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Assessing the Neutrality and Non-Neutrality of Fiscal Policy in Pakistan

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Abstract

The objective of this paper is to assess the neutrality and non-neutrality of fiscal policy in Pakistan. We use Dynamic Stochastic General Equilibrium (DSGE) model for Pakistan economy. We examine the impact of fiscal policy, particularly government spending, taxes and borrowing on output growth, inflation and interest rate. Findings of this research paper show the non-neutrality of fiscal policy with respect to inflation, interest rate and economic growth. We find supportive evidences for the existence of fiscal theory of price level indicating the significant impact of fiscal policy on price level. Interest rate also positively responds to fiscal policy. Findings further revealed that economic growth is negatively affected by increase in government spending and tax rate. The findings of this study provide empirical supports for cohesive and increased coordination between fiscal and monetary policy.

Keywords: Fiscal Neutrality; Central Bank; DSGE Model; Pakistan.

Introduction

The subject of fiscal policy neutrality is extensively debated. Fiscal neutrality is a concept that refers to a situation where the decision of the treasury or fiscal authority of government spending and taxes has no effects on aggregate demand and output. Fiscal policy is also neutral when the instruments of fiscal policy do not affect inflation and interest rate. Sargent and Smith (1987) find empirical evidences of widely accepted notion of the neutrality of fiscal policy having no real impact. Policy makers usually use macroeconomic policies particularly fiscal and monetary policy to reduce volatility in output, minimize fluctuations in inflation and unpredictability in interest rate variation. Government through the formulation and alteration of fiscal policy plays an important role and has the potential to alter these economic variables. Changes in government spending, taxes, borrowing and the level of public debt determine the behavior of macroeconomic variables.

Every successive government in Pakistan attempts hard to find solution to the economic problems particularly economic growth, unemployment and price stability. The treasury benches use fiscal policy to achieve these goals. The state bank of Pakistan also uses monetary policy instruments to control inflation and secondary goal of modest growth. Monetary authority blames the fiscal branch for running persistent budget deficits and creation of inflation in Pakistan. This leads to the debate on the notion of fiscal theory of price determination in the country.

State Bank of Pakistan also blames fiscal authority for reducing the effectiveness of monetary policy in curbing inflation. This debate between the fiscal and monetary authority questioned the neutrality of fiscal authority ultimately led to the introduction of legislation. The non-neutrality of fiscal policy in Pakistan forces the policy makers and legislators to introduce Fiscal and Monetary Policy Coordination Board (FMPCB). Other institutional arrangements are made in order to ensure the sustainability of public finances. For instance, Fiscal Responsibility and Debt Limitation (FRDL) act is responsible for containing the ruthless spending of the government and to ensure fiscal sustainability. Fiscal Responsibility and Debt Limitation act suggests the establishment of Debt Policy Coordination Office (DPCO) to prepare a ten-year plan for debt reduction and restrict the government borrowing to the prescribed limit of public debt as a percentage of GDP. These institutional arrangements indicate that fiscal policy in Pakistan is not neutral. This situation demands the harmonization and increased coordination of fiscal and monetary authority. The findings of this paper will help policy makers to work for the coordination of monetary and other macroeconomic policies in perspective of the influence of the fiscal policy.

