period, help to eliminate the effect of systematic part of discretionary fiscal policy. In this paper, we mainly focus on the effects of fiscal policy shocks on the macroeconomic variables, specifically on trade balance, real exchange rate and output. In other words, we are interested in measuring the effects of non-systematic part of discretionary fiscal policy on real exchange rate, foreign trade and output.

As we mentioned in the previous section, our structural VAR model contains five variables: log of real government spending, log of real tax revenues, log of real GDP, net export to GDP ratio ($\frac{X-M}{Y}$), and log of CPI based real effective exchange rate. Our benchmark VAR specification includes constant and a linear time trend as deterministic terms. We also add a dummy variable that represents the economic crisis happened in 2009⁶. Appropriate lag length has been chosen as five, which is suggested by all model selection criteria except Schwarz criterion (SC) which indicates a lag length of one⁷. We also checked whether or not our results are sensitive to other VAR specifications with different lag lengths. However, the estimation results show that our results do not alter qualitatively under different VAR specifications.

Estimating the VAR model requires to impose some restrictions on the parameters of the model. Hence, we make some assumptions related to parameters of the model in order to just-identify VAR. First, we assume that government spending elasticity with respect to output is zero ($\alpha_{gy} = 0$), which implies that there is no automatic feedback from economic activity to government spending within the same period (Blanchard and Perotti (2002))⁸. Second, the automatic response of government spending to the real exchange rate is also set to zero ($\alpha_{gq} = 0$), which implies the existence of home bias in government spending (de Castro and Garrote (2012)). Third, tax elasticity with respect to output is set to 1.1 ($\alpha_{ty} = 1.1$) as calculated in Çebi and Özlale (2012)⁹. Additionally, we impose zero restrictions on the coefficients on net export to GDP ratio in tax and government spending equations ($\alpha_{tnx} = \alpha_{gnx} = 0$). Besides, the automatic response of tax to the real exchange rate is also set to zero ($\alpha_{tq} = 0$). Finally, one can put restrictions on β_{gt} or β_{tg} in order to just-identify the VAR system. Assuming $\beta_{gt} = 0$ ($\beta_{tg} = 0$) allows government spending shocks (tax shocks) affect tax (government spending) via β_{tg} (β_{gt}). We assume that government spending decision comes first ($\beta_{gt} = 0$) in our benchmark specification¹⁰.

Due to the fact that fiscal variables affect output contemporaneously and vice versa, the existence of simultaneity problem prevents to obtain consistent estimators¹¹. Eliminating the simultaneity

⁶The impulse dummy takes value of 1 at 2009:1 and zero otherwise.

⁷VAR(5) specification does not contain an autocorrelation problem. However, we detect an evidence of autocorrelation problem at VAR(1) model.

⁸It is quite common in the literature to assume that government spending elasticity with respect to output is zero. This is because government spending consists of government consumption and government investment, which do not respond to economic activity within the same period.

⁹Giving high or low values for tax elasticity with respect to output (for example, $\alpha_{ty} = 0.9$ or $\alpha_{ty} = 1.3$) left the responses of macroeconomic variables to the government spending shock unchanged.

¹⁰Using the alternative specification, where tax decision comes first ($\beta_{tg} = 0$), does not alter the estimation results qualitatively.

¹¹This might happen due to the behaviour of taxes and output. While the change in the output affects tax rev-

problem requires to construct cyclically-adjusted fiscal shocks by removing the automatic responses of fiscal variables to macroeconomic variables. One may construct the cyclically-adjusted government spending and tax shocks $\begin{pmatrix} \tilde{u}_t^g \\ \tilde{u}_t^t \end{pmatrix}$ as follows:

$$\begin{aligned} \tilde{u}_t^g &\equiv u_t^g - \beta_{gt}\varepsilon_t^t + \varepsilon_t^g \\ \tilde{u}_t^t &\equiv u_t^t - \alpha_{ty}u_t^y = \beta_{tg}\varepsilon_t^g + \varepsilon_t^t \end{aligned}$$

4 Impulse Response Analysis

This section documents the responses of the real exchange rate, trade balance and output to government spending shocks in Turkey. Initially, the responses of the relevant variables to an increase in the government primary spending are examined. Then, the relative effects of the components of the government spending, namely government consumption (wage and non-wage) and government investment on the real exchange rate, trade balance and output are explored. Figure 1 shows the responses to a shock in government primary spending¹².

