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THE IMPACT OF PUBLIC DEBT ON INVESTMENT: EVIDENCE FROM NIGERIA

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Abstract

In view of the upward trend in the debt profile of Nigeria and the corresponding increase in the volume of investment as well as the recent decline in foreign direct investment inflow in Nigeria, this study investigated the impact of the components of public debts on the various forms of investment in Nigeria both in the short-run and the long-run using the Autoregressive Distributed Lag (ARDL) framework over the period, 1981-2016.

The empirical results showed that domestic debt improves both private and public investment in the short-run and long-run that is, domestic debt crowds-in both private and public investment but it does not attract FDI. The results also showed that external debt crowds-in private investment both in the short-run and the long-run; crowds-out public investment; and does not influence FDI.

Moreover, the impact of external debts on all forms of investment in Nigeria is greater than domestic debts. In addition, the results revealed that real GDP is a determinant of private investment while interest rate is a driver of all forms of investment in Nigeria.

The study, therefore, recommended that policy makers formulate and implement appropriate policies that will ensure that public debts put to optimal use to further stimulate investment and that embezzlement and misappropriation of public funds be adequately checked to ensure that public debt are not diverted for personal gain. Also, external debt should be favoured over domestic debt as it has more positive impact on all form of investment in the country. Finally, interest rate should be appropriately adjusted to serve as incentives for current and prospective investors.

***Keyword**: Domestic debt, External debt, Private investment, Public investment, Foreign Direct Investment (FDI), Autoregressive Distributed Lag (ARDL), Nigeria.*

1.1 Introduction

The goal of every economy is to achieve the macroeconomic goals of price stability, full employment, favourable balance of payments position, and high and sustainable economic growth, among others (Apere, 2014). Government relies on the use of a mix or either of fiscal and monetary policy to achieve these macroeconomic goals. Fiscal policy involves the government's choice regarding levels of spending and taxation while monetary policy involves the central bank's choice regarding the supply of money which influences aggregate demand. In a situation where a government has fiscal deficit, it finances it by either borrowing (internal or external) to supplement domestic savings, printing more money or drawing down on foreign reserves account. Many developing economies resort to borrowing (public debt) to finance their fiscal deficit because of the need to bridge the gap between their savings and investments and the resources to finance the optimal level of economic growth and development are in short supply.

Traditional and modern economic theories state that incurring reasonable public debts (both domestic and external) will most likely enhance economic activities and hence, economic growth. However, the direction of government spending will determine, to a large extent, if public debt will lead to economic growth or not. For instance, borrowing to service debts, for current consumption or for recurrent expenditure may not stimulate the economy while borrowing to carry out development projects, increase capital expenditure and rational investment in productive ventures will, in the long run, lead to economic growth. Unfortunately, many developing countries borrow for the former reason, which is why their debt profile keeps increasing, investment keeps falling, unemployment rises, national output falls and majority of the residents are trapped in poverty. The failure of debt overhang model to explicitly analyse how public debt influences growth does not limit the fact that a high debt profile retards growth partly by lowering investment and increasing poverty (Egbetunde, 2012).

An escalating debt profile imposes a critical bottleneck on the path to economic growth and development of nations. This is because it costs more to service debt and the costs may grow beyond the capacity of the debtor nation which will thereby have a negative impact on the ability of the borrowing nation to achieve the desired monetary and fiscal goals. Furthermore, government borrowing can crowd-out private investment and reduce future output and wages which obviously threatens the welfare of residents by reducing their standard of living (Stieglitz, 2002).

Sanni (2007) observed that Nigeria's fiscal operations over the years have resulted in varying degrees of deficit; the financing of which has had tremendous implications for the economy. The large fiscal deficits experienced in Nigeria over time have had adverse effects on the economy because it reduced national savings, which in turn increased domestic interest rates, thereby hindering capital formation and crowds out private sector investment (Anyanwu, 1998). The reduction in investment in turn affected employment as firms or businesses reduced their demand for labour and other factor inputs. All these reduced national outputs, which in turn led to trade deficits and balance of payments problem, and a reduction in the overall well-being of the people. In this kind of situation whereby the economy is faced with both a fiscal deficit and a trade deficit simultaneously, we have what is usually referred to as the '*the twin deficits phenomenon*'.

In recent times, the Nigerian economy has been having persistent fiscal deficit, adverse balance of payment problems and incessant fall in the price of crude oil (Nigeria's major export product) in the international market which led to a recession in the economy in 2016. However, to boost the economy, the government is left with no choice than to engage in borrowing (internal and external). The adverse effects of public debt, investment and economic growth-related problems on the Nigerian economy are becoming unbearable as it is becoming increasing difficult for the government to pay salaries of civil servant let alone execute developmental project. Unfortunately, despite the huge public debt the country owes, there is a high level of embezzlement and misappropriation of funds among public office holders in Nigeria such that the

money intended for the general good is siphoned by an (some) individual(s), thus making public debt ineffective as it is unable to achieve the purpose for which it was borrowed in the first instance.

In addition, fiscal deficits have been financed through internal and external borrowing over time. The internal borrowing affects the interest rate as it crowds out the private investment in the long run. While fiscal imbalance can influence current account balance and vice versa, the volume of public debts (external debt especially), which is one of the panaceas for fiscal deficit, could affect the current account position. Hence, there is a link between fiscal balance and current account balance. However, the major causes of huge public debt in Nigeria are not far-fetched. The situation is such that, the national output (GDP) is relatively low primarily due to overdependence on imports; unemployment rate is on the increase; per capita income is relatively low; exchange rate is highly volatile; and interest rate is fixed at double-digit, among others unpleasant economic situations. Unfortunately, the cost of debt servicing is also persistently increasing thus, making debt repayment take longer time than expected. All these discourage borrowing and therefore hinder and retard investment.

It is against this background that this study seeks to answer the following research questions: what kind of relationship exists between public debt (domestic and external debts) and private and public investment as well as foreign direct investment in Nigeria? What are the nature and degree of their influence? What can be done to optimize the use of public debt to improve the volume of investment in the Nigerian economy?