Literature Review

Extensive literature is available on the neutrality and non-neutrality of fiscal policy. Edge and Rudd (2002) provide some interesting insights on the absence of Ricardian equivalence while indicating the neutrality of fiscal policy in reporting the positive coefficient for inflation in the Taylor interest rate rules. The decisions of the fiscal authority affect macroeconomic variables through endogenous effects on budget deficits. Leeper and Yun (2006), Leeper (1991), Woodford (2001) and Schmitt and Uribe (1997) reveal the non-neutrality of fiscal policy through the monetization of public debt which has implications for inflation. Substantial literature examines the monetary consequences of fiscal policy declaring the non-neutrality of fiscal policy. The debt dynamics for inflation are different in different countries depend on the monetization of debt. Fiscal policy affects the price level in economy through debt monetization. Kydland and Prescott (1977) examine the impact of fiscal policy and find that accommodative fiscal policy affects the general price level even in the presence of a very conservative central bank. The debate on fiscal implications provide interesting insights when we investigate the spillover effects of fiscal policy. Jrbashyan and Harutyunyan (2006) investigate the phenomenon and find that transaction cost reduces the effectiveness of the monetary policy leading to the non-neutrality of fiscal policy. The distortionary nature of taxation normally brings price instability which negatively hurt the policy options of the central bank. Sargent and Wallace (1981) also report the non-neutrality of fiscal policy by identifying the effects of seigniorage on inflation and growth. Rozina (2012) finds that decisions of the fiscal authority in Pakistan have significant impact of growth, inflation and interest rate. The influence of fiscal

policy on growth, inflation and interest rate comes from different avenues in Pakistan. The decisions of the government to impose new taxes, spending, budget deficit financing by printing more and more money. Ando and Modigliani (1965) validate the non-neutrality of fiscal policy by stating that government taxes and expenditures are more crucial in altering the economy. Barro (1974) finds that inflation considerable depends on the claim on for liquidity. Sargent and Wallace (1981) investigate the interaction between fiscal and monetary policy and reported that fiscal profligacy of the government put pressure on monetary growth and ultimately affect price level and interest rate. Budget deficits distort interest rate in the economy between fiscal and monetary policy and central bank. Blinder and Solow (2005) also find that government's spending and revenue decisions has the potential to alter and redirect the resource allocation of private sector thus affect growth and other macroeconomic variables. Substantial literature seeking the neutrality of fiscal policy revealed and validated the presence of Ricardian equivalence. Dornbusch et al. (1998) study the effects of fiscal policy on macroeconomic variables and find that any increase in the government spending is offset by increase in the interest rate and crowding out. Gemmell (2004) identified that decision of the government to change direct taxes affect the level of investment and growth in the economy. Hermes and Lensik (2004) noted that the imposition of both direct and indirect taxes in the country is distortionary in nature affect macroeconomic indicators including consumption, investment, inflation and growth. Leibfritz et al. (1997) conduct the cross-country analysis and reported the non-neutrality of fiscal policy by identifying a negative relationship between government taxes and economic growth. Plosser (1992) found a negative relationship between government taxes and per capita GDP thus established the non-neutrality of fiscal policy. McGillivray and Morrissey (2004) found that insufficient revenue resources and ruthless government spending widens budget deficit that constrained economic growth. Marsden (1983) and Fölster and Henrekson (1999) established the non-neutrality of fiscal policy while reporting the distortionary effect of taxes and government budget deficits. Miller and Russek (1997) reported the positive effects of government's spending and taxing decisions on economic growth while establishing the non-neutrality of fiscal policy. Leibfritz et al. (1997) concluded that fiscal policy affects the behavior of the interest rate thus alters different macroeconomic indicators including investment, consumption, inflation and growth. Their findings reveal that any increase in the level of public debt negatively affects the macroeconomic performance. Severely indebted countries allocate considerable chunk of their resource for servicing public debt thus leaving very meager resources for the development of the country. Herd (1989) found that the any reduction in the budget deficit has positive impact on economic growth and conclude that fiscal policy is non-neutral. Clements et al. (2002) examined the non-neutrality of government spending and taxes and found that fiscal consolidation has no short run as well as long effects on economic

