

Fiscal Policy and Current Account Dynamics in the Case of Pakistan

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1. INTRODUCTION

The relationship between fiscal policy and the current account has long attracted interest among academic economists and policymakers after introduction of the standard intertemporal model of the current account by Sachs (1981) and its extension by Obstfeld and Rogoff, (1995) in open economy macroeconomics. There are two major strands of the current account literature Mundell-Fleming [Mundell (1968) and Fleming (1967)] and Ricardian equivalence [Barro (1974, 1989)] to explain such variations in the deficits. According to Mundell-Fleming model budget deficits cause current account deficits through stimulating income growth or exchange rate appreciation [Darrat (1988); Abell (1990); Bachman (1992) and Bahmani-Oskooee (1992)]. On the other hand, there is Ricardian view that the financing of budget deficits, either through reduced taxes or by issuing bond does not alter present value wealth of private households since both temporarily reduced taxes and issuance of bonds represent future tax liabilities [Kaufmann, *et al.* (2002); Evans (1989); Miller and Russek (1989); Enders and Lee (1990) and Kim (1995)]. The underlying reason is that the effects of fiscal deficits on the current account depend on the nature of the fiscal imbalance. For example, in a simple theoretical model in which Ricardian equivalence holds, a cut in lump sum taxes and the ensuing fiscal deficit would not affect the current account as the private savings increase will offset the fiscal deficit but investment will be unchanged. Conversely, a transitory increase in government spending will increase both the fiscal deficit and the current account deficit, a case of twin deficits. And a permanent increase in government spending will have no effects on the current account while its effects on the fiscal balance will depend on whether the extra spending is financed right away with taxes (in which case the fiscal balance is unchanged) or whether it is financed with debt (future taxes) in which case the fiscal balance worsens. Thus, fiscal deficit may or may not lead to current account deficits depending on the nature and persistence of the fiscal shock. There is also a third scenario relate to Ricardian view that portrays the possibility of negative relationship between the deficits where, for example, output shock give rise to endogenous movements and two deficits are divergent.

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There are various channels that explain theoretically the impact of fiscal policy on the current account. The direct channel through which fiscal policy affects the current account is by changes in the government's consumption or investment demand for tradable goods which shift the government import demand function and causes changes in the trade balance. In a Keynesian framework a fiscal expansion (a tax reduction or spending increase) tend to increase demand including demand for imports, and hence the trade deficit. Fiscal policy can also affect the current account by changing the relative price of non-tradables which induces higher government spending on non-tradable causing a real appreciation, more private consumption of non-tradable and less production of tradable leads to deterioration of current account. Fiscal contraction can reduce interest rates, including on external debt, thereby improving the current account balance. At the same time, lower risk premium can also increase capital inflows, which can boost demand and real appreciation pressures and eventually worsens the current account. Fiscal expansions have opposite effect if they are unsustainable can generate capital flight and force a rapid external account adjustment which can be the case of balance of payments crises. However, the relative strength of these mechanisms, and thus the net impact of fiscal policy on the current account is determined by model assumptions and empirically depend on country characteristics [Abbas, *et al.* (2010)].

The present study empirically examines the relationship between fiscal policy and the current account for Pakistan. In Pakistan where fiscal and current account imbalances are large, a question arises to what extent fiscal adjustment can contribute to resolving external imbalances.¹ Some studies are done to explore the link between fiscal deficits and current account deficits [Zaidi (1995); Burney and Akhtar (1992) and Burney and Yasmeen (1989)] and analysing the possible causal relation 'twin deficit' hypothesis [Kazimi (1992); Aqeel and Nishat (2000) and Hakro (2009)]. However this issue needs to be further investigated from policy point of view, because the fiscal and current account balances seem to be highly persistent and causing other macro economic imbalances and indebtedness, thus persistent deficits become a major cause of concern in Pakistan. The present study contributes to the existing empirical literature by analysing the impact of fiscal policy on the current account for a developing economy. The study examines the dynamic interactions among variables: fiscal policy, current account and other variables, output, exchange rate and interest rate using a structural VAR model. Blanchard and Perotti (2002) suggest that the structural VAR approach seems more suitable for the study of fiscal policy than of monetary policy.²

¹Budget deficits in 80s average is nearly 6 percent of GDP, it increases to 6.9 percent in 90s and fell down to 4.3 percent in 2000- 01, rises again to 4.3 percent of GDP in 2005-06, in 2008-09 it is 5.2 percent of GDP. The current account deficit in 80's average is 3.9 percent of GDP, in 90s it is 4.5 percent and in 2000-01 it fell down 0.7, and it rises again in 2005-06 to 4.4 and in 2008-09 it is 5.7 percent of GDP, see Economic Survey (2009-10).