This study will serve as an eye-opener to the government, policy makers and other stakeholders in the Nigerian economy on the impact public debts have on the overall investment position of the country thereby, making them see the need to formulate appropriate policies relating to effective and optimal use of public debts and effectively implementing these policies and those already in place. This study will also contribute its quota to the existing literature thereby, expanding the frontier of knowledge on the relationship between public debt and investment in Nigeria.

The rest of this paper is structured as follows: Section 2 comprises an overview of Nigeria's fiscal, debt and investment profile; review of related literature is the main thrust of Section 3; Section 4 presents data issues and methodology of this study; Section 5 is concerned with the empirical analysis of this study; and Section 6 concludes the study and make evidence-based policy recommendations.

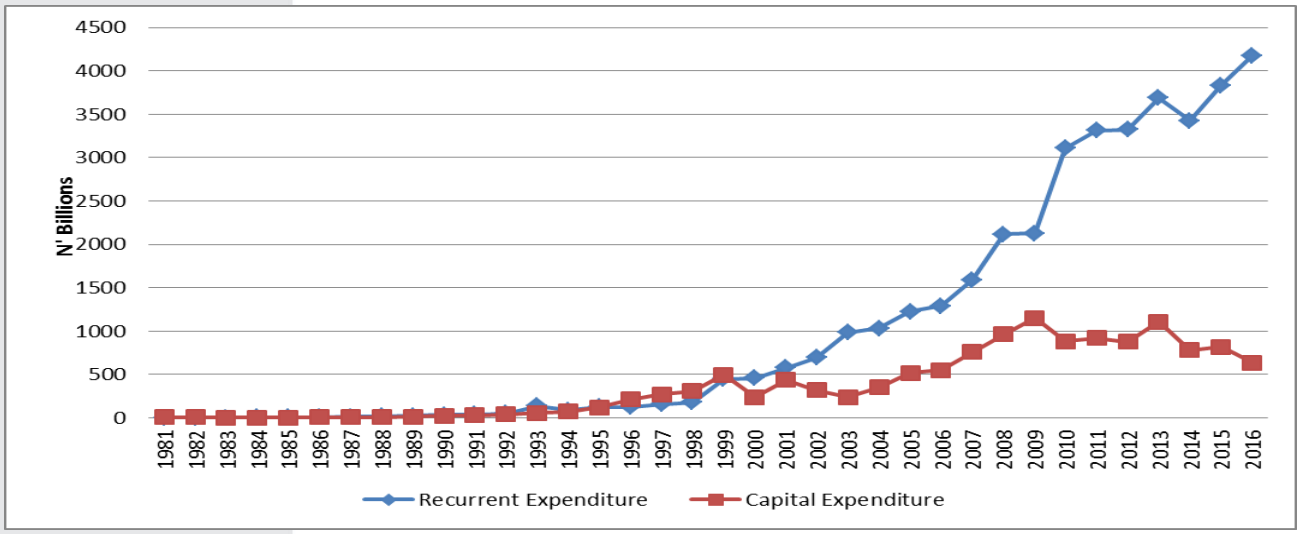
2.0 Nigeria's Fiscal, Debt and Investment Profile

The main sources of revenue to the Nigerian government includes proceeds from crude oil sales, company income tax, custom and excise duties, petroleum profit tax, education tax, privatisation/GSM proceeds, and value-added tax, among others. Government expenditure comprises recurrent and capital expenditure (CBN, 2016). Recurrent expenditure is the expenditure government incurs on a regular basis like salaries, subventions, public debt servicing, subsidies, pensions and gratuities, among others while capital expenditure is the cost government incurs on capital/developmental projects like infrastructures, educational facilities, as well as intangible assets such as education, research and development, and other kinds of expenditure that brings about improvement in the functionalities of the assets. Hence, government capital expenditure is a major driver or determinant of the volume of investment in Nigeria. The components of the Nigerian government expenditure profile include expenditure on administration, economic services, social community services and transfers, among others (CBN, 2016). The difference between government revenue and expenditure is fiscal balance.

Figure 2.1 shows that for most of the period under review, the Nigerian government spent more on recurrent expenditure than capital expenditure implying that the Nigerian government places more priority on present consumption than investing in the economy through implementing capital projects to increase future consumption. Similarly, Figure 2.2 shows that Nigeria witnessed fiscal surplus for most of the period under review as government revenue was greater than government expenditure except in a few years. However, public debt in Nigeria during the period under review increased incessantly over the years until it reached an unprecedented height of ₦6260.59

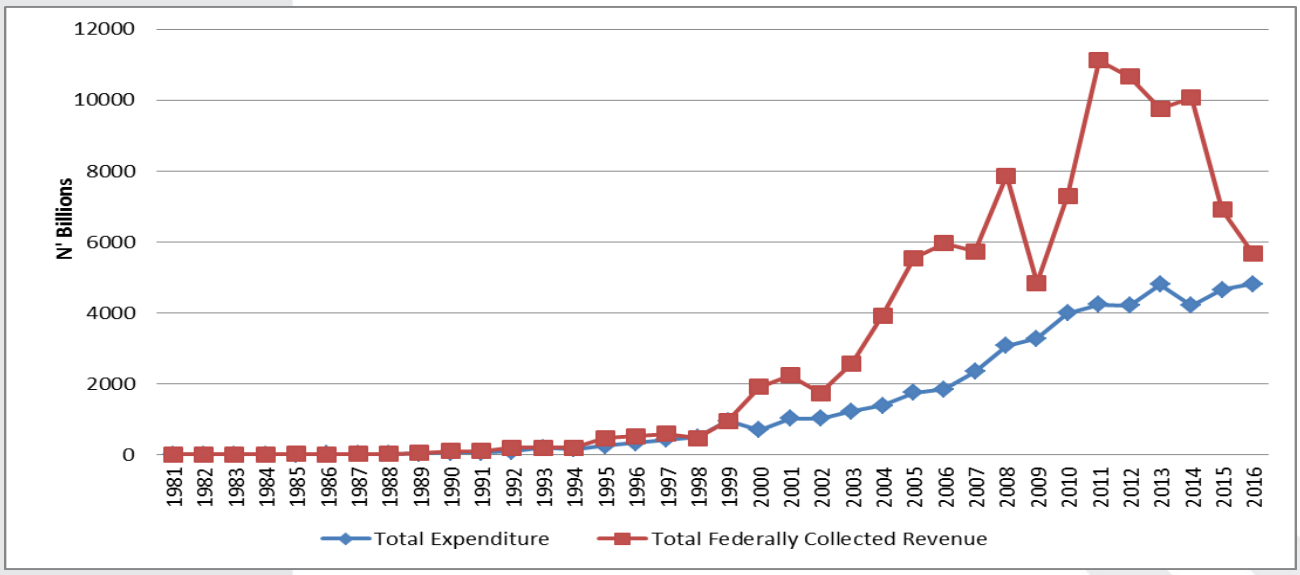
billion in 2004 before it slowed down in subsequent years. This raises a concern as to why a country with fiscal surplus will continue to borrow. One plausible reason for this unusual situation is the high rate of corruption and high-level misappropriation of funds among public office holders and other stakeholders alike. Another reason for this is that in a bid to satisfy the proponents of Structural Adjustment Programme (SAP) as well as stimulate the economy, the Nigerian government danced to the tune of the World Bank and International Monetary Fund (IMF) policies by adopting their policies hook, line and sinker.

