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## Empirical Analysis of Fiscal Policy Shocks and Current Account Dynamics in Nigeria

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### Abstract

*The study examines the effects of fiscal policy shocks on the current account as well as the dynamic interactions among fiscal policy shocks and current account with the other macroeconomic variables: real output, real interest rate and exchange rate for Nigeria over the periods 1980:1-2010:4. The identification of fiscal policy shocks is achieved via structural VAR approach proposed by Blanchard-Perotti (2002). The results of this study indicate that*

*the expansionary fiscal policy shock has a positive effect on output, exchange rate and negative impacts on current account balance and interest rate. By implication, this study suggests that fiscal policy can stimulate economic activity through expenditure expansions at a cost of lower interest rate and exchange rate appreciation in the medium term and a sustained current account balance will enhance output via fiscal consolidation.*

## **Introduction**

Although, the issue of government budget deficit and current account balance has long ago attracted the interest of economic scholars and policymakers in both developed and developing nations in which the Nigerian case is not an exception (Oladipo et al 2012). However, the introduction of the standard intertemporal model of the current account by (Sachs (1980) and its extension by Obstfeld and Rogoff, (1995) in open economy macroeconomics pave more room for the subject area. Though, theoretical literatures on current account have explained the variations in the deficits using Mundell-Fleming and Ricardian Equivalence models (Mundell (1968), Fleming (1967) and Barro, (1989)). In the work of Mundell-Fleming model, budget deficits cause current account deficits (Abell, (1990) and Bahmani- Oskooee, (1992)). On the other hand, the Ricardian Equivalence theory postulated that the financing of budget deficits, either through reduced taxes or by issuing bond does not change the present value wealth of private households since both temporarily reduced taxes and issuance of bonds represent future tax liabilities (Kaufmann et al., (2002) and Kim, (1995)). Thus, this indicates that the effects of fiscal deficits on the current account depend on the nature of the fiscal disproportion. For example, in a Ricardian equivalence model, a cut in lump sum taxes and the ensuing fiscal deficit would not affect the current account as the private savings increase will equipoise the fiscal deficit but investment remain unchanged. On the contrary, a temporary increase in government spending will increase both the fiscal deficit and the current account deficit, a case of twin deficits. And an undying increase in government spending will have no effects on the current account while its effects on the fiscal balance will depend on the mode of financing the extra spending. If it is financed with taxes, the fiscal balance remains unchanged but if it is financed with debt (future taxes), the fiscal balance worsens. Therefore, fiscal deficit on a probability leads to current account deficits depending on the nature and persistence of the fiscal shock.

Also, various channels have elucidated theoretically the impact of fiscal policy on the current account but the direct channel where fiscal policy affects the current account is via changes in the public consumption or investment demand for marketable products which shift the government import demand function and this leads to changes in the trade balance. Besides, in the Keynesian framework fiscal extension (expansion - a tax reduction or spending increase) tends to increase demand including demand for imports, and hence the trade deficit. Fiscal policy affects the current account by changing the relative price of non-marketable goods which encourage higher government spending on non-marketable causing a real appreciation, more private consumption of non-marketable and less production of marketable deteriorating the 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. But unsustainable fiscal expansions can generate capital flight and a force rapid external account adjustments can lead to balance of payments crises. However, the relative strength of these mechanisms, and thus the net impact of fiscal policy on the current account are determined by model assumptions and empirically depend on country characteristics (Abbas et al 2010).

Although a number of authors have examined the effects of government budget deficit on the current account balance in Nigeria but their claims and results are sketchy at best. The present study empirically examines the relationship between fiscal policy and the current account for Nigeria where fiscal and current account imbalances are large. This has made policymakers in Nigeria to ask a question on the extent to which fiscal adjustment can contribute to resolving external imbalances. Some studies are done to explore the link between fiscal deficits and current account deficits and analyzing the possible causal relation 'twin deficit' hypothesis (Oladipo et al, (2012) 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 Nigeria.

