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Public Debt, Domestic Investment And Foreign Direct Investment In Nigeria: A Structural Var Approach (1981-2015)

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Abstract: ***Nigeria escalating debt crisis has severe implications on her aggregate level of economic activities, particularly its adverse effect on investment inflows. Therefore, this study examines the response of domestic investment and foreign direct investment to shocks from public debt. In addition, the study adopts the Structural Vector Autoregressive Framework (SVAR) to trace the response of non-policy variables (public debt, domestic investment and foreign direct investment) to shocks from domestic policy variables (real exchange rate and lending interest rate). It covers the period of investigation from 1981-2015 as an alternative framework for addressing the weaknesses of prior economic planning and revenue shortfall. Key findings which examines the response of domestic investment and foreign direct investment to shocks from public debt revealed that high foreign debt simultaneously increases internal debt, since part of domestic borrowing goes into the servicing of the external debt obligation, interest, and capital repayment. Thus, as public debt rises, credits to private sector are crowded out and subsequently domestic investment decline over time. However, FDI failed to respond to shocks from public debt as high indebted profile countries tend to reduce FDI inflows. Similarly, result obtained from the Impulse Response Analysis revealed that domestic investment would continuously fall as exchange rate depreciates since most Nigerian goods are imported but real exchange rate depreciation encourages the inflow of foreign direct investment to the host country. However FDI exhibit insignificant response from interest rate. Implying that an increase in the rate of interest couple with the high inflation in Nigeria, lowers the expectation of foreign investors and subsequently reduce the flow of FDI. Therefore, this study recommends that the Nigerian government policy response should be targeted towards encouraging FDI inflows in order to generate employment opportunities which creates revenue to the government leading to reduction in deficit financing of the government.***

Keywords: Public Debt, Domestic Investment, FDI, SVAR and Nigeria

I. INTRODUCTION

Public debt has been seen as one of the ways in which developing countries can complement their low capital stock given their high marginal returns on capital but over the years facts has shown that these public debts has not yielded its desired result as a result of the non-utilization of the funds for the infrastructural and developmental purposes in which they were acquired due to corruption and some fiscal indiscipline as well as the high interest rates in which these are acquired thereby making debt repayment and servicing highly problematic and not sustainable. This non-sustainability has hindered the goal of achieving an inclusive growth and most

importantly led to the deterioration of external reserves at a significant proportion.

Ajayi (2012) defines public debt as a measure for bridging the gap between saving-investment in order to secure further investment required to sustainable growth and development. Therefore, in a bid to provide basic infrastructural facilities, employment, social securities, subsidized goods and services government in developing countries resort to borrowing since their revenue are usually inadequate to finance its expenditures. Public debt as a source of finance for the government to aid developmental projects plays a crucial role for achieving sustainable growth for the Nigerian economy; however debts becomes a burden to its debtors when diverted from its initial purpose for personal gains. In addition, when debt is not well appropriated and managed, it discourages the flow of investment.

Previous studies has shown that high level of debt service payment in Nigeria had prevented the country from undertaking more volume of domestic investment, which could have foster sustained economic growth and development (Oke & Suleiman, 2012; Adepoju, Salau & Obayelu, 2007). Therefore appropriate and efficient utilization of debt management must be embarked on to induce productive capacity and economic growth through resourceful capital projects.

A rising public debt stock shows an increasing burden on production and external reserve depletion. An increase in debt service which is exacerbated by huge accumulation of stock of debt which will not necessarily result in an increased budget deficit. To finance this deficit, the government has to borrow from external or internal sources but, in a situation when such borrowing is excessive, it could crowd out investment in the private sector increasing burden on external reserve. Hence, there is a competition between government and private sector for private savings, this will drive up interest rate due to the demand for limited financial resources which will increase the cost of borrowing and budget deficit (Mama, Owino & Mutai, 2008). Therefore, this study examines the relationship between public debt, Domestic Investment and Foreign Direct Investment in Nigeria.

II. SCOPE OF THE STUDY

This study covers the period 1981-2015. This scope provides a long period dynamic of variables and their effect on the performance of the Nigerian Debt profile. The Structural Adjustment Program (SAP) was adopted in 1986, as a substitute for addressing the weaknesses and ineffectiveness of previous development planning and revenue shortfall which brought about unconstrained external borrowing. Hence, the study covers both the pre SAP and the post SAP years.

III. LITERATURE REVIEW

Public debt usually forms a major portion of the total supply of credit in the economy, liquidity variation in it becomes an important policy tool in the hands of the authority Bhatia (2009). However, governments usually mobilise public debt resources to undertake large capital investment projects in order to finance these projects, the net effect of the budget deficit will depend on whether it's crowding in or crowding out foreign and private investments.

Crowding in effect occurs when the government increases private sector investment through the undertaking of capital projects such as road infrastructure, hydro-power, education or health care facilities which ultimately reduces the marginal cost of producing one unit of output for the private sector Piana (2001). This entails that the large public spending directed towards the production of capital goods can potentially increase the stock of public capital investments and thus crowd in private sector participation. The Keynesians provide an argument to the crowding-out effect by making a reference to the expansionary effects of budget deficits. They argue that usually budget deficits result in a rise in domestic production, which makes private investors to become more optimistic about the future.

Juárez and Almada (2016) examine the relationship between public debt of state governments, public investment and economic growth in Mexico. They employed dynamic models of panel data and Generalized Method of Moments with evidence from 32 states from 1993 to 2012. The study found that public debt is positively correlated with public investment and that this in turn generates economic growth.

Azeez, Oladapo and Aluko (2015) evaluate the impact of external debt and foreign direct investment on the growth of Nigeria through an error correction modeling approach. They found that external debt is inversely and insignificantly related to economic growth while foreign direct investment is also inversely and significantly related. Also, Awan, Ahmad, Shahid and Hassan (2014) evaluate the factors that influence FDI inflow in Pakistan from 1988 to 2012; they found that national income, domestic investment (gross capital formation) and exports have positive and significant influence on foreign direct investment (FDI) in the country while external debt and imports are negative factor.

Godfrey and Cyrus (2013) assessed the development in public domestic debt and economic growth nexus of Kenya. They opined that the need for government to formulate and implement prudent domestic debt management strategies to mitigate the effects of the rising debt level. The researchers use advanced econometric technique like VAR and ECM with quarterly time series data spanning from 2000 to 2010. The findings of this study shows that domestic debt expansion has a positive, long run and significant effect on economic growth. In view of this, the study recommends that the Kenyan government should encourage sustainable domestic borrowing provided the funds are utilized in productive economic avenues.

In Nigeria, Asogwa and Chetachukwu (2013) investigated the relationship between budget deficit and private investment in Nigeria. Their study found out that there is crowding-out effect of deficit financing on private investment in the country.

Also, Paiko (2012) examined deficit financing and its implication on private investment. His findings revealed a negative relationship between deficit financing and investment in the period, which implies that deficit financing crowds out private investment.

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Ejigayehu (2013) employing panel data for eight highly indebted poor counties in Africa from 1991 to 2010, in order to assess whether foreign debt influences economic growth through debt crowding-out effect or debt overhang effect. The study found that economic growth is affected by debt crowding-out effect rather than debt overhang.

Aminu, Ahmadu and Salihu (2013) investigated the effect of domestic and foreign debts on economic growth in Nigerian from 1970 to 2010 using Ordinary Least Square (OLS) method and Granger causality test. They found that external debt and internal debt influence economic growth inversely and directly. Also, there is bi-directional causality test between foreign debt and economic growth with no causality between internal debt and economic growth.

A similar study by Obi and Abu (2009), explained that fiscal deficits and government debt have a positive impact on the interest rate which adversely affect private credits. The study used Vector Autoregressive model covering a period of 1985 to 2006 and found evidence that deficit financing leads to a huge debt stock and tends to crowd out private sector investment.

