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Fiscal Deficit, Financing Options and Macroeconomic Stability in Nigeria: A Disaggregated Approach

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Fiscal Deficit, Financing Options and Macroeconomic Stability in Nigeria: A Disaggregated Approach

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ABSTRACT

The study examines empirically the relationship between fiscal deficits and macroeconomic stability in Nigeria from 1970 to 2016. The data for the empirical analysis was sourced from secondary sources such as the CBN statistical bulletin. The study used Inflation Rate (INFL) and Exchange Rate (EXCR) to proxy macroeconomic stability whereas Overall Fiscal Deficits (OFDE), fiscal deficit financed by Domestic Borrowing (DBFD), fiscal deficit financed by External Borrowing (EBFD), Interest Rate (INTR), Money Supply (MS), Foreign Direct Investment (FDI) and External Reserve Balance (EXTR) are used as the endogenous variables. The study employed descriptive statistics, unit root test, co-integration and VAR estimation methods to analyze the data. The results of the variance decomposition reveal that Interest rate (INTR), overall fiscal deficits (OFDE) and the size of fiscal deficits financed by domestic borrowing (DBFD) are the main shocks causing the variation in inflation (INFL), while overall fiscal deficits (OFDE), the size of fiscal deficits financed by external borrowing (EBFD) and the size of fiscal deficits financed by domestic borrowing (DBFD) are the main shocks causing the variation in exchange rate (EXCR) in Nigeria. The study concludes that fiscal deficits have significant negative impact on macroeconomic stability vis-a-viz inflation and exchange rates in Nigeria. The study recommends that fiscal deficits should be moderated and financed chiefly through bonds as empirical finding suggests that both domestic and external borrowing options are detrimental to the macroeconomic stability on the Nigerian economy.

Keywords: Fiscal deficit, domestic borrowing, external borrowing, macroeconomic stability, inflation rate, exchange rate and expansionary effect.

1. INTRODUCTION

Fiscal deficits are chiefly undertaken to stimulate economic growth and employment especially in less developed countries where dearth of critical infrastructures, low and/or inadequate savings and capital formation, as well as underdeveloped productive capacity of the economy persists. Fiscal deficit arises as a result of fiscal authority's deliberate action of unbalancing the fiscal budgets in the form of budget deficits. Deficit budget therefore is a deliberate fiscal policy of government whereby budgeted expenditures exceed budgeted revenues in a given period, usually a year. Given the rise of such deliberate deficits so created, there arises the need to bridge these deficits in terms of the funding. According to Anyanwu (1998) and Udaba (2002), fiscal deficits are conventionally financed by any or combination of the following options: public borrowing (domestic and external), money creation, drawing from accumulated reserve balances, sale of government assets, proceeds from privatization of public enterprises and/or with share of current revenues of government, among others.

The work of John Maynard Keynes in his book titled "The General Theory of Employment, Interest and Money" in 1936; as well as the aftermath of the "Great Depression" of the early 1930s which ravaged the United States, gave prominence to fiscal policy in particular and Keynes theory in general, as a panacea to unemployment, growth in output and national income. Keynes believe that unemployment and depression was as a result of deficiency in aggregate demand (Jhinghan, 1997); (Deepak, 2001). Therefore, expansion in government consumption (or reduction in taxes) can stimulate employment, output and income through the multiplier. He premised his theory on the fact that the economy is inherently unstable and needs to be steadied through vigorous government intervention and/or appropriate policies of government. Deficit financing to the Keynesians is an important tool to achieve a desired level of aggregate demand consistent with full employment. In the submission of Mohanty (2012), however, fiscal policy to the Monetarists are basically interventionist in nature given that they have a shorter lag. Fiscal deficits are most desirable in an economy faced with deficiencies in aggregate demand or an economy experiencing recession or depression as the case may be.

In the case of Nigeria, however, fiscal deficit operation dates back to 1961 when the first deficit financing exercise was undertaken and subsequently it became presumably part of the budgetary norms in the country (Oluba, 2008). For instance, from 1970 to 2016 with the exception of these years: 1971, 1973, 1974, 1979, 1995, & 1996 where overall fiscal surpluses of #0.171billion, #0.166billion, #1.80billion, #1.16billion, #1billion, and #32.05billion respectively were recorded, Nigeria has had 4 decades (40 years) of sustained overall fiscal deficits. Whereas overall fiscal deficits were N0.455billion in 1970, it rose to N2.82billion in 1978, N3.6billion, N35.76billion, N221.05billion, N1.158trillion and N1.577trillion in 1981, 1991, 2001, 2011 and 2015 respectively (CBN, 2015).

Despite the envisaged expansionary effects of fiscal deficits so undertaken, this objective may be counterproductive to macroeconomic stability objectives of an economy vis-a-viz price stability and exchange rate stability. Thus, fiscal deficits may stimulate economic growth at the expense of rising inflation and exchange rate volatility. The economy may witness an inflation induced growth which invariably robs the economy the productive capacity, savings and capital formation the deficit set out primarily to achieve. Therefore, the targeting of economic growth stimulation which fiscal deficit originally set out to achieve, may come at a premium in the form of undesirable macroeconomic instability vis-a-viz inflation and exchange rate volatilities (Audu, 2012). This is because, fiscal deficits entails expansion in government expenditures which in turn increases monetary base or money supply in the economy. Theoretically, increase in money supply without equivalent output increase could result into inflationary pressure as too much money would be chasing few goods and services, thereby putting pressure on the general price levels (Isenmila, 2008). Also, financing deficits through borrowing (both domestic and foreign) could lead to accumulated debt burden of both principal and interest; as well as could lead to "crowding out" of private investment spending and interest sensitive consumer spending, thereby inhibiting the multiplier effect of the initial public expenditure and by extension, contract economic growth that was primarily targeted. Crowding out effect may arise as a result of continuous government borrowing from the domestic market to finance fiscal deficits (Ali and Ahmad, 2014). The implication therefore is that government would be competing with private investors for available loanable funds. This competitive demand for funds would drive the equilibrium interest rate upward. Given that investment and rate of interest are inversely related, this option of financing deficit would ultimately result in crowding out of private investment which negates the intended economic growth objectives of undertaking fiscal deficits.

In recent history of Nigeria's economic performance, the challenges of rising inflation and exchange rate volatility seem intertwined. Scholars have argued that Nigeria's inflation coloration is not necessarily that of demand pull inflation, rather cost push inflation. The cost related inflation in Nigeria, however, could be best described as "imported" or "exchange rate" inflation. Given that the Nigerian economy is import dependent as a result of low and underdeveloped domestic productive capacity, exchange rate shocks and costs are transferred as costs of the imported goods and services to be borne by the final consumers. More so, rising interest rate which is the cost of borrowing funds by businesses could be inadvertently transferred to the cost of production or importation (as in the case of Nigeria), thereby fuelling inflationary pressure in the economy. What chiefly constitutes cost of production in Nigeria is basically cost attached to exchange rate and its volatility, given that even most of the raw materials beings used by local manufacturers are imported from Nigeria's trading partners.

The combined effects of rising inflation and exchange rates may both in the short and long run dwarf and subdue the relative growth recorded in terms of real Gross Domestic Product (GDP). The trend of inflation rate and exchange rate has been a roller-coaster one. For instance, inflation rates in Nigeria was 13.7%, 33.9%, 23.4%, 72.8%, 17.8% and 15.7% in 1970, 1975, 1983, 1995, 2005 and 2016 respectively. On the other hand, the corresponding exchange rates in the same period were 0.71, 0.61, 0.72, 21.89, 131.70, and 253.4 respectively. These volatilities in the rate of inflation and exchange rate are red flag to both domestic and foreign investors, which is capable of undermining the growth of savings and capital formation, investment and expansion of the productive capacity of the economy. Therefore, it is not good enough to undertake doses of fiscal deficits without analyzing how they hurt the stability of general price levels in the economy. According to Obi and Nurudeen (2008), Nigeria's fiscal deficits have been blamed for much of the economic crisis that beset it resulting in over indebtedness in both external and domestic borrowing, public debt crisis, high inflation, poor private investment performance and economic growth.

