Fiscal Deficit Expansion and External Sector Imbalance in Nigeria: Implications for Monetary Policy

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ABSTRACT

The recent phenomenon of increasing deficit financing as a preferred fiscal instrument by resource-rich emerging economies calls for an understanding of an optimal level of deficit financing and the fleeting effects on aspects of international accounts, to allay external sector imbalances. This paper fills the void by using the Structural Vector Autoregressive (SVAR) framework to examine the interrelationship between fiscal deficit and external sector and the implications for monetary policy in Nigeria. In furtherance of the above, the study incorporates three key monetary policy transmission channels – money supply, interest rates and exchange rates – to the SVAR model, due to the vital role they play in the macroeconomy thus, establishing the effects of shocks from fiscal and current account deficits. Using data for the period 2000-2021, we found that a shock to fiscal deficit as a share of GDP causes a decline in current account deficit in the fourth period and vice-versa for a shock to the current account balance. However, there are no significant impacts in the first three periods. This implies a bi-directional causal relationship between fiscal deficit expansion and external sector imbalances. We further observe a detrimental effect of increase in fiscal deficit on interest and exchange rates. Quite saliently, our forecast analysis shows that Current account deficit is strongly influenced by exchange rate, while other variables are strongly exogenous. The ensuing policy implications and recommendations are noteworthy.

Keywords: External imbalance; Fiscal deficit; Impulse response functions; Monetary Policy; SVAR.

INTRODUCTION

Deficit finance, a financing mechanism that should largely be employed to facilitate growth and development, has become a common fiscal feature of most developing economies. In the aftermath of the Great Depression, John Maynard Keynes identified government deficit spending as a crucial economic tool. He argued for the use of budgetary methods to address business cycles caused by shifts in economic paths. The 2015/2016 recession and the COVID–19 pandemic, both of which produced significant changes in the performance of major economic indicators, including the external sector, necessitated an increase in government spending far in excess of available revenue. The implication has been undesirable outcomes of exchange rate and inflationary pressures.

The fiscal position of most oil producing African countries have been impacted due to their susceptibility to oil price shocks and substantial reliance on foreign borrowing (Eregha, Aworinde & Vo, 2022). Nigeria inclusive, these economies are characterised by poor revenue generation, low domestic savings mobilisation, and persistent current account deficits. In the case of Nigeria, the fiscal space has significantly narrowed over the last ten (10) years due to the overreliance on crude oil receipts. Despite occasions of strong oil prices, government expenditure consistently outpaced its retained revenue, which grew less proportionately from ₦3.09 trillion in 2010 to ₦5.05 trillion in 2021[1]. Consequently, Nigeria's budget deficit continued

To expand, growing from 2.0% of GDP (and 15.1% of revenue) in 2010 to 4.1% of GDP (and 66.1% of revenue) in 2021 (CBN, 2021). While borrowing became an option considering Nigeria's economic circumstances, the rapid growth in external debt stock calls for concern due to the associated currency risk and threat to fiscal sustainability.

In terms of external sector performance, a key question that arises is the external viability of the country. Nigeria's current account (CA) balance has been in deficit for over ten (10) quarters, only turning to a surplus in the last three (3) quarters from Q2 2021. The improvement in the CA came from secondary income balance, specifically, personal remittances. Other components of CA – goods and services accounts and primary income balance – have continued to be in deficits over time. This reflects the high proportion of the country's imports over exports, driven by the import of refined petroleum products whose subsidy element has become a major drain on government finances,

Discussions on fiscal deficit-external sector imbalance have largely conceptualized the relationship unidirectionally, heavily relying on the model of aggregate demand management expounded by the International Monetary Fund (IMF). Its application links the magnitude of external imbalances to excesses in the domestic aggregate demand, specifically the public component. Therefore, from the plausible argument in which external disequilibrium is largely due to fiscal imbalances, this study also wishes to consider a rethink of the causality from external imbalance – current account deficit, exchange rate instability, and shocks in foreign demand – to fiscal imbalance.

The need to finance the deficit in a way that does not exacerbate external sector imbalance and improve the overall external sector performance remains the economy's desire notwithstanding the seemingly persistent twin deficit. Deficit financing from local sources could increase interest rates, thus, crowding out private investors and lowering productivity. On the other hand, external financing of deficit, comes with the burden of debt servicing, reducing the monetary authorities' ability to achieve exchange rate stability. More so, given the Nigerian economy's strong import propensity, deficit spending implies an increase in money supply, which could exacerbate imports.

Worthy of note is that deficit in the balance of payments can only be financed through either depleting external reserves, obtaining credit and loans from bilateral and multilateral sources, or from exceptional financing sources. Either of these has an exchange rate implication in both the near and the long term, and this has been looked at in the works of (Korsu, 2007; Fasoranti and Amasoma, 2013). The fact that the current and capital account performance is a major determinant of foreign investors' choices, has also necessitated the investigation of the effect of fiscal deficit on foreign portfolio and direct investments capital, key components of the financial account (see Murthy and Philips, 1996; Dornean and Oanea, 2014; and Babalola and Onikosi-Alliyu, 2020).