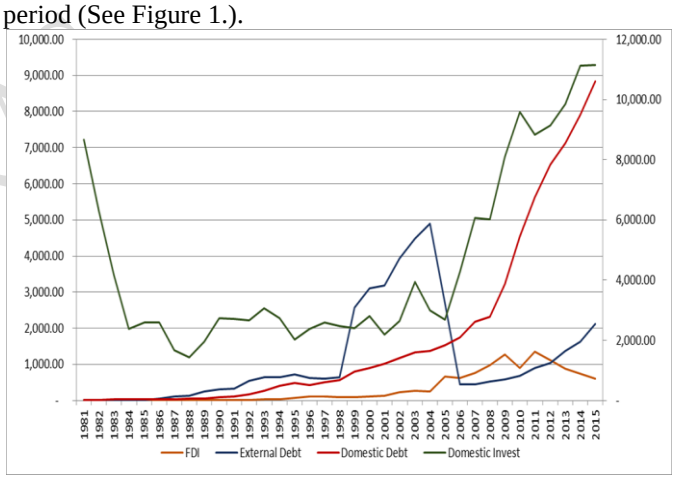
In conclusion, previous studies conducted on public debt focused on the relationship between external debt and economic growth, public debt and private investment, the impact of domestic debt on private investment, public debt and monetary policy, debt financing and firms investment behaviour and so on (Akomolafe, 2015; Utomi, 2014; Agu, 2013; Jiming, 2010) while others studies examined fiscal deficit and its implication on private investment (Asogwa & Chitachukwu, 2013; Paiko, 2012). Although, these studies made useful attempt in assessing the relationship between debt and investment from their different perspective. However, few studies assess the relationship of both domestic investment and foreign direct investment on public debt. Specifically this paper adopts the Structural Vector Autoregressive (SVAR) Framework to examine the response of both investment behaviour to shocks from public debt for the Nigerian economy. Furthermore, based on theoretical underpinings, this paper provides discussion on the trajectory response of domestic investment and foreign direct investment to shocks from public debt.

IV. STYLIZED FACTS

TREND ANALYSIS OF DOMESTIC INVESTMENT, FDI AND PUBLIC DEBT IN NIGERIA

Investment expenditure in economic analysis is both a component of aggregate demand and an injection into the circular flow of national income. It is a crucial variable on the supply side of the economy as it is the means by which changes in the real capital stock are brought about, thereby adding to country's productive capacity. Total investment consists of both domestic and foreign investment. This study analysis the size of domestic investment primarily through gross capital formation and foreign direct investment (FDI) in Nigeria.

Due to the continuous fall in the domestic investment prior to the introduction of Structural Adjustment Program in 1986, the FDI flow into the economy rose by 233.35 percent in 1987, external debt burden upsurge 143.14 percent with 29.36 percent increase in domestic borrowing. This suggests that even with the raise in foreign investment as a result of SAP, the debt burden of the country continue to skyrocket unchecked from 1987 to 2004 (see Figure 3.2.3). The trend analysis revealed that between 2004 to 2005, domestic investment and external debt decline by 10.43 percent and 44.89 percent respectively while domestic debt rose by 11.35 percent. However, there was an unprecented increase in the flow of foreign direct investment (FDI) into the economy. This sharp rise in FDI flow in 2005 could be due to the recapitalization exercise in the banking sector which induce increase in FDI by 163.55 percent from ₦248 billion in 2004 to ₦654 billion in 2005(see Figure 3.2.3). Coupled with the low returns on external debt to GDP due largely to boost in the confidence of the foreign investors as most of the forth coming returns from investment are available for re-investment Froot & Krugman (1990). This scenario contributes to the expansion of domestic activities and the improvement of the social welfare of domestic residents. In addition, the aftermath of the global financial crisis of 2008/2009 induces 28.9 percent fall in FDI from ₦1.27 trillion in 2009 to ₦905 billion in 2010 while domestic investment, external debt and domestic debt rose marginally during the period (See Figure 1.).



Source: Author's Computation from CBN Statistical Bulletin (2015)

Figure 1: FDI, Domestic investment, Domestic and External Debt from 1981-2015 (₦Billion)

V. METHODOLOGY

Vector Autoregressive Model (VAR) is an attempt to solve problems associated with simultaneous equations. In simultaneous equation models, some variables are treated as endogenous while others are treated as exogenous or predetermined thus, in estimating such models, we need to ensure that the equations are identified either exactly or over exactly identified. According to Sims, if true simultaneity exists among a set of variables, they should be treated as equal footing in which there is no prior distinction between the endogenous and exogenous variables. In light of this, Sims (1980) introduced the standard Vector autoregression (VAR) methodology to model the joint dynamics and causal

relationships among a set of macroeconomic variables where a VAR (p), is a system of n linear equation where each equation describes the dynamics of one variable as a linear function of the previous lags of every variable in the system, including its own p lags.

The Structural Vector Autoregressive (SVAR) Models are linear combinations of exogenous shocks that brings together multiple time series analysis and economy theory to determine the dynamic response of estimated variables to various shocks that takes place within the economy. Therefore, we employed the method of SVAR to assess the response of domestic investment and foreign direct investment to shocks from public debt based on theoretical underpinings.

APPROPRIATENESS FOR THE USE OF SVAR FRAMEWORK

We adopted the SVAR model approach based on the following criterion:

- ✓ SVAR is appropriate for observing the response of external non policy variables (domestic investment, foreign direct investment and public debt) to shocks from domestic policy variables (real exchange rate and lending interest rate)
- ✓ SVAR adopts econometrics theory rather than cholesky decomposition to recover structural innovations from residual of a residual VAR
- ✓ SVAR approach is used to impose contemporaneous structural restrictions that are consistent with aprior expectations as well as prior knowledge of the Nigerian economy in order to identify the effects of various shocks.

MODEL SPECIFICATION

The model framework for this paper is based on debt overhang theory and credit crowding hypothesis as the major theoretical channels through which external and domestic debt relate to investment and economic growth. Also, this study employs a multivariate regression model based on SVAR system of equation in estimating the response of domestic investment and foreign direct investment to shocks from public debt in order to understand the relationship of several endogenous variables in the system allowing for dynamics.

$DOMINV_t$= F ($DOMINV_{t-1}$, FDI_{t-1}, $PDEBT_{t-1}$, $LENIR_{t-1}$, $INFR_{t-1}$, EXC_{t-1}) …….. (1)

FDI_t= F (FDI_{t-1}, $DOMINV_{t-1}$, $PDEBT_{t-1}$, $LENIR_{t-1}$, $INFR_{t-1}$, EXC_{t-1}) …….(2)

$PDEBT_t$ = F ($PDEBT_{t-1}$, $DOMINV_{t-1}$, FDI_{t-1}, $LENIR_{t-1}$, $INFR_{t-1}$, EXC_{t-1}) ……. (3)

LENIR= F ($LENIR_{t-1}$ $DOMINV_{t-1}$, FDI_{t-1}, $PDEBT_{t-1}$, $INFR_{t-1}$, EXC_{t-1}) ……. (4)

$INFR_t$= F ($INFR_{t-1}$, $DOMINV_{t-1}$, FDI_{t-1}, $PDEBT_{t-1}$, $LENIR_{t-1}$, $EXCt_{-1}$) ……. (5)

EXC_t=F (EXC_{t-1}, $DOMINV_{t-1}$, FDI_{t-1}, $PDEBT_{t-1}$, $LENIR_{t-1}$, $INFR_{t-1}$,) …….. (6)

Where PDEBT: Public Debt
DOMINV: Domestic Investment
FDI: Foreign Direct Investment
LENIR: Lending Interest Rate
INFR: Inflation Rate
EXC: Exchange Rate.