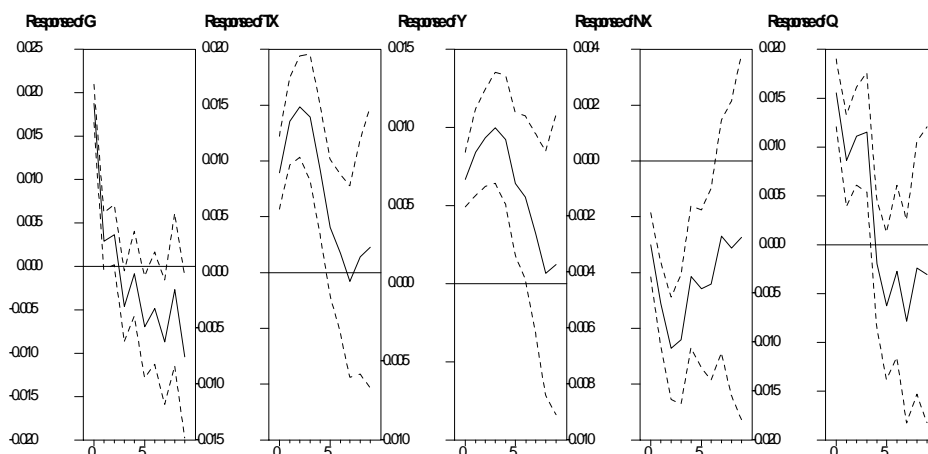


Figure 1: Responses to a Shock in Government Primary Spending

As it is expected, a rise in government spending enhances the output on impact and subsequent quarters and demonstrates its largest effect on output in the third quarter after the shock (Figure 1). Afterwards, the positive effect on output gradually dwindles by showing a hump-shaped behavior. We observe that the responses of output to a spending shock have a persistent behavior and they are statistically significant at the first six quarters.

enues contemporaneously via automatic stabilisers, the change in taxes also affects the output contemporaneously via consumption decisions of individuals and investment decisions of firms.

¹²Impulse response functions are presented with one-standard deviation confidence intervals which are calculated by Monte Carlo simulations.

Consistent with the findings of Beetsma et al. (2008), Bénétrix and Lane (2009a, b), de Castro and Fernandez (2013) and de Castro and Garrote (2012) we find that real exchange rate appreciates in response to a positive government spending shock. Besides, in accordance with the majority of the empirical literature, government spending shocks tend to deteriorate the trade balance in Turkey. Real exchange rate appreciates over a one-year horizon and then begins to depreciate, but the response becomes insignificant then after. Net exports, with a statistically significant response over the most of the forecast horizon, exhibit a sharp deterioration in the first two quarters after the shock and tend to moderate in the remainder of the period.

Turkey received large amounts of capital inflows during the last decade which had significant repercussions on growth performance and real exchange rate appreciation. Although output and real exchange rate variables in our baseline VAR model already capture these effects to a large extent, we re-estimated the baseline VAR model by replacing net export to GDP ratio (nx_t) with net capital inflows to GDP ratio (nci_t)¹³ as a control variable to examine whether the outcomes from the baseline model differ substantially. In fact, as shown in Figure A1 in appendix A, this specification does not change the main findings of the baseline model: A shock to government spending leads to an increase in output and appreciation in the real exchange rate¹⁴.

As mentioned earlier, Neo-Keynesian models with nominal rigidities predict that an increase in government spending is associated with a rise in output, which in turn leads to an increase in labour demand and real wages. Accordingly, private consumption grows resulting in an exchange rate appreciation. This process tends to end up with deterioration in the trade balance. In fact, Figure 2, where real output (y_t) is replaced by real private consumption (c_t) in the baseline VAR model, shows that positive shocks to government spending cause an increase in private consumption. Hence, our empirical finding that positive shocks to government spending are associated with real exchange rate appreciation and deterioration in trade balance in Turkey appears to be in accordance with the predictions of the Neo-Keynesian models.

¹³Net capital inflow is defined as the financial account of the balance of payments net of foreign exchange assets of the banking sector, IMF credits and official foreign exchange reserves.