Given the obvious expansion in government expenditures and sustained fiscal deficits, this study shall investigate the long run relationship between fiscal deficits; how these deficits are financed vis-a-viz domestic and external borrowing and macroeconomic stability in Nigeria. The interest of this work is not whether fiscal deficit stimulates economic growth and employment, rather the interest is to investigate at what cost does the economic growth and development targeting of fiscal deficit is to the Nigerian economy in terms of macroeconomic stability. Thus, this work is a disaggregated evaluation of fiscal deficits; how these deficits are financed vis-a-viz domestic and external borrowing financing, and their magnitude influences on macroeconomic stability vis-a-viz inflation and exchange rate volatility in Nigeria. The study period shall enclose from 1970 to 2016.

2. LITERATURE REVIEW

2.1 Review of Theoretical Literature

The theoretical framework of this work is based on Keynes theory of employment which gave utmost relevance to fiscal policy and government consumption. However, the criticisms of this postulation and the corresponding versions as presented by the Classical and the neoclassical economists shall also be stated.

In the Keynesian theory of employment, public spending can contribute positively to stimulating economic growth. An increase in government consumption is likely to lead to an increase in employment, profitability and investment through the multiplier effects on aggregate consumption. As a result government spending augments the aggregate demand, which triggers an increased output depending on expenditure multipliers. To Keynes, the economy is inherently unstable and needs to be steadied through vigorous government intervention and/or appropriate policies of government. Deficit financing to the Keynesians is as an important tool to achieve a desired level of aggregate demand consistent with full employment. The major assumption of this theory is that the economy is working at less than full employment level of national income. Given the existence of output gap in the economy, increase in debt financed government expenditure will bring expansion in output and income (Jhinghan, 2012). Thus, they argue that an escalation in government spending through the use of borrowed money cause an upward shift on the aggregate demand curve. By implication therefore, deficit financing according to the Keynesian theory can be used to create additional employment when the economy is suffering from a deficiency of effective demand. As an instrument of recovery after recession, deficit financing can be used to mitigate against severe cyclical fluctuations (Dewett, 2009).

Keynesian postulation on the efficacy of fiscal deficit being able to stimulate employment and economic growth is premised on his multiplier concept. If the assumption of the existence of unutilized human and material resources in terms of economic recessions holds therefore, an increase in government spending (or tax reduction) over its revenue will increase both investment and consumption hence leading to expansion of output in multiples of the government expenditure, which Keynes christened the government expenditure multiplier. However, the magnitude of the output expansion is a function of the marginal propensity to consume (MPC) in the economy. Summarily therefore, government spending increases total output more rapidly in an economy with high MPC than country with low MPC (Gale and Peter, 2003).

The above theory however was strongly opposed by the classical and neoclassical schools. The classical school criticism postulate that fiscal deficits incessantly financed by domestic debt crowds out investment and by extension lower the level of economic growth. In sum, they postulate that excessive fiscal deficits lead to poor economic performance. Thus, fiscal deficits financed by public debts are principally counterbalance by the crowding out effect of deficit financing on private sector investment, and this by extension lowers the level of economic growth. The implication of such policy does not stop at the crowding out effect on private investment, also the society will have to bear the burden of increased public debts as a result of debt financed expansion in government expenditure. There is also the danger of fuelling inflationary tendencies, as financing government expenditure expansion entails expansion in money supply, which could lead to rise in general price levels.

This overriding objection of Keynes employment theory as well as the efficacy of fiscal deficit in stimulating economic growth by the classical economists was premised on their assumption that the economy always operates at full employment. If an economy is already operating at full employment, any extra expenditure financed by debt or by money creation is bound to create inflationary rise in prices (Anyanwu, 1995); (Dewett, 2009).

On their part, the neo-classical economists collaborated the position of the classical economists that fiscal deficit would have adverse effect on economic growth. Their argument is that fiscal deficit is an obvious weakening of government savings. If government savings are weakened, it will put pressure on rate of interest except if it is fully offset by private savings. Therefore, a decline in national savings will exert pressure on cost of credit (interest rate) which crowds out private investment and a resultant fall in general level of output in the long-run. The neoclassical economists further argued that the manner in which the deficit is financed is capable of influencing the level of consumption and investment and by extension economic growth (Omitogun and Tajudeen, 2007); (Mohanty, 2012).

2.2 Review of Empirical Literatures

From the theoretical reviews, it is clemently obvious therefore that the subject of fiscal deficit and its' effect on the economy has been characterized by a great deal of controversies and counter arguments. These controversies have continued to dominate policy discussions in the developed, developing and the underdeveloped economies. Whereas some scholars believe that fiscal deficits are desirable to stimulate growth as suggested by Keynes and his disciples, others have argued and supported the classical position that it could be counterproductive as it could fuel rise in general price level especially when the economy is operating at full employment level.

In studying the relationship between fiscal deficits and inflation, Cooper and Fisher (1997), analyzed the existence of long term stable relationship between budget deficits, money growth and inflation using annual Turkish data, to find positive and significant relationships. Using the co-integrating vectors for the study, they concluded that a significant impact of budget deficits on inflation cannot be refuted under the assumption of long-run monetary neutrality. However, a further check using an ARIMA approach and quarterly data corresponding to the post bond financing period, suggested a weakened link from the other variables to inflation. They adduced that the availability of bond financing after 1986 might account for the weakening in the link from budget deficits to inflation to a certain extent. Ozmen and Tekin-Koru (1998), researched the long run relationships between budget deficits, inflation and monetary growth in Turkey. They considered two alternative systems corresponding to the narrowest and broadest monetary aggregates. Their findings was that while the joint endogeneity of money and inflation rejects the validity of the monetarist view, lack of direct relationship between inflation and budget deficits make pure fiscal theory explanations illegitimate for the Turkish case. Consistent with policy regime of financing domestic debt through commercial banking system, budget deficits leads to a growth not of currency monetary aggregates but of broad money in Turkey. They however suggested that this mode of financing deficit, leading to a creation of near money and restricting the scope for an effective monetary policy, may not be sustainable as government securities/broad money ratio cannot grow without limit. Also while investigating the relationships between government budget deficit and money growth in the developing countries, Haan and Zelhorst (1990), could not establish any positively significant link between fiscal deficits, money growth and inflation. The overall conclusion of their study does not support the hypothesis that government budget deficit influences monetary expansion and therefore, does not create inflation.

Indication on the relationship between fiscal deficit and external sector is also split. For instance, the study of Piersanti (2000) deployed the Granger-Sims causality technique to study the relationship between the current account deficits and budget deficits for seventeen OECD countries over the period 1970-1997. The findings reveal that external sector performance is negatively correlated with budget deficits. Other studies that fall under this findings include that of Al-Khedair (1996), Islam (1998), Volker (1984), Bundt and Solocha (1988), Zaidi (1985) and Laney (1986). On the flip side, the study of Khalid and Guan (1999) using the sample of developed countries in their study, with data from 1950 to 1994, found out that there is no relationship between fiscal deficit and external sector performance, as measured by the current account deficit. Other studies that support this finding include Bachman (1992), Zaidi (1985), and Evans (1988), in the case of Brazil.

Abiola and Folorunsho (2000), investigated the long run determinants of inflation in Nigeria between 1970 and 1998, using the econometric method of co-integration and error correction model. They found out that inflation in Nigeria could be caused by the level of income, money supply and budget deficit. The results also indicated that in the long-run, exchange rate, money supply, and income level determine the inflation spiral in Nigeria. The study therefore concludes that a reduction in money supply, an increased domestic production and a stable exchange rate should be pursued as a cure to inflation in Nigeria. The study of Uduakobong (2014), attempted to empirically investigate the long-run causal relationship between budget deficit and inflation in Nigeria between 1970 and 2010. Employing a multivariate co-integration regression technique, it was empirically confirmed that there exists a causal long-run relationship between budget deficit and inflation with the direction of causality running from budget deficit to inflation in Nigeria.