Against this background, the paper aims to examine the relationship amongst fiscal deficit and external sector indicators and how the interaction influences monetary policy in Nigeria. For policy purposes, it is important to know the extent to which budgetary changes impact on external disequilibria, particularly in the event of escalating external and fiscal variation, as this remains largely under-explored. Especially in the case of rising external and fiscal imbalances, as this remains largely under-explored. The paper, thus, aim at contributing to the empirical literature on the subject using recent data and the implications on monetary policy. While these are key monetary policy transmission channels, their interaction with the overall macroeconomy remains vital in that exchange rate is a major determinant of international trade and a notable path through which external sector imbalance and fiscal deficit interact. Interest rates also influence capital flows, exchange rates, and the international accounts. To accomplish this, the paper is divided into 5 sections. Following this section, is literature review on the relationship between fiscal and external sector imbalances and their monetary policy effects. In section 3, we explain the methodology used for our empirical estimations.

Chapter 4 presents an interpretation of the results while in section 5, we summarise and draw conclusions from the findings of the paper.

LITERATURE REVIEW

Multiple theoretical approaches have been adopted in addressing the interrelationship between fiscal deficit and external sector imbalance, with most focusing on the link going from fiscal deficit to current account deficit. These theoretical constructs range from the financial approach to the balance of payments premised on the Keynesian reasoning (Stockman, 1987, Mansouri, 2003a and Krugman and Obstfeld, 2006) to the Mundel-Fleming model and the Ricardian Equivalence thesis (Barro, 1989 and Sobry and Verez 1996).

The Keynesian argument posits that fiscal imbalance drives BOP disequilibrium. Using the following identity:

$$C+I+G+X=C+S+T+M \qquad (1)$$

$$(X-M)=(S-I)+(T-G+T_f) \qquad (2)$$

Where represents Household Consumption, I for Investment, G for Government Expenditure, T_f is Transfer Payments, S for Savings, T is Tax Revenue, X is Export, and for Imports. When (X-M) is < 0 the country has current account deficit. Similarly, when (T-G) < 0, the country has fiscal deficit.

Identity 2 states that the current account position – deficit (surplus) is a sum of the financial private deficit (surplus) and the financial public deficit (surplus). This implies that in an event of a fiscal deficit while the financial private balance remains unchanged, the current account balance must decline by the amount of the fiscal deficit (twin-deficit). Thus, fiscal deficit, an indication of public dissaving, will lead to a fall in aggregate saving, thus, pushing the interest rate upwards. A higher interest rate would attract portfolio inflows and drive exchange rate appreciation which would result in decreasing export and increasing imports, thus, deteriorating the current account position.

In the Mundell-Fleming model, which also presents the twin-deficit hypothesis, the fiscal deficit-external sector imbalance relationship is presented in the context of fixed and flexible exchange rate regimes using the well-known IS-LM framework. In a regime of fixed exchange rate, fiscal deficit would raise interest rate, accelerate capital inflows (on the assumption of perfect capital mobility) and improve capital balance, hence, influencing the capital and financial account. The resulting domestic currency appreciation would have a negative impact on the current account balance. Fiscal deficit can also improve purchasing power through government expenditure on consumption and investment and drive up aggregate demand with adverse impact on trade balance as domestic price-competitiveness declines. The monetary policy action required at this point would be central bank intervention to purchase some of the foreign currency inflows to moderate the local currency appreciation and correct the current account position, and in so doing increasing money supply in the economy.

The degree of capital mobility would also be a factor in determining how a flexible exchange rate regime would affect fiscal deficit. Where capital mobility is not perfect owing to considerations of sovereign risks[2], fiscal deficit would increase aggregate income but at the same time push up interest rate and attract some foreign capital, thus, appreciating the exchange rate and worsening the current account position. However, because of imperfect capital mobility, the income or aggregate demand effect may outweigh the capital flows effect, thus demanding a monetary policy action to take out liquidity in the system to moderate the likely inflationary pressure.

A variant to the foregoing prepositions is the Ricardian equivalence hypothesis (REH). The theory postulates the equivalence of taxation and public debt and compensating in their effect on the economy. In other words, a rise in fiscal deficit will have no impact on aggregate demand or external sector balance (Hashemzadeh and Wilson, 2006). The argument is that households would opt to save money privately rather than spend it if their income increased temporarily due to tax cuts or government deficit financing (Barro, 1989). Therefore, as argued by Khalid and Guan (1999), the rise in private savings lowers interest rate and moderate inflow of foreign capital, thus limiting the occurrence of current account deficit.

Although it is generally presumed that both domestic macroeconomic forces and external sector factors affect a country's balance of payment position (see e.g., Garg and Prabheesh, 2017), the channels through which they impact each other and the peculiarities of the economies studied offer diverse outcomes (see e.g., Eregha, Aworinde and Vo, 2022; Ilori, Paez-Farrell, and Thoenissen, 2022; Akalpler, 2019; Josifidis, Mitrović and Bodor, 2019).

Given the various assumptions upon which the highlighted theories are founded, they have been subjected to various criticisms over the years. However, due to the significance of the fiscal and external sectors and the macroeconomic issues arising therefrom, more studies have continued to empirically test their applicability to various economies (see e.g., Thobeka and Thamaga, 2019; Ilori, Paez-Farrell and Thoenissen, 2022; Billman and Karaoğlan, 2020; Wollmershauser and Schnabl and 2013; Kundu and Goyal, 2020).

Empirical Literature

Studies have looked at how fiscal and external sector deficits relate to one another. Discussion on this subject can be broadly categorized into two strands. Discussion on this subject can be broadly categorized into two strands. The first strand dwells on literature that investigates the reliability of theories on the nexus. These are grouped into studies that explore the reliability of the Twin-Deficit and the Ricardian Equivalence Hypotheses. The second strand discusses the direction of flow of the twin deficits as well as the effects of the deficit financing methods on the external sector.