Figure 2.1: Trend of Recurrent and Capital Expenditure (1981-2016)



***Source*:** Computed by Author from CBN Statistical Bulletin (2016)

Figure 2.2: Trend of Fiscal Balance in Nigeria (1981-2016)



***Source*:** Computed by Author from CBN Statistical Bulletin (2016)

Economic theory argues that reasonable levels of public debt could stimulate economic growth in developing economies (Pereira and Xu, 2000). Thus, debt in itself is not bad, but lack of optimal utilization of the debt is. Nigeria's domestic debt outstanding comprises debt instruments such as treasury bills, federal government bonds, promissory notes, treasury certificates, promissory note, treasury bonds and development stocks, among others and are sourced from the Central Bank of Nigeria (CBN), commercial banks, merchant banks, sinking fund, the total banking system and non-bank public, among others. On the other hand, external debts are sourced from Paris Club, London Club, promissory notes, and multilateral organizations like the World Bank and IMF, among other foreign creditors. However, in 2006, Nigeria stopped borrowing from Paris Club and London Club, and in 2007, promissory notes stopped being a source of debt to Nigeria (CBN, 2016).

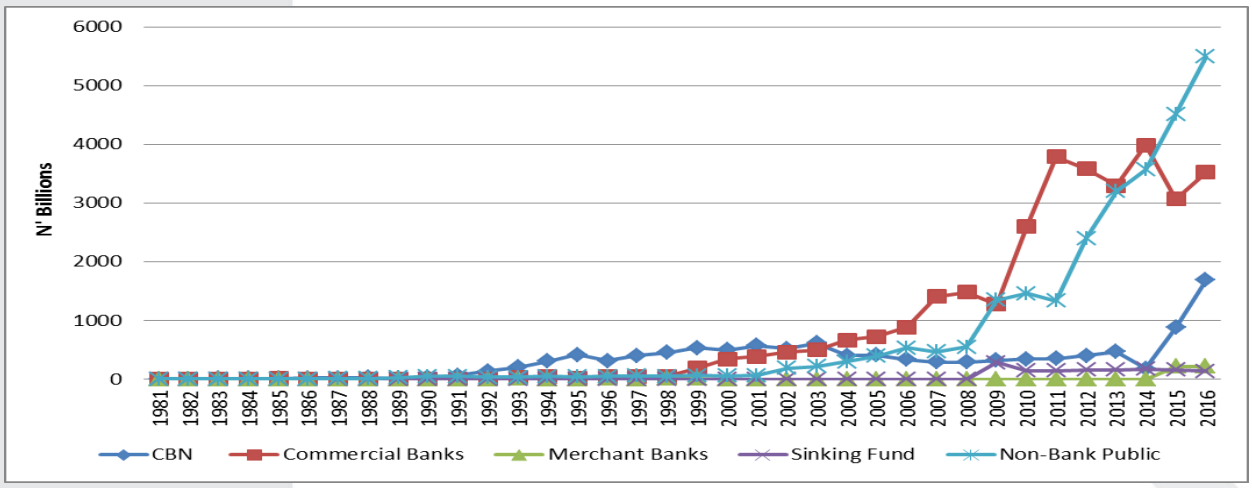
Figure 2.3 and 2.4 show the different sources from where Nigeria borrows to finance her budget and augment her expenditure. Nigeria's biggest external creditor was the Paris Club but now multilateral organizations. However, Nigeria's biggest domestic creditor was commercial banks but now, non-bank public indicating the crowding out effect holds in Nigeria. Nigeria borrows domestically from its Central Bank (CBN), commercial banks, merchant banks and non-bank public, among others while its external creditors include Paris Club, London Club, and multilateral organisations, among others. Figure 2.5 shows that both the domestic debt and external debt profile experienced upsurge overtime. Domestic debt grew from ₦11.19 billion in 1981 to ₦84.09 billion in 1990 from when it increased markedly to ₦898.25 billion in 2000, ₦4551.82 billion in 2010 and ₦7904.02 billion and ₦11,058.20 billion in 2014 and 2016 respectively. The external debt profile also followed almost the same trend as it increased sharply from ₦2.33 billion in 1981 to ₦298.61 billion in 1990 and further increased markedly to ₦3097.38 billion in 2000 and to a record high of ₦4890.27 billion in 2004 and fell to 2695.07 in the following year. Interestingly, Nigeria stopped borrowing from Paris Club and London club in 2006 and the value of external debt outstanding fell sharply to ₦ 451.46 billion in the same year but has continued to increase since then as it

increased steadily to ₦1631.52 billion and ₦3478.92 billion in 2014 and 2016 respectively.