This study assumes a non-linear model structured in its explicit form as:

$DOMINV_t = A_1 . DOMINV_{t-1}^{\alpha 1}. FDI_{t-1}^{\alpha 2} PDEBT_{t-1}^{\alpha 3}. LENIR_{t-1}^{\alpha 4}. INFR_{t-1}^{\alpha 5}. EXC_{t-1}^{\alpha 6}. e_{1t}$ .. (7)

$FDI_t = A_2 . FDI_{t-1}^{\beta 1}. DOMINV_{t-1}^{\beta 2}. PDEBT_{t-1}^{\beta 3}. LENIR_{t-1}^{\beta 4}. INFR_{t-1}^{\beta 5}. EXC_{t-1}^{\beta 6}. e_{2t}$ …… (8)

$PDEBT_t = A_3 . PDEBT_{t-1}^{\delta 1}. DOMINV_{t-1}^{\delta 2}. FDI_{t-1}^{\delta 3}. LENIR_{t-1}^{\delta 4}. INFR_{t-1}^{\delta 5}. EXC_{t-1}^{\delta 6}. e_{3t}$ ….. (9)

$LENIR_t = A_4 . LENIR_{t-1}^{\gamma 1}. DOMINV_{t-1}^{\gamma 2}. FDI_{t-1}^{\gamma 3}. PDEBT_{t-1}^{\gamma 4}. INFR_{t-1}^{\gamma 5}. EXC_{t-1}^{\gamma 6}. e_{4t}$ ..... (10)

$INF_t = A_5. INFR_{t-1}^{\theta 1}. DOMINV_{t-1}^{\theta 2}. FDI_{t-1}^{\theta 3}. PDEBT_{t-1}^{\theta 4}. LENIR_{t-1}^{\theta 5}. EXC_{t-1}^{\theta 6}. e_{5t}$ ……. (11)

$EXC_t = A_6 . EXC_{t-1}^{\lambda 1}. DOMINV_{t-1}^{\lambda 2}. FDI_{t-1}^{\lambda 3}. PDEBT_{t-1}^{\lambda 4}. LENIR_{t-1}^{\lambda 5}. INFR_{t-1}^{\lambda 6}. e_{6t}$ …….. (12)

α_i, β_i, δ_i, γ_i, θ_i, λ_i are the parameters to be estimated; i= 1, 2,…., 6.

t= 1981 to 2015; and e_{it}= stochastic term.

The first stage of SVAR analysis is the estimation of the reduced form or the standard VAR. Also, the reduced form of the VAR model is further estimated because the model do not have contemporaneous endogenous variables which as shown in the equations (13 –18) below:

$$\mathbf{DOMINV_t} = \beta_{10} + \sum_{i=1}^{p} b_{11}^{i} FDI_{t-i} + \sum_{i=1}^{p} b_{12}^{i} PDEBT_{t-i} + \sum_{i=1}^{p} b_{13}^{i} LENIR_{t-i} + \sum_{i=1}^{p} b_{14}^{i} INFR_{t-i} + \sum_{i=1}^{p} b_{15}^{i} EXC_{t-i} + \sum_{i=1}^{p} b_{16}^{i} DOMINV_{t-i} + \varepsilon_t^{DOMINV} \quad (13)$$

$$\mathbf{FDI_t} = \beta_{20} + \sum_{i=1}^{p} b_{21}^{i} DOMINV_{t-i} + \sum_{i=1}^{p} b_{22}^{i} PDEBT + \sum_{i=1}^{p} b_{23}^{i} LENIR_{t-i} + \sum_{i=1}^{p} b_{24}^{i} INFR_{t-i} + \sum_{i=1}^{p} b_{25}^{i} EXC_{t-i} + \sum_{i=1}^{p} b_{26}^{i} FDI_{t-i} + \varepsilon_t^{FDI} \quad (14)$$

$$\mathbf{PDEBT_t} = \beta_{30} + \sum_{i=1}^{p} b_{31}^{i} DOMINV_{t-i} + \sum_{i=1}^{p} b_{32}^{i} FDI_{t-i} + \sum_{i=1}^{p} b_{33}^{i} LENIR_{t-i} + \sum_{i=1}^{p} b_{34}^{i} INFR_{t-i} + \sum_{i=1}^{p} b_{35}^{i} EXC_{t-i} + \sum_{i=1}^{p} b_{36}^{i} PDEBT_{t-i} + \varepsilon_t^{PDEBT} \quad (15)$$

$$\mathbf{LENIR_t} = \beta_{40} + \sum_{i=1}^{p} b_{41}^{i} DOMINV_{t-i} + \sum_{i=1}^{p} b_{42}^{i} FDI + \sum_{i=1}^{p} b_{43}^{i} PDEBT_{t-i} + \sum_{i=1}^{p} b_{44}^{i} INFR_{t-i} + \sum_{i=1}^{p} b_{45}^{i} EXC_{t-i} + \sum_{i=1}^{p} b_{46}^{i} LENIR_{t-i} + \varepsilon_t^{LENIR} \quad (16)$$

$$\mathbf{INF_t} = \beta_{50} + \sum_{i=1}^{p} b_{51}^{i} DOMINV_{t-i} + \sum_{i=1}^{p} b_{52}^{i} FDI + \sum_{i=1}^{p} b_{53}^{i} PDEBT_{t-i} + \sum_{i=1}^{p} b_{54}^{i} LENIR_{t-i} + \sum_{i=1}^{p} b_{55}^{i} EXC_{t-i} + \sum_{i=1}^{p} b_{56}^{i} INFR_{t-i} + \varepsilon_t^{INF} \quad (17)$$

$$\mathbf{EXC_t} = \beta_{60} + \sum_{i=1}^{p} b_{61}^{i} DOMINV_{t-i} + \sum_{i=1}^{p} b_{62}^{i} FDI + \sum_{i=1}^{p} b_{63}^{i} PDEBT_{t-i} + \sum_{i=1}^{p} b_{64}^{i} LENIR_{t-i} + \sum_{i=1}^{p} b_{65}^{i} INFR_{t-i} + \sum_{i=1}^{p} b_{66}^{i} EXC_{t-i} + \varepsilon_t^{EXC} \quad (18)$$

The structural component of the SVAR model for this study is described by the following dynamic system of simultaneous equations:

$$DOMINV_t = \beta_{10} - A_{12} FDI - A_{13} PDEBT_t - A_{14} LENIR_t - A_{15} INFR_t - A_{16} EXC_t + \sum_{i=1}^{p} \alpha_{11}^{i} FDI_{t-i} + \sum_{i=1}^{p} \alpha_{12}^{i} PDEBT_{t-i} + \sum_{i=1}^{p} \alpha_{13}^{i} LENIR_{t-i} + \sum_{i=1}^{p} \alpha_{14}^{i} INFR_{t-i} + \sum_{i=1}^{p} \alpha_{15}^{i} EXC_{t-i} + \sum_{i=1}^{p} \alpha_{16}^{i} DOMINV_{t-i} + \varepsilon_t^{DOMINV} \quad (11)$$

$$FDI_t = \beta_{20} - A_{22} DOMINV_t - A_{23} PDEBT_t - A_{24} LENIR_t - A_{25} INFR_t - A_{26} EXC_t + \sum_{i=1}^{p} \beta_{21}^{i} DOMINV_{t-i} + \sum_{i=1}^{p} \beta_{22}^{i} PDEBT + \sum_{i=1}^{p} \beta_{23}^{i} LENIR_{t-i} + \sum_{i=1}^{p} \beta_{24}^{i} INFR_{t-i} + \sum_{i=1}^{p} \beta_{25}^{i} EXC_{t-i} + \sum_{i=1}^{p} \beta_{26}^{i} FDI_{t-i} + \varepsilon_t^{FDI} \quad (12)$$