To validate these theoretical postulations, several issues are identified. Firstly, extant literature has established key arguments around the direction of flow between fiscal deficit expansion and external sector imbalance. While a strand of studies found evidence of a direct relationship (Mudhassar et al, 2013; Mansouri, 2018; Mahuni, 2016; (El-Khishin & El-Saeed, 2021; Gerson et al., 2011; Chinn & Prasad, 2003; and Corsetti & Muller, 2006; Goyal and Kumar, 2018, Garg and Prabheesh, 2017), supporting the twin deficit hypothesis, outcomes from another group acknowledge the existence of the twin divergence hypothesis, such that growth of fiscal deficit result in an improvement in the external sector (Banday & Aneja, 2019; Nazier and Essam, 2012; Litsios and Pilbeam, 2017). Also consistent with the Ricardian hypothesis, studies that found no observable relationship between the two deficits abound (Jostifidis et al., 2019; Sterdniak, 1983; Dewald &Ulan, 1990; Sobrino 2013; Ganchev, 2010).

In addition to the discussion around the direction of flow, it is noteworthy that a number of studies have also identified a bi-directional relationship, in which fiscal deficit causes external imbalance, while external sector performance is also found to be a key driver of fiscal deficit (Darrat, 1988; Rajasekar and Deo, 2016; Eihendawy, 2014 and Mansouri, 2018). This may be the case with Nigeria, which has largely been net importer. Foreign exchange pressures and efforts to meet the huge foreign exchange demand may have adverse implications for fiscal deficit. To confirm this, Adedeji (2001) advocated that the Nigerian economy is heavily reliant on imports of manufactured and intermediate goods with no corresponding export. Thus, the economy's dependence on crude oil exports has implications for current account sustainability, as oil price is exogenously determined and volatile. Consequently, shocks emanating from exchange rate due to

oil price volatility may cause a deterioration in revenue and the inability of a country to finance its budget, thus, necessitating borrowing. To buttress this further, Hashemz and Wade (2009) also asserted that the nature of trade policies, monetary system, taxation system, and exchange rate policies are factors that influence the relationship between fiscal deficit and external sector imbalance.

The relationship between fiscal policy and capital flows has also attracted several studies, given the role of capital and financial accounts as components of external sector accounts. For instance, Koptis (2004) advocates that persistent fiscal deficit depletes the external reserve thereby causing exchange rate pressures, hence, causing a shift in investors sentiment and an outflow of foreign capital. On the other hand, Babalola and Onikosi-Alliyu (2020) found that budget deficit crowds in foreign direct investment (FDI). However, domestic borrowing has negative long term effect on FDI. This could influence external sector as a result of the link connecting the capital, financial and current account. Ersoy (2011) noted that capital inflows for the Turkish economy result in current account deficits and that current account sustainability can be attained through improved financial account management.

To support this, Chinn and Prasad (2003) contend that capital inflows to developing nation's shallow financial industry could worsen the country's current account.

Strands of literature also dwelled on deficit financing. This is crucial, as financing also has implications for external sector imbalance, particularly, for a developing economy. This is justifiable in some studies, which postulate that a temporary debt financing tax cut culminates in a current account deficit (see Feyrer and Shambaugh (2009); kumhof and Laxon (2009), Tanzi and Blejer (1982)). Besides the abovementioned studies, Egwaikhide (1999) also argued that due to the multiplier effect on household consumption, deficit financing through bank credit increases aggregate demand. Additionally, because bank credit is high-powered money, its expansion puts pressure on the domestic money supply and the level of prices. For an economy like that of Nigeria, this could result in higher imports owing to the country's high import propensity, with effect on exchange rate and external sector balance. In the same vein, some studies have found a direct link connecting foreign debt and current account balance, implying that growth in external debt increases current account imbalance. Regarding deficit financing through external debt, strand of literature also pointed to the negative impact on exchange rate and current account balance (Okoh et al, 2020; Ocharo & Muli, 2018; Olasode & Babatunde (2016), Mervalous, Baba & Audu, 2020).

In summary, the relationship between fiscal deficit and external sector imbalance has been studied with the goal of testing the validity of the various hypotheses on the subject. Much insight into the direction of the relationship observed in the reviewed studies, reflect country-specific characteristics, which is important for policy purposes (Bernheim, 1988 Rosensweig & Tallman, 1993; Khalid & Guan, 1999; Salvatore, 2006; Fidrmuc, 2002; Mukhtar et al. 2007; Lau & Tang, 2009; Ganchev, 2010; Kulkarni & Erickson, 2011; Holmes, 2011; Banday & Aneja, 2016). From the survey of available literature, there seems to be a paucity of studies on Nigeria. Given the peculiarities of the Nigerian economy, whose current account balance was in deficit of US$16.98 billion in 2020[3] and fiscal deficit exceeding the threshold of 3 percent of GDP[4], this study is a contribution to the discussion using a relatively more recent data.

DATA AND METHODOLOGY

Data

The study used quarterly time series from 2000Q1 to 2021Q4, which were sourced from the National Bureau of Statistics (NBS) and the Central Bank of Nigeria (CBN) Annual statistical bulletin. This time frame is chosen because it corresponds with the period when the budgetary process followed a constitutional provision for a legislative process and was non-discretionary. As a result, the country began to see significant swings in its nominal budget balance, which may be partially attributed to erratic oil prices and business cycles.