This study contributes to the existing empirical literature by analyzing the impact of fiscal policy shocks on the current account and the dynamic

interactions among fiscal policy and current account with other macroeconomic variables (such as output, exchange rate and interest rate) for Nigeria between 1980:1 to 2010:4 within a structural VAR framework which relies on institutional information about the tax and transfer systems and the timing of tax collections to identify the automatic response of taxes and spending to activity, and by, implication, to infer to fiscal shocks. Blanchard and Perotti (2002) suggest that the structural VAR approach seems more suitable for the study of fiscal policy than of monetary policy . They 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, at high enough frequency— say, within a quarter—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.

Following the introductory aspect, this study is organized as follows. Section two discusses brief theoretical and empirical literatures. Section three presents the methodology and data while section four discusses the empirical results. Section five concludes the study.

### **Literature review**

Over the years, there is a strong increase in theoretical and empirical work on the dynamics of fiscal and the current account deficit. In the literature, there are two strands for current account. First, in the literature some findings focus on the budget deficit as a major cause of current account deficits called twin deficits. Whereas, Ricardian identifies either ways of financing the budget deficits (through reduced taxes or by issuing bonds) and these do not change the 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, optimizing real business cycle models and new open economy macro models are mostly come up with related conclusions that a passing 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 optimizing real business cycle models come up with different results that a temporary 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 analyzes 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 of GDP worsens the trade balance and appreciates real effective exchange rate concluding that the main short-term transmission channel upon impact is output, with the real exchange rate playing a greater role over longer horizons. Monacelli and Perotti (2006) find that, following an increase in real government consumption GDP, 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 analyze 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 percent of GDP. Few studies are done to analyze 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 an 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) findings 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) adopted narrative analysis which allows them to distinguish tax policy changes resulting from exogenous legislative initiative targeting for example, at 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 post-war 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.

Giorgio and Salvatore (2007) develop a tractable stochastic two-country “perpetual youth” Dynamic New Keynesian model of the international business cycle with incomplete international financial markets and stationary net foreign assets. The model allows for a thorough analysis of the interactions of monetary policy with endogenous, non-balanced budget fiscal policy. We use the model to derive the dynamic and cyclical properties of fiscal deficit feedback rules, recently in the spotlight of the empirical literature. They also study a wide range of structural shocks under alternative monetary and fiscal policy regimes, and discuss the implications for net foreign assets and exchange rate dynamics. Our results imply that a crucial role for the dynamics of net foreign assets is played by the degree of “fiscal discipline”, i.e. the extent to which the fiscal rule responds to debt dynamics. The paper shows that under low fiscal discipline (characterizing most industrialized countries, first and foremost the U.S.) temporary positive productivity shocks may result in highly persistent deteriorations of the external position. Our results also suggest that any attempt by monetary policy alone to stabilize the dynamics of net foreign assets would induce excessive and costly fluctuations of the exchange rate.

Christiane and Isabel (2008) analyse the empirical relationship between fiscal policy and the current account of the balance of payments and considers how Ricardian equivalence changes this relationship. They estimate a dynamic panel threshold model for 22 industrialised countries in which the

relationship between the current account and the government balance is allowed to alter according to the government debt to GDP ratio. The results show that for countries with debt to GDP ratios up to 90% the relationship between the government balance and the current account is positive, i.e. an increase in the fiscal deficit leads to a higher current account deficit. For very high debt countries this relationship however turns negative but insignificant, suggesting that a rise in the fiscal deficit does not result in a rise in the current account deficit. Implicitly this result suggests that households in very high debt countries tend to become Ricardian. Estimating the same model for the 11 largest euro area countries shows that the relationship between the government balance and the current account turns statistically insignificant when the debt to GDP ratio exceeds 80%.

Ali Abbas et al (2011) examines the relationship between fiscal policy and the current account, drawing on a large sample of advanced, emerging, and low-income economies and using a variety of statistical methods: panel regressions, an analysis of large fiscal policy and current account changes, and panel vector autoregressive (VAR). On average, across estimation methods, a strengthening in the fiscal balance by 1 percentage point of GDP is associated with a current account improvement of about 0.3 percentage point of GDP. With our preferred estimation method (quarterly structural VAR using government consumption to identify fiscal policy shocks), the relationship is stronger, in the 0.3–0.5 range. The association is stronger in emerging markets and low-income countries; in economies that are more open to trade; and when the economy is somewhat overheated to begin with. The effect is, however, notably weaker during episodes of large fiscal policy and current account changes, suggesting that fiscal policy may have a more limited role in correcting large external imbalances.