The work of Ifionu and Ogbuagu (2007) was an econometric evaluation of exchange rate and external sector performance in Nigeria under the regulation and deregulation era. Their study tested Balance of Payments on exchange rate, external debt burden, external debt service, external reserve and exchange rate regime using the Ordinary Least Squares technique. They found that external sector performance was better under a deregulation regime than during a regulated regime. Their main recommendation is that the government should adopt a mixed exchange rate policy and diversify the productive base of the economy.

3. METHODS OF STUDY

3.1 Research Design

The study is mainly a quantitative research and adopted this design because it is an empirical study of the relationships and/or interactions between fiscal deficits; financing options vis-a-viz domestic and external borrowing and macroeconomic stability in Nigeria. The econometric modeling technique of Vector Autoregression (VAR) was adopted as the main analytical tool.

3.2 Model Specification

3.2.1 The Variables in the Model.

1). Inflation Rate is an annualized percentage change in general price index or consumer price index, over time. Inflation is the rapid and persistent rise in general price level of goods and services in an economy over a period of time. Inflation has a negative impact on economic growth in an economy. It also discourages investment and savings as a result of uncertainty over the future.

2). Exchange Rate is annual exchange rate (naira/US dollar) valued in rate. It is the number of units of the Naira that can purchase a unit of the US dollars. A decrease in this rate is called nominal appreciation of the Naira, while an increase of this rate is called nominal depreciation.

3). Fiscal Deficits defines the overall or accumulated shortfall of government revenues over government expenditures. Thus the overall gap between government expenditure and government revenue in a given period was used as fiscal deficits. The overall fiscal deficits figure which represents accumulated deficits or surpluses of the Federal Government of Nigeria overtime will be used for this variable. Overall fiscal deficits are chiefly financed by two broad classifications; Domestic and External Borrowings.

4). Domestic Borrowing Financed Deficit represents the size of overall fiscal deficit that is financed by domestic borrowing.

5). External Borrowing Financed Deficit represents the size of overall fiscal deficit that is financed by external borrowing.

6). Interest Rate is the price of money i.e. the amount of interest paid per unit of time expressed as a percentage of the amount borrowed.

7). Money Supply is the total amount of monetary assets available in an economy at a specific time.

8). External Reserves also known as foreign exchange reserves are assets or money held by the central bank or other monetary authorities in foreign currencies, used to back liabilities on Naira as well influence monetary policy.

9). Foreign Direct Investment is an investment made by individual or a company from other countries in Nigeria in business interests, in the form of either establishing a business operations or acquiring business assets in Nigeria, such as ownership or controlling interest in a Nigerian company.

3.2.2 Analytical Framework

This study is aim at examining empirically the relationships between fiscal deficits; financing options vis-a-viz domestic and external borrowing and macroeconomic performance in Nigeria. This study adopted the Vector Autoregressive (VAR) model. The vector autoregressive (VAR) model is a theoretical modeling technique used in economic analysis. It is one of the most successful, flexible, and easy to use models for the analysis of multivariate time series. It is a natural extension of the univariate autoregressive model to dynamic multivariate time series. This study will adopt the model specified by (Sims 1980).

A VAR is a system in which every equation has the same right hand variable, and those variables include lagged values of all of the endogenous variables. VARs are useful for forecasting systems of interrelated time series variables. VARs are also used for analyzing the dynamic impact of different types of random disturbances on systems of variables. The VAR approach sidesteps the need for structural modeling by treating every variable as an endogenous variable in the system as a function of the lagged values of all the endogenous variables in the system.

The mathematical representation of a VAR is stated as follows:

$$y_t = A_1 y_{t-1} + O + A_p y_{t-1} + Bx_t + e_t \quad (3.1)$$

Where y_t is a K vector of endogenous variables, x_t is a d vector of exogenous variables, A_1 , A_p , and B are matrices of coefficients to be estimated, and e_t is a vector innovations that may be contemporaneously correlated but are uncorrelated with their own lagged values and uncorrelated with all of the right-hand side variables (Green, 2000); (Gujarati, 2009).

Since this study examines the relationships between fiscal deficits; financing options vis-a-viz domestic and external borrowing and macroeconomic stability in Nigeria. Some of the macroeconomic stability indicators adopted to form our models in this study are as follows:

1. Inflation Rate
2. External Sector proxy by exchange rate

These variables can be transformed into a Vector Autoregressive (VAR) model with the variables stated in their lagged values as follows:

Model One: Inflation Model

This model is built to estimate the effect of the overall fiscal deficits; domestic and external borrowing financed deficit shocks on inflation rate in Nigeria. The endogenous variables included in the model are specified thus:

$$(\text{INFL}, \text{OFDE}, \text{DBFD}, \text{EBFD}, \text{INTR}, \text{EXCR}, \text{MS}) \quad (3.2)$$

The Vector Autoregressive (VAR) transformation of model two (equation 3.2) is stated as:

$$\text{INFL}_t = \beta_{11}\text{INFL}_{t-1} + \beta_{12}\text{OFDE}_{t-1} + \beta_{13}\text{DBFD}_{t-1} + \beta_{14}\text{EBFD}_{t-1} + \beta_{15}\text{INTR}_{t-1} + \beta_{16}\text{EXCR}_{t-1} + \beta_{17}\text{MS}_{t-1} + e_{1t} \quad (3.2a)$$

$$\text{OFDE}_t = \beta_{21}\text{INFL}_{t-1} + \beta_{22}\text{OFDE}_{t-1} + \beta_{23}\text{DBFD}_{t-1} + \beta_{24}\text{EBFD}_{t-1} + \beta_{25}\text{INTR}_{t-1} + \beta_{26}\text{EXCR}_{t-1} + \beta_{27}\text{MS}_{t-1} + e_{2t} \quad (3.2b)$$

$$\text{DBFD}_t = \beta_{31}\text{INFL}_{t-1} + \beta_{32}\text{OFDE}_{t-1} + \beta_{33}\text{DBFD}_{t-1} + \beta_{34}\text{EBFD}_{t-1} + \beta_{35}\text{INTR}_{t-1} + \beta_{36}\text{EXCR}_{t-1} + \beta_{37}\text{MS}_{t-1} + e_{3t} \quad (3.2c)$$

$$\text{EBFD}_t = \beta_{41}\text{INFL}_{t-1} + \beta_{42}\text{OFDE}_{t-1} + \beta_{43}\text{DBFD}_{t-1} + \beta_{44}\text{EBFD}_{t-1} + \beta_{45}\text{INTR}_{t-1} + \beta_{46}\text{EXCR}_{t-1} + \beta_{47}\text{MS}_{t-1} + e_{4t} \quad (3.2d)$$

$$\text{INTR}_t = \beta_{51}\text{INFL}_{t-1} + \beta_{52}\text{OFDE}_{t-1} + \beta_{53}\text{DBFD}_{t-1} + \beta_{54}\text{EBFD}_{t-1} + \beta_{55}\text{INTR}_{t-1} + \beta_{56}\text{EXCR}_{t-1} + \beta_{57}\text{MS}_{t-1} + e_{5t} \quad (3.2e)$$

$$\text{EXCR}_t = \beta_{61}\text{INFL}_{t-1} + \beta_{62}\text{OFDE}_{t-1} + \beta_{63}\text{DBFD}_{t-1} + \beta_{64}\text{EBFD}_{t-1} + \beta_{65}\text{INTR}_{t-1} + \beta_{66}\text{EXCR}_{t-1} + \beta_{67}\text{MS}_{t-1} + e_{6t} \quad (3.2f)$$

$$\text{MS}_t = \beta_{71}\text{INFL}_{t-1} + \beta_{72}\text{OFDE}_{t-1} + \beta_{73}\text{DBFD}_{t-1} + \beta_{74}\text{EBFD}_{t-1} + \beta_{75}\text{INTR}_{t-1} + \beta_{76}\text{EXCR}_{t-1} + \beta_{77}\text{MS}_{t-1} + e_{7t} \quad (3.2g)$$