²They argue that there are many factors which contribute to the movement in budget variables, in other words, there are exogenous (with respect to output) fiscal shocks. In addition, decision and implementation lags in fiscal policy imply that there is little or no discretionary response of fiscal policy to unexpected movements in activity. Thus, with enough institutional information about the tax and transfer systems and the timing of tax collections, one can construct estimates of the automatic effects of unexpected movements in activity on fiscal variables, and, by implication, obtain estimates of fiscal policy shocks.

The study is organised as follows. Section 2 discusses the theoretical and empirical literature on this area briefly. The methodology and data is presented in Section 3. The empirical results are discussed in Section 4 and last section concludes the study.

2. LITERATURE REVIEW

The past three decade has seen a strong increase in theoretical and empirical work on the dynamics of fiscal and the current account deficit. There are two strands of the current account literature. First, some findings of the literature focused on the budget deficit as a major cause of current account deficits called twin deficits. Whereas, Ricardian states that either ways of financing the budget deficits (through reduced taxes or by issuing bonds) do not alter present value wealth of private households. Financing budget deficits by issuing bonds leads to higher consumption expenditures due to wealth effects and raises interest rates, higher interest rates appreciate the currency, and, because of loss in competitiveness in addition to higher consumption, worsen the current account balance. Both approaches share an intertemporal perspective on the current account, which is regarded in both cases as net savings of the economy.

The traditional Keynesian models, optimising real business cycle models and new open-economy macro models are mostly come up with similar conclusions described as a transitory fiscal expansion is likely to lead to a fiscal deficit, a current account deficit, and an appreciation of the real exchange rate in the short run. The effects on the real exchange rate may be reversed in the long run and even the current account may revert over time to insure the solvency of the country's external liabilities. However, the impact and short-term effects of the fiscal shock are likely to be a worsening of the current account and a real appreciation. However, Baxter (1995) in framework of optimising real business cycle models come up with different results that a transitory tax rate cut can lead to current account improvement though intertemporal substitution effects that lead private saving to respond more than the initial government deficit. New open-economy macro models like Obstfeld and Rogoff (1995) also suggest that permanent government spending shocks may lead to a short-run demand-driven increase and cause shift in the net output that, improves the current account and depreciates the real exchange rate.

There are three distinct approaches that have been widely employed in the empirical literature. The first approach analyses the impact of fiscal policy on external imbalances using causality tests and structural Vector Autoregressive (VAR) models. The second followed the long-term correlation between indicators of fiscal policy and external imbalances, using cointegration techniques, and single or panel regressions techniques. The third approach invokes the narrative approach to identify exogenous changes in fiscal policy and uses regression analysis to study their impact on external imbalances.

In VAR analysis an important methodological choice is how to identify exogenous fiscal shocks; one choice is to use changes in the log of real government consumption, because this measure is less affected by changes in GDP than is the case for alternatives such as the overall deficit/GDP ratio or the ratio of real government consumption to GDP. For selected EU countries, Beetsma, *et al.* (2007) find that a government spending innovation worsens the trade balance and appreciates real effective exchange rate concluding that the main short-term transmission channel impact is upon output, with the

real exchange rate playing a greater role over longer horizons. Monacelli and Perotti (2007) find that, following an increase in real government consumption, the trade balance stays around trend initially, but improves after about 3 years for US. They find stronger evidence in support of the twin deficits hypothesis in the United Kingdom, Australia, and Canada. Corsetti and Muller (2006) report that the impact of fiscal shocks on the current account seems to be greater and longer-lasting in economies where total trade is higher as a share of GDP (Canada and the United Kingdom) than in economies where trade is a smaller share of GDP (US and Australia).