Attiya et al (2011) empirically investigates the effects of fiscal policy or government budget deficit shocks on the current account and the other macroeconomic variable: real output, real interest rate and exchange rate for Pakistan over the period 1960-2009. The structural Vector Autoregressive model is employed; the exogenous fiscal policy shocks are identified after controlling the business cycle effects on fiscal balances. The results suggest that an expansionary fiscal policy shock improves the current account and depreciates the exchange rate. The rise in private saving and the fall in investment contribute to the current account improvement while the exchange rate depreciates. The twin divergence of fiscal deficit and current



account deficit is also explained by the output shock which seems to drive the current account movements and its co-movements with the fiscal balance which supports the Ricardian view.

Stefan and Bernhard (2012) investigate serious current account imbalances which have developed within the euro area over the last decade are at the core of the current financial crisis. For the members of the currency union fiscal policy has gained in importance due to the loss of monetary policy as an autonomous policy instrument. Based on a small open economy DSGE model with fiscal feedback rules, we analyze dynamic macroeconomic responses in particular of the current account to different shocks under alternative exchange rate regimes. Our results indicate that entry into monetary union and the subsequent loss of national monetary policy make the economy more vulnerable to a productivity shock and leads to higher variability of the real exchange rate and the current account. On the contrary, for a risk premium shock, an entry into EMU implies lower variability of most macroeconomic variables, but a higher persistence in the adjustment process of the current account. For both shocks, a countercyclical fiscal response to the current account stabilizes most macroeconomic variables better than a conventional countercyclical response to output, independently of the underlying exchange rate regime. Stabilizing the current account via fiscal policy intervention comes at the price of higher variability of output in the short-run.

A review of the empirical literature on Nigeria shows that apart from the traditional variables such as fiscal balance, exchange rate and oil price, some important oil variables tend to be ignored by researchers. For instance Egwaikhide (1997) focused on the relationship between budget deficit and the CAB in Nigeria between 1973 and 1993. Using a macro econometric model that captures the interrelationships between government budgetary developments, credit creation and CAB, the study found that budget deficit leads to a deterioration of the current account. Egwaikhide et al. (2002) extended the work by Egwaikhide (1997) by investigating the relationship between government budget deficit or surplus and CAB using a group of African countries including Nigeria. The main finding was that causality runs from the CAB to the budget balance. The co-integration and error correction technique together with the vector auto-regression methodology were applied by Chete (2001) to examine the factors driving current account behaviour in Nigeria. The study found that while relative income, inflation, the degree of

openness and the growth rate of industrialized countries are negatively correlated with the CAB, net foreign assets, budget deficit and exports show a positive association with the CAB.

Okojie (2005) showed that the key determinants of the CAB in Nigeria are the exchange rate, the domestic interest rate as well as the trade balance to export ratio. The study further found that Nigeria's current account deficits were caused by rising investment income going to foreigners, rising imports relative to exports, and a deficit on the balance of trade in services. Ogunmuyiwa and Salisu (2005) in a study conducted to find the determinants of fiscal deficit behaviour in Nigeria found that only inflation (proxied by consumer price index) accounted for between 23 and 35% of the variation in fiscal deficit for the period under focus. Ogunmuyiwa (2008) while conducting a similar study on Fiscal Deficit-Inflation Nexus in Nigeria between 1970 and 2004 affirms that causality is uni-directional and it runs from inflation to fiscal deficit in a high inflation country like Nigeria (Wikipedia, 2006).

Olumuyiwa (2008) used the intertemporal model of the current account to examine the sustainability of Nigeria's current account over the period 1960 to 2003. The study found that excessive reliance on oil revenues and structural weaknesses contribute to unsustainable current account deficits and external crisis.