Figure 2.3, 2.4 and 2.5 show that Nigeria's total public debt stood at ₦13.52billion in 1981 with domestic debt taking the lion share of about 83 percent while external debt had only about 17 per cent. However, in 1986 when Structural Adjustment Programme (SAP) was introduced in Nigeria, the share of external debt in total public debt was more than that of domestic debt. The effects of SAP continued in subsequent years leading to an escalating growth in public debt by about 448 percent between 1986 and 1990. As the public debt of Nigeria continued to grow tremendously, the share of external debt in total public debt dominated domestic debt's share from 1986 to 2005 from when domestic debt started taking the lion share in public debt. Nigeria's public debt continued to experience a tremendous increase as it grew to a record ₦6260.59 billion in 2004 but fell to ₦4220.98 billion in 2005 and plummeted further to ₦2204.72 in 2006, its lowest in the millennium because Nigeria stopped borrowing from Paris and London Club. However, the debt grew steadily to ₦5241.66 billion, ₦9535.54 billion and ₦14,537 billion in 2010, 2014 and 2016 respectively (CBN, 2016).

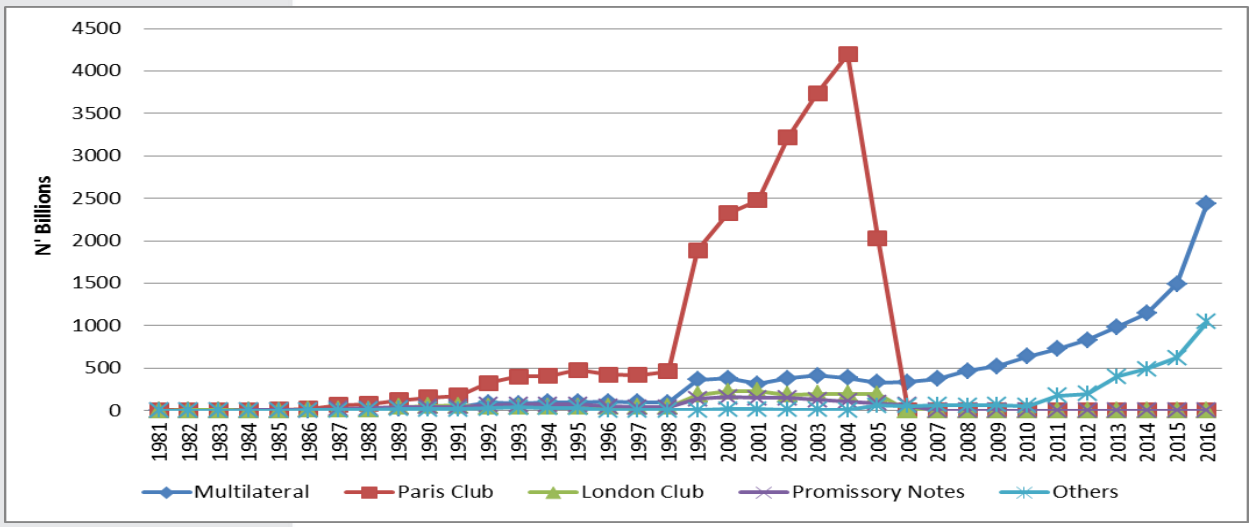
Debt-to-GDP ratio is a good indicator of a country's ability to repay its debt. Figure 2.5 shows that this ratio had an upward trend for most of the period under review and it has a positive relationship with total public debt such that they have similar trend. The implication of the upward trend of the debt-to-GDP ratio is that public debt is growing faster than GDP thus, the available resources the economy is inadequate to repay the debts hence, the deferment of debt repayment to the future (Apere, 2014).

Figure 2.3: Sources of Domestic Debt in Nigeria (1981-2016)



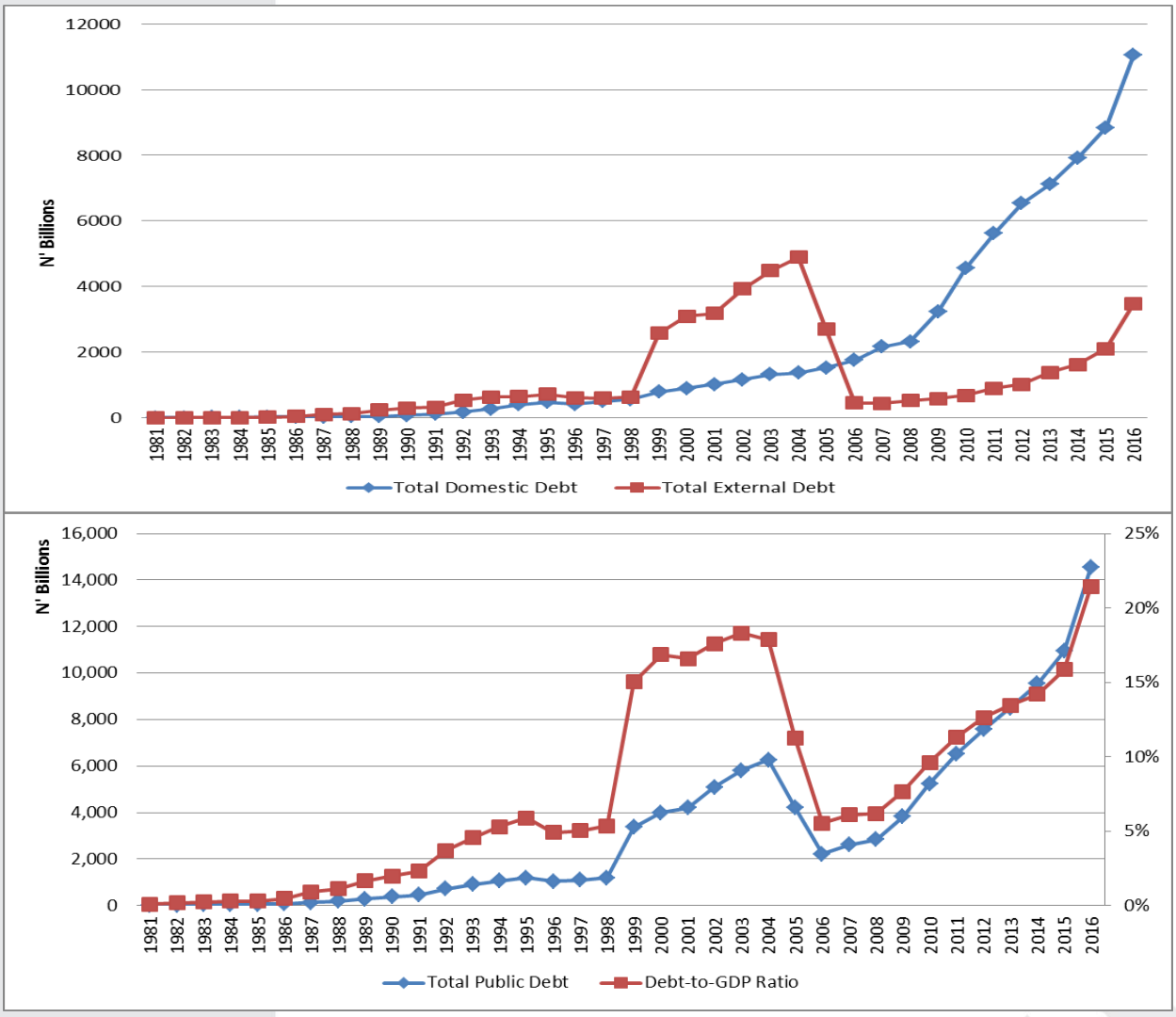
Source: Computed by Author from CBN Statistical Bulletin (2016)