To analyse this issue on a set of countries using panel regressions some studies are done and find a statistically significant impact of fiscal variables on external imbalances. Most recent among these studies is by Abbas, *et al.* (2010) examine the determinants of the current account for 135 countries during 1975–2004 using random effects GLS regressions, and report a positive association on the fiscal balance. Few studies are done to analyse this issue on a set of countries using panel regressions and find a statistically significant impact of fiscal variables on external imbalances. Leigh (2008) finds that a increase in government consumption is related with an appreciation of the equilibrium real exchange in case of both developing and advanced economies by using panel estimation. The actual impact on the current account could vary depending on the dynamic adjustment path of the actual real exchange rate toward the equilibrium; large current account worsening can obtain if the real exchange rate appreciates above its equilibrium level that is overshooting. Mohammadi (2004) finds broadly symmetrical impact for fiscal expansions and contractions for a sample of 20 advanced and 43 emerging and developing economies that a tax-financed spending increase is associated with a current account worsening both for developing and developed countries and the current account balance worsens more if the spending is bond-financed in case of developing economies rather than developed ones. The study done by Khalid and Guan (1999) does not support any long-run relationship between the current account deficit and the fiscal deficit for advanced economies, while the data for developing countries does not reject such a relationship. However, their results suggest a causal relationship between the fiscal and current account balances for most countries in their sample, running from the budget balance toward the current account balance.

Romer and Romer (2007) have adopted narrative analysis to distinguish tax policy changes resulting from exogenous legislative initiative targeting, for example, reducing an inherited budget deficit, or promoting long-run growth from changes driven by prospective economic conditions, countercyclical actions, and government spending. They use the narrative record, presidential speeches, executive branch documents, and Congressional reports to identify the size, timing, and principal motivation for all major postwar tax policy actions to investigate the impact of exogenous changes in the level of taxation on economic activity in the U.S. The results indicate that exogenous tax increases are highly contractionary as indicated by negative effect on investment, investment spending turns out an important current account determinant and there exist a strong association between fiscal contraction and current account improvements. Feyrer and Shambaugh (2009) estimate that one dollar of unexpected tax cuts in the U.S. worsens the U.S. current account deficit by 47 cents by using Romer and Romer (2007) data. The results of these studies seem to suggest that the association between fiscal

imbalance and current account might be an issue for emerging economies more than for developed ones where both imbalances are rising. This motivates to investigate systematically the dynamic interactions between these two fiscal deficit and current account deficit using the structural VAR model in case of Pakistan.

The study is organised as follows. Section 2 discusses the theoretical and empirical literature on this area briefly. The methodology and data is presented in Section 3. The empirical results are discussed in Section 4 and last section concludes the study.

3. METHODOLOGY AND DATA

Fiscal policy and the current account are related through the identity

$$CA = (Spr - Ipr) + (Sg - Ig)$$

where CA is the current account, Spr and Ipr are private savings and investment, respectively; and Sg and Ig are government savings and investment. $Sg - Ig$ is equivalent to the fiscal balance. The same identity holds, and is often used, in terms of shares of GDP. Various theoretical studies have sought to find out the mechanisms whereby fiscal policy would affect the terms in the identity above, and to assess the net implications for the current account.

Following Blanchard and Perotti (2002) this study employs structural VAR analysis. Let X_t a vector of macro variables: log of the real GDP, a government budget deficit as a percentage of GDP, the current account as a percentage of GDP, the treasury bill rate adjusting for inflation as real interest rate and exchange rate. The study of the dynamic response of shifts in fiscal policy on current account is typically carried out by estimating a VAR of the following form.

The reduced-form VAR can be written as

$$X_t = u_0 + u_1(t) + A(L)X_{t-1} + U_t \quad \dots \quad \dots \quad \dots \quad \dots \quad \dots \quad (1)$$

Where $X_t = [RGDP, BD, CUR, RIR, ER]$ is five dimensional vector of endogenous variables consisting of the log of the real GDP (GDP), a government budget deficit (BD) as a percentage of GDP, the current account as a percentage of GDP (CUR), real interest rate (RIR) and exchange rate (ER); the $A(L)$ is an autoregressive lag polynomial, u_0 is a constant, t is a linear time trend. The vector $U_t = (u_t^{GDP}, u_t^{DB}, u_t^{CUR}, u_t^{RIR}, u_t^{ER})$ contains the reduced-form residuals, which in general will have non-zero correlations. As the reduced-form disturbances will in general be correlated it is necessary to transform the reduced-form model into a structural model. Pre-multiplying the Equation (1) by the (kxk) matrix A_0 gives the structural form

$$A_0 X_t = A_0 u_0 + A_0 u_1 + A_0 A(L) X_{t-1} + B e_t \quad \dots \quad \dots \quad \dots \quad \dots \quad \dots \quad (2)$$

where $B e_t = A_0 u_t$ describes the relation between the structural disturbances e_t and the reduced-form disturbances u_t . In the following, it is assumed that the structural disturbances e_t are uncorrelated with each other, i.e., the variance-covariance matrix of the structural disturbances Σe is diagonal. The matrix A_0 describes the contemporaneous relation among the variables collected in the vector X_t . In the literature this representation of the structural form is often called the AB model [Blanchard and Perotti (1999)]. Without restrictions on the parameters in A_0 and Bt this structural model is not identified.