Testing the Marshall-Lerner condition for Nigeria, Ogwuru and Ewubare (2008) found that the relationship between the depreciation of the naira and the CAB is negative, implying that the condition does not hold for Nigeria. On their part, Chuku et al. (2011) used a structural vector autoregressive technique to identify oil price shocks and to evaluate its net effect on Nigeria's CAB. After introducing three control variables (output gap, real exchange rate misalignment and the lagged values of current account ratio), they found that oil price shocks have a significant short-run effect on CAB for Nigeria. Enang (2011) adopted the granger causality test, the co-integration test and the variance decomposition and impulse response function to investigate the impact of macroeconomic policy, non policy and financial sector variables on Nigeria's CAB. The results show exchange rate, monetary policy credibility and budget deficit are the important macroeconomic variables that influence current account movement in Nigeria.

In addition, Adofu and Abula (2010) investigated the empirical relationship between domestic debt and economic growth in Nigeria using OLS regression techniques and the time series data from 1986 – 2005, their study explored the relationship between domestic debt and economic growth in Nigeria. They found that domestic debt has affected the growth of the economy negatively. In the light of their findings, the study recommend that Government domestic borrowing should be discouraged and that increasing the revenue base through its tax reform programmes should be encouraged.

Ogunmwiwa (2011) investigates the direction of causality as well as the impact of fiscal deficit on external debt in Nigeria. It goes further to determine whether structural shift actually exists in the pattern and direction of fiscal deficit and debt in the period under review. Econometric analysis such as unit root test, Granger causality test, ordinary least square (OLS) and the Chow break point test were performed on time series data from 1970 to 2007. The results reveal that a structural shift actually exists in the pattern of deficit and debt in Nigeria, but no strict causality or causal relationship actually exists between the variables.

Eberechukwu and Maxwell (2012) examined the determinants of current accounts balance in Nigeria with emphasis on oil-related variables, using the Johansen-Julius VAR co-integration estimation, the impulse response function and the variance decomposition analysis. The results showed that oil price, oil balance and oil revenue were positively related with the current account, with only oil wealth having a significant negative impact in the long-run. They found that the impact of oil price on the current balance was only significant in the short-run. The variance decomposition analysis indicated that the variance in the current account was better explained by own shocks followed by shocks to oil price, oil balance and fiscal balance.

Finally, Oladipo et al (2012) examined the effects of twins' deficits in Nigeria for the period 1970-2008 using time-series data and analysed using econometric techniques. The results showed there was a bidirectional causality relationship between budget deficits and trade deficits in Nigeria. The study concluded that an appropriate policy measures to reduce budget deficits could play an important role in reducing trade deficit and complement this with budget-cut policies via a coherent package that focus on policies for export promotion, productivity improvement and exchange rate, among others.

This motivates the investigation of the dynamic interactions between fiscal deficit and current account deficit using the structural VAR model in Nigeria.

## Data and methodology

### Data

This paper employs quarterly data on real GDP (*rgdp*), a fiscal deficit (*fd*) as a percentage of GDP, the current account as a percentage of GDP (*ca*), real interest rate (*ir*) and exchange rate (*exr*). The data for the fiscal variables is available in annual series so these data series are interpolated from annual to quarterly series. All variables are seasonally adjusted and enter in logs except the interest rate, which enters in levels. The sample covers the period 1980:1 2011:4.

### The Model

Theoretically, fiscal policy and current account are related via the identity:

$$CAB = (PS - PINV) + (GS - GINV) \quad 1$$

where *CAB* is the current account, *PS* and *PINV* are private savings and investment, respectively; and *GS* and *GINV* are government savings and investment. *GS - GINV* 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.