Where;

OFDE= Overall fiscal deficits

DBFD = Size of overall fiscal deficits financed by domestic borrowing

EBFD= Size of overall fiscal deficits financed by external borrowing

INFL= inflation rate

INTR= interest rate

EXCR= real exchange rate

MS= M2 definition of money supply

Model Two: External Sector Model

This model is built to estimate the effect of overall fiscal deficits; domestic and external borrowing financed deficit shocks on exchange rate in Nigeria. The endogenous variables included in the model are specified thus:

$$(\text{EXCR}, \text{OFDE}, \text{DBFD}, \text{EBFD}, \text{EXTR}, \text{FDI}) \quad (3.3)$$

The Vector Autoregressive (VAR) transformation of model five (equation 3.3) is stated as:

$$\text{EXCR}_t = \omega_{11}\text{EXCR}_{t-1} + \omega_{12}\text{OFDE}_{t-1} + \omega_{13}\text{DBFD}_{t-1} + \omega_{14}\text{EBFD}_{t-1} + \omega_{15}\text{EXTR}_{t-1} + \omega_{16}\text{FDI}_{t-1} + e_{1t} \quad (3.3a)$$

$$\text{OFDE}_t = \omega_{21}\text{EXCR}_{t-1} + \omega_{22}\text{OFDE}_{t-1} + \omega_{23}\text{DBFD}_{t-1} + \omega_{24}\text{EBFD}_{t-1} + \omega_{25}\text{EXTR}_{t-1} + \omega_{26}\text{FDI}_{t-1} + e_{2t} \quad (3.3b)$$

$$\text{DBFD}_t = \omega_{31}\text{EXCR}_{t-1} + \omega_{32}\text{OFDE}_{t-1} + \omega_{33}\text{DBFD}_{t-1} + \omega_{34}\text{EBFD}_{t-1} + \omega_{35}\text{EXTR}_{t-1} + \omega_{36}\text{FDI}_{t-1} + e_{3t} \quad (3.3c)$$

$$\text{EBFD}_t = \omega_{41}\text{EXCR}_{t-1} + \omega_{42}\text{OFDE}_{t-1} + \omega_{43}\text{DBFD}_{t-1} + \omega_{44}\text{EBFD}_{t-1} + \omega_{45}\text{EXTR}_{t-1} + \omega_{46}\text{FDI}_{t-1} + e_{4t} \quad (3.3d)$$

$$\text{EXTR}_t = \omega_{51}\text{EXCR}_{t-1} + \omega_{52}\text{OFDE}_{t-1} + \omega_{53}\text{DBFD}_{t-1} + \omega_{54}\text{EBFD}_{t-1} + \omega_{55}\text{EXTR}_{t-1} + \omega_{56}\text{FDI}_{t-1} + e_{5t} \quad (3.3e)$$

$$\text{FDI}_t = \omega_{61}\text{EXCR}_{t-1} + \omega_{62}\text{OFDE}_{t-1} + \omega_{63}\text{DBFD}_{t-1} + \omega_{64}\text{EBFD}_{t-1} + \omega_{65}\text{EXTR}_{t-1} + \omega_{66}\text{FDI}_{t-1} + e_{6t} \quad (3.3f)$$

Where;

EXTR= external reserve balance

All other variables included in equation (3.6) remains as earlier defined.

3.3 Data Analysis Technique

This study relies on the descriptive statistics as well as Vector Autoregressive model (VAR) approach as the main analytical tools to analyze the determinants of foreign direct investment in Nigeria. In order to achieve this, the unit root model test, co-integration as well as Vector Autoregressive model (VAR) approaches were used to model the relationships between fiscal deficits; financing options vis-a-viz domestic and external borrowing and macroeconomic performance in Nigeria.

3.3.1 Descriptive Statistics

One of the methods researchers normally use to investigate the cause-effect relationship between variables is through descriptive statistics. Descriptive statistics is that type of statistics that involves organizing, summarizing and presenting data in a meaningful form or usable format. Thus, in this research simple averages (i.e. mean), kurtosis, Jarque-Bera, and more were employed to analyze the trends of the variables used in this study between 1970 and 2016.

3.3.2 Unit Root Test

It is now a common practice to examine the time series properties of economic data as a guide to a subsequent multivariate modeling and inference. If we discover that the variables are integrated of order greater than or equal to one, then it could be the case that these variables are co-integrated. Hence, the study employed the Augmented Dickey-fuller test (ADF) to test for the stationarity of the variables both at level and at difference. Thus, the model is stated as follows:

$$y_t = \mu + P y_{t-1} + \varepsilon_t \quad (3.4)$$

Where μ and P are parameters and ε_t is assumed to be white noise, y is a stationary series.

If $-1 < P < 1$, if $P = 1$, y is a non-stationary series.

If the process is started at some point, the variance of y increases steadily with time and goes to infinity. If the absolute value of P is greater than one, the series is explosive. Therefore, the hypothesis of a stationarity series can be evaluated by testing whether the absolute value of P is strictly less than one. The simple unit root test described above is valid because the series is an AR (1) process. If the series is correlated at higher order lags, the assumption of white noise disturbances is violated.

The Dickey fuller tests take the unit root as the null hypothesis $H_0: P = 1$. since explosive series do not make much economic sense, this null hypothesis is tested against the one-sided alternative $H_1: P < 1$. The null hypothesis of a unit root is rejected against the one sided alternative if the t-statistic is less than the critical value (Isiwu, 2004)

3.3.3 Co-integration Tests

The co-integration (Johansen, 1995) deals with the methodology of modeling non-stationary time series variables. According to Maddala (1992) and Iyeli (2010) the theory of co-integration explains how to study the interrelationship between the long-run trends in economic variables. Basically, the idea of co-integration rests on the thesis that even though two time series may not themselves be stationary, a linear combination of the two non-stationary time series may be stationary. This study adopts the co-integration to test the existence of a long-term relationship among the variables in the five models.

3.3.4 Vector Autoregressive (VAR)

A VAR is system in which every equation has the same right hand variable, and those variables include lagged values of all of the endogenous variables. VARs are useful for forecasting systems of interrelated time series variables. VARs are also used for analyzing the dynamic impact of different types of random disturbances on systems of variables. The VAR approach sidesteps the need for structural modeling by treating every endogenous variable in the system as a function of the lagged values of all the endogenous variables in the system (Gujarati, 2009).

It has been pointed out in the literature that individual coefficients from the error-correction model are hard to interpret in the case of vector-autoregressive model. Consequently, the dynamic properties of the two models are analyzed by examining the impulse response functions and the variance decompositions.

3.3.5 Impulse Response Function

A shock to a particular variable may not only directly affect the variable but is also transmitted to all of the other endogenous variables. An impulse-response function traces the impact of a one-time shock to one of the innovations on the current and future values of the endogenous variables. The impulse-response, therefore, tells us how macro variables respond to innovations in foreign direct investment. In other words, an impulse-response will be applied to trace the reactions of the variables used in this study.

3.3.6 Forecast Error Variance Decomposition (FEVD)

While impulse-response functions trace the effects of a shock to one endogenous variable onto the other variables in the VAR, the Variance Decomposition provides information about the relative importance of each random innovation in affecting the random variables in the VAR (Hamilton, 1994). Therefore, Variance Decompositions show the magnitude of the variations in the endogenous variables.

4.0 RESULTS AND DISCUSSIONS

4.2 Data Analysis

4.2.1 Descriptive Statistics

Tables 1a and 1b below presents the result of the descriptive statistics of the variables employed in the estimations in this study.