Figure 2.4: Sources of External Debt in Nigeria (1981-2016)



***Source*:** Computed by Author from CBN Statistical Bulletin (2016)

Figure 2.5: Public Debt Profile in Nigeria (1981-2016)

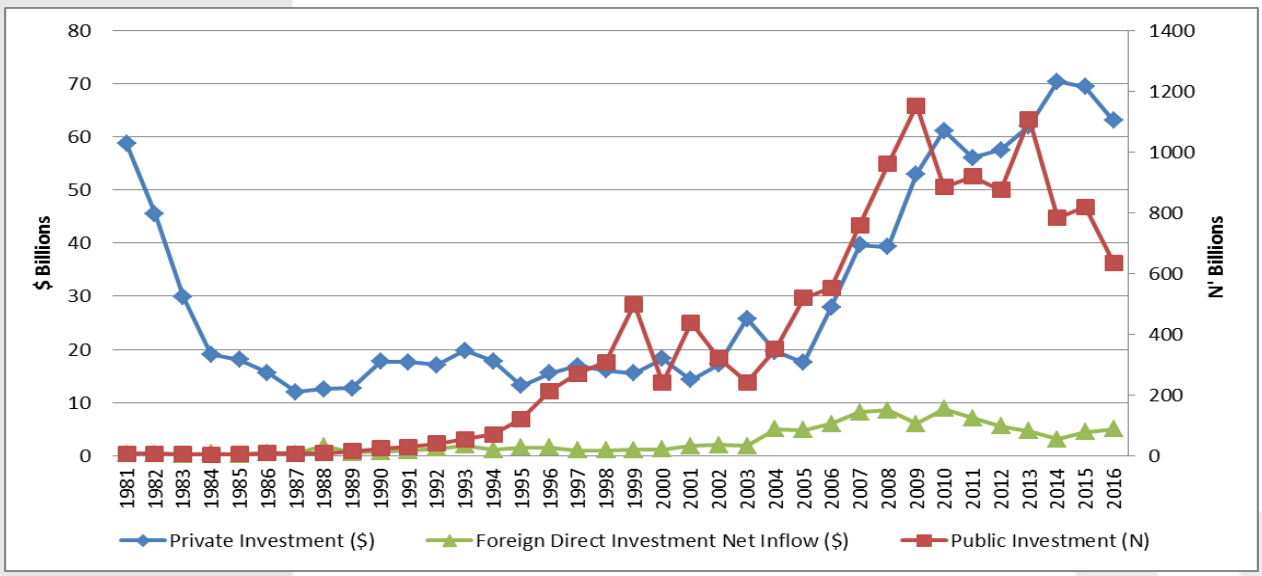


***Source*:** Computed by Author from CBN Statistical Bulletin (2016)

Investment is the monetary outlay of real assets such as factory plants, inventories, real estates, as well as the provision of socially desirable assets like education transportation, communication and health-related utilities, among others. Put differently, any asset that does not contribute towards the provision or production of goods and services cannot be referred to as investment. The total investment in an economy is cumulatively the sum of both domestic and foreign investible capital. Domestic investment, which can be disaggregated into private and public investment, is a vital component of total investment. Private investment can be described as gross capital formation while public investment can be said to be government capital expenditure. Foreign direct investment is the other side of the divide as it constitutes the volume of investment by foreign investors.

Figure 2.6 shows the volume of investment (domestic and foreign) in Nigeria between the year 1981 and 2016. It is apparent from the Figure that there are significant fluctuations in the volume of private and public investment in Nigeria from 1981 to 2016. It also shows the volume of private investment as well as public investment exceeds foreign direct investment almost throughout the period under review. This indicates that domestic investment takes the lion share in total investment in the economy and that the Nigerian is not so attractive to foreign investors. This dismal trend in the volume of investment in Nigeria is closely linked with the unfavourable investment climate of the country occasioned by poor infrastructural base, institutional failure, unfavourable economic policies, insecurity and political instability, among others (Ogunjimi and Amune, 2017).

Figure 2.6: Nigeria's Investment Profile (1981-2016)



***Source*:** Computed by Author

3.0 Literature Review

There is a large volume of empirical studies on the relationship between public debt and investment in different economies of the world. Some studies found a direct relationship between these macroeconomic variables while others found that they are inversely related. Whereas some studies found the relationship between public debt and investment to be significant, others discovered that one does not influence the other.

For instance, Sánchez-Juárez and García-Almada (2015) used Dynamic Models of panel data and the Generalized Method of Moments to investigate the impact of the growing public debt of state governments on public investment and economic growth in the Mexican states between 1993 and 2012. The empirical results indicated a positive correlation between public debt and public investment, which in turn generates economic growth.