Thus, the reduced-form VAR can be written as:

$$X_t = u_0 + u_1(t) + A(L)X_{t-1} + u_t \quad 2$$

Where  $X_t = [rgdp, fd, ca, ir, exr]$  is five dimensional vector of endogenous variables consisting of the log of the real GDP (*rgdp*), a government budget deficit (*fd*) as a percentage of GDP, the current account as a percentage of GDP (*ca*), real interest rate (*ir*) and exchange rate (*exr*); the  $A(L)$  is an autoregressive lag polynomial,  $u_0$  is a constant,  $t$  is a linear time trend. The vector  $U_t = (u_t^{rgdp}, u_t^{fd}, u_t^{ca}, u_t^{ir}, u_t^{exr})$  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 (2) by the  $(k \times k)$  matrix  $Z_0$  gives the structural form

$$Z_0 X_t = Z_0 u_0 + Z_0 u_1(t) + Z_0 A(L) X_{t-1} + P \varepsilon_t \quad 3$$

where  $P \varepsilon_t = A_0 u_t$  describes the relation between the structural disturbances  $\varepsilon_t$  and the reduced form disturbances  $u_t$ . In the following, it is assumed that the structural disturbances  $\varepsilon_t$  are uncorrelated with each other, i.e., the variance-covariance matrix of the structural disturbances  $Se$  is diagonal. The matrix  $Z_0$  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 *ZP* model (Lutkepohl, (2005)). Hence, without restrictions on the parameters in  $Z_0$  and  $P_t$  this structural model is not identified.

### **Identification of fiscal policy shocks**

The empirical literature classifies four approaches to identify a structural VAR to analyse the fiscal policy effects on macro variables. These approaches include; first, the recursive approach introduced by Sims (1980) and applied to study the effects of fiscal shocks by Fatas and Mihov (2001); second, the structural VAR approach proposed by Blanchard and Perotti (2002) and extended in Perotti (2005, 2008); third, the sign- restrictions approach developed by Uhlig (2005) and applied to fiscal policy analysis by Mountford and Uhlig (2005); and, fourth, the event-study approach introduced by Ramey and Shapiro (1998) to study the defence spending of large unexpected increases in government defence spending and also used by Edelberg et al. (1999), Eichenbaum and Fisher (2005), Perotti (2008) and Ramey (2007). In this paper we use one identification approach i.e the structural VAR approach proposed by Blanchard and Perotti (2002).

### **The Blanchard-Perotti approach**

The identification approach introduced by Blanchard and Perotti (2002) relies on institutional information about tax and transfer systems and about the timing of tax collections in order to identify the automatic response of taxes and government spending to economic activity. This paper follows the identification scheme introduced by Perotti (2005) as he employs a five variable VAR model. Therefore, in this paper 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. Interest rate (ir) is also an important macro variable that may provide an important evidence 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  $\{rgdp, fd, ca, ir, exr\}$  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, follows by 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 value added tax is very likely to depend on the current level of economic activities. The parameter values on the relation between the reduced-form and the structural disturbance can be written in matrix form:

$$\Gamma U_t = PV_t \tag{4}$$

Where  $V_t$  is the vector containing the orthogonal structural shocks.

$$\begin{bmatrix} 1 & 0 & 0 & 0 & 0 \\ \beta_{fd,rgdp} & 1 & 0 & 0 & 0 \\ \beta_{ca,rgdp} & \beta_{ca,fd} & 1 & 0 & 0 \\ \beta_{ir,rgdp} & \beta_{ir,fd} & \beta_{ir,ca} & 1 & 0 \\ \beta_{exr,rgdp} & \beta_{exr,fd} & \beta_{exr,ca} & \beta_{exr,ir} & 1 \end{bmatrix} \begin{bmatrix} u_t^{rgdp} \\ u_t^{fd} \\ u_t^{ca} \\ u_t^{ir} \\ u_t^{exr} \end{bmatrix} = \begin{bmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 1 \end{bmatrix} \begin{bmatrix} e_t^{rgdp} \\ e_t^{fd} \\ e_t^{ca} \\ e_t^{ir} \\ e_t^{exr} \end{bmatrix} \tag{5}$$