Table 1a: Descriptive Statistics Results

	INFL	OFDE	DBFD	EBFD	EXCR
Mean	18.58957	-245079.5	1605096.	928822.9	58.81478
Median	12.88000	-15134.70	273836.4	451461.7	21.88610
Maximum	72.84000	202724.7	1105820.4	4890270.	253.4923
Minimum	3.460000	-2208222.	987.3000	175.0000	0.546400
Std. Dev.	16.06534	490515.4	2713923.	1318736.	70.74818
Skewness	1.845076	-2.284982	1.947913	1.613844	0.818461
Kurtosis	5.533704	7.822578	5.875914	4.477524	2.378138
Jarque-Bera	39.23888	86.44441	45.91966	24.67706	6.004696
Probability	0.000000	0.000000	0.000000	0.000004	0.049670
Sum	873.7100	-1151873.5	7543950.4	4365467.7	2764.294
Sum Sq. Dev.	11872.38	1.11E+13	3.39E+14	8.00E+13	230244.0
Observations	47	47	47	47	47

Source: Author's Computation (2017)

Table 1b: Descriptive Statistics Results

	INTR	MS	FDI	EXTR
Mean	15.07298	3196702.	265619.6	1721677.
Median	16.79000	165338.8	66787.00	40333.20
Maximum	29.80000	21607682	1360308.	8218632.
Minimum	6.000000	789.5600	1003.200	104.6000
Std. Dev.	6.209806	5830436.	401466.5	2676910.
Skewness	0.091749	1.854568	1.458880	1.213905
Kurtosis	2.265598	5.159869	3.703995	2.790583
Jarque-Bera	1.122161	36.07782	17.64249	11.62880
Probability	0.570592	0.000000	0.000148	0.002984
Sum	708.4300	1.50E+08	12484122	80918841
Sum Sq. Dev.	1773.838	1.56E+15	7.41E+12	3.30E+14
Observations	47	47	47	47

Source: Author's Computation (2017)

From tables 1a and 1b, the standard deviation showed that MS (5830436.0) was the most volatile variable in the series followed by EBFD (2713923) and DBFD (1318736). The skewness statistic showed that INFL, EXCR, DBFD, EBFD, INTR, MS, FDI AND EXTR were positively skewed while OFDE variable was negatively skewed. The kurtosis statistic showed that EXCR, INTR and EXTR were platykurtic, suggesting that their distributions were flat relative normal distribution while INFL, OFDE, DBFD, EBFD, MS, and FDI was leptokurtic, suggesting that its distribution was a peaked relative normal distribution. Based on these observations, it indicates that the series are non-stationary. However, this indication is not surprising since it involves time series data. In sum, there is unit root (non-stationarity) in the series. In such a case, the presence of unit root in the model is further supported by the values of the Jarque-Bera statistic of most of the variables (INFL, OFDE, DBFD, EBFD, MS, FDI and EXTR) in tables 1a and 1b which are above 5.99 (that is, the Jarque-Bera statistic rejects the null hypothesis of normal distribution for all the variables at 5 percent critical value) depicting the presence of unit root.

Based on these observations, it is therefore necessary to test for the long run relationship of the series. This we begin by testing for unit root of the series. The unit root test is conducted so as to make the variables stationary. The study adopts the Dickey and Fuller (1979) method called Augmented Dickey Fuller (ADF) unit root tests procedures.

4.2.2 Unit Root Test

Tables 2, 3 and 4 below present the results of the stationarity test for each of the variables used in this study. The Augmented Dickey Fuller (ADF) test was tested with intercept but no trend.

Table 2: ADF Test Results at Level

Variables	ADF test Statistic	ADF Critical Value	Level of Significance	Remark
INFL	-3.352121	-2.926622	5%	Stationary
EXCR	2.014691	-2.926622	5%	Non Stationary
OFDE	1.460327	-2.926622	5%	Non Stationary
DBFD	-6.268916	-2.936942	5%	Stationary
EBFD	-2.023845	-2.928142	5%	Non Stationary
INTR	-1.647287	-2.928142	5%	Non Stationary
MS	2.027039	-2.931404	5%	Non Stationary
FDI	9.203682	-2.941145	5%	Non Stationary
EXTR	-0.877330	-2.938987	5%	Non Stationary

Source: Author's Computation (2017)

The results of the unit root test in table 2 reveals that INFL and DBFD variables were stationary at level while all the other variables were non stationary at level. We therefore accept the unit root null hypothesis indicating the presence of a unit root at levels and then proceed to employ first differentiation approach to establish the order of integration of the variables using the Augmented Dickey Fuller tests unit root test as presented in the table 3 below.

Table 3: ADF Test Results at 1st Difference

Variables	ADF test Statistic	ADF Critical Value	Level of Sign	Order of Integration	Remark
EXCR	-4.035462	-2.928142	5%	I(1)	Stationary
OFDE	-5.965287	-2.928142	5%	I(1)	Stationary
EBFD	-3.860411	-2.928142	5%	I(1)	Stationary
INTR	-10.65209	-2.928142	5%	I(1)	Stationary
MS	-3.325341	-2.945842	5%	I(1)	Stationary
FDI	1.971444	-2.943427	5%	-	Non Stationary
EXTR	-2.124853	-2.943427	5%	-	Non Stationary

Source: Author's Computation (2017)

Table 4: ADF Test Results at 2nd Difference

Variables	ADF test Statistic	ADF Critical Value	Level of Sign	Order of Integration	Remark
FDI	-8.281047	-2.943427	5%	I(2)	Stationary
EXTR	-4.392813	-2.948404	5%	I(2)	Stationary

Source: Author's Computation (2017)

Tables 3 and table 4 revealed that EXCR, OFDE, EBFD, INTR and MS were stationary in their first difference while FDI and EXTR were stationary in the second difference. Hence, the study then concluded that the variables of the model are integrated of order two. Having stabilized and stationarized the data, we now conduct the co-integration test.

4.2.3 Co-integration Test Results

Since all the variables were integrated of order 1 and 2, we turned to determine the existence of long run equilibrium relationship between the variables. Separate co-integration tests were carried out on fiscal deficits; financing options vis-a-viz domestic and external borrowing with respect to their relationship with Inflation (INFL) and Exchange rate (EXCR).

Non-stationary time-series can be co-integrated if there are linear combinations of them that are stationary, that is, the combination does not have a stochastic trend. In other words, if two or more I(1) variables are co-integrated, they must obey an equilibrium relationship in the long-run, although they may diverge substantially from that equilibrium in the short run.

The co-integration tests are based on the Johansen and Juselius (1989) test. Tables 5 and 6 present the co-integration test results.

Table 5: Co-integration Results for Model Two: INFL, OFDE, DBFD, EBFD, INTR, EXCR and MS

Unrestricted Cointegration Rank Test (Trace)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.925508	321.4695	125.6154	0.0000
At most 1 *	0.857490	204.6014	95.75366	0.0000
At most 2 *	0.637282	116.9261	69.81889	0.0000
At most 3 *	0.578671	71.29019	47.85613	0.0001
At most 4 *	0.385383	32.39486	29.79707	0.0246
At most 5	0.175144	10.49083	15.49471	0.2449
At most 6	0.039771	1.826261	3.841466	0.1766
Trace test indicates 5 cointegrating eqn(s) at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon-Haug-Michelis (1999) p-values				
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.925508	116.8681	46.23142	0.0000
At most 1 *	0.857490	87.67534	40.07757	0.0000
At most 2 *	0.637282	45.63587	33.87687	0.0013
At most 3 *	0.578671	38.89533	27.58434	0.0012
At most 4 *	0.385383	21.90403	21.13162	0.0389
At most 5	0.175144	8.664569	14.26460	0.3151
At most 6	0.039771	1.826261	3.841466	0.1766
Max-eigenvalue test indicates 5 cointegrating eqn(s) at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon-Haug-Michelis (1999) p-values				

Source: Author's Computation (2017)

The co-integration results in table 5 for model two (INFL, OFDE, DBFD, EBFD, INTR, EXCR and MS) reveals that both trace test and the Max-eigenvalue test indicates 5 co-integrating equation(s) at the 5 percent level of significance. Thus there is a long-run relationship between the variables (INFL, OFDE, DBFD, EBFD, INTR, EXCR and MS). We therefore reject the null hypothesis of no co-integration amongst the variables but we do not reject the alternative hypothesis.