SVAR Specification

In order to achieve its goal, this study uses the VAR framework. Thus, a small open economy Structural Vector Autoregressive (SVAR) is specified. This consists of five endogenous variables: Fiscal Deficit as a share of GDP (*fd-gdp*), Current Account Deficit (*cad*), and macroeconomic indicators of Log of Broad Money Supply (*m3*), Exchange Rate (*exr*), and Maximum Lending Rate (*mlr*).

The reduced form errors that allow for the recovery of structural shocks is provided by the standard reduced form VAR. To recover the needed information, Short- run and long-run approaches can be utilized. Sims (1986), Bernanke (1986), Blanchard et al., (1986) and Ndako (2008) used the short-run method, by employing non-recursive and direct restrictions on the contemporaneous interactions among the variables. The long-run restrictions of Astley and Garrat (1996), Blanchard and Perotti (2002) and Chakraborty and Chakraborty (2006) is another method. To identify the structural shocks, restrictions on the long-run dynamic impact of the shocks on particular system variables were used. In this study, the Blanchard and Perotti (2002) long-run restriction approach is to be examined in the moving average representation. The sequences *fd-gdp, cad, m3, exr,* and *mlr* can be expressed as a linear combination of recent structural shocks and those from the past.

The SVAR Model is employed to identify how various structural shocks impact the variables under study in an interactive manner. The SVAR methodology is built from the reduced form standard VAR (Lutkepohl, 2007) given below.

$$A_0 Y_t = A_1 Y_{(t-1)} + A_2 Y_{(t-2)} + \ldots + A_P Y_{(t-P)} + \varepsilon_t \qquad (3)$$

$$E = (e_t e_t^I) = \Sigma \qquad (4)$$

Where denotes vector of n endogenous variables, A_i is the coefficient matrices, e_t is the error terms, and Σ the covariance matrix of the errors. Even though economic theory calls for contemporaneous relationships between variables, the reduced form VAR above only permits arbitrary lag lengths because the error term from the convention VAR is likely to be correlated. Amisano and Giannini (1997), Martin, Hurn and Harris (2013) suggests that the SVAR makes use of additional identifying restrictions and estimation of structural matrices to transform VAR errors into uncorrelated structural shocks.

We begin our SVAR specification below as:

$$A_0 Y_t = A_1^s Y_{(t-1)} + A_2^s Y_{(t-2)} + \ldots + A_p^s Y_{(t-P)} + B\varepsilon_t \qquad (5)$$

Where A_0 and A_i^s are structural coefficients and is the othor normal unobserved structural innovation with $E = (u_t u_t^I) = I_k$. To reflect the connection between the SVAR and the reduced form VAR, the equation is rewritten. This is carried out under the presumption that A is invertible.

$$Y_t = A^{-1} A_1^s Y_{(t-1)} + A^{-1} A_2^s Y_{(t-2)} + \ldots + A^{-1} A_p^s Y_{(t-P)} + A^{-1} Bu_t$$

$$= A_1 Y_{(t-1)} + A_2 Y_{(t-2)} + \ldots + A_p Y_{(t-P)} + \varepsilon_t \qquad (6)$$

The reduced form matrices $A_i = A^{(-1)} A_1^s$ and the reduced form structural error is given by:

$$\varepsilon_t = A^{-1} Bu_t \qquad (7)$$

$$E = (e_t e_t^1) = A^{-1} B B^1 AA^{-1} = SS^1 \qquad (8)$$

Where $S = A^{-1} B$ and $B^I AA^{-1I}$ = variance-covariance matrix

The SVAR estimation assumes that there are only k(k+1)/2 moments in and more than k(k+1)/2 elements are not identified except additional restrictions are used. A common method of identification that meets the order condition is to set and B to be all entries above the diagonals being replaced with zeroes, resulting in a lower triangular matrix, and placing n2 restrictions on A and n(n-1)/2 restrictions on B.

The SVAR model is adopted for this study because of its reliance on economic theory in sorting out the contemporaneous link between the variables in the model. Once more, it enables the imposition of an ad hoc structure to guard against drawing the incorrect conclusions. To get around the unit root issue, the variables were logged or transformed. Therefore, the variables used in the study's data generation process were subjected to a standard transformation process. Again, the ideal lag length for the model was determined by the Akaike Information Criterion (AIC).

To track the impact of mutually (un)correlated shocks on the macroeconomic variables of interest and to determine the dynamic response of the variables to shocks of one standard deviation, the impulse response function and forecast error variance decomposition are used. Additionally, the study was put through typical model checks. Aside from that, the Forecast Error Variance Decomposition through the prediction mean squared error at various horizons, is used to decompose the impact of shocks in explaining changes in the macroeconomic variables.

ESTIMATIONS

Descriptive Statistics

Table 1 presents the descriptive statistics of *fd-gdp*, *m3*, *exr*, *cad*, and (*mlr*. The mean values range between ?23.9 trillion for *m3* and 3.82 for *fd-gdp*, while Maximum values ranged from ?39.4 trillion for *m3* to 11.76 for *fd-gdp*. There seems to be variations in the series as shown by the difference between the maximum and minimum values of all variables. The standard deviation ranges from ?8.84 million for m3 to 3.12 for *fd-gdp* suggesting a high variability around the mean for all variables. All series appear to be Platykurtic, with kurtosis falling below three indicating that the series experience fewer extreme positive or negative changes. Two out of the five variables are negatively skewed including *mlr*, and *cad*, while *exr*, *m3* and *fd-gdp* are positively skewed. Finally, the results suggest normality for all variables, except for *cad*, given that the kurtosis values are lower than the Jacque-bera statistics.