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$$PDEBT_t = \beta_{30} - A_{32}DOMINV_t - A_{33}FDI_t - A_{34}LENIR_t - A_{35}INFR_t - A_{36}EXC_t + \sum_{i=1}^{p}\delta_{31}^{i}\,DOMINV_{t-i} + \sum_{i=1}^{p}\delta_{32}^{i}\,FDI_{t-i} + \sum_{i=1}^{p}\delta_{33}^{i}\,LENIR_{t-i} + \sum_{i=1}^{p}\delta_{34}^{i}\,INFR_{t-i} + \sum_{i=1}^{p}\delta_{35}^{i}\,EXC_{t-i} + \sum_{i=1}^{p}\delta_{36}^{i}\,PDEBT_{t-i} + \varepsilon_t^{PDEBT} \quad (13)$$

$$LENIR_t = \beta_{40} - A_{42}DOMINV_t - A_{43}FDI_t - A_{44}PDEBT_t - A_{45}INFR_t - A_{46}EXC_t + \sum_{i=1}^{p}\gamma_{41}^{i}\,DOMINV_{t-i} + \sum_{i=1}^{p}\gamma_{42}^{i}\,FDI + \sum_{i=1}^{p}\gamma_{43}^{i}\,PDEBT_{t-i} + \sum_{i=1}^{p}\gamma_{44}^{i}\,INFR_{t-i} + \sum_{i=1}^{p}\gamma_{45}^{i}\,EXC_{t-i} + \sum_{i=1}^{p}\gamma_{46}^{i}\,LENIR_{t-i} + \varepsilon_t^{LENIR} \quad (14)$$

$$INFR_t = \beta_{50} - A_{52}DOMINV_t - A_{53}FDI_t - A_{54}PDEBT_t - A_{55}LENIR_t - A_{56}EXC_t + \sum_{i=1}^{p}\theta_{51}^{i}\,PDEBT_{t-i} + \sum_{i=1}^{p}\theta_{52}^{i}\,DOMINV + \sum_{i=1}^{p}\theta_{53}^{i}\,FDI_{t-i} + \sum_{i=1}^{p}\theta_{54}^{i}\,LENIR_{t-i} + \sum_{i=1}^{p}\theta_{55}^{i}\,EXC_{t-i} + \sum_{i=1}^{p}\theta_{56}^{i}\,INFR_{t-i} + \varepsilon_t^{INFR} \quad (15)$$

$$EXC_t = \beta_{60} - A_{62}DOMINV_t - A_{63}FDI_t - A_{64}PDEBT_t - A_{65}LENIR_t - A_{66}INFR_t + \sum_{i=1}^{p}\lambda_{61}^{i}\,DOMINV_{t-i} + \sum_{i=1}^{p}\lambda_{62}^{i}FDI_{t-1} + \sum_{i=1}^{p}\lambda_{63}^{i}\,PDEBT_{t-i} + \sum_{i=1}^{p}\lambda_{64}^{i}\,LENIR_{t-i} + \sum_{i=1}^{p}\lambda_{65}^{i}\,INFR_{t-i} + \sum_{i=1}^{p}\lambda_{66}^{i}\,EXC_{t-i} + \varepsilon_t^{EXC} \quad (16)$$

From the above, the matrix of the innovation can be expressed as:

$$\begin{pmatrix}\varepsilon_t^{DOMINV}\\ \varepsilon_t^{FDI}\\ \varepsilon_t^{PDEBT}\\ \varepsilon_t^{LENIR}\\ \varepsilon_t^{INFR}\\ \varepsilon_t^{EXC}\end{pmatrix} \sim i.i.d. \left(\begin{pmatrix}0\\0\\0\\0\\0\\0\end{pmatrix}, \begin{pmatrix}\delta^2_{DOMINV} & 0 & 0 & 0 & 0 & 0\\ 0 & \delta^2_{FDI} & 0 & 0 & 0 & 0\\ 0 & 0 & \delta^2_{PDEBT} & 0 & 0 & 0\\ 0 & 0 & 0 & \delta^2_{LENIR} & 0 & 0\\ 0 & 0 & 0 & 0 & \delta^2_{INFR} & 0\\ 0 & 0 & 0 & 0 & 0 & \delta^2_{EXC}\end{pmatrix}\right)$$

$DOMIN_t$, FDI_t, $PDEBT_t$, $LENIR_t$, $INFR_t$, EXC_t, are endogenous variables determined by the coefficient of A and the exogenous error terms are $\varepsilon_t^{DOMINV}, \varepsilon_t^{FDI}, \varepsilon_t^{PDEBT}, \varepsilon_t^{LENIR}, \varepsilon_t^{INFR}$ ε_t^{EXC} which are independently and identically distributed with mean zero and constant variance.

The model can be rewritten in its matrix form as:

$$\begin{bmatrix}1 & a_{12} & a_{13} & a_{14} & a_{15} & a_{16}\\ a_{21} & 1 & a_{23} & a_{24} & a_{25} & a_{26}\\ a_{31} & a_{32} & 1 & a_{34} & a_{35} & a_{36}\\ a_{41} & a_{42} & a_{43} & 1 & a_{45} & a_{46}\\ a_{51} & a_{52} & a_{53} & a_{54} & 1 & a_{56}\\ a_{61} & a_{62} & a_{63} & a_{64} & a_{65} & 1\end{bmatrix}\begin{bmatrix}DOMINV_t\\ FDI_t\\ PDEBT_t\\ LENIR_t\\ INFR_t\\ EXC_t\end{bmatrix} = \begin{bmatrix}\beta_{10}\\ \beta_{20}\\ \beta_{30}\\ \beta_{40}\\ \beta_{50}\\ \beta_{60}\end{bmatrix} + \begin{bmatrix}\alpha_{11} & \alpha_{12} & \alpha_{13} & \alpha_{14} & \alpha_{15} & \alpha_{16}\\ \beta_{21} & \beta_{22} & \beta_{23} & \beta_{24} & \beta_{25} & \beta_{26}\\ \delta_{31} & \delta_{32} & \delta_{33} & \delta_{34} & \delta_{35} & \delta_{36}\\ \gamma_{41} & \gamma_{42} & \gamma_{43} & \gamma_{44} & \gamma_{45} & \gamma_{46}\\ \theta_{51} & \theta_{52} & \theta_{53} & \theta_{54} & \theta_{55} & \theta_{56}\\ \lambda_{61} & \lambda_{62} & \lambda_{63} & \lambda_{64} & \lambda_{65} & \lambda_{66}\end{bmatrix}\begin{bmatrix}DOMINV_{t-i}\\ FDI_{t-i}\\ PDEBT_{t-i}\\ LENIR_{t-i}\\ INF_{t-i}\\ EXC_{t-i}\end{bmatrix} + \begin{bmatrix}\varepsilon_t^{DOMINV}\\ \varepsilon_t^{FDI}\\ \varepsilon_t^{PDEBT}\\ \varepsilon_t^{LENIR}\\ \varepsilon_t^{INFR}\\ \varepsilon_t^{EXC}\end{bmatrix}$$

Where i=1, 2… n.

The coefficients α_i, β_i, δ_i, γ_i, θ_i, λ_i of the lagged variables in the structural VAR model vary from the coefficients, *b*, of the lagged variables in the reduced form VAR model. Without imposing a number of restrictions, the parameters in the VAR model (13–18) cannot be identified. These restrictions will therefore, allow for contemporaneous interaction between the responses of domestic investment and foreign direct investment to shocks from public debt on the Nigerian economy. To impose restrictions in order to identify the response of domestic investment and foreign direct investment to one standard shock from public debt, the Short-run parameter restrictions are applied in this study.

DATA SOURCES AND MEASUREMENTS

This study employ secondary annual time series data sourced from CBN statistical bulletin and CBN annual publications. Both public debt, domestic investment and foreign direct investment were measured in billion naira while inflation rate, real exchange rate and lending interest rate were measured in percentages. However, in order to assess their relationship without the complexity of varied units of measurement, all the variables were logged and interpreted with respect to their elasticity.