Table 6: Co-integration Tests for Model Five: EXCR, OFDE, DBFD, EBFD, EXTR and FDI

Unrestricted Cointegration Rank Test (Trace)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.921297	326.9481	95.75366	0.0000
At most 1 *	0.832766	212.5546	69.81889	0.0000
At most 2 *	0.714882	132.0783	47.85613	0.0000
At most 3 *	0.705823	75.60995	29.79707	0.0000
At most 4 *	0.288035	20.54908	15.49471	0.0079
At most 5 *	0.110344	5.261412	3.841466	0.0218
Trace test indicates 6 cointegrating eqn(s) at the 0.05 level * denotes rejection of the hypothesis at the 0.05 level **MacKinnon-Haug-Michelis (1999) p-values				
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.921297	114.3936	40.07757	0.0000
At most 1 *	0.832766	80.47629	33.87687	0.0000
At most 2 *	0.714882	56.46831	27.58434	0.0000
At most 3 *	0.705823	55.06087	21.13162	0.0000
At most 4 *	0.288035	15.28767	14.26460	0.0343
At most 5 *	0.110344	5.261412	3.841466	0.0218
Max-eigenvalue test indicates 6 cointegrating eqn(s) at the 0.05 level * denotes rejection of the hypothesis at the 0.05 level **MacKinnon-Haug-Michelis (1999) p-values				

Source: Author's Computation (2017)

The co-integration results in table 6 for model five (EXCR, OFDE, DBFD, EBFD, EXTR and FDI) reveals that both the trace test and the Max-eigenvalue test also indicate 6 co-integrating equation(s) at the 5 percent level of significance. This suggests that there is a long-run relationship between the variables. We therefore reject the null hypothesis of no co-integration amongst the variables but we do not reject the alternative hypothesis.

Having established that the variables in all of our five models above are co-integrated (Co-integrating Vector) at 5% level of significance in each case, we therefore proceed to estimate our Vector Auto Regression (VAR) model.

4.2.4 VAR Lag Order Selection

The first step in model building, impulse response analysis and decomposition of the forecast error variance is the selection of the lag order. In this study we use some commonly used lag-order selection criteria to choose the lag order, such as the "Akaike information criterion (AIC)", "Schwartz criterion (SC)", "Hannam-Quinn criterion (HQC)" and "final prediction error (FPE)" to determine the optimum lag and then analyze the residuals.

Table 7: Optimum Lag Test

AIC	2
SC	2
HQC	2
FPE	2

Source: Author's Computation (2017)

Table 4.11 shows that lag 2 is chosen as the optimum lag in the specification of VAR model on the relationship between fiscal deficit and macroeconomic performance in Nigeria between 1970 and 2016. Thus, we now estimate and analyze the VAR, impulse response and decomposition of the forecast error variance.

4.2.5 Impulse Response Analysis and Variance Decomposition

Since the long-run relationship has been established amongst the variables in the five models, their dynamic properties are further supplemented by the impulse response analysis and forecast error variance decomposition. The first difference of the series can be estimated by inverting the VAR into a moving average representation after which the impulse response as well as the variance decomposition can be estimated.

4.2.5a Impulse Response Function (IRF) Analysis

The impulse response analysis is presented in tables 8 and 9 below. It presents a fraction of the impulse response analysis for each variable in the five models that is attributed to its own innovations and to innovations in other variables.

Table 8: Impulse Response Function for Model Two: INFL = f(OFDE, DBFD, EBF, INTR, EXCR, MS)

Period	INFL	OFDE	DBFD	EBFD	INTR	EXCR	MS
1	13.42977	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
2	8.425409	0.903839	-0.248884	-0.319118	1.403342	-1.802227	-0.250586
3	-0.945735	3.589766	-1.468609	-0.069431	4.022628	-1.665873	-0.213890
4	-3.282706	3.266446	-2.580277	-0.645425	4.238053	-1.592653	-0.369789
5	-1.165821	1.996922	-2.153886	-1.051439	2.610140	-0.825741	-0.241338
6	0.498212	1.389022	-2.431344	-1.778635	1.715098	0.102272	-0.201081
7	0.852965	1.684019	-2.489047	-1.888711	1.297219	0.108348	0.004757
8	0.261527	2.599591	-2.064314	-1.659686	1.374653	-0.044990	-0.376581
9	-0.113423	2.685300	-1.662559	-1.402065	1.335067	-0.121035	-0.378501
10	0.052617	1.382098	-1.407459	-1.328047	0.998795	-0.056014	-0.621950

Source: Author's Computation (2017)

Table 8 (Inflation (INFL) model) present the results of the impulse response function for model two. From table 8 above, the response of Inflation (INFL) to one standard innovation in fiscal deficit (OFDE) is all positive at each time responsive period in the long-run. This implies that OFDE has a positive relationship with INFL in the long-run as shown in figure 1 below.

Figure 1: Response of INFL to OFDE

The response of Inflation (INFL) to one standard innovation in the size of fiscal deficit financed by both domestic (DBFD) is all negative at each time responsive period in the long-run. This implies that INFL has a negative relationship with DBFD in the long-run as shown in figure 2 below.

Figure 2: Response of INFL to DBFD

The response of Inflation (INFL) to one standard innovation in the size of fiscal deficit financed by external (EBFD) borrowing is all negative at each time responsive period in the long-run. This implies that INFL has a negative relationship with EBFD in the long-run as shown in figure 3 below.

Figure 3: Response of INFL to EBFD

The response of Inflation (INFL) to one standard innovation in Interest Rate (INTR) is all positive at each time responsive period in the long-run. This implies that INTR on the average has a positive relationship with INFL in the long-run as shown in figure 4 below.

Figure 4: Response of INFL to INTR

The response of Inflation (INFL) to one standard innovation in Exchange Rate (EXCR) is all negative at each time responsive period in the long-run except in periods 6 and 7. This implies that EXCR on the average has a negative relationship with INFL in the long-run as shown in figure 5 below.

Figure 5: Response of INFL to EXCR

The response of Inflation (INFL) to one standard innovation in Money Supply (MS) is all negative at each time responsive period in the long-run except in the 7th period. This implies that MS has a negative relationship with INFL in the long-run as shown in figure 6 below.

Figure 6: Response of INFL to MS

Table 9: Impulse Response Function for Model Five: $EXCR = f(OFDE, DBFD, EBF, EXTR, FDI)$

Period	EXCR	OFDE	DBFD	EBFD	EXTR	FDI
1	12.36180	0.000000	0.000000	0.000000	0.000000	0.000000
2	13.39375	-0.039471	-1.484123	1.891804	-3.141797	0.323962
3	12.76615	1.054617	1.957053	6.457456	-2.071763	-0.823352
4	13.70607	-0.357235	2.747287	6.542624	-1.548712	-2.689669
5	13.12921	-2.288306	3.867180	5.355670	-1.314496	-2.538366
6	10.98287	-4.558225	5.269954	6.057713	-0.905562	-1.896945
7	9.674074	-5.864813	7.871787	8.600255	-1.365161	-1.680154
8	9.094808	-7.477257	10.19372	9.825237	-1.619963	-1.324112
9	8.485924	-10.64479	11.48786	10.30104	-2.009107	-1.534620
10	7.316368	-13.82564	13.34135	10.79555	-1.734679	-1.263179

Source: Author's Computation (2017)

Table 9 (Exchange Rate (EXCR) model) present the results of the impulse response function for model five. From table 9 above, the response of Exchange Rate (EXCR) to one standard innovation in the overall fiscal deficit (OFDE) is all negative at each time responsive period in the long-run except in the 3rd period. This implies that OFDE has a negative relationship with EXCR in the long-run as shown in figure 7 below.