The recursive approach restricts B to a k -dimensional identity matrix and A_0 to a lower triangular matrix with percent diagonal, which implies the decomposition of the variance-covariance matrix $\Sigma_u = A_0^{-1}\Sigma_e(A_0^{-1})'$. This decomposition is obtained from the Cholesky decomposition $\Sigma_u = PP'$ by defining a diagonal matrix D which has the same main diagonal as P and by specifying $A_0^{-1} = PD^{-1}$ and $\Sigma_e = DD'$ i.e. the elements on the main diagonal of D and P are equal to the standard deviation of the respective structural shock. The recursive approach implies a causal ordering of the model variables. Note that there are $k!$ possible orderings in total.

In this study real GDP is the key macro variables showing the general economic performance, and is included to control the cyclical components of the government budget deficit. RIR is also an important macro variable that may provide an important clue on the transmission of the fiscal policy, and that may be related to monetary policy actions which the study also uses as to control variable. The order of the identification scheme uses a recursive model in which the ordering of the variables is {GDP, DB, CUR, RIR, ER}, where the contemporaneously exogenous variables are ordered first. In the model, the (exogenous) fiscal deficit shocks are extracted by conditioning on the current and lagged GDP and all other lagged variables. The real GDP ordered first, then comes the government fiscal deficit because budget deficit is likely to be endogenously affected by the current level of general economic activities during a year. In particular, government revenue part such as sales tax is very likely to depend on the current level of economic activities.

$$\begin{bmatrix} 1 & 0 & 0 & 0 & 0 \\ \gamma_{BD,GDP} & 1 & 0 & 0 & 0 \\ \gamma_{CUR,GDP} & \gamma_{CUR,BD} & 1 & 0 & 0 \\ \gamma_{RIR,GDP} & \gamma_{RIR,BD} & \gamma_{RIR,CUR} & 1 & 0 \\ \gamma_{ER,GDP} & \gamma_{ER,BD} & \gamma_{ER,CUR} & \gamma_{ER,RIR} & 1 \end{bmatrix} \begin{bmatrix} u_t^{GDP} \\ u_t^{BD} \\ u_t^{CUR} \\ u_t^{RIR} \\ u_t^{ER} \end{bmatrix} = \begin{bmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 1 \end{bmatrix} \begin{bmatrix} e_t^{GDP} \\ e_t^{BD} \\ e_t^{CUR} \\ e_t^{RIR} \\ e_t^{ER} \end{bmatrix}$$