Table 1: Descriptive Statistics

			mlr	*fd-gdp*	*cad*
Mean	81.74	23929675	26.90	3.82	761.50
Maximum	101.76	39435900	31.55	11.76	8582.600
Minimum	65.42	10887994	21.86	0.28	-6676.400
Std. Dev.	10.06	8840608	3.20	3.12	3916.625
Skewness	0.27	0.15	-0.08	0.73	-0.11
Kurtosis	1.95	1.78	1.73	2.36	2.02
Jarque-Bera	2.65	3.05	3.12	4.86	1.94
Probability	0.27	0.22	0.21	0.09	0.38

Source: Computed by authors using Eviews12

Table 2 shows the Augmented Dickey Fuller unit root tests conducted on all variables used in the study. Based on the results obtained, all variables appear to be integrated of order one, making them valid for the estimation using SVAR.

Table 2: ADF Test for Stationarity

Variables	t-statistic	Prob.	I(D)
fd-gdp	-6.771	0.000	I(1)
cad	-10.925	0.000	I(1)
exr	-6.324	0.000	I(1)
m3	-5.934	0.000	I(1)
mlr	-6.752	0.000	I(1)

Source: Computed by authors using Eviews 12

Impulse Response Functions

Figure 1 shows the responses of monetary policy variables including money supply, exchange rate and interest rates to structural shocks associated with changes in fiscal deficit and current account deficit. Considering the initial response of broad money supply to fiscal deficit, a positive shock to fiscal deficit as a share of GDP causes a marginal decline of about 0.04 per cent in broad money in the first quarter. This implies that a rise in fiscal balance causes a fall in broad money supply in the first quarter of impact. However, there is a slight rise in money supply in the third quarter and the impact becomes transient in subsequent quarters as it hovers around the zero line. This response is expected, considering that fiscal deficit could be financed through domestic and foreign borrowing. When government borrows from domestic sources, there is a reduction in the volume of money in circulation. Given that money supply also constitutes currency outside the banking system, it is expected that increased government borrowing will first reduce narrow money supply as households and firms invest buy buying the treasury instruments offered by government. The result also suggests that over time, money supply increases as government expend the borrowed money in the economy, especially by way of higher recurrent expenditure.

Figure 1: Impulse Response Functions
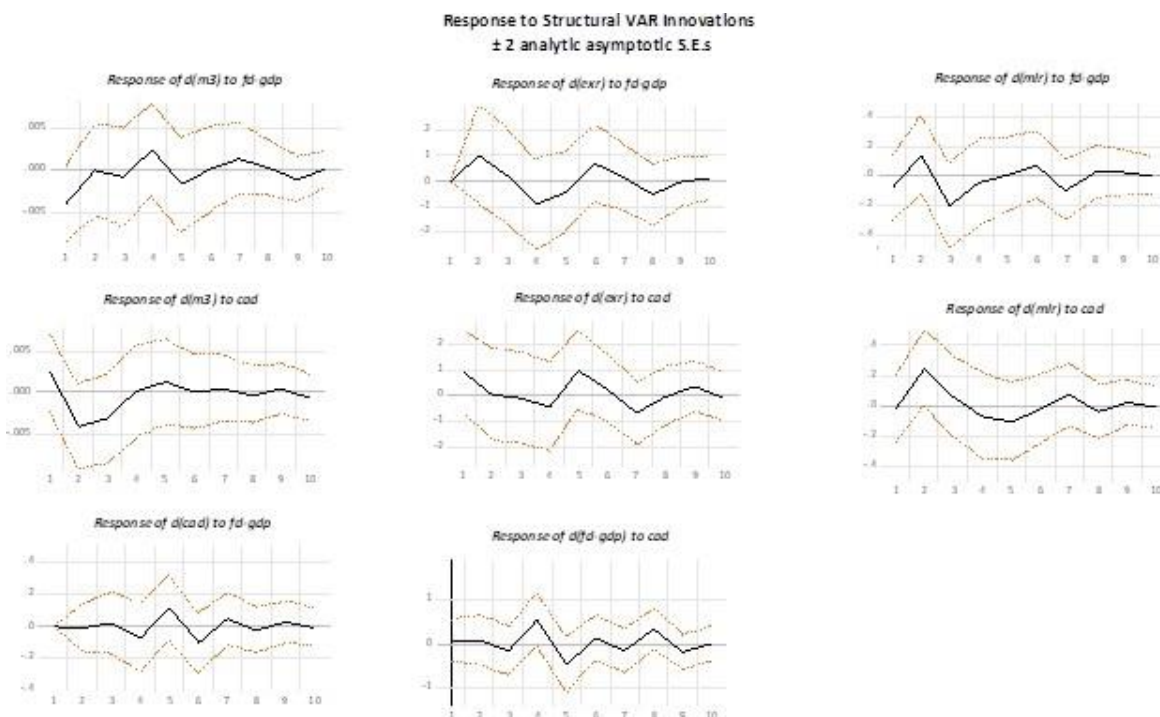
Source: Computed by authors using Eviews 12

Current Account deficit had a different impact on money supply shock. The initial impulse response suggests that a rise in *cad* leads to 0.02 per cent increase in the broad money supply in the initial period. This is followed by marginal decline in the second period. This was however reversed in the third period and the impact remained neutral until the final period. Current account deficit may be the indication or sign of the less competitiveness of the economy. As imports outstrip export, there is exchange rate pressure on the local currency owing to greater demand for foreign currency. In essence, when there is an increase in economic activities, usually accompanied by a rise in money supply, there is likely to be an increase in current account deficit. This is supported by the response of exchange rate to current account deficit.