Similarly, Clements, Bhattacharya and Nguyen (2003) examined the channels through which external borrowing influence growth in low-income countries. The findings of the study revealed that the substantial reduction in the external debt stock projected for highly indebted poor countries would lead to about one percent increase in per capita income; and a decline in external debt service could stimulate economic growth indirectly through its effects on public investment. It was also found that growth could accelerate by an additional 0.5 percent in some highly indebted poor countries if half of all debt-service relief were channelled for such purposes without raising the budget deficit.

Apere (2014) used time-series data sourced from CBN Statistical Bulletin to examine the impact of public debt on private investment in Nigeria for the period 1981 to 2012. He adopted the instrumental variable technique of estimation and bootstrapping technique for the computation of normal based standard errors for the turning points to regress private investment as a ratio of GDP on domestic debt, domestic debt squared, external debt, external debt squared, and private consumption expenditure as a percentage of GDP. The results revealed a linear and positive relationship between domestic debt and private investment; a U-

shaped impact of external debt on private investment; and an inverse relationship between private consumption expenditure and private investment.

In their study of external debt, economic growth and investment in Nigeria, Oke and Sulaiman (2012) used data spanning the period between 1980 and 2008 to examine the impact of external debt on the economic growth and volume of investment in Nigeria. The finding of the study was that there is a positive relationship between external debt, investment and economic growth. Also, the result showed that current external debt ratio of GDP stimulates economic growth in the short run while private investment experiences a decline.

Using Johansen cointegration technique and Vector Error Correction Model (VECM), Akomolafe, Bosede, Emmanuel and Mark (2015) in their study aimed at investigating the effect public borrowing has on private investment in Nigeria using time-series data from 1980 to 2010 to examine this relationship. The study disaggregated public debt into domestic and external debt. The empirical results revealed that domestic debt crowds-out domestic investment both in the short run and long run while external debt crowds-in domestic investment in the long run.

Ezeabasili and Nwakoby (2013) adopted the cointegration and structural analysis technique to re-examine the controversial relationship between government expenditure and private investment within the Nigerian context using time series data from 1970 to 2006. The result showed that there is a positive long run relationship between private investment and real growth of the national economy which confirms the relevance of the accelerator principle to Nigeria. In addition, the result indicates that fiscal deficits have had a depressive effect on private investment in the country and that Nigeria's debt profile has had strong and negative impact on private investment in Nigeria.

Paiko (2012) examined the impact of deficit financing on the performance of private investment in Nigeria. Estimating time-series secondary data sourced from CBN statistical bulletin and National Bureau of Statistics bulletin, it was found that an inverse relationship exists between deficit financing and private investment and that the former crowds-out the latter.

Ekpo (2016), in his study, examined the determinants of private investment in Nigeria. The finding of the study showed that the determinants of private investment in Nigeria are interest rate, public investment rate, domestic inflation rate, fiscal deficits, size and growth rate of market, poor provision of infrastructure, political and economic stability, availability and access to bank credit, institutional factors and investment climate.

Erhieyovwe and Onovwoakpoma (2013) used time-series data sourced from Nigeria Bureau of Statistics to examine the impact of external debt burden on major macroeconomic variables in Nigeria. The result of the cointegration test carried out in the study revealed that long run relationship exists among external debt, export, inflation, foreign direct investment and real GDP. The result of the estimation showed that external debt burden, foreign direct investment, inflation and export have a positive relationship with economic growth.

Ebi, Abu, and Clement (2013) investigated, using time series data obtained from different source for the period between 1970 and 2011, the relative impact or potency of both external and domestic debts on the performance of the Nigerian economy with emphasis on which of the debt type exert more impact or influence on the major macroeconomic variables of per capita GDP and gross domestic investment. It was found out that external debt is superior to domestic debt in terms of economic growth, external debt and not domestic debt crowd-out domestic investment in Nigeria.

Asogwa and Okeke (2013) examined the crowding out effect of budget deficits on private investments in Nigeria's economy. The result showed that budget deficits crowds out private investments and that private investments granger cause budget deficit with feedback. Based the findings, the study recommended that stakeholders reduce recurrent expenditure and increase its capital expenditure in order to encourage and make conducive environment for private investment to thrive which will ensure economic growth.

Using cointegration technique and error correction model, Obudah and Tombofa (2013) investigated the effects of domestic debt and interest rate on private

equity investment growth and examined the crowding-out hypothesis holds in Nigeria for the period between 1987 and 2010. The a priori expectation of domestic debt and GDP growth having a positive impact on equity investment holds. However, an inverse relationship exists between monetary policy rate and equity investment.

From the above reviewed literatures, it is obvious that several studies were restricted to investigating the link between public debt and private investment (which is only a part of the investment profile in Nigeria). Investment in Nigeria can be disaggregated into private investment, public investment and foreign direct investment, thus, conducting a study on only a fraction of a whole might not give the accurate picture of the relationship that exists between public debt and investment in Nigeria.

Moreover, from the few studies that examined the impact of public debt on investments in Nigeria, the whole component of public debt (domestic and external debt) was not used to investigate the relationship of the two variables in question. For instance, in the study by Oke and Sulaiman (2012), they examined the relationship between external debt and the volume of investment in Nigeria between 1980 and 2008. This might not give a true picture of the link between public debts and investment in Nigeria as external debt constitutes only a fraction of public debt, a gap which this study will fill.

4.0 Data and Methodology

This study assessed the impact of public debt (domestic and external debts) on the volume of investment (private, public and foreign direct investment) in Nigeria for the period between 1981 and 2016. This study estimated three models where private investment, public investment and foreign direct investment were dependent variables. Theoretically, output and interest rate are key determinants of investment and are thus added to the models as control variables. Public debt was divided into two: external debt and domestic debt and will be regressed on the three investment models. For the purpose of analysis, the natural logarithm of each of the variables except interest rate is taken to neutralise the unit effect and also to make interpretation in proportionate terms.