VI. PRELIMINARY DATA ANALYSIS

SUMMARY STATISTICS

Summary statistics are used to describe the main features of the data set which include: measures of central tendency (mean, median, mode); measures of variability (standard deviation, variance); the minimum and maximum values of variables (kurtosis and skeweness) providing summary of samples and observations which forms the basis for the description of the data set.

Variables	PDEBT	DOMINV	FDI	LENIR	INFR	EXC
Mean	2902.725	4538.763	326.5212	21.21457	19.57714	154.3257
Median	1194.600	2736.978	110.4527	21.34000	12.22000	99.10000
Maximum	10948.53	11153.72	1360.308	36.09000	72.73000	546.0000
Minimum	13.52380	1439.070	0.264300	10.00000	3.230000	49.70000
Std. Dev.	3064.484	3029.888	422.5601	5.864231	17.53583	126.7051
Skewness	0.984887	1.013488	1.093160	0.062985	1.563783	1.710278
Kurtosis	2.999405	2.506491	2.812109	3.154265	4.417424	5.007355
Jarque-Bera	5.658351	6.346937	7.022307	0.057846	17.19486	22.93910
Probability	0.059062	0.041858	0.029862	0.971491	0.000185	0.000010
Sum	101595.4	158856.7	11428.24	742.5100	685.2000	5401.400
Sum Sq. Dev.	3.19E+08	3.12E+08	6070939.	1169.233	10455.18	545842.2
Observations	35	35	35	35	35	35

Source: Authors compilation using Eviews 9.0

Table 1: Summary Statistics of Variables in the Model

Table 1 shows the statistical description of each variables, these includes: PDEBT, DOMINV, FDI, LENIR, INF and EXC with their respective Mean (2902.72, 4538.76, 326.52, 21.22, 19.58, 154.33**)** which is the sum of all the values in the data group divided by the total number of the values, their respective Standard deviation (3064.48, 3029.89, 422.56, 5.86, 17.54, 126.71**)** which is the positive square root of the variance.

The minimum Nigeria's debt profile ever accrued was recorded in 1981 at ₦13.52380 billion while the maximum debt profile accrued was recorded in 2015 at ₦10.94853 trillion with the mean value of ₦2.902725 trillion.

Skeweness shows the degree of asymmetry of the distribution which could be negatively or positively skewed, and Kurtosis which measures the degree to which the frequency distribution is focused about its mean or the peakedness of the distribution and it could be mesokurtic (when the kurtosis coefficient is = 0), platykurtic (when the kurtosis coefficient is < 0) and leptokurtic (when the kurtosis coefficient is > 0). Looking at the Skeweness, all variables were all positively skewed and examining the Kurtosis, all variables had their entire kurtosis coefficient >0 which shows that they are Leptokurtic.

Also, Skewness as an indicator used for sign of asymmetry and deviation from normal distribution reveals that all the variables in the model; PDEBT, DOMINV, FDI, LENIR, INF, and EXC are rightly skewed since each of their skewness is greater than zero, implying that these variables are concentrated on the left side of their individual mean with extreme values to the right.

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CORRELATION ANALYSIS

The correlation matrix determines the degree of relationship existing between two random variables of a data set involving the correlation coefficients of row_i and $column_j$ matrix in which the diagonal element must be 1. It also determine the strength and direction of linear relationship between two variables. The closer the correlation Values is to (-1 or +1), a perfect linear and strong relationship exist between the explanatory variables.

Variables	PDEBT	DOMINV	FDI	LENIR	INFR	EXC
PDEBT	1.000000					
DOMINV	0.690340	1.000000				
FDI	0.674662	0.737068	1.000000			
LENIR	0.401805	0.048080	0.163835	1.000000		
INFR	-0.350781	-0.358208	-0.346322	0.193783	1.000000	
EXC	-0.387747	-0.049117	-0.314893	0.096459	0.036432	1.000000

Source: Authors Compilation using Eviews 9.0

Table 2: Correlation Matrix for variables in the model

The result obtained in table 2 revealed that there is absent of strong correlation among the explanatory variables which suggests the absence of multicollearity in the variables of the model.

STATIONARITY TEST

Stationarity test is crucial because it determine whether our time series data are stationary in the long run, as regressing non stationary series on each other yielding spurious regression results. This approach involves testing for stationarity of individual variables and determining their order of integration of the time series in order to obtain reliable and consistent results. Hence, this study adopts Augumented Dickey Fuller (ADF) unit root test.

Variables	ADF t-Statistic Value	5% Critical Value	Lag Length	Remarks	Decision
LPDEBT	-5.717509	-4.859812	1	Stationary	I(1)
LDOMINV	-7.310235	-4.859812	1	Stationary	I(1)
LFDI	-9.976427	-4.859812	1	Stationary	I(1)
LLENIR	-7.741122	-4.859812	1	Stationary	I(1)
LINF	-7.025875	-4.859812	1	Stationary	I(1)
LEXC	-7.372377	-4.859812	1	Stationary	I(1)

Source: Author's Computation from Eviews 9.0

Table 3: ADF Unit Root Test at 5% significant level

The decision rule for the ADF unit root test states that the ADF test statistic value must be greater than the critical value at 5 percent absolute term for it to be stationary at level and if otherwise, differencing occurs using the same decision rule.

The results of the Augumented Dickey Fuller (ADF) unit root test statistics based on Schwarz Information Criterion (SIC) reveals that all the variables became stationary at first difference, i.e., they are integrated of the same order I (1). Thus Table 3 presents the results of the stationarity test in summary and order of integration.

VAR CAUSALITY TEST

Pairwise Granger causality analysis is a statistical hypotheses for determining if an individual timeseries is useful in forecasting another. In other words, whether an endogenous variable can be treated as exogenous since causality occurs when two time series X_t and Y_t are co integrated; thus, a linear combination of them must be stationary. X_t is said to Granger-cause Y_t , if Y_t can be predicted with greater accuracy by past values of X_t assuming all other relevant information in the model remains the same. Principally, the VAR granger causality test are multivariate test that is used to examine the causal relationships between variables in vector autoregressive (VAR) models. This study adopts the Wald block exogeneity statistic which is used to test for significance of each lagged endogenous variables in the VAR system of more than two variables since the true value of the parameter is based on the sample estimate.

Equation	Excluded	chi2	df	Prob > chi2
log_pdebt	log_dominv	0.2847	2	0.089
log_pdebt	log_fdi	2.7689	2	0.002
log_pdebt	log_lenir	10.755	2	0.160
log_pdebt	log_infr	1.1444	2	0.000
log_pdebt	log_exc	0.4512	2	0.021
log_dominv	log_pdebt	4.3271	2	0.250
log_dominv	log_fdi	0.2603	2	0.867
log_dominv	log_lenir	8.3887	2	0.005
log_dominv	log_infr	5.9979	2	0.564
log_dominv	log_exc	2.9682	2	0.798
log_fdi	log_pdebt	4.8462	2	0.878
log_fdi	log_dominv	12.555	2	0.115
log_fdi	log_lenir	3.6618	2	0.015
log_fdi	log_infr	19.982	2	0.050
log_fdi	log_exc	7.7287	2	0.227

Source: Authors Compilation from STATA 12

Table 4: Granger causality Wald tests

INTERPRETATION OF GRANGER CAUSALITY TEST RESULTS

Panel A: Captures the direction of causality between Public debt and Domestic Investment

H_0: PDEBT does not Granger-cause DOMINV

H_1: PDEBT Granger cause DOMINV

Panel B: Captures the direction of causality between Public debt and Foreign Domestic Investment

H_0: PDEBT does not Granger cause FDI

H1: PDEBT Granger cause FDI

Panel C: Captures the direction of causality between Domestic Investment and Public debt

H0: DOMINV does not Granger cause PDEBT

H1: DOMINV Granger cause PDEBT

Panel D: Captures the direction of causality between Foreign Domestic Investment and Public debt

H0: FDI does not Granger cause PDEBT

H1: FDI Granger cause PDEBT

From the table above, the p-value indicates that the coefficient is not statistically significant at the acceptable 5% level of significance. Thus the null hypothesis in panel A and C which states that "PDEBT does not granger cause DOMINV" is accepted implying that domestic investment is not a primary source of government borrowing to finance huge

fiscal deficit because it crowds out credit for private investors to make investment.