Figure 7: Response of EXCR to OFDE

The response of Exchange Rate (EXCR) to one standard innovation in the size of fiscal deficit financed by domestic borrowing (DBFD) is all positive at each time responsive period in the long-run except in the 2nd period while that of the size of fiscal deficit financed by external borrowing (EBFD) is all positive at each time responsive period in the long-run. This implies that EXCR has a positive relationship with DBFD and EBFD in the long-run as shown in the table above.

Figure 8: Response of EXCR to DBFD

The response of Exchange Rate (EXCR) to one standard innovation in the size of fiscal deficit financed by domestic borrowing (DBFD) is all positive at each time responsive period in the long-run except in the 2nd period. This implies that EXCR has a positive relationship with DBFD in the long-run as shown in figure 9 below.

Figure 9: Response of EXCR to EBF

The response of Exchange Rate (EXCR) to one standard innovation in External Reserve Balance (EXTR) is all negative at each time responsive period in the long-run. This implies that EXTR have a negative relationship with EXCR in the long-run as shown in figure 10 below.

Figure 10: Response of EXCR to EXTR

The response of Exchange Rate (EXCR) to one standard innovation in Foreign Direct Investment (FDI) is all negative at each time responsive period in the long-run except in the 2nd period. This implies that FDI have a negative relationship with EXCR in the long-run as shown in figure 11 below.

Figure 11: Response of EXCR to FDI

4.2.5b Forecast Error Variance Decomposition (FEVD) Analysis

The forecast error variance decomposition analysis is presented in tables 10 and 11 below. It presents a fraction of the forecast error variance decomposition for each variable in the five models that is attributed to its own innovations and to innovations in other variables. The variance decomposition was estimated so as to see the forecast error

components of each of the variables originating from shocks in the system. The ordering of the variables in the variance decomposition is vital and this is stated in tables 10 and 11 below over the same forecasting horizon for a period of ten (10) years.

Table 10: Forecast Error Variance Decomposition for Model Two: INFL = f(OFDE, DBFD, EBFD, INTR, EXCR, MS)

Period	S.E.	INFL	OFDE	DBFD	EBFD	INTR	EXCR	MS
1	13.42977	100.00000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
2	16.05014	97.56960	0.317121	0.024046	0.039532	0.764486	1.260843	0.024376
3	17.10415	86.22079	4.684074	0.758414	0.036457	6.204336	2.058832	0.037102
4	18.48531	76.97152	7.132733	2.597722	0.153123	10.56813	2.504985	0.071783
5	18.98292	73.36620	7.870302	3.750734	0.451991	11.91195	2.564595	0.084232
6	19.35449	70.64251	8.086069	5.186184	1.279324	12.24423	2.469861	0.091823
7	19.73871	68.10582	8.502207	6.576360	2.145577	12.20409	2.377656	0.088288
8	20.13684	65.45623	9.835916	7.369802	2.740886	12.19230	2.285066	0.119805
9	20.47892	63.29079	11.22944	7.784730	3.118812	12.21338	2.212856	0.149996
10	20.65022	62.24580	11.49186	8.120656	3.480883	12.24554	2.177033	0.238229

Source: Author's Computation (2017)

Table 10 (INFL model) present the results of the variance decomposition for model two. It shows that 100 percent of variance in Inflation Rate (INFL) in period 1 is explained by the shock from the variable itself. This implies that there was no shock from other variables. In period 2, 97 percent of the variance in Inflation Rate (INFL) was explained by the shock from the variable itself; 0.31 percent from fiscal deficit (OFDE); 0.02 percent from the size of fiscal deficit financed by domestic borrowing (DBFD); 0.03 percent from the size of fiscal deficit financed by external borrowing (EBFD); 0.76 percent from Interest Rate (INTR); 1.26 percent from Exchange Rate (EXCR); and 0.02 percent from Money Supply (MS).

Inferences from period 2 to 10 shows that apart from the variance due to the shock from the variance of Inflation Rate (INFL) itself, Interest rate (INTR) is the variable with the highest percentage of induced variance on Inflation Rate (INFL) of about 12 followed by overall fiscal deficit (OFDE) of about 11 percent in period 10 while DBFD, EBFD, EXCR and MS induce 8 percent, 3 percent, 2 percent and 0.23 percent respectively.

Table 11: Forecast Error Variance Decomposition for Model Five: EXCR = f(OFDE, DBFD, EBFD, EXTR, FDI)

Period	S.E.	EXCR	OFDE	DBFD	EBFD	EXTR	FDI
1	12.36180	100.0000	0.000000	0.000000	0.000000	0.000000	0.000000
2	18.65384	95.47112	0.000448	0.633000	1.028527	2.836743	0.030161
3	23.71816	88.02419	0.197986	1.072379	8.048628	2.517653	0.139162
4	28.46966	84.27136	0.153160	1.675497	10.86752	2.043326	0.989138
5	32.24816	82.25578	0.622893	2.743933	11.22819	1.758701	1.390506
6	35.35861	78.06853	2.180009	4.503789	12.27475	1.528480	1.444443
7	38.97218	70.42422	4.059121	7.787094	14.97383	1.380878	1.374860
8	43.15415	61.87792	6.312719	11.93078	17.39600	1.267128	1.215449
9	47.87564	53.41668	10.07261	15.45129	18.76350	1.205631	1.090283
10	53.25312	45.06093	14.88139	18.76470	19.27496	1.080545	0.937473

Source: Author's Computation (2017)

Table 11 (EXCR model) present the results of the variance decomposition for model five. It shows that 100 percent of variance in Exchange Rate (EXCR) in period 1 is explained by the shock from the variable itself. This implies that there was no shock from other variables. In period 2, 95 percent of the variance in Exchange Rate (EXCR) was explained by the shock from the variable itself; 0.0004 percent from fiscal deficit (OFDE); 0.63 percent from the size of fiscal deficit financed by domestic borrowing (DBFD); 1.02 percent from the size of fiscal deficit financed by external borrowing (EBFD); 2.83 percent from External Reserve balance (EXTR) and 0.03 percent from foreign direct investment (FDI).

Inferences from period 2 to 10 shows that apart from the variance due to the shock from the variance of Exchange Rate (EXCR) itself, the size of fiscal deficit financed by external borrowing (EBFD) is the variable with the highest percentage of induced variance on Exchange Rate (EXCR) of about 19 percent followed by the size of fiscal deficit financed by domestic borrowing (DBFD) while OFDE, EXTR, and FDI induce 14 percent, 1 percent, and 0.93 percent respectively.

4.4 DISCUSSION OF FINDINGS

The result of the variance decomposition analysis shows that the percentage of variance explained by own shocks for inflation (INFL) declines to about 97 percent in the second period and continues falling until it ends with an average of about 62 percent in the 10th period. The study further reveals that inferences from periods 2 to 10 shows that the percentage variance in inflation (INFL) due to shocks from overall fiscal deficits (OFDE) increased at a constant rate from about 0.32 percent in period 1 to 7.87 percent in period 5 and to an average of about 11.49 percent in period 10. Also, the percentage variance in inflation (INFL) due to shocks from the size of fiscal deficits financed by both domestic and external borrowing maintained a constant rate of increase from the 2nd period to the 10th period. That is, it increased from steadily from 0.02 percent and 0.4 percent respectively in period 2 to 5. 18 percent and 1.27 percent respectively in period 6 to an average of about 8.12 percent and 3.48 percent respectively in period 10. Again, the percentage variance in inflation (INFL) due to shocks from interest rate (INTR), exchange rate (EXCR) and money supply (MS) shows a constant rate of increase within the period under review. It shows INTR, EXCR and MS increased at a constant rate of 0.76 percent, 1.26 percent and 0.24 percent respectively in period 2 to 11.91 percent, 2.56 percent and 0.08 percent respectively in period 5 and to 12.24 percent, 2.17 percent and 0.24 percent respectively in period 10.