This study employed the use of annual time series data sourced from Central Bank of Nigeria Statistical Bulletin (2016) and World Development Indicator (2017) for the period between 1981 and 2016. Whereas data on public investment (₦ Billion), real GDP (₦ Billion), monetary policy rate (interest rate [%]), domestic debt (₦ Billion) and external debt (₦ Billion) are source from CBN Statistical Bulletin (2016), data on foreign direct investment (FDI) ($ Billion) and private investment ($ Billion) are sourced from World Development Indicator (2017). Hence, it is needful to run preliminary tests such unit root test and cointegration test before estimating the ARDL model. To prevent spurious regression, this study tested for unit root using Augmented Dickey Fuller (ADF) and Phillip Perron methods. To determine the existence of long-run relationship between the explanatory and dependent variables, the Autoregressive Distributed Lag (ARDL) Bounds test approach to cointegration is employed. The choice of the ARDL Bounds test approach to cointegration is premised on the fact that it accommodates series that are stationary at levels, first difference or both. Thereafter, the short-run and long-run ARDL models are estimated and diagnostic (post-estimation) tests carried out to check for robustness of the models to ensure that they do not violate the Classical Linear Regression Model (CLRM) assumptions.

Based on the theoretical framework, this study adopted the model used by Akomolafe et al (2015) on the relationship between private investment and public debt. The mathematical models can be presented as:

LPRINV = f (LEXDBT, LDMDBT, LRGDP, INT) -- -- -- -- (1)

LPUINV = f (LEXDBT, LDMDBT, LRGDP, INT) -- -- -- -- (2)

LFDI = f (LEXDBT, LDMDBT, LRGDP, INT) -- -- -- -- (3)

The econometric models can be specified as follows:

$LPRINV_t = \alpha_0 + \alpha_1 LEXDBT_t + \alpha_2 LDMDBT_t + \alpha_3 LRGDP_t + \alpha_4 INT_t + \varepsilon_{1t}$ -- (4)

$LPUINV_t = \beta_0 + \beta_1 LEXDBT_t + \beta_2 LDMDBT_t + \beta_3 LRGDP_t + \beta_4 INT_t + \varepsilon_{2t}$ -- (5)

$LFDI_t = \Omega_0 + \Omega_1 LEXDBT_t + \Omega_2 LDMDBT_t + \Omega_3 LRGDP_t + \Omega_4 INT_t + \varepsilon_{3t}$ -- (6)

A priori Expectations: $\alpha_0, \alpha_1, \alpha_3 > 0; \alpha_2, \alpha_4 < 0$

$\beta_0, \beta_1, \beta_2, \beta_3 > 0; \beta_4 < 0$

$\Omega_0, \Omega_1, \Omega_2, \Omega_3, \Omega_4 > 0$

Where:

LPRINV = Log of Private Investment

LPUINV = Log of Public Investment

LFDI = Log of Foreign Direct Investment Net Inflow

LEXDBT = Log of External Debt

LDMDBT = Log of Domestic Debt

LRGDP = Log of Real Gross Domestic Product

INT = Interest Rate (Monetary Policy Rate)

ε_t = White Noise Stochastic Error Term

The ARDL representations of equation (4), (5) and (6) are specified below:

$$\Delta LPRINV_t = \alpha_0 + \sum_{i=1}^{n} \alpha_{1i} \Delta LPRINV_{t-i} + \sum_{i=0}^{n} \alpha_{2i} \Delta LEXDBT_{t-i} + \sum_{i=0}^{n} \alpha_{3i} \Delta LDMDBT_{t-i} + \sum_{i=0}^{n} \alpha_{4i} \Delta LRGDP_{t-i} + \sum_{i=0}^{n} \alpha_{5i} \Delta INT_{t-i} + \beta_2 LPRINV_t + \beta_3 LEXDBT_t + \beta_4 LDMDBT_t + \beta_5 INT + \varphi ECT_{t-1} + \varepsilon_t \quad -- \quad (7)$$

$$\Delta LPUINV_t = \alpha_0 + \sum_{i=1}^{n} \alpha_{1i} \Delta LPUINV_{t-i} + \sum_{i=0}^{n} \alpha_{2i} \Delta LEXDBT_{t-i} + \sum_{i=0}^{n} \alpha_{3i} \Delta LDMDBT_{t-i} + \sum_{i=0}^{n} \alpha_{4i} \Delta LRGDP_{t-i} + \sum_{i=0}^{n} \alpha_{5i} \Delta INT_{t-i} + \beta_2 LPRINV_t + \beta_3 LEXDBT_t + \beta_4 LDMDBT_t + \beta_5 INT + \varphi ECT_{t-1} + \varepsilon_t \quad -- \quad (8)$$

$$\Delta LFDI_t = \alpha_0 + \sum_{i=1}^{n} \alpha_{1i} \Delta LFDI_{t-i} + \sum_{i=0}^{n} \alpha_{2i} \Delta LEXDBT_{t-i} + \sum_{i=0}^{n} \alpha_{3i} \Delta LDMDBT_{t-i} + \sum_{i=0}^{n} \alpha_{4i} \Delta LRGDP_{t-i} + \sum_{i=0}^{n} \alpha_{5i} \Delta INT_{t-i} + \beta_2 LPRINV_t + \beta_3 LEXDBT_t + \beta_4 LDMDBT_t + \beta_5 INT + \varphi ECT_{t-1} + \varepsilon_t \quad -- \quad (9)$$

Where Δ denotes the first difference operator, α_0 is the drift component, and ε_t is the white noise residuals.

5.0 Empirical Analysis

5.1 Descriptive Statistics

Table 5.1 presents the summary of the descriptive statistics of the macroeconomic variables employed in this study. A critical look at the Table shows that Nigeria's average domestic debt stood at ₦2013.47 billion ranging from ₦11.19 billion to ₦11058 billion. Similarly, the mean value of Nigeria's external debt for the period under review is ₦1212.82 billion, which is less than the domestic debt owed, with a minimum and maximum value of ₦2.33 billion and ₦4890.27 billion respectively. In addition, the average value of private investment, public investment, foreign

direct investment, interest rate and real GDP of Nigeria for the period under review stood at $30.64 billion, ₦368.15 billion, $2.83 billion, 12.99 percent and ₦31757.15 billion respectively. Table 5.1 also shows that all the variables except public investment are normally distributed as depicted by the probability value of Jarque-Bera (significant at 10 percent) as well as the values of skewness and kurtosis have a very low standard deviation signifying a small deviation from their respective mean values.