The p-value in panel B indicates that the coefficient is strongly statistically significant at 1% level of significance thus the null hypothesis in panel B which states that "PDEBT does not granger cause FDI" was rejected and the alternative hypothesis ("PDEBT granger cause FDI") is accepted. Also for panel D, we accept the null hypothesis that FDI does not granger cause PDBT. Therefore, we make a case of unidirectional causation arguing that Nigeria's escalating debt profile discourages foreign investors thus hampers investment inflows into the economy; however Nigeria's debt crisis is not strong enough to detach all foreign investment since the economy is characterized with high mass consumption thus foreign investors have confidence in the future, i.e. the economy been able to respond after shock. Also, foreign investors come into the Nigerian economy to network freely (i.e. by avoiding heavy import duties) with other African countries through ECOWAS trade liberalization scheme.

LAG ORDER SELECTION CRITERIA

The FPE, AIC, SB and HQ criteria suggested that the lag strength should be four while LR suggested the use of one as the lag strength. The lag order that minimizes the value of the information criterion is selected as the optimum lag length.

Sample: 1985 - 2015 Number of Obs = 31

lag	LL	LR	df	p	FPE	AIC	HQIC	SBIC
0	-129.258	-	36	0.000	0.000248	8.72629	8.81677	9.00384
1	16.7732	292.06	36	0.000	2.2e-07	1.62754	2.26085	3.57036
2	73.782	114.02	36	0.000	7.4e-08	0.272126	1.44828	3.88022
3	146.732	145.9	36	0.000	1.6e-08	-2.11175	-0.392758	3.16163
4	349.053	404.64*	36	0.000	4.4e-12*	12.8421*	-10.5803*	-5.90348*

Source: Author's compilation using STATA 12
*Note: * 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

Table 5: Lag Order Selection Criteria

LAGRANGE MULTIPLIER TEST

The Lagrange multiplier test is conducted to test the presence of serial correlation among the disturbance term. The LM statistics for residual autocorrelation reveals no presence of autocorrelation at lag 1 and 2 using the Chi2 statistics. Therefore we accept the null hypothesis at both lag order. Also, the VAR stability test conducted also satisfies the stability condition as all the eigenvalues were within the unit circle.

lag	chi2	df	Prob > chi2
1	46.3235	36	0.11633
2	27.2585	36	0.85256

Note: H0: no autocorrelation at lag order

Table 6: Lagrange-multiplier test

VARIABLES	LDOMINV	LFDI	LPDEBT	LENIR	LINFR	LEXC
LDOMINV	1	0	0	0	0	0
LFDI	-0.6734842 (-1.93)**	1	0	0	0	0
LPDEBT	-20019139(-1.04)	-0.7304674 (0.80)	1	0	0	0
LENIR	-0.16741743 (-1.41)	-1.3992383 (2.50)**	-0.23871878 (-2.26)**	1	0	0
LINFR	1.5840308 (4.17)*	-0.72700767 (3.84)*	-0.36068909 (1.03)	0.71554749 (-1.33)	1	0
LEXC	-17317509 (-1.11)	-0.23207718 (3.07)**	-0.7634775 (-6.45)*	0.2857193 (1.56)	0.6207843 (1.08)	1

Source: Author's Compilation STATA 12, Note: &** indicates 1 %, 5% significance levels.*

Table 7: Estimated Coefficients of the Contemporaneous Short-Run Variables

The Table 7 presents estimated coefficients of contempraneous short run (endogenous) variables to observe the response of external non policy variables (domestic investment, foreign direct investment, public debt and inflation rate) variables to shocks from domestic policy.

From our variables of interest, the response of DOMINV, FDI and PDEBT to its own shock is restricted to one. Domestic investment will respond contemporaneously with a decline from a positive shock to lending interest rate. Also, a positive shock in lending interest rate will cause foreign direct investment to respond contemporaneously with a marginal but significant decline. Lastly, public debt respond contemporaneoulsy with a significant decline from a positive shock in lending interest rate.

Whereas, domestic investment will respond contemporaneously with an insignificant decline from a positive shock in real exchange rate. However, Foreign direct investment will respond contemporaneously with a significant decline from a positive shock of real exchange rate. In addition, public debt will respond contemporaneously with a strong significant decline from a positive shock in real exchange rate.

STRUCTURAL AND ORTHOGONALIZED IMPULSE RESPONSE ANALYSIS

A structural vector-autoregressive (SVAR) model imposes restrictions on the response of variables on each other based on the underlying VAR model. The goal is to give impulse response functions, as well the variance decomposition a "more" causal meaning to know the effect of a unit shock of one variable on another variable, while imposing restrictions e.g. the current foreign direct investment has an effect on current domestic investment and also, the current lending interest rate (as domestic policy variable) has an effect on foreign direct investment and public debt. Therefore, the short run SVAR models is used where the current values of each variables affect each other (i.e contemporaneous effect). For short SVAR models, the short run restrictions is placed on the A and B matrix, where A

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matrix is the major focus, and the B matrix places restrictions on the error structure.

Given matrix A and matrix B,

Let $A\varepsilon_t = B\varepsilon_t$

We may proceed to impose restrictions on matrices A and B. As stated earlier on (chapter 4), where ε_t are VAR residuals, and e_t are the structural shocks based on theoretical expectations, following Sims original idea, we assume recursive contemporaneous interactions among the variables, i.e. by imposing a certain structural ordering of the variables setting A to a lower triangular matrix, and B to a diagonal/identity matrix.

The resulting parameter restrictions for the short run SVAR model specified in equations (11 -16)

are:

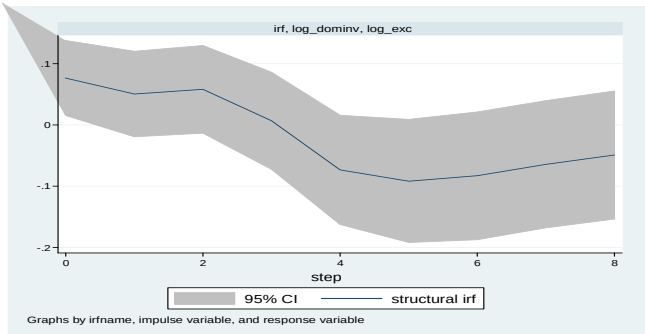
$$\begin{bmatrix} \varepsilon_t^{DOMINV} \\ \varepsilon_t^{FDI} \\ \varepsilon_t^{PDEBT} \\ \varepsilon_t^{LENIR} \\ \varepsilon_t^{INFR} \\ \varepsilon_t^{EXC} \end{bmatrix} = \begin{bmatrix} \alpha_{11} & \alpha_{12} & \alpha_{13} & \alpha_{14} & \alpha_{15} & \alpha_{16} \\ \beta_{21} & \beta_{22} & \beta_{23} & \beta_{24} & \beta_{25} & \beta_{26} \\ \delta_{31} & \delta_{32} & \delta_{33} & \delta_{34} & \delta_{35} & \delta_{36} \\ \gamma_{41} & \gamma_{42} & \gamma_{43} & \gamma_{44} & \gamma_{45} & \gamma_{46} \\ \theta_{51} & \theta_{52} & \theta_{53} & \theta_{54} & \theta_{55} & \theta_{56} \\ \lambda_{61} & \lambda_{62} & \lambda_{63} & \lambda_{64} & \lambda_{65} & \lambda_{66} \end{bmatrix} \begin{bmatrix} e_t^{DOMINNV} \\ e_t^{DOMINV} \\ e_t^{FDI} \\ e_t^{LENIR} \\ e_t^{INFR} \\ e_t^{EXC} \end{bmatrix}$$

Domestic investment does not respond contemporaneously to structural shocks in FDI, PDEBT, LENIR, INFR and EXC but only to itself while Foreign direct investment respond contemporaneously to structural shocks in DOMINV but not to PDEBT, LENIR, INFR and EXC. Similarly, public debt respond contemporaneously to structural shocks in DOMINV and FDI but not to LENIR, INFR and EXC. Lending interest rate respond contemporaneously to structural shocks in DOMINV, FDI and PDEBT.