growth. Martin and Fardmanesh (1990) identified the non-neutrality of fiscal policy by identifying the negative impact of budget deficits on GDP. Government also forces the central bank to finance deficit through monetization thus pushing up interest rate in the economy. Barro and Gordon (1983) found that central bank can create inflation in the presence of accommodating behavior. Rogoff (1985) identified that fiscal sustainability through fiscal consolidation affect monetary policy thus established the non-neutrality of fiscal policy in Pakistan. Perotti (2002) reported positive effects of fiscal policies on the price level and interest rate. The fiscalists approach or those who support the non-neutrality of fiscal policy believed that behavior of the interest rate depends on the behavior of fiscal authority. The departure from the assumption of Ricardian equivalence substantiates the non-neutrality of fiscal policy. Government spending as well as the negative effects of distortionary taxes increases the utility of fiscal policy. The absence of Ricardian equivalence provides reasons to assess the effects of fiscal policy on macroeconomic indicators. The dominant treasury benches force central bank to keep the interest rate low to spur economic growth. Gale and Orszag (2003) found that fiscal profligacy forces the government to borrow from the commercial banks as well as monetization from the central banks. This behavior of the fiscal authority creates the shortage of funds in the economy thus push the interest rate upward. Fischer et al. (2002), Cottarelli and Balino (1994), Terrones and Catão (2001), Arratibel et al. (2002) debated the Ricardian and non-Ricardian equivalence and find the non-neutrality of fiscal policy through the strong and positive relationship between deficit and inflation. Nadoveza and Penava (2016) reported that reduction in the fiscal policy instruments particularly a decline in the income tax rate stimulate national income. Palić (2018) using VAR reveals that monetary policy instruments interact with fiscal policy validate the none neutrality of the treasury. Using VAR techniques, Benazic (2006) finds that fiscal policy is the main driver of economy and government expenditures significantly and positively affect GDP. Sever et al. (2011) examine the issue and find that fiscal policy affects economic outcome positively in the short run and negatively in the long run. Gnip (2014) provides very interesting insights that fiscal policy is more effective in recessionary periods compare to the effectiveness in boom.

Theoretical Framework and Methodology

In this research we use the model[1] which identified the budget constraint as

$$G_{t-i} + i_{t-1}B_{t-1}^{T} = T_t + \left(B_t^{T} - B_{t-1}^{T}\right) + CB_t^{R} \qquad (1)$$

[1] The model is heavily based on Walsh

The above equation shows that government spending *G* should be equal to revenue from the collection of taxes *T*, borrowing *B* and revenue generated from the central bank *CB*. The real value of the government spending and debt servicing is given by the

$$g_t + \bar{r}_{t-1} b_{t-1} = \tau_t + (b_t - b_{t-1}) + h_t - \frac{h_{t-1}}{(1+\pi_t)(1+\mu_t)} \qquad (2)$$

Above equation reveal that government spending is affected by the availability of resources generated through taxes, borrowing from the banks, and by printing currency. The inter temporal budget constraint of the government is

$$(1+r)b_{t-1} = \sum_{i=0}^{\infty} \frac{g-t-s}{(1+r)^i} = \sum_{i=0}^{\infty} \frac{\Delta_{t+1}}{(1+r)^i} \qquad (3)$$

The above equation indicates that when the level of outstanding debt is positive i.e. $b_{t-1} > 0$ then fiscal authority should avoid budget deficit. The household budget constrain is

$$c_t + m_t + b_t = y + (1+r_{t-1})b_{t-1} + \frac{m_t}{1+\pi_t} - \tau_t \qquad (4)$$

We know that inflation depends on the consumption pattern and behavior of the consumers. The above equation implies that consumption of the household depends on the decisions of the government about taxes, interest rate and level of the money stock.

$$P^{ss} = \frac{\beta r^{ss}}{\delta y}\left[M + (1-\psi)B\right] \qquad (5)$$

This equation shows that price level in the economy not only depend on money supply *M* but also on the level of public Debt *B*.

$$D_t = P_t \sum_{i=0}^{\infty} \lambda_{t,t+i}\left[\tau_{t+1} + \bar{s}_{t+1} - g_{t+1}\right]$$

$$D_t \frac{1}{\sum_{i=0}^{\infty} \lambda_{t,t+i}\left[\tau_{t+1} + \bar{s}_{t+1} - g_{t+1}\right]} = P_t$$

$$P_t^* = \frac{D_t}{\sum_{i=0}^{\infty} \lambda_{t,t+i}\left[\tau_{t+1} + \bar{s}_{t+1} - g_{t+1}\right]} \quad (6)$$

The above equations reveal that altering of the fiscal policy, changes in taxes, government spending and seigniorage has implications for price level. This in turn affects monetary policy and ultimately macroeconomic indicators like inflation and economic growth.