Accordingly, the reduced-form residuals are linear combinations of the orthogonal structural shocks of the form:

$$U_t = \Gamma^{-1}PV_t \tag{6}$$

## **Results and discussions**

### **Empirical results**

The estimated results in table one is presented through the Blanchard and Perotti (2002) approach. In this case, the estimated coefficient of fiscal policy shock to output is positively signed but statistically insignificant. It suggests that a positive one percent shock in fiscal deficit increases the output productivity by 1.05 percents. Also, the coefficient of the shocks in fiscal policy indicates a negative and a statistically significant value in current account balance. Thus, a shock in fiscal policy hits Nigerian current account negatively. This shows that a positive one percent shock in fiscal deficit decreases current account balance by 0.01 percent. Hence, the result shows that the magnitude of the shock is low and by implication, it may not have deep impacts on the growth of the economy. The negative coefficient of  $\beta_{ir,fd}$  indicates that a positive shock in fiscal deficit contributes to low interest rate and again it is statistically significant. This result also captures the theoretical consistent sign which implies that a positive shock in government spending will reduce the lending rate and there would be a crowding out effect in the economy. A positive and significant value of  $\beta_{exr,fd}$  indicates that increase in fiscal deficit will lead to exchange rate appreciation. The positive and statistically significant value of  $\beta_{rgdp,ca}$  shows that increase in current account balance will increase output. A one percent shock in current account balance increases output by 0.99 percents.

A negative value of  $\beta_{ir,ca}$  suggests an inverse relationship between lending rate and current account balance. This relationship is highly significant because a positive shock in current account balance contributes to decrease in lending rate and this will foster investment in the country. A positive value of  $\beta_{rgdp,exr}$  augments that an increase in output is as a result of appreciation in exchange rate and this estimate is theoretical consistent and statistically significant. The estimated coefficient of  $\beta_{ir,exr}$  suggests a direct relationship between exchange rate shocks and interest rate. A negative value of  $\beta_{rgdp,ir}$  implies an inverse relationship between interest rate and output and this relationship is statistically significant.

## **Results of fiscal policy shocks**

This section analyses the effect of fiscal policy shocks through impulse response function generated through the Blanchard and Perotti (2002) SVAR identification i.e. shocks to one fiscal variable at a time without constraining the response of the other respective fiscal variable.

### **The effects of fiscal deficit shocks**

Figure 1 shows the responses of endogenous variables to a positive shock in government expenditure. It reflects that an increase in fiscal deficit raises the real GDP in the second quarter and this result is persistent over three years time. This evidence is further supported by the cumulative output multipliers which reflect that output increases by 34% over the time span of three years but the multiplier value is still less than one. This result is further consistent with Looney (1995) and Hyder (2001)'s findings which confirm the complementary relationship between public and private investment.

A positive shock in government budget leads to lower current account balance for the period of estimate and remain positive and significant for next ten quarters. Higher government budget balance also brings about a significantly positive response of exchange rate for ten quarters. Such response in the exchange rate implies appreciation in exchange rate in the quarters following a positive shock in government budget. Also, the real interest rate decreases persistently until the seventh quarter, following a positive shock to government budget.

## **Conclusion**

This study examines the relationship between fiscal policy and current account dynamic in Nigeria using SVAR methodology for the period 1980:1-2010:4, drawing on a new set of quarterly data built from the annual data series taken from Central Bank of Nigeria, Statistical Bulletin. It employs the Blanchard and Perotti(2002) approach to identify the SVAR model. The results from Blanchard and Perotti (2002) approach reveal a significant role of fiscal deficit in explaining the changes current account balance and other macroeconomic variables (output, interest rate and exchange rate) in Nigeria. The empirical evidence suggests that fiscal deficit shocks have negative effect on current account balance and interest rate while a positive effect on output and exchange rate. These results can be summarized as following; (i) the output multipliers of government budget are increasing over the time



period of three years. These are positive in short term, while negative in the longer term; ii) positive shocks in fiscal deficit increase the output and yield significant effects on exchange rate; iii) these fiscal policy shocks also decreases the interest rate in short run;

Conclusively, two main policies are drawn from the results of this study. Firstly, fiscal policy is able to stimulate economic activity through expenditure expansions at the cost of lower interest rate and exchange rate appreciation in the medium term. Secondly, attempts to achieve fiscal consolidation by increasing the tax burden seems to be successful in short term and medium term but, such a policy might slow economic activity in the long run.