Regarding exchange rate, Nigeria's response to a budget deficit demonstrates the connection between public spending and the exchange rate. A positive shock to fiscal deficit as a share of GDP causes a rise (depreciation) in exchange rate in the first to second quarter, however, between the third period and the fourth period, the exchange rate declined (appreciated). Exchange rate continued such behavior between the fifth and nineth periods and remained neutral in subsequent quarters. The observed fluctuation in the exchange rate response to fiscal deficit could be explained by the understanding that Nigeria's fiscal deficit is both domestically and externally financed. In the case of foreign currency-denominated financing, a rise in government deficit is expected to first lead to foreign currency inflows, increase the country's external reserves stock and institute some stability and appreciation of exchange rate.

The result also showed that a decline in current account balance does not lead to an instantaneous decline in exchange rate of the naira. The currency, however, depreciates in the second quarter and remains until the fourth period, and only stabilizes temporarily from the fifth to the sixth quarters, thereafter, the pressure resumes. The depreciation of exchange rate as a result of current account deficit is indicative of the country's dependence on imports. This is accompanied by a rise in exchange rate pressure as demand for foreign currency to pay for imports exceeds supply from exports. The occasional relative stability from the result could be attributed to a number of policy measures introduced by the CBN and the Federal Government, aimed at restricting access to foreign exchange for importation of some items the country has comparative advantage in their production and generally encouraging consumption of locally produced goods overimported goods.

A rise in interest rate, can result from a contractionary monetary policy which aims at reducing money supply to curtail inflation pressure. The initial response of maximum lending rate to increase in fiscal deficit showed increase in the former, which then decline in the third quarter. This is consistent with the expectation that a surge in government deficit will lead to a rise in interest rates as public borrowing crowd out private credit. In the case of current account deficit, the response is an initial rise in interest rate, followed by a muted impact in the subsequent quarters. This is expected as high current account deficit, caused by a rise in imports over exports, would result in exchange rate pressure, thus, prompting the monetary authority to raise interest rate to address the monetary element of price developments.

Considering the initial response of current account deficit to fiscal deficit, a shock to fiscal deficit has no effect in the first to third period, and only marginally negative in the fourth period before reverting to its mean in subsequent quarters. On the other hand, fiscal deficit responded the same way to a shock in current account deficit, which was largely insignificant. The findings indicate that the fiscal and current account deficits move together somewhat and have a reciprocal relationship with one another.

Forecast Error Variance Decomposition

The forecast error variance decomposition gives insight on the necessity of each shock in explaining variations of the variables in the model. It is expected that at the initial period, nearly all variations in the model will be accounted for by the variable's own shock, and thereafter, other variables in the model will contribute, at different degrees, to the variation in the variable.

Figure 2: Variance Decomposition

Variance Decomposition using Structural VAR Factors
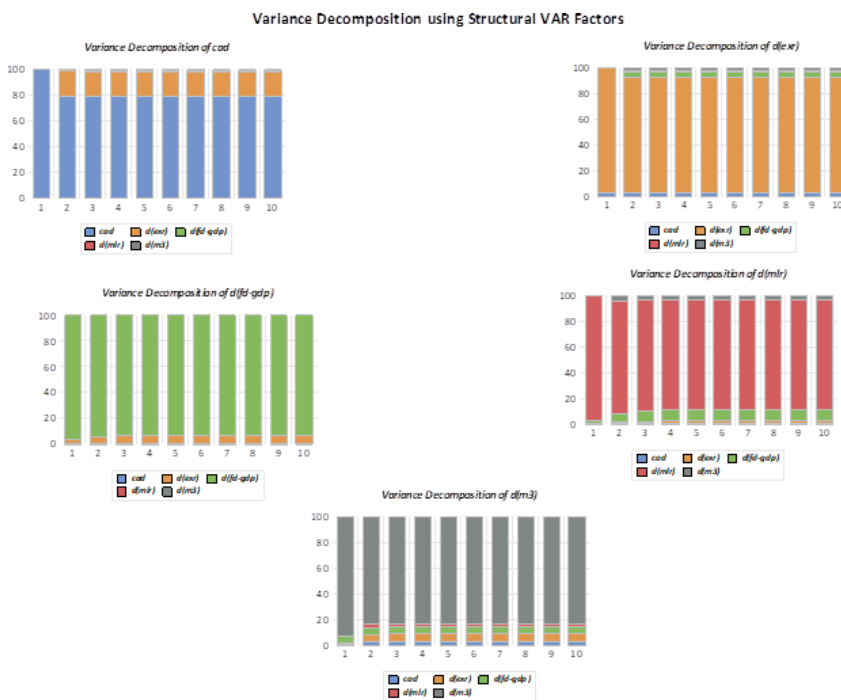
Source: Computed by authors using EViews 12

In the first graph, 100 per cent of variation in current account deficit (*cad*) is explained by shock from itself in the initial period. Over the subsequent forecast horizon, only about 20 per cent of the variation was attributed to exchange rate. The result showed weaker influence of other variables in the model to variation in *cad.* For example, the variation of *cad* explained by Maximum Lending Rate was 4.08 per cent in the second quarter, and 7.82 per cent in the tenth quarter. On the other hand, the variation explained by Money supply (*m3*) was 0.56 per cent, it increased to 5.11 per cent in the fourth quarter and 8.22 per cent in the tenth period of the forecast horizon. Thus, all other variables except exchange rate are strongly exogenous (This implies that they have weak influence on current account deficit).