There is no single study in Pakistan that investigated the non-neutrality of fiscal policy using dynamic stochastic general (DSGE) model. This study uses the New Keynesian model as in Fragetta and Kirsanova (2010). DSGE model is modified with the incorporation of taxes and government along with government borrowing to check the implications of fiscal policy for economic growth, inflation and interest rate. Consumers with the sole objective of maximizing face the following constraint:

$$U = E_0 \sum_{t=0}^{\infty} \beta^t \left(\frac{C_t^{1-\sigma_c}}{1-\sigma_c} + \chi \frac{G_t^{1-\sigma_g}}{1-\sigma_g} - \frac{N_t^{1+\varphi_n}}{1+\varphi_n} \right) \quad (7)$$

The above equation indicates that utility depends on consumption, government decisions about spending and taxes, and labor supply. Following Çebi (2012), behavior of the firm is shown with the continuum of identical monopolistically firms producing heterogeneous products

$$Y_t(j) = A_t N_t(j) \quad (8)$$

The log linearized open economy hybrid Phillips is given by

$$\hat{\pi}_{H,t} = \lambda^b \hat{\pi}_{H,t-1} + \lambda^f E_t\left[\hat{\pi}_{H,t+1}\right] + \kappa \hat{m} c_t + \varepsilon_t^{\pi} \quad (9)$$

$$\hat{mc}_t = \sigma_\alpha + \varphi\left(\hat{y}_t - \hat{y}_t^n\right) - \sigma_\alpha \hat{g}_t + \hat{\tau}_t \qquad (10)$$

$\hat{mc}_t$ is the marginal cost. This is clear from the above equation that price level depends on marginal cost that in turns depends on the government spending and taxes. Thus, fiscal policy affects inflation through changing marginal cost of the firm. The slope coefficient of Phillips curve κ shows responsiveness of the price level to changes in real marginal cost. Following, Choudhri and Malik (2012), we use the modified augmented Taylor rule

$$\hat{r}_t = \rho_r\left(\hat{r}_{t-1} - \hat{r}_{t-1}^n\right) + (1-\rho_r)\left[r_\pi \hat{\pi}_{H,t} + r_y\left(\hat{y}_t - \hat{y}_t^n\right) + r_b\left(b_t - b_{t-1}\right)\right] + \hat{r}_t^n + \varepsilon_t^r$$

(11)

The above equation indicates that interest rate depends on past inflation, economic growth and weight is also assigned to fiscal policy.

In this research we use Dynare tool box for MATLAB to estimate our DSGE model to assess the neutrality and non-neutrality of fiscal policy. We estimated the values of parameters by calibration. We use annual time series data derived from State Bank of Pakistan. The variable on which the data is derived includes output, inflation, interest rate, government borrowing and debt, government spending and taxes.

Results and Discussion

Our findings indicate that fiscal policy is non-neutral in Pakistan. Economic growth increases with increase in government spending in the short run, but this quickly die out as government increases spending. This implies that fiscal policy is effective in the short run but has very negligible effects in the long. This is not unusual behavior in the developing countries or in the countries where government finances its spending by relying heavily on printing of money that pushes interest rate upward. Increase in interest rate add to the cost of capital and doing business in the country thus crowd out private investment. The corrective measures adopted by the SBP by pushing up policy rate to stop fiscal profligacy and inflation in the country causing sluggish growth. Increase in the interest rate is anti-growth in