¹⁴Figures A2, A3 and A4 in appendix A present the responses to the shocks to components of government spending in the model where net export is replaced with net capital inflows. Results from these alternative specifications are quite similar to those obtained from the original VAR models with the exception that real exchange rate responds positively and significantly at the first few quarters to a shock in government investment expenditures.

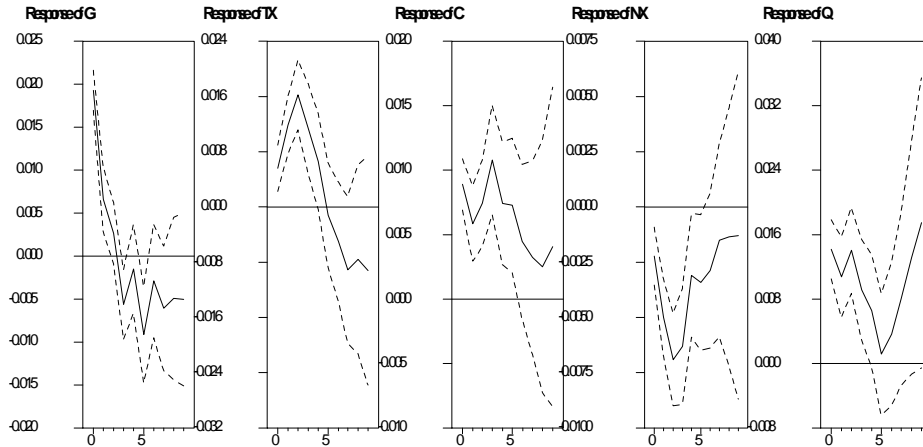


Figure 2: Responses of Private Consumption to a Shock in Government Primary Spending

An examination of the interactions between fiscal variables reveals that a positive government spending innovation is associated with an increase in tax revenues. This finding can be attributed to two main factors. Firstly, the enhanced output induced by the rise in the government spending also causes a rise in tax revenues. As shown in Figure 1, the shape of the tax response to a shock in government spending simply mimics that of the output response. Secondly, a rise in government spending causes a worsening in the budget deficit, which in turn raises the concerns about the sustainability of the debt stock. This might urge the government to raise taxes to ensure fiscal discipline and to mitigate the concerns about the debt sustainability. This is almost factually what happened in Turkey following the 2001 economic crisis. The government strived a lot to bring the fiscal balances to a sound basis and managed to reach relatively high levels of primary budget surpluses essentially by means of tax regulations which also helped to broaden the tax base. The success in the fiscal entrenchment process, in turn, led to a swift improvement in the sentiment concerning the sustainability of the debt stock¹⁵. The fact that expansionary fiscal policy via government spending is followed by tax increases to keep the fiscal balances in check implies the existence of a spending-driven tax adjustment process in Turkey¹⁶.

While we observe that government spending shocks causes appreciation in the real exchange rate, the composition of the government spending might have differential effects on exchange rate as suggested by Galstyan and Lane (2009a, b). To this end, we use disaggregated data in order to investigate the effects of the components of government spending¹⁷. We are particularly interested in assessing the

¹⁵While EU-defined general government debt stock to GDP ratio was approximately 78% in 2001, it declined to 46.5% in 2006 and to 36.1% in 2012.

¹⁶Çebi (2012), who employs a New-Keynesian Dynamic Stochastic General Equilibrium (DSGE) model for Turkey to examine the interaction between fiscal instruments, also yields the same evidence.

¹⁷We estimate the baseline five-variable VAR(5) model by replacing government primary spending with its components,

effects of government non-wage and wage consumption expenditures, namely government purchases of goods and services (g_good) and government personnel expenditures (g_wage), and government investment expenditures (g_inv) on output, real exchange rate and trade balance. Figures 3 and 4 present the effects of purchases of goods and services and personnel expenditures, respectively, while Figure 5 depicts the effects of government investment expenditures on the relevant macroeconomic variables.