With regards to Fiscal Deficit, the bulk of the variation is explained by itself from the initial period by 96.96 per cent to the tenth (10th) period by 65.02 per cent, indicating strong endogeneity in fiscal deficit. In explaining the fiscal deficit, the other factors provide only modest responses. Variations in *fd-gdp* explained by *cad* is 0.10 per cent in the first quarter, 7.8 per cent in the fourth quarter and 13.36 per cent in the 10th quarter. The *exr* accounted for 2.92 per cent, 6.3 per cent, and 10.81 per cent variation in *fd-gdp* in the first, fourth and tenth quarters, respectively. The estimates of the forecast error variance of money supply, exchange rate and lending rate shows that the contribution of *fd-gdp* and *cad* become more significant over time.

CONCLUSION

This paper examined the interactions between fiscal and external sector indicators and how such interactions impact monetary policy of the Nigerian economy. Outcome of the investigation revealed a bi-directional causality between fiscal deficit expansion and external sector imbalances. This is clear given that Nigeria's fiscal deficit has persistently expanded since 2010, with the fiscal gap funded through domestic and foreign borrowings. The bi-directional influence arises from the link between imports, exchange rate and inflation. Given the depreciatory impact of external shocks on the domestic currency, and the largely oil-based

Nigeria's revenue, the need to accomplish developmental goals results in increased deficit spending. Further findings also show the detrimental effect of fiscal deficit on lending rate. Financing deficit through domestic borrowing crowds out private sector investment, thus, driving interest rate upward. Consequently, rise in interest rate stifles growth as investment declines. The study also found a gradual exchange rate depreciation as fiscal deficit increase, reflecting the impact of high recurrent spending that tends to fuel domestic demand over supply. Finally, the result shows that rise in government expenditure is closely linked to increase in money supply which could cause exchange rate depreciation, with a pass-through on domestic inflation.

From the foregoing, therefore, our findings showed that the high fiscal deficit in Nigeria do not only result in external sector disequilibrium and vice versa, but also, the outcomes have significant impact on monetary policy variables – money supply, exchange and interest rates.

Nigeria and other developing economies with similar fiscal experiences must consider expenditure restructuring in favour of directing deficit spending to capital development programmes as against recurrent-related activities. This is to ensure that the spending broaden and open opportunities for more tax revenues that would finance future government budgets.

Again, while deficit financing may be an unavoidable fiscal policy tool for developing economies with relatively weak or undiversified revenue base, the financing, either through borrowing from the domestic or external market, demands a close process of coordination between the fiscal and monetary authorities, the absence of which could result in fiscal pursuit undermining monetary policy goals with deleterious effect on the macroeconomy. Based on our findings the study recommends the following:

1. Given the bi-directional causal relationship between fiscal deficit and current account balance, it is imperative for monetary and fiscal policy custodians to develop a close degree of co-ordination in terms of formulation and implementation of their objectives and policies. This is important as the two deficits are interlinked through exchange rate, inflation, money supply and interest rate. To achieve this, effective communication of policies is also beneficial.
2. Crowding out of private investment leads to a rise in lending rate, which also has significant influence on the level of output, employment, and overall welfare of the citizens. Therefore, alternative means of reducing public deficit, such as employing a effective tax system, should be considered. Furthermore, to encourage and create an environment that is conducive for private investment to thrive, government must take the necessary steps to decrease recurrent spending and increase capital spending. Policies that would directly improve informal economic activities into the formal sector, should be deepened as a significant level of the productive capacity of the economy is domiciled in this sector. The various programmes currently running to aid in the growth of micro, small, and medium-sized businesses by the monetary and fiscal authorities should be made to attract informal businesses towards their formalization.
3. Although this is outside the control of the central bank, increase in money supply through government expenditure that could be inflationary can be mitigated by ensuring that deficit spending is channelled to productive infrastructural expenditure. Nigeria has long history of high recurrent expenditure, which increases the money in circulation. Fiscal discipline is therefore necessary, such that recurrent expenditure that does not attract returns is minimised.

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FOOT NOTES

[1] The corresponding increase in government expenditure was from N4,19 trillion in 2010 to N12.16 trillion in 2021 (CBN, 2021)

[2] These risks include nationalisation, restrictions on transfer of assets, default risk. See Dornbusch, et al (2004), 9th edition, pp314.