nature thus negatively affecting growth in Pakistan. Secondly, we know that government is allocating considerable amount in the federal budget to service the public debt which is unproductive in nature. This implies that substantial resources are not allocated for the productive activities and for the development of infrastructures. The presence of shrinking fiscal space and budget deficits undermines growth in Pakistan. Furthermore, output also negatively responds to any increase in government's taxes. Increase in taxes in Pakistan is adding to the cost of doing business and thus discourage investment and causes slow growth. Furthermore, fiscal non-neutrality is also established by the positive response of price level to the tax rise in the country. The impact of tax on inflation is significant. Government's decisions to increase tax rate or impose new taxes alter the behavior of the producers as well as consumers thus adding to the cost of production that negatively affects economic growth. Our findings also provide some interesting insights on the presence of Fiscal Theory of Price Level (FTPL) in Pakistan. The impulse response function reveals that inflation increases with an increase in government spending. This validates the concern of monetary authority over the fiscal profligacy and its ultimate monetization. This also increases the importance of fiscal sustainability through fiscal consolidation. Furthermore, there is a policy lesson for the government that beside contractionary monetary policy, disciplined fiscal policy is required for containing inflation in the country.

The non-neutrality of government spending and taxes is further validated by increasing interest rate in response to an increase in the tax rate in the country. This implies that both treasury as well as State Bank of Pakistan simultaneously follows contractionary fiscal and monetary policy respectively. This is not a good sign for the economy. Literature review suggests that monetary authority needs to adopt expansionary or pro-growth policy to minimize the slackening effects of the tight fiscal stance of the treasury. We have another hypothesis from these findings that both SBP and Ministry of Finance design and implement fiscal and monetary policy independently. The independent formulation and implementation of both policies is good, and consultation is needed to make more effective policies. In order to increase the effectiveness of our macroeconomic policies in promoting growth, reducing inflation and stable interest rate, we need more cohesive and coordinated fiscal and monetary policy environment.

Conclusion and Policy Lesson

In this study we empirically investigated the neutrality and non-neutrality of fiscal policy in the country. Our findings reported that fiscal policy is non-neutral and has the potential to affect macroeconomic variables like inflation, interest rate and output. Inflation responds positively to the surge in government spending. Price level also increases with the imposition of new taxes or with increase in the existing tax rate. Fiscal profligacy is also causing an increase in the interest rate thus forcing

the central bank to alter its monetary policy. Interest rate also increases with the increase in tax rate validating the existence of simultaneous contractionary fiscal and monetary policy. The simultaneous contraction of two key macroeconomic policies is not good for the economy. Output declines with an increase in the tax rate or imposition of new taxes. Economic growth also drops with an increase in government spending verifying the crowding out phenomenon while pushing interest rate up. From the above discussion we can conclude the inflation, interest rate and output implications of the non-neutral fiscal policy. The presence of non-neutral fiscal policy indicates the growing importance of fiscal policy. Policy adopted by the central bank for controlling inflation is counter-productive and distortionary if inflation is created by the fiscal profligacy. This situation demands for the increased coordination between fiscal and monetary authority that requires more cohesive policy environment. Another policy lesson is the partial responsibility shift towards treasury to play an active role to ensure price stability and allow the central bank to rationalize the behavior of the interest rate. This kind of cohesive policy environment will also minimize the negative spillover and harmful effects in the economy.