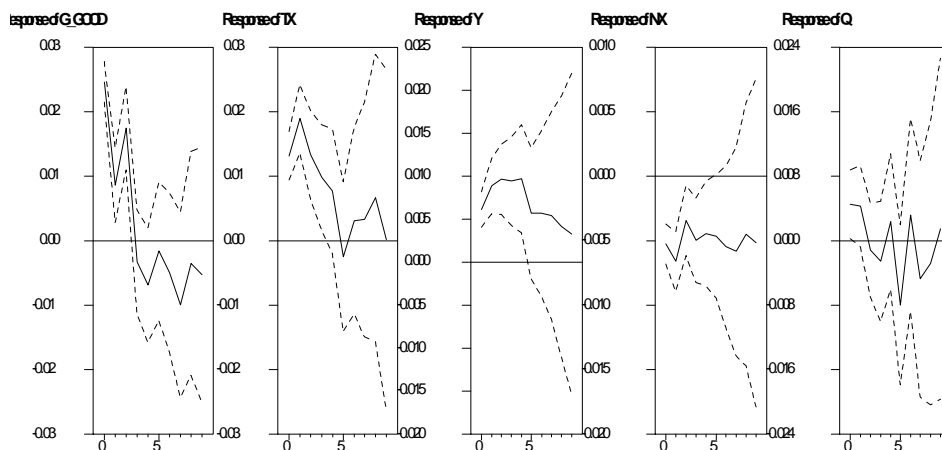


Figure 3: Responses to a Shock in Government Purchases of Goods and Services

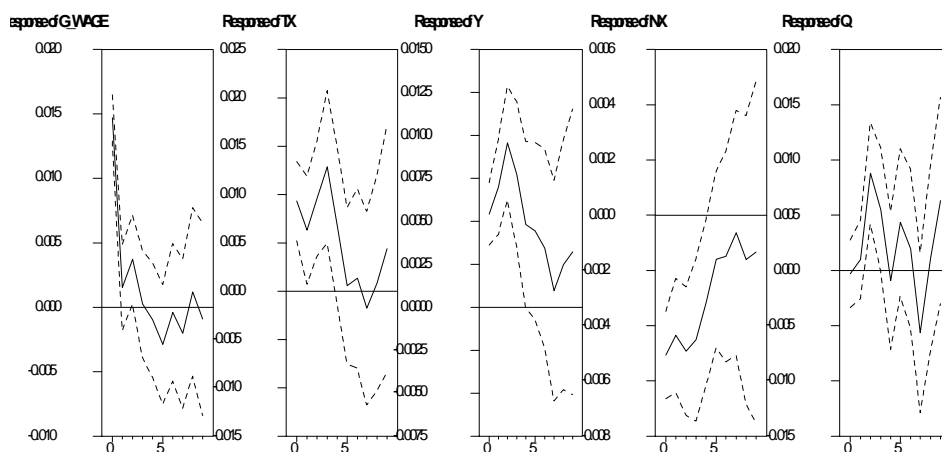


Figure 4: Responses to a Shock in Government Personnel Expenditures

namely government wage and non-wage consumption and government investment.