Inflation rate respond contemporaneously to structural shocks in DOMINV, FDI, PDEBT, and LENIR but not to EXC. Conclusively, exchange rate respond contemporaneously to structural shocks for all the variables; DOMINV, FDI, PDEBT, LENIR, INFR and itself.

IMPULSE RESPONSE FUNCTION OF THE VARIABLES IN THE MODEL

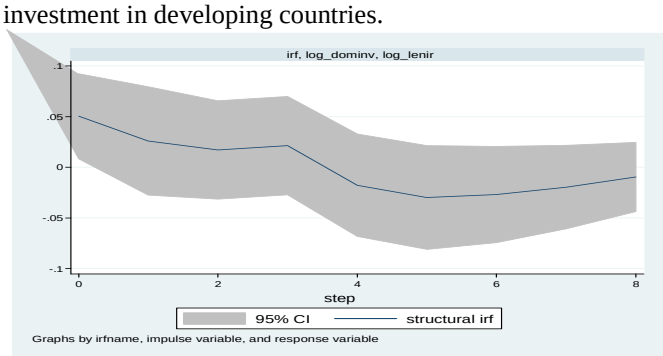
An impulse response function traces the effect of a one-time shock to one of the innovations on current and future values of the endogenous variables by measuring the effect of a shock to an endogenous variable on itself or on another endogenous variable. This segment take into consideration a pictorial illustration of the Impulse Response Function Analyis of Domestic Policy Variables to External non Policy Variables and also captures the relationship between the variables of interest in the model.



Source: Authors Compilation STATA 2017

Figure 2

Figure 2 shows the structural response of domestic investment to expansionary shock in exchange rate. Here, domestic investment steadily falls within the first three periods (years) due to expansionary shocks from exchange rate, afterward the response becomes insignificantly and dies out. This is due to the fact that real depreciation rises the costs of imported capital goods, and since a large chunk of investment goods in developing countries like Nigeria are imported, domestic investment would continuously fall as exchange rate depreciates (Adelowokan & Balogun, 2015). This response of domestic investment is in line with the findings of Serve (2003) that exchange rate uncertainties adversely affecting investment in developing countries.

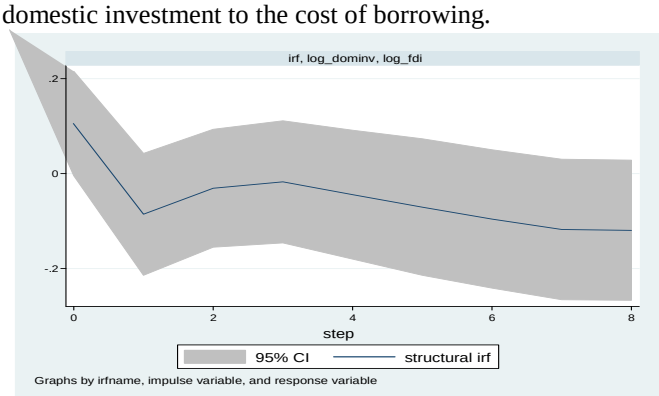


Source: Author's Compilation from STATA 12

Figure 3

Figure 3 shows the structural response of domestic investment to expansionary shock in interest rate. Here, domestic investment experience a slight fall within the first two periods and assumed a steady state into the third period with a significant decline afterwards. Investment will not respond instantaneously to an increase in interest rate. However, information signals would gradually change investor's preference as the market adjust to lending interest rate policy changes.

Furthermore, when this policy shock is consistent, domestic investment plunges significantly as depicted in period three into period four, a steady state is assumed into period eight which is said to be a commensurate level of domestic investment to the cost of borrowing.



Source: Author's Compilation from STATA 12

Figure 4

Figure 4 shows the structural response of domestic investment to expansionary shock in foreign direct investment (FDI). Domestic investment falls quickly and significantly within the first period due to embryonic nature of domestic

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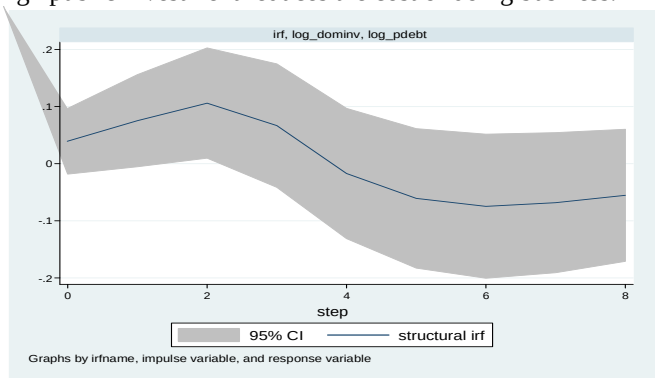
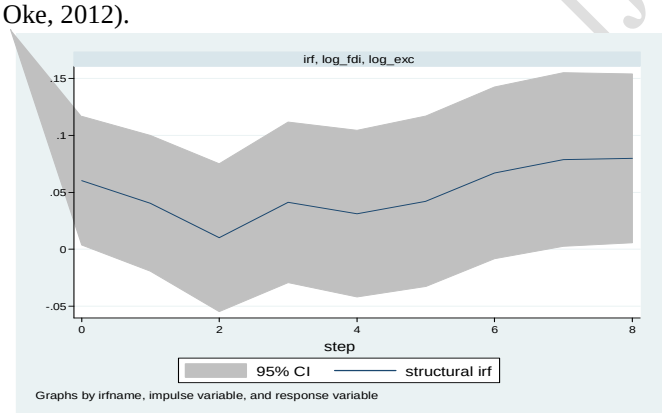
investment at its initial stage and then a recovery path into the first quarter of period one. The rise of domestic investment was sustainable from period two down to period three. However, into period four, there was an infinitesimal but steady decline in domestic investment. This suggest a long run positive relationship of public and private domestic investment with FDI in Nigeria. A high private domestic investment is a signal for returns to capital and public infrastructure through high public investment reduces the cost of doing business.



Source: Author's Compilation from STATA 12

Figure 5

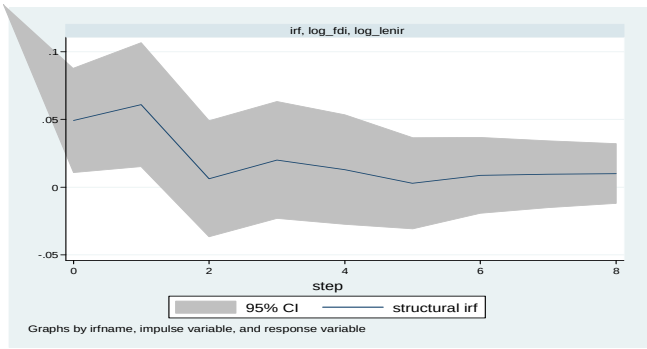
Figure 5 shows the structural response of domestic investment to expansionary shock in public debt. Domestic investment rises minimally within the first three periods due to expansionary shocks from public debt. Then, the responses fell in the fourth periods and die out subsequently. High foreign debt can raise internal debt, owing to the fact that share of domestic borrowing goes into the servicing of the external debt obligation, interest, and capital repayment. As public debt rises, credits to private sector are crowd out and subsequently domestic investment decline over time (Ajayi & Oke, 2012).