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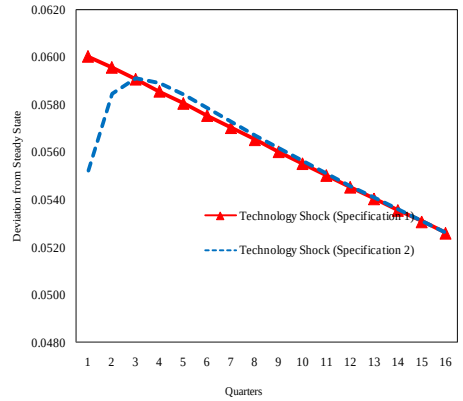
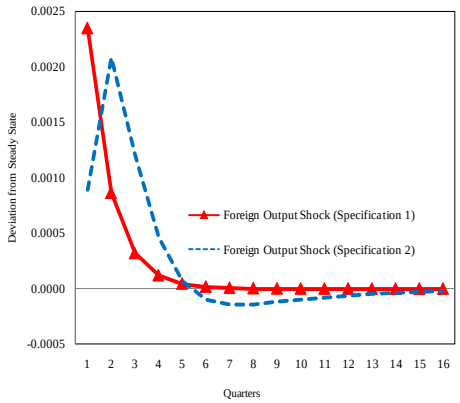
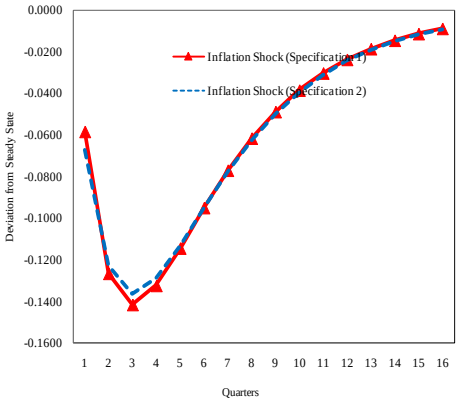
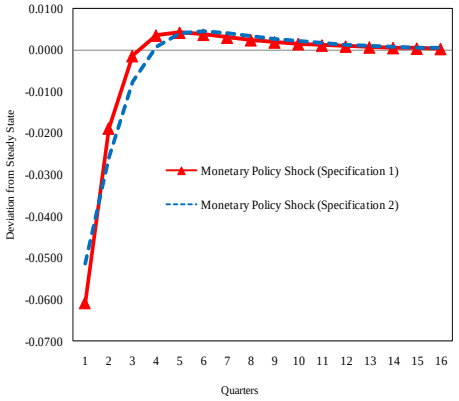
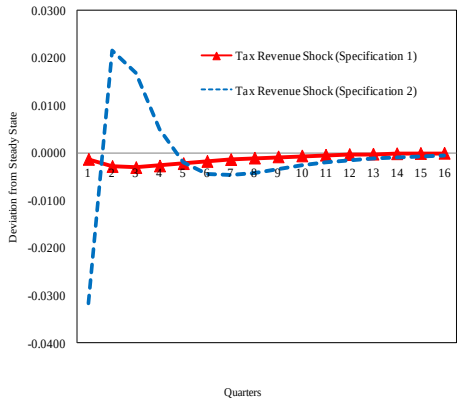
Figure 1: Response of Output











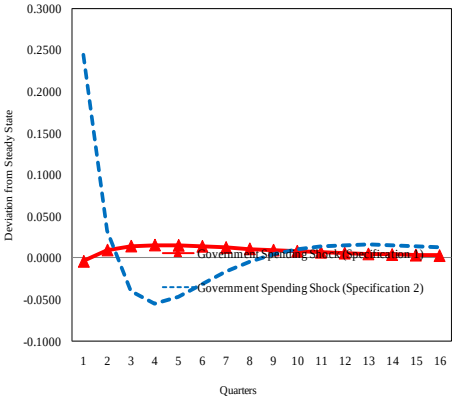
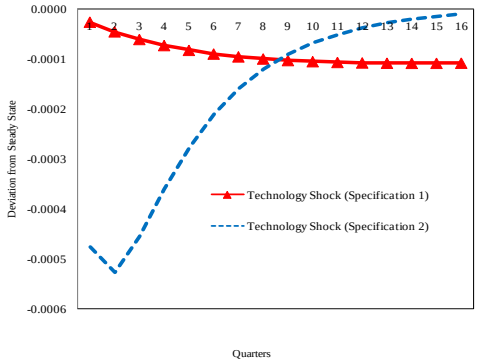
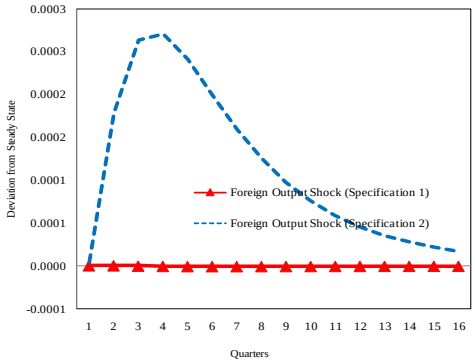
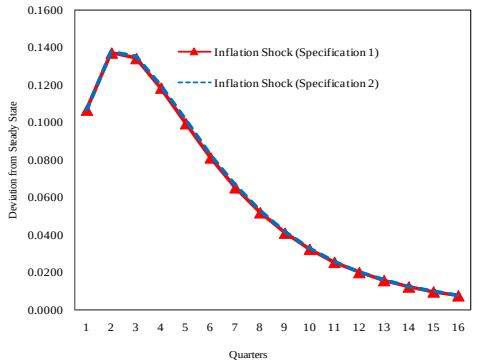
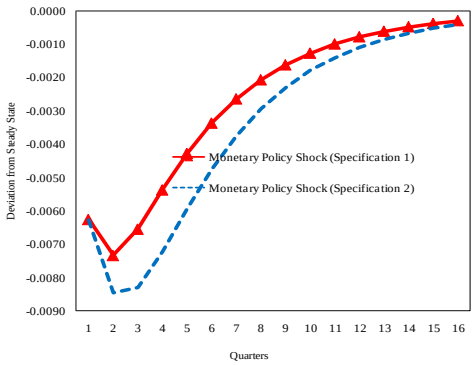