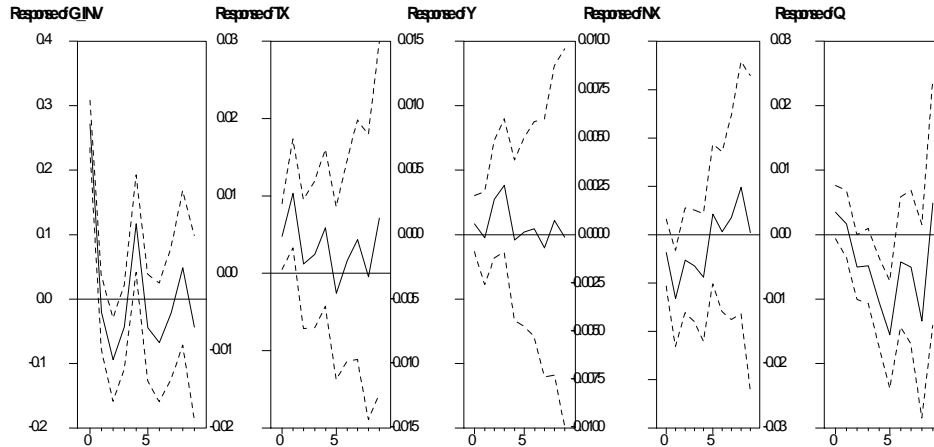


Figure 5: Responses to a Shock in Government Investment Expenditures

An inspection of Figure 3 reveals that a positive shock to government purchases of goods and services leads to an increase in output, real exchange rate appreciation and deterioration in the trade balance, which are quite similar with the effects of a shock to government primary spending. Figure 4, likewise, shows that a shock to government personnel expenditures increases output and leads to a deterioration in the trade balance, whereas the effect on the real exchange rate appears to be insignificant. As for the effects of government investment expenditures, Figure 5 reveals that output enhances, real exchange rate appreciates and trade balance deteriorates in response to a government investment shock. However, the responses of the relevant variables remain mostly statistically insignificant throughout the forecast period. Accordingly, while shocks to government consumption, specifically shocks to government purchases of goods and services seem to cause real exchange rate appreciation and trade balance deterioration, the effects of shocks to government investment expenditures remain insignificant to a large extent for the Turkish case, which appears to be broadly in line with the findings of Galstyan and Lane (2009a, b), de Castro and Fernandez (2013) and de Castro and Garrote (2012).

5 Conclusion

This paper assesses the dynamic effects of government spending shocks on output, real exchange rate and foreign trade balance in Turkey for the 2001 post-crisis period. To this end, we estimate a standard structural VAR model with quarterly data by using an extended version of Blanchard and Perotti (2002). The identification of fiscal policy shocks is achieved by taking into account decision lags in fiscal policy and imposing reasonable restrictions on some parameters of the model. Cyclically adjusted fiscal shocks are constructed in order to remove simultaneity problem between fiscal variables and output.

The analysis shows that shocks to government spending are associated with an increase in the real output, real exchange rate appreciation and deterioration in foreign trade balance. This finding of the study points to the importance of maintaining fiscal discipline by keeping government spending under control in the economies with a high current account deficit. In addition, our analysis suggests a fiscal transmission mechanism consistent with the predictions of the Neo-Keynesian models wherein government spending shocks enhance real private consumption leading to the appreciation of the real exchange rate. We also examine the effects of the components of the government spending, namely government wage and non-wage consumption and government investment expenditures on the relevant variables. The analysis demonstrates that the composition of government spending matters. While shocks to government non-wage consumption (purchases of goods and services) lead to real exchange rate appreciation and deterioration in trade balance, the effects of shocks to government investment expenditures on the real exchange rate and the trade balance appear to be insignificant. Furthermore, it is observed from the analysis that government spending shocks are associated with an increase in taxes, which can be essentially attributed to the enhanced output led by the increase in government spending. Besides, the deterioration in fiscal balances due to the rise in government expenditures appears to lead the government to raise taxes which points to the existence of a spending-driven tax adjustment process in Turkey.

Appendix A

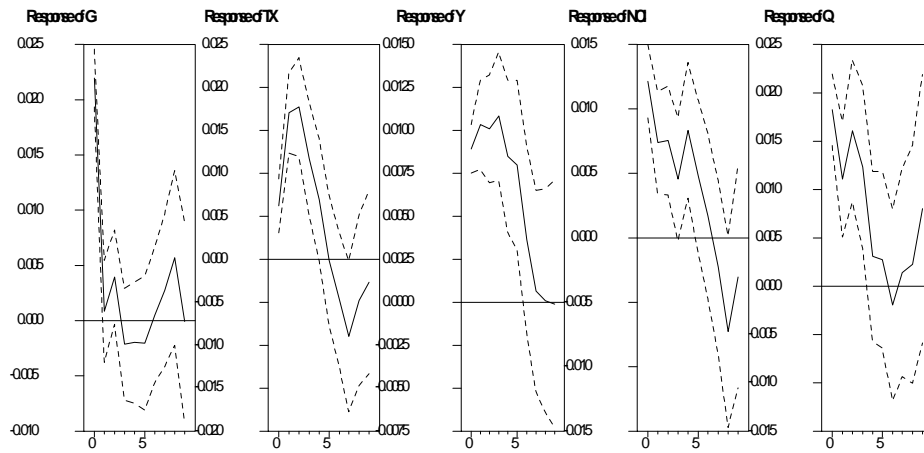


Figure A1: Responses to a Shock in Government Primary Expenditures in the Model with Net Capital Inflows