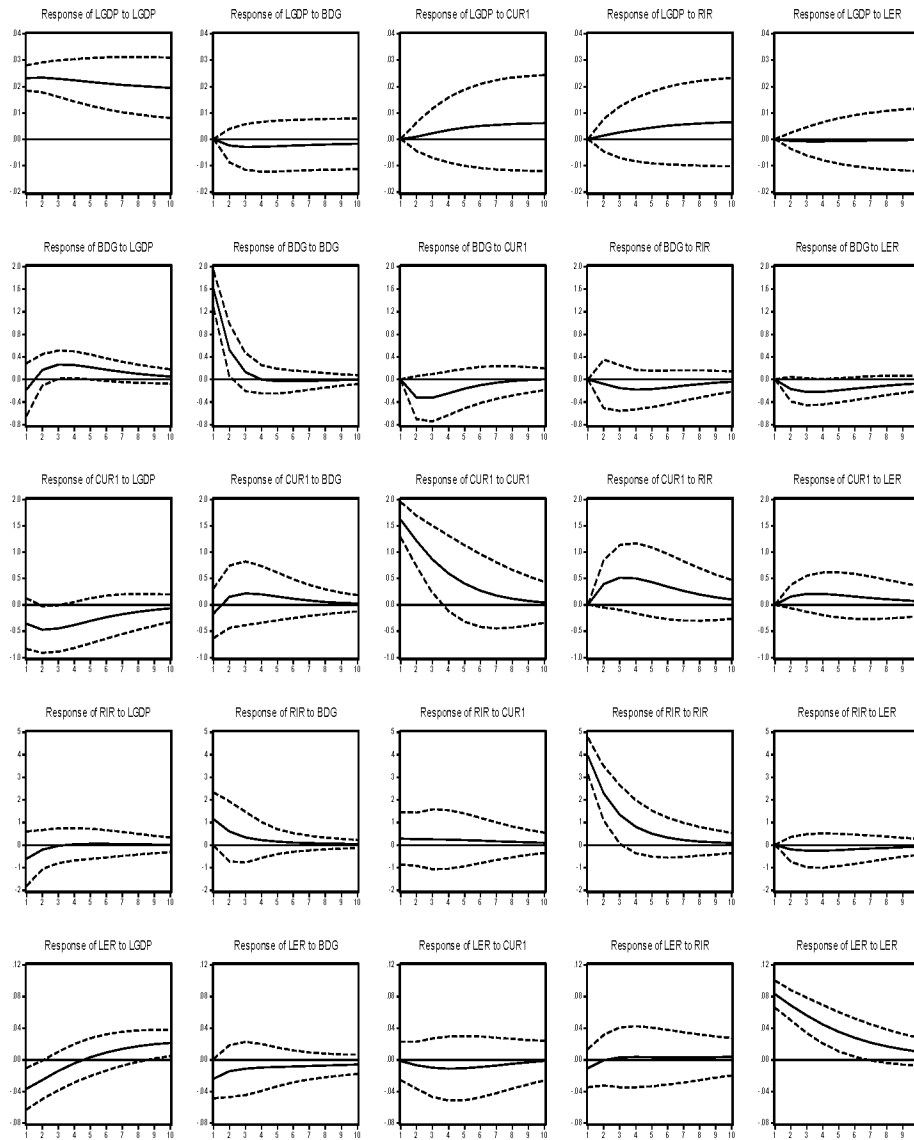
4. EMPIRICAL RESULTS

This section present the analysis of real GDP, current account deficit and fiscal policy shocks through impulse response function generated through the identification scheme of structural VAR proposed by Sims (1980) extended to fiscal shocks suggested by Blanchard and Perotti (2002) and Kim and Roubini (2008) as discussed above.

Figure 1 shows the impulse responses of each variable to each structural shock over ten years, with one standard error bands. The effects of output (GDP) shocks give important insights. In response to a positive output shock, the government budget deficit decreases (or the government budget improves) for two years, consistent with the automatic-stabilisation role of government budget or the pro-cyclical behaviour of government budget. In response to a positive output shock, the current account worsens up to three years, remains negative thereafter, the exchange rate depreciates, and the real interest rate increases. This counter-cyclical current account movement is consistent with traditional theories of current account where an increase in output increases the demand

for foreign goods and worsens the current account. In terms of modern theories of the current account, the output shocks may be regarded as a productivity shock; a positive persistent productivity shock may increase investment strongly and worsen the current account, which generates a counter-cyclical behaviour of current account, as suggested by Mendoza (1991) and Backus, *et al.* (1992) and Kim and Roubini (2008).

Response to Cholesky One S.D. Innovations ± 2 S.E.



Note: The SVAR model is estimated with one lag and a constant.

Fig. 1. Effect of Budget Deficit Shock

The ordering is real GDP, budget deficit, current account deficit, real interest rate and exchange rate

An increase in the real interest rate is also a likely response to a positive, persistent productivity shock which is consistent with the results of Kim and Roubini (2008), King and Rebelo (1999). The exchange rate depreciation is also consistent with theoretical models suggested by Finn (1998) and empirically supported by Kim and Roubini (2008). The impulse responses dynamics is consistent with the view called twin divergence by Kim and Roubini (2008) that output fluctuations generate a negative comovement between the current account and the government saving: a positive output shock worsens the current account while improving the fiscal balance. These results also reveal that the model properly accounts for the endogenous current account and government deficit movements especially those driven by business cycle fluctuations of output, which supports in examining the causal relation between the exogenous budget deficit shocks and the current account.