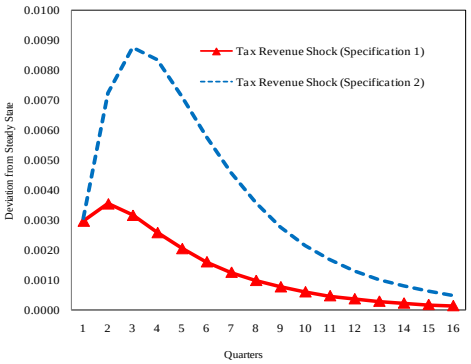
Figure 2: Response of Domestic Inflation











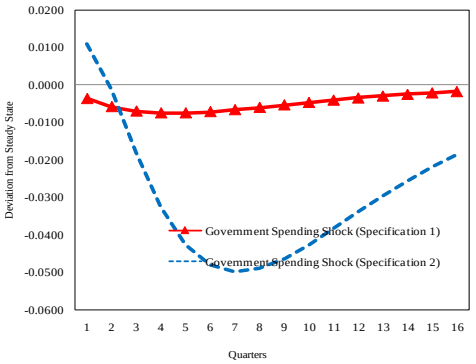
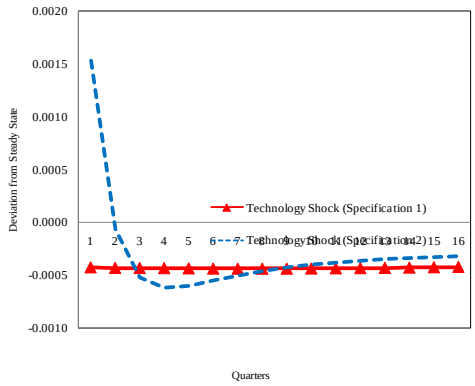
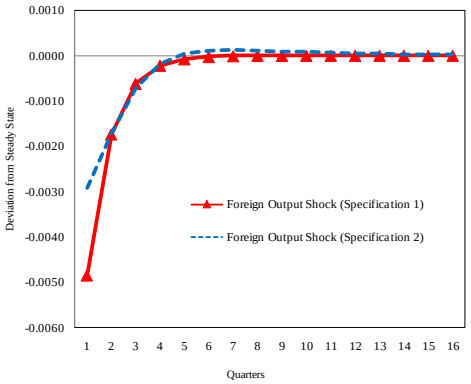
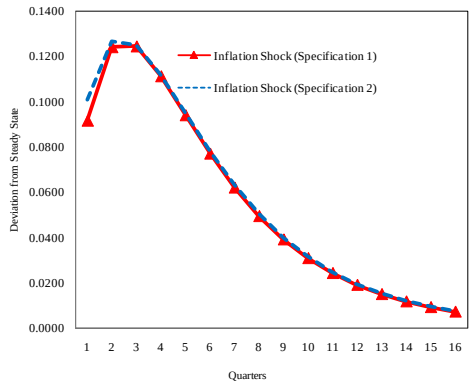
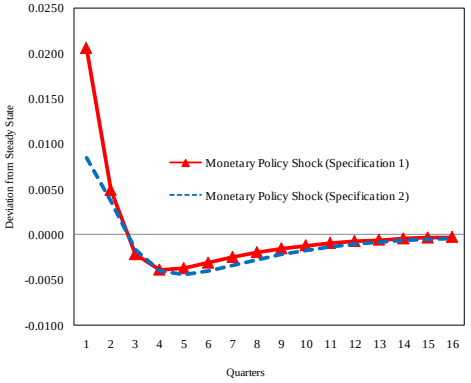