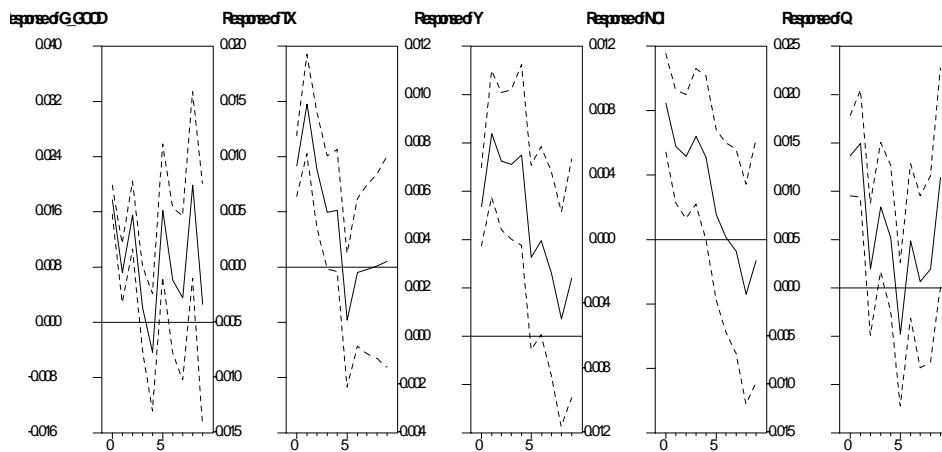


Figure A2: Responses to a Shock in Government Purchases of Goods and Services in the Model with Net Capital Inflows

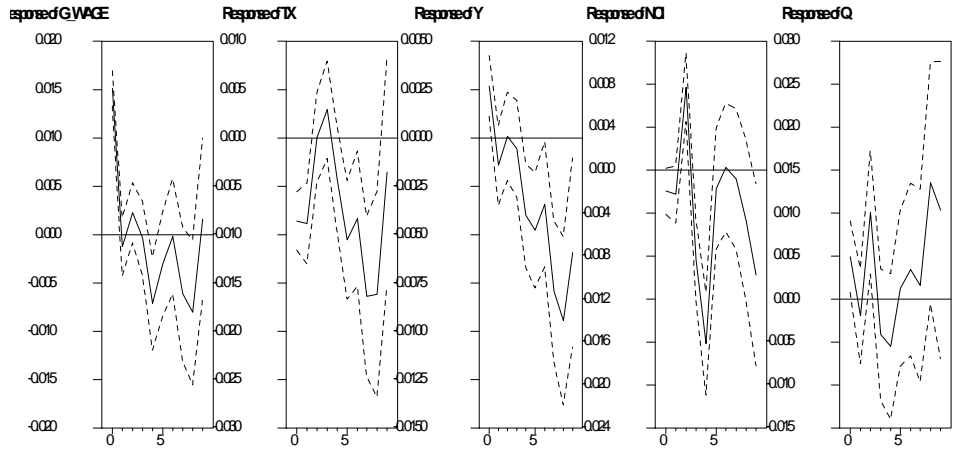


Figure A3: Responses to a Shock in Government Personnel Expenditures in the Model with Net Capital Inflows

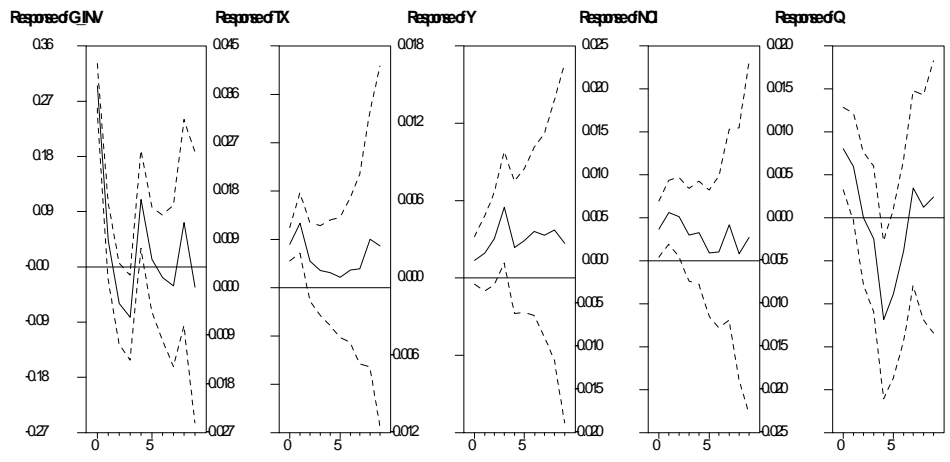


Figure A4: Responses to a Shock in Government Investment Expenditures in the Model with Net Capital Inflows

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