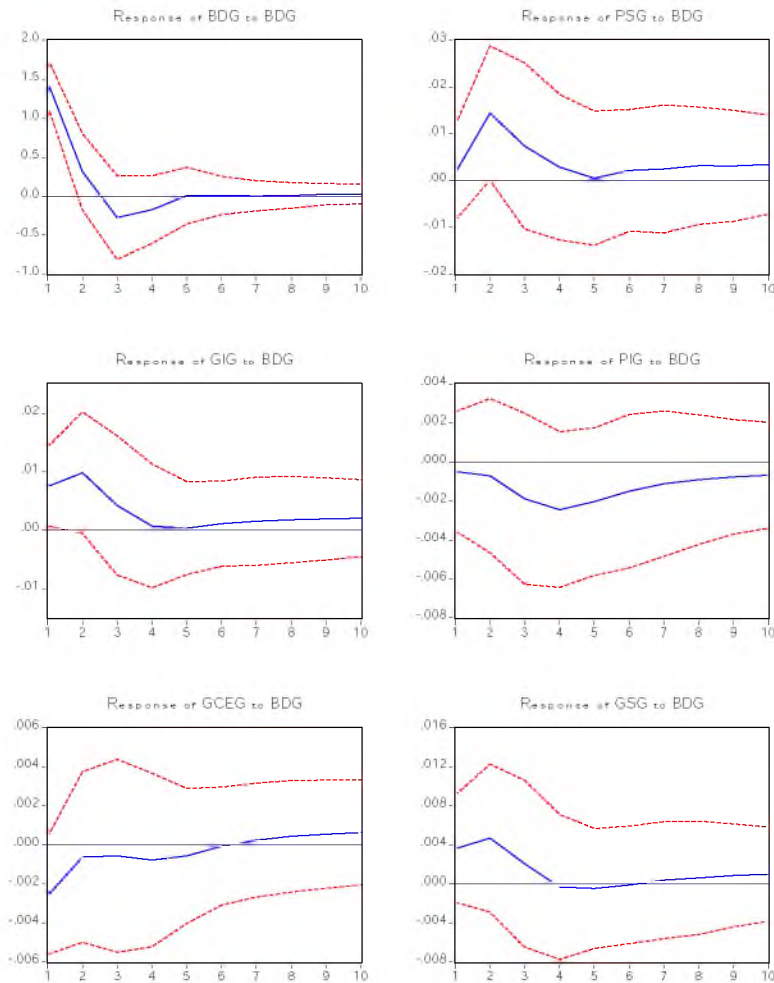
The main issue to investigate is fiscal policy shocks and results are presented in column 2 about the response of other variables to budget deficit shocks. In response to a positive budget deficit shock, output increase persistently, the current account, improves the exchange rate depreciates persistently and the real interest rate increases. These effects on the current account are according to the standard prediction of the most theoretical models.

As regards the effects of other structural shocks, a positive shock to the real interest rate leads to an output decrease that increases the government deficit, exchange rate depreciation and current account improvement in short run and a long-run worsening. The real interest rate shocks may be considered as proxy for monetary policy shocks, since the monetary authority is controlling the short-term real interest rate by changing the nominal interest rate given the inflation rate as in sticky price models. The impulse responses to real interest rate shocks are consistent with such an interpretation; a monetary contraction that is an increase in the real interest rate leads an increases the government deficit, and a real exchange rate appreciation. The current account response, a short-run improvement and a long-run worsening, is also similar to the effects of monetary policy shocks in the previous studies such as Kim and Roubini (2008); short-run income absorption effect and long run expenditure switching effect based on the traditional sticky price model and the interplay of saving and investment based on the intertemporal model can explain the current account dynamics, as interpreted by Kim (2001, 2008). On the other hand, a positive shock to the exchange rate (depreciation) improves the current account, which is consistent with the expenditure-switching effect.

4.1. Effect of Budget Deficit on Components of Current Account

To examine how each component of the current account responds to the government budget deficit shock, four components: private saving (PSG), private investment (PIG), government investment (GIG), government saving (GSG) and government consumption expenditure (GCEG) all as percent of GDP are used.

Figure 2 illustrate the results of impact of components of current account in response to budget deficit shock.

Response to Cholesky One S.D. Innovations ± 2 S.E.

Note: The effect of budget deficit shock on the component of current account (CAC) including Private saving, private investment, Government investment. The ordering is real GDP, budget deficit BD, current account components CAC, real interest rate RIR and exchange rate ER.

Fig. 2. Effect of Budget Deficit Shock on Components of Current Account

In response to government deficit shocks (government saving decreases), private saving increases to almost fully compensate the government saving decrease, this result supports the Ricardian effect, but such an effect is partial: consumption increases a bit in the short run and the private saving increase is smaller than the government deficit increase. In addition, government deficit shocks crowd out private investment in the short run, which may be a result of an increase in the real interest rate. Overall, the private saving increase and the private investment increase outweigh the government deficit increase in the short run. As a result, the current account improves in the short-run.

4.2. Component of the Government Budget Deficit

In this section the impact of component of budget deficit shock that is the government spending and taxes both as ratio to GDP are assessed. Although both may increase the government deficit, however, the effects of shocks to government spending and taxes on the current account can be different [Baxter (1995) and Blanchard and Perotti (1999)] and suggest that a temporary tax rate cut may improve the current account while positive spending shock has opposite effect. Therefore, it is needed to test whether separate shocks to government spending and taxes can explain the results found above.