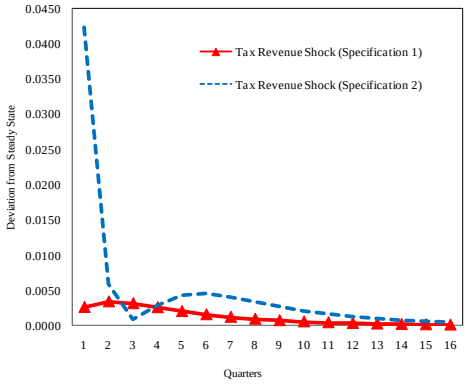
Figure 3: Response of Interest Rate











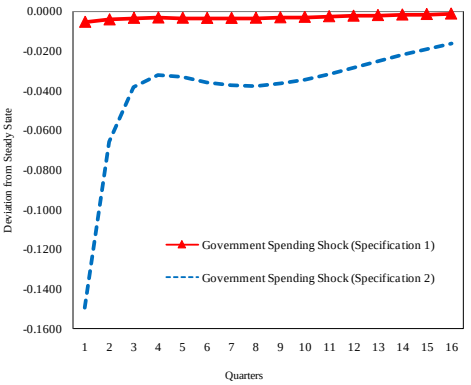


Table 1: Selection of Parameter Values for estimating DSGE Model

Parameter	Description	Value	Reference
α	Degree of Openness	0.23	Haider and Khan (2008)
β	Subjective Discount Factor	0.99	Ahmed et al., (2012)
θ	Degree of Price Stickiness	0.24	Haider and Khan (2008)
φ	Inverse Elasticity of labor supply	1.00	Haider and Khan (2008)
σ	Inverse Elasticity of substitution in consumption supply	0.59	Ahmed et al., (2012)
ρ_r	Degree of interest rate smoothing	0.28	Ahmad et al., (2012)
γ_π	Taylor rule coefficient on inflation	1.48	Ahmad et al., (2012)
γ_y	Taylor rule coefficient on output gap	0.52	Ahmad et al., (2012)
ρ_g	Degree of govt spending smoothing	0.78	Ahmad et al., (2012)
g_y	Spending Coefficient on past output gap	0.01	Author's Calculations
ρ_τ	Degree of tax smoothing	0.22	Author's Calculations
τ_y	Tax Coefficient on past output gap	0.01	Author's Calculations
g_b	Spending Coefficient on debt	0.03	Author's Calculations
τ_b	Tax Coefficient on debt	0.01	Author's Calculations
ζ	Degree of backwardness	0.76	Haider and Khan (2008)
ρ_a	AR coefficient of Technology	0.91	Ahmad et al., (2012)
ρ_{y^*}	AR coefficient of world output	0.36	Ahmad et al., (2012)
σ_a	SD of Technology innovation	0.02	Ahmad et al., (2012)
σ_π	SD of Inflation innovation	0.05	Author's Calculations
σ_{y^*}	SD of world consumption innovation	0.02	Author's Calculations
σ_r	SD of interest rate innovation	0.02	Ahmad et al., (2012)
σ_g	SD of govt spending innovation	0.14	Ahmad et al., (2012)
σ_τ	SD of tax innovation	0.06	Author's Calculations