Thus, these results are in line with most economic theories that suggest a fiscal expansion should be associated with a worsening of the current account and an initial appreciation of the real exchange rate.

Although VARs are a useful forecasting tool in the short term but their use is limited on the basis of two caveats. Firstly, their accuracy declines at longer horizons. Therefore, the conclusions obtained regarding the long-term responses to fiscal policy shocks, in general, have to be interpreted with caution. Secondly, the econometric model employed in this study ensures the symmetry of the responses to shocks of equal absolute value with opposite signs. However, the real economy may not be symmetric and, accordingly, reactions to fiscal expansions might be of very different magnitude to fiscal retrenchments, with the size of the difference depending on a complex set of variables, including the initial state of public finances. In addition fiscal variables data series are interpolated due to no availability of quarterly data so they are not free from econometric issues associated with interpolation of data. The result of this study is in conformity with the work of Favero and Giavazzi (2007), Ramey (2007) and Kim and Roubini, (2008).

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**Appendix**

**Table 1: Blanchard and Perotti (2002) Approach**

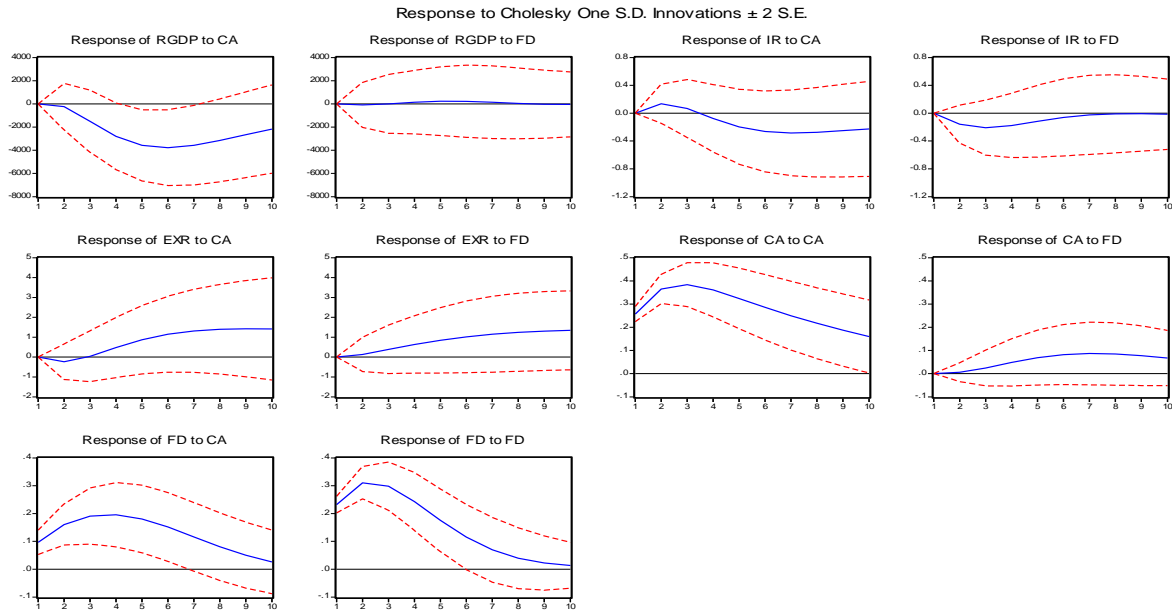
	$\beta_{rgdp,fd}$	$\beta_{ca,fd}$	$\beta_{ir,fd}$	$\beta_{exr,fd}$	$\beta_{rgdp,ca}$	$\beta_{ir,ca}$	$\beta_{exr,ca}$	$\beta_{rgdp,ca}$
Coefficients	1.05	-0.01	-1.04	3.07	0.99	-0.31	-1.22	0.28
z-value	1.52	-0.01	-5.01	3.75	29.98	-44.06	-44.31	2.59

Source: Authors' Computation





**Figure 1: Effects of fiscal policy shocks: impulse response of structural VAR result**



Source: Authors' Compilation from E-view