[3] See Nigeria: Current Account Balance. www.theglobaleconomy.com

[4] The ECOWAS primary convergence criteria that Nigeria is a signatory to provides that budget deficit (commitment basis, including grant) as a ratio of GDP, should be lower than or equal to 3 per cent of GDP

APPENDIX

VAR Lag Selection

VAR Lag Order Selection Criteria
Endogenous variables: D(FD_GDP) D(CAD) D(MS3) D(EXR) D(MAX_LR)
Exogenous variables: C
Date: 06/10/22   Time: 16:16
Sample: 2010Q1 2021Q4
Included observations: 43

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-191.3215	NA	0.006358	9.131233	9.336023*	9.206753*
1	-165.8748	43.79203	0.006284*	9.110455	10.33920	9.563578
2	-143.1559	33.81413	0.007338	9.216554	11.46925	10.04728
3	-112.5343	38.45503*	0.006430	8.955085*	12.23174	10.16341
4	-92.27531	20.73015	0.010480	9.175596	13.47620	10.76153

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

SVAR Results

Structural VAR Estimates

Date: 06/10/22 Time: 15:11				
Sample (adjusted): 2011Q1 2021Q4				
Included observations: 44 after adjustments				
Estimation method: Maximum likelihood via Newton-Raphson (analytic derivatives)				
Convergence achieved after 184 iterations				
Structural VAR is just-identified				
Model: Ae = Bu where E[uu']=I				
A =				
1	0	0	0	0
C(1)	1	0	0	0
C(2)	C(5)	1	0	0
C(3)	C(6)	C(8)	1	0
C(4)	C(7)	C(9)	C(10)	1
B =				
C(11)	0	0	0	0
0	C(12)	0	0	0
0	0	C(13)	0	0
0	0	0	C(14)	0
0	0	0	0	C(15)
	Coefficient	Std. Error	z-Statistic	Prob.
C(1)	-0.008582	0.040072	-0.214170	0.8304
C(2)	0.002223	0.001394	1.595002	0.1107
C(3)	-0.710126	0.498335	-1.424997	0.1542
C(4)	0.009688	0.068391	0.141649	0.8874
C(5)	-0.005704	0.005241	-1.088362	0.2764
C(6)	-1.765935	1.846267	-0.956490	0.3388
C(7)	0.144404	0.250292	0.576942	0.5640
C(8)	-63.94653	52.40553	-1.220225	0.2224
C(9)	-16.14034	7.149685	-2.257490	0.0240
C(10)	-0.010725	0.020228	-0.530206	0.5960
C(11)	1.592137	0.169722	9.380830	0.0000
C(12)	0.423198	0.045113	9.380830	0.0000
C(13)	0.014713	0.001568	9.380833	0.0000
C(14)	5.114416	0.545199	9.380830	0.0000
C(15)	0.686245	0.073154	9.380830	0.0000
Log-likelihood	-164.3995			
Estimated A matrix:				
1.000000	0.000000	0.000000	0.000000	0.000000
-0.008582	1.000000	0.000000	0.000000	0.000000

0.002223	-0.005704	1.000000	0.000000	0.000000
-0.710126	-1.765935	-63.94653	1.000000	0.000000
0.009688	0.144404	-16.14034	-0.010725	1.000000
Estimated B matrix:				
1.592137	0.000000	0.000000	0.000000	0.000000
0.000000	0.423198	0.000000	0.000000	0.000000
0.000000	0.000000	0.014713	0.000000	0.000000
0.000000	0.000000	0.000000	5.114416	0.000000
0.000000	0.000000	0.000000	0.000000	0.686245
Estimated S matrix:				
1.592137	0.000000	0.000000	0.000000	0.000000
0.013664	0.423198	0.000000	0.000000	0.000000
-0.003462	0.002414	0.014713	0.000000	0.000000
0.933386	0.901708	0.940827	5.114416	0.000000
-0.063259	-0.012478	0.247559	0.054853	0.686245
Estimated F matrix:				
0.710549	0.130567	0.072650	0.285653	0.096401
-0.016895	0.209348	0.001776	-0.019131	-0.040902
-0.003220	-0.003241	0.012899	-0.000952	0.001097
1.465355	1.171778	1.307665	6.212086	1.958532
-0.051434	0.164871	0.689689	0.394644	0.663417

III. Variance Decomposition

Variance Decomposition of D(FD_GDP):

Period	S.E.	Shock1	Shock2	Shock3	Shock4	Shock5
1	1.592137	100.0000	0.000000	0.000000	0.000000	0.000000
2	1.825439	96.31909	0.332974	2.322334	0.013604	1.011995
3	1.922875	87.59446	1.016877	5.749389	0.327690	5.311581
4	2.072698	76.25544	7.997188	5.000702	4.915302	5.831370
5	2.234485	70.07111	11.57985	4.396946	8.774429	5.177663
6	2.258575	68.58441	11.58778	4.699456	10.03667	5.091682
7	2.294170	67.72756	11.66520	4.822490	10.42269	5.362062
8	2.332385	65.58313	13.28355	4.714563	10.89722	5.521537
9	2.348430	64.70775	13.81917	4.759672	11.25988	5.453523
10	2.359022	64.79645	13.69614	4.728286	11.30935	5.469776

Variance Decomposition of D(CAD):

Period	S.E.	Shock1	Shock2	Shock3	Shock4	Shock5
1	0.423419	0.104139	99.89586	0.000000	0.000000	0.000000
2	0.560706	1.383088	74.86313	4.538471	16.42532	2.789990
3	0.645576	2.254866	56.58779	3.571757	35.17350	2.412084
4	0.672192	3.455467	53.18448	8.151704	32.93245	2.275896
5	0.687792	5.682892	51.43710	8.002634	32.49636	2.381013
6	0.711606	7.490686	49.09181	9.415338	30.67980	3.322359
7	0.715263	7.887766	48.88411	9.394618	30.45728	3.376230
8	0.732491	7.619781	47.94525	8.959874	29.05854	6.416549
9	0.741268	7.514281	48.14868	8.752744	28.40759	7.176708
10	0.744324	7.452728	47.83860	8.857341	28.57745	7.273879

Structural VAR