As regards, the effects of government spending or government purchase shocks. Blanchard and Perotti (1999), Fatas and Mihov (2001) and Javid and Arif (2010) also assumed that government spending is contemporaneously exogenous to other variables in the system. However, this study extend the basic model using government spending and taxes as percentage of GDP, model becomes {LGDP, LGCEC, CUR1, PIG}. To examine the effects of tax shocks as the government budget deficit shocks, {LGDP, TAX, CUR1, RIR, LER}. The results on the effects of the government spending and tax shocks are reported in Figure 3.

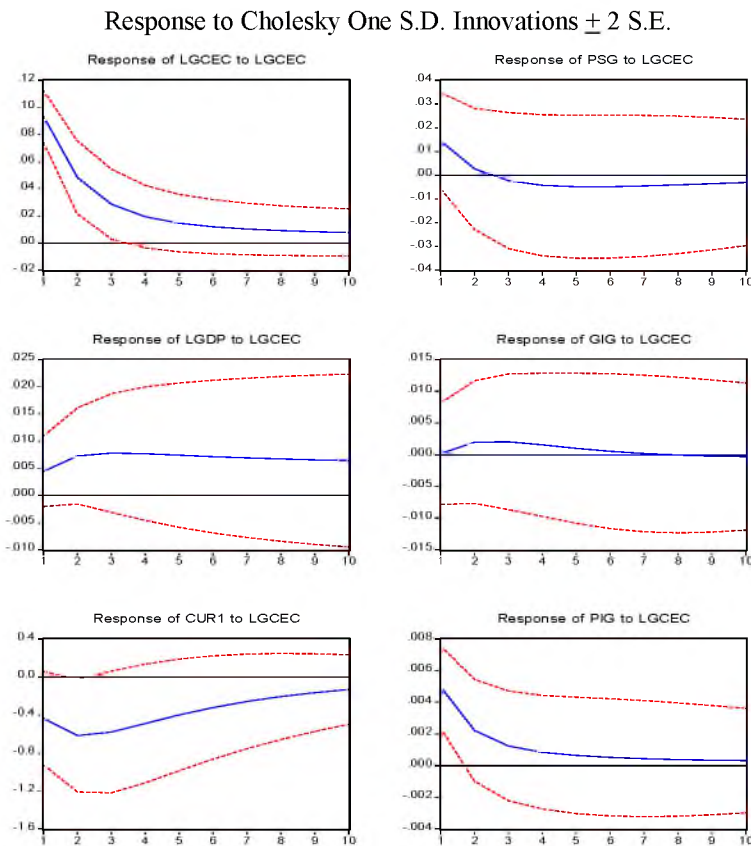
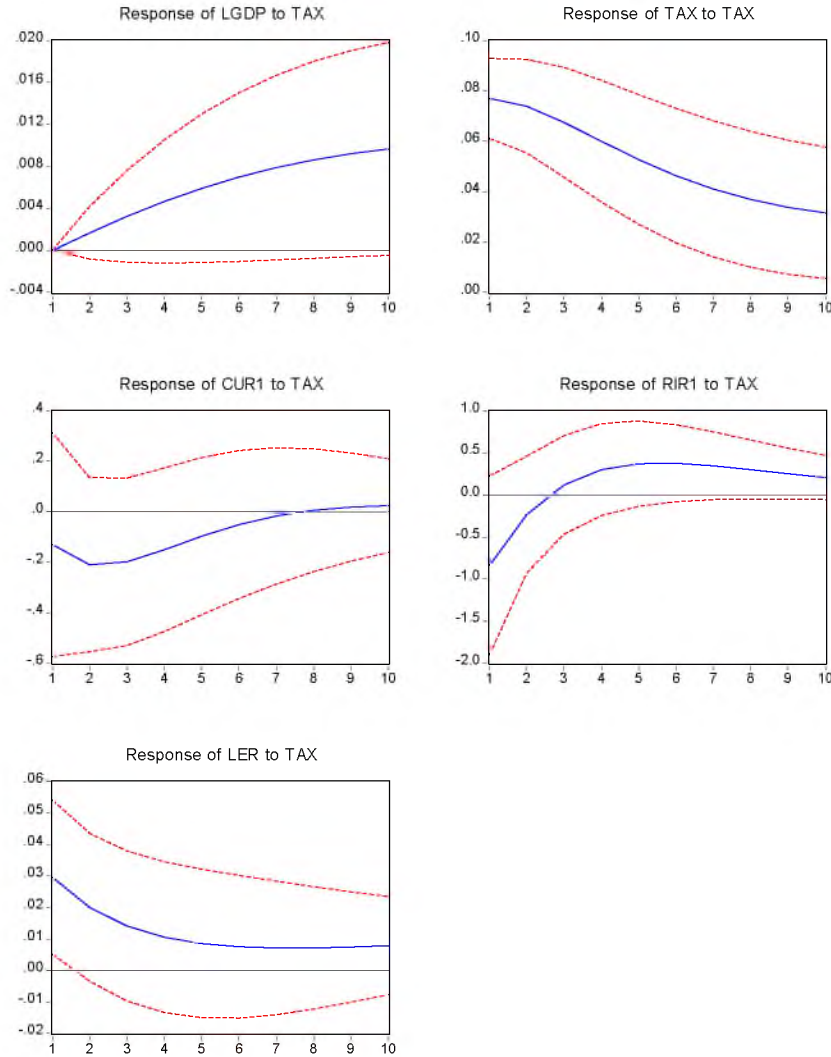