In sum, the study reveals that among the endogenous variables, the shocks due to interest rate (INTR) contributes more to variance in inflation (INFL) with an average of about 12 percent followed by overall fiscal deficits (OFDE) with an average of about 11 percent and then the size of fiscal deficits financed by domestic borrowing (DBFD) with an average of about 8 percent within the period under review. This implies that interest rate (INTR), overall fiscal deficits (OFDE) and the size of fiscal deficits financed by domestic borrowing (DBFD) are the main shocks causing the variation in inflation (INFL) in Nigeria within the period of study. This finding is reasonably true giving that fiscal deficits are chiefly financed via domestic borrowing with higher interest rate compare to external sources. This finding supports the works of Solomon and Wet (2004), Jose, Alexandra and Tiago (2014) and Bon (2015). These scholars have found interest rate, fiscal deficit and domestic debt causes inflation in an economy especially developing economies with inefficient and under developed financial systems like ours.

The empirical result from the variance decomposition analysis shows that the percentage of variance explained by own shocks for exchange rate (EXCR) declines to about 95 percent in the second period and continues falling until it ends with an average of about 45 percent in the 10th period.

The study further reveals that inferences from periods 2 to 10 shows that the percentage variance in exchange rate (EXCR) due to shocks from overall fiscal deficits (OFDE) increased steadily from 0.0004 percent in period 2 to 0.62 percent in period 5 and to an average of about 14.88 percent in period 10. Also, the percentage variance in exchange rate (EXCR) due to shocks from the size of fiscal deficits financed by both domestic and external borrowing maintained a constant rate of increase from the 2nd period to the 10th period. That is, it increased from steadily from 0.63 percent and 1.03 percent respectively in period 2 to 4.50 percent and 11.22 percent respectively in period 5 to an average of about 18.76 percent and 19.27 percent respectively in period 10. Again, the percentage variance in exchange rate (EXCR) due to shocks from external reserve balance (EXTR) decreased steadily from 2.83 percent in period 2 to 1.75 percent in period 5 and to an average of about 1.08 percent in period 10 while the percentage variance in exchange rate (EXCR) due to shocks from foreign direct investment (FDI) increased from 0.03 percent in period 2 1.44 percent in period 6 and later decreased steadily until it ends in 0.93 percent in period 10.

In sum, the study reveals that among the endogenous variables, the shocks due to the size of fiscal deficits financed by external borrowing (EBFD) contributes more to variance in exchange rate (EXCR) with an average of about 19 percent followed by the size of fiscal deficits financed by domestic borrowing (DBFD) with an average of

about 18 percent and then overall fiscal deficits (OFDE) with an average of about 15 percent within the period under review. This implies that the size of fiscal deficits financed by public borrowing, that is, both domestic (DBFD) and external borrowing (EBFD) and overall fiscal deficits (OFDE) are the main shocks causing the variation in exchange rate (EXCR) in Nigeria within the period of study. This finding confirms with the works of previous studies such as Awan, Asghar and Rehman (2011), Taiwo and Abayomi (2011), Hassan, Abubakar and Abu (2015), Udeh, Ike and Onuka (2016). These scholars have found that increased public borrowing both domestic and external borrowings to finance fiscal deficit has caused the instability of exchange rate in Nigeria.

5.0 SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary of the Major Findings

The study found a cointegrating (or long run) relationships between fiscal deficits; financing options vis-a-viz domestic and external borrowing and macroeconomic stability as measured by inflation rate and exchange rate in Nigeria.

On the impulse response functions, the study summarily found out that; the response of inflation to one standard innovation in overall fiscal deficit (OFDE), the size of fiscal deficits financed by domestic borrowing (DBFD) and the size of fiscal deficits financed by external borrowing (EBFD) at each time responsive period on the average are positive, negative and negative respectively in the long-run in Nigeria; the response of domestic private sector credit to one standard innovation in overall fiscal deficit (OFDE), the size of fiscal deficits financed by domestic borrowing (DBFD) and the size of fiscal deficits financed by external borrowing (EBFD) at each time responsive period on the average are negative, positive and negative respectively in the long-run in Nigeria; as well as the response of exchange rate to one standard innovation in overall fiscal deficit (OFDE), the size of fiscal deficits financed by domestic borrowing (DBFD) and the size of fiscal deficits financed by external borrowing (EBFD) at each time responsive period on the average are negative, positive and positive respectively in the long-run in Nigeria.

Finally, the forecast error variance decomposition results found out that in relation to inflation, Interest rate (INTR), overall fiscal deficits (OFDE) and the size of fiscal deficits financed by domestic borrowing (DBFD) are the main shocks causing the variation in inflation (INFL) in Nigeria within the period of study. In the same manner, the size of fiscal deficits financed by public borrowing, that is, both domestic (DBFD) and external borrowing (EBFD) and overall fiscal deficits (OFDE) are the main shocks causing the variation in exchange rate (EXCR) in Nigeria within the period of study.

5.2 CONCLUSIONS

The study examines empirically the relationships between fiscal deficits; financing options vis-a-viz domestic and external borrowing and macroeconomic stability in Nigeria between 1970 and 2016. In order to achieve this objective, descriptive statistics, co-integration and vector auto regression (VAR) estimation methods were employed to analyze the data.

The result of the analysis reveals that overall fiscal deficit (OFDE), especially the size financed by domestic borrowing (DBFD) is inflationary in Nigeria. This is unconnected to sustained domestic borrowing used in financing fiscal deficits which fuel increases in interest rate which in turn lead to inflationary pressure in Nigeria. The finding also shows that the size of fiscal deficits financed by public borrowing, that is, both domestic (DBFD) and external borrowing (EBFD) and overall fiscal deficits (OFDE) are the main shocks causing the variation in exchange rate (EXCR) in Nigeria within the period of study.

The study, therefore, concludes that fiscal deficits have chiefly contributed to macroeconomic instability measured in terms of inflation and exchange rate stability in Nigeria. Although fiscal deficit objectives may be well intended to stimulate economic growth and employment, its negative impact on inflation and exchange rate would erode possible expansionary impact on output, thereby, resulting into poor macroeconomic performances in Nigeria. These findings may not be unconnected with the nature of Nigeria's fiscal operation which is characterized by fiscal indiscipline, wastes, systemic corruption and unsustainable debt burden, given that deficits are chiefly financed through public borrowing in Nigeria.

5.3 RECOMMENDATIONS

1. Fiscal deficits should be moderated. The negative macroeconomic effects of unrestricted fiscal deficits regime as in the case of Nigeria, far outweigh any gain these deficits can produce. Whatever gains recorded by fiscal deficits in terms of output growth would be eroded by high inflation and interest rates, which were found to have been significantly fuelled by fiscal deficits. Government should, therefore, moderate the level of fiscal deficits and financing of deficits through public borrowing for effective control of inflation rate in Nigeria. The need arises because increase in fiscal deficit increases money supply which negatively affects output growth in the long run.
2. Government should adopt fiscal adjustment mechanism that increases revenue through improved taxes rather than borrowing to finance deficit and dependence on crude oil. With appropriate adjustments and reforms in place, Nigeria has enormous capacity to increase revenue from taxes to finance her fiscal expenditures. Nigeria's tax to GDP ratio that is currently at about 6 percent indicates huge underutilized capacity to generate revenue through taxes. This would lessen the over reliance on public borrowing to finance government expenditures.
3. Effective monetary policy. For fiscal deficits to benefit Nigeria, the monetary authorities must collaborate with fiscal managers by promoting effective monetary policies that could counteract fiscal excesses.
4. Decimation of Systemic Corruption. Suffice it to say that systemic corruption is one of the main reasons fiscal deficits have not positively impacted macroeconomic indicators in Nigeria. Corruption which is cancerous to every system or society seems to have been institutionalized and 'normalized' in Nigeria. If Nigeria must decimate and defeat systemic corruption, the 'fight' must be moved from investigative to preventive. Our value systems, norms and way of thinking (institutions) which moral corruption has eroded and made weak, must be restored and made strong, otherwise, Nigeria is gradually drifting into extinction.

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