Source: Author's Compilation from STATA 12

Figure 6

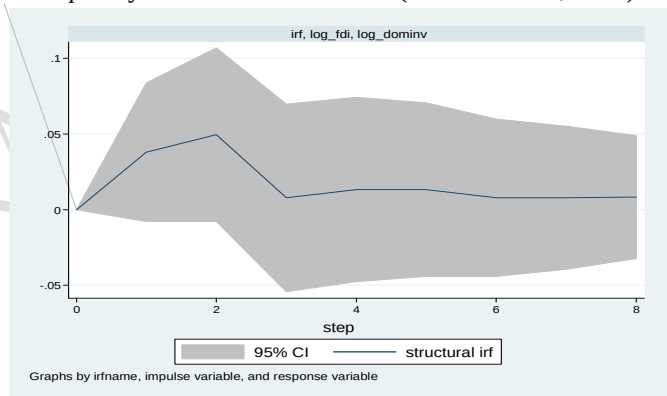
Figure 6 shows the structural response of foreign direct investment to expansionary shock (depreciation) in exchange rate. Foreign Direct Investment (FDI) response to explanatory shocks from exchange rate was negative in the first two periods and steadily becomes positive afterwards. This response to shock is in line with the assertion of Benassy-Quere, *et al.* (2001) that the effects of the level of exchange rates on FDI inflows are rather ambiguous. Nonetheless, Masayuki and Ivohasina (2005) posit that exchange rate depreciation may encourage the inflow of foreign direct investment to the host country.



Source: Author's Compilation from STATA 12

Figure 7

Figure 7 shows the structural response of FDI to expansionary shock in lending interest rate. FDI rises initially, then falls quickly and significantly within the first two periods (years) due to expansionary shocks but jolt upward in the three period. Afterward, FDI exhibit insignificant response from interest rate. This is due to the fact that external debt has a positively linear relationship with interest rate; the higher the external debt, the higher the interest rate (Chen, 2006). An increase in interest rate couple with the high inflation in Nigeria, lowers the expectation of foreign investors and subsequently reduce the flow of FDI (Lemi & Asefa, 2003).



Source: Author's Compilation from STATA 12

Figure 8

Figure 8 shows the structural response of foreign direct investment to expansionary shock in domestic investment. Foreign Direct Investment (FDI) significantly rose in the first and second period due to explanatory shocks from domestic investment, after which it exhibit insignificant response from public debt. However, the effect of domestic investment on FDI flows is more intricate. Domestic investment could encourage or discourage FDI flows in an economy. It depends on the specific relationship between private and foreign firms as well as how developed the domestic private sector. In a situation where most private firms in a sector are operating in utmost technical and economic efficiency and have high-rated international standing, the potentials of market competition is almost exhausted, foreign firms view such sector as unprofitable, thus driving foreign investors away in Nigeria. But in situation of less competition among private firms, FDI is attracted (Mose, *et al*. 2013; Ndikumana & Verick, 2008). In other words, this scenario suggests high domestic investment is a signal for high returns to capital, while adequate public infrastructure (through high public investment) reduces the cost of doing business, which raises

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the marginal return to FDI. Hence, high domestic investment helps in attracting FDI but policy uncertainty can later discourage further flow of FDI.

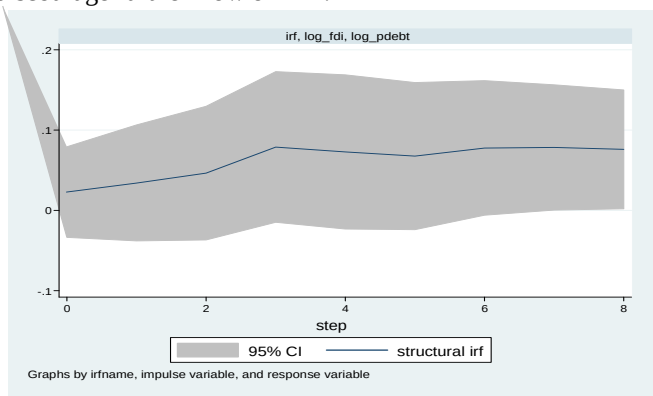

Figure 9

Figure 9 shows the structural response of FDI to expansionary shock in public debt. FDI failed to response to shocks from public debt in all the eight periods examined. This is due to the fact that Nigeria's current public debt is not a pull factor of capital flow but a push factor of capital flow (high debt profile countries tend to reduce FDI inflows).

VII. CONCLUSION AND POLICY RECOMMENDATION

Nigeria is characterized with escalating debt which has raised major concerns about its implications on aggregate economic activities particularly its adverse effects on the flow of investments. Therefore, this study adopted the Debt Overhang theory which posits that high external debt reduces investor's expectation on returns from investment thus impedes foreign direct investment inflows and the crowding out hypothesis also provides the basis for which domestic debt instruments used to finance huge fiscal deficits have negative effects (i.e. by crowding out private investment) on the private sector in Nigeria.

This study critically examined the relationship between Public Debt, Domestic investment and Foreign Direct Investment dynamics. Specifically, adopting the structural vectoautoregressive Framework to observe the response of external non policy variables (domestic investment, foreign direct investment and public debt) to shock from domestic policy variables (real exchange rate and lending interest rate). The structural/orthogonalized impulse response analysis results were consistent with the short-run SVAR results suggesting that the structural estimates are sustainable over time. Also, the implications of key findings in this study is based on the Structural/ Orthogonalized impulse response analysis because the result obtained, proved more informative and reliable than the structural parameter estimates obtained from the short-run SVAR and all key findings were individually consistent with theoretical expectations.

The Structural/Orthogonalized impulse response analysis result revealed that domestic investment contemporaneously responds in the same direction to a positive shock from real effective exchange rate implying that domestic investment would continuously fall as exchange rate depreciates increasing costs of imported capital goods, because a large chunk of invested goods in developing countries like Nigeria are imported. Whereas domestic investment contemporaneously responds in an opposite direction to a positive shock from lending interest rate, implying that investment will not respond instantaneously to an increase in interest rate. However, information signals would gradually change investor's preference as the market adjust to lending interest rate policy changes.

Foreign direct investment contemporaneously responds in an opposite direction to a positive shock from real effective exchange rate, arguing that exchange rate depreciation encourages the inflow of foreign direct investment to the host country. Also, Public debt contemporaneously responds in the same direction to a positive shock from lending interest rate implying that external debt has a positive linear relationship with interest rate; the higher the external debt, the higher the interest rate. An increase in interest rate couple with the high inflation in Nigeria, lowers the expectation of foreign investors and subsequently reduce the flow of FDI.

Nigeria's present escalating debt situation influences key macroeconomic variables, specifically on Aggregate investment inflows into the economy. However Nigeria's debt crisis is not strong enough to detach all foreign investment because the economy is characterized with high mass consumption. Hence, foreign investors have confidence in the future, i.e. the economy been able to respond after shock. Also, foreign investors come into the Nigerian economy to network freely (i.e. by avoiding heavy import duties) with other African countries through ECOWAS trade liberalization scheme. Thus to this end it becomes imperative that government policy response is crystalized and channeled towards a robust economic and healthy competitive business environment to attract both domestic and foreign investors within the economy in order to encourage inflows of FDI which drives the current investment climate because it determines the level of confidence investors have for an economy and promotes future returns on investment which in turn generates employment opportunities and thus creates revenue to the government (via corporate tax system) leading to reduction in deficit financing of the government.

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