Fig. 3A. Effect of Government Spending shock on Current Account

Response to Cholesky One S.D. Innovations ± 2 S.E.

Note: The SVAR model is estimated with one lag and a constant.

The ordering is {LGDP, GCEC, CUR, RIR, ER} and {LGDP, TT, CUR, RIR, ER} respectively.

Fig. 3B. Effect of Government Tax Shock on Current Account

The effect of government spending shock improves the current account and real GDP. The results are similar to one find by Kim and Roubini (2008). We also examine the component of the current account following this shock. Private saving decreases modestly while private investment fell significantly and persistently. This effect contributes to the improvement of the current account. Results of tax shock also show improvement in current account after initial deterioration which is consistent with Kim and Roubini (2008).

5. CONCLUSION

The study empirically investigates the effects of fiscal policy (government budget deficit shocks) on the current account and the other macroeconomic variable: real output, interest rate and exchange rate for Pakistan over the period 1960–2009. The analysis is performed through the structural Vector Autoregressive model (VAR) approach; the exogenous fiscal policy shocks are identified after controlling the business cycle effects on fiscal balances. In contrast to the predictions of the most theoretical models, the results suggest that an expansionary fiscal policy shock (or a government budget deficit shock) improves the current account and depreciates the exchange rate. The private saving rises initially then fall and the investment falls that contribute to the current account improvement while the exchange rate depreciation. The twin divergence of fiscal balances and current account balances is also explained by the prevalence of output shocks; output shocks, more than fiscal shocks, appear to drive the current account movements and its co-movements with the fiscal balance. The interesting, and somewhat different result of this study is that, while most economic theories suggest that a fiscal expansion should be associated with a worsening of the current account and an initial appreciation of the real exchange rate, the empirical results suggest the opposite: fiscal expansions and fiscal deficits are associated with an improvement of the current account and a exchange rate depreciation. The current account improvement occurs even after we control for the effects of the business cycle when an economic expansion improves the fiscal balance but worsens the current account. Therefore, even exogenous fiscal shocks seem to be associated with an improvement of the current account. This dynamics seems to be explained by a combination of factors such as, a fall (increase) in investment driven by crowding-out (crowding-in) caused by changes in real interest rates following fiscal shocks and movement in private savings can account for the paradoxical negative correlation between exogenous fiscal shocks and the current account which support the Ricardian view [Nickel and Vansteenkiste (2008) and Kim and Roubini (2008)].

APPENDIX

Table A1

Variance Decomposition of BDG

Period	S.E.	LGDP	BDG	CUR1	RIR	LER
1	0.023228	0.330233	99.66977	0.000000	0.000000	0.000000
2	0.034440	0.877998	94.71721	0.011904	0.176277	4.216610
3	0.042401	7.963733	82.75321	4.191541	0.649404	4.442115
4	0.048514	11.97551	68.28784	13.26093	2.687550	3.788167

Table A2

Variance Decomposition of CUR1

Period	S.E.	LGDP	BDG	CUR1	RIR	LER
1	1.727798	5.524829	1.282259	93.19291	0.000000	0.000000
2	2.331007	12.69081	1.039011	82.85250	2.414011	1.003673
3	2.760526	16.34560	0.926345	76.00495	5.930536	0.792570
4	2.989704	16.14626	1.031587	74.22740	7.894974	0.699780

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