Table 5.1: Descriptive Statistics of the Macroeconomic Variables

	DDBT	FDI	EXDBT	INT	PRINV	PUINV	RGDP
Mean	2013.47	2.83	1212.82	12.99	30.64	368.15	31757.15
Median	677.82	1.73	625.17	13.00	18.66	255.67	22391.14
Maximum	11058.20	8.84	4890.27	26.00	70.34	1152.80	69023.93
Minimum	11.19	0.19	2.33	6.00	11.97	4.10	13779.26
Std. Dev.	2914.61	2.64	1390.06	4.20	19.63	372.33	18151.71
Skewness	1.68	0.94	1.28	0.70	0.85	0.65	0.87
Kurtosis	4.72	2.60	3.41	4.12	2.09	2.06	2.32
Jarque-Bera	21.33	5.54	10.11	4.87	5.58	3.90	5.29
Probability	0.0000	0.0625	0.0064	0.0875	0.0614	0.1426	0.0710
Sum	72484.88	101.72	43661.39	467.81	1103.10	13253.38	1143257.
Sum Sq. Dev.	2.97E+08	243.11	67629204	616.96	13485.90	4852075	1.15E+10
Observations	36	36	36	36	36	36	36

Source: Author's computation using Eviews9
Note: DDBT = Domestic Debt (₦ Billion); FDI = Foreign Direct Investment ($ Billion); EXDBT = External Debt (₦ Billion); INT = Interest Rate (%); PRINV = Private Investment ($ Billion); PUINV = Public Investment; RGDP = Real GDP (₦ Billion)

5.2 Results of Unit Root Tests

This study employs Augmented Dickey-Fuller and Philip-Perron unit root tests method to check for the stationarity properties of the macroeconomic variables of interest in this study in order to guard against spurious regression. The results of the unit root tests are presented in Table 5.2. The Augmented Dickey Fuller unit root test results show that all the variables are stationary at first difference except interest rate which is stationary at level. Similarly, the Phillip Perron unit root test results show that only interest rate and log of external debt are stationary at level while others are stationary after being differenced once. This implies that most of the variables employed in this study contain unit roots and trends with time.

Table 5.2: Unit Root Test Results

	Augmented Dickey Fuller (Constant)			Phillip Perron (Constant)		
Variables	**Level**	**First Difference**	**Order of Integration**	**Level**	**First Difference**	**Order of Integration**
INT	-3.1885**	-	I(0)	-3.1427**	-	I(0)
LDDBT	-1.1102	-4.4673*	I(1)	-1.5281	-4.4673*	I(1)
LEXDBT	-1.8801	-4.5455*	I(1)	-3.0107**	-	I(0)
LFDI	-1.6256	-11.2938**	I(1)	-1.3481	-11.2336*	I(1)
LPRINV	-0.8115	-3.2516**	I(1)	-1.4226	-4.4795*	I(1)
LPUINV	-1.2743	-5.8335*	I(1)	-1.2619	-5.8663*	I(1)
LRGDP	0.0973	-3.2294**	I(1)	1.2121	-3.0447**	I(1)

Source: Author's computation using Eviews9

Note: * and ** represent 1% and 5% levels of significance respectively

5.3 ARDL Bounds Test Cointegration Results

Sequel to the determination of the order of integration of the macroeconomic variables employed in this study, it is needful to proceed to determining the existence of a long-run relationship among the variables. Since the variables are stationary at level [I(0)] and first difference [I(1)], the appropriate cointegration test to run is the ARDL Bounds test approach to cointegration. The rule for accepting the null hypothesis is that the value of the computed F-statistic must be less than the critical lower bound; greater than the upper bound for the null hypothesis to be rejected and fall between the upper and lower bound for the test to be inconclusive. Table 5.3 shows that the computed F-statistic of the private investment model is greater than the upper bound at all level of significance, thus, there is a long run relationship among the variables in the model. Similarly, the F-stat value of 4.34 of the FDI model, which is greater than the upper bound critical value at 5 percent and 10 percent significance level), indicates the existence of a long-run relationship among the variables as the However, cointegration cannot be ascertained for the public investment model as its computed F-statistic falls between the upper and lower bound at 5 percent and 10 percent level of significance.

Table 5.3: Result of ARDL Bounds Test Approach to Cointegration

	F(LPRINV/ LEXDBT, LDMDBT, LRGDP, INT)			F(LPUINV/ LEXDBT, LDMDBT, LRGDP, INT)			F(LFDI/ LEXDBT, LDMDBT, LRGDP, INT)		
	Critical Value		F-Stat.	Critical Value		F-Stat.	Critical Value		F-Stat.
	Lower Bound	Upper Bound		Lower Bound	Upper Bound		Lower Bound	Upper Bound	
1% Sig. Level	3.74	5.06	9.31	3.74	5.06	2.61	3.74	5.06	4.34
5% Sig. Level	2.86	4.01		2.86	4.01		2.86	4.01	
10% Sig. Level	2.45	3.52		2.45	3.52		2.45	3.52	

Note: The Akaike Info Criterion (AIC) selected the optimal lag length (k=4). The Bounds critical values are obtained from Narayan (2005) case III for 40 observations.
***Source*:** Author's Computation using Eviews9

5.4 Results of Short-Run and Long Run ARDL Estimated Models

Having determined the cointegration status of three specified models of this study, it is needful to proceed to the estimation of the short-run and long-run ARDL models; the results of which are presented in Table 5.4 and 5.5 respectively. Starting with the short run model result in Table 5.4, the error correction term follows a priori expectation as it both negative and statistically significant for all the three investment equations. It is noteworthy to state that the question on the cointegration status of the long-run relationship among the variables in the public investment model which was not answered by the Bounds test has been answered by the error correction term of the model as it confirms the existence of a long-run relationship among the variables. For the private and public investment models, its value of -0.9610 implies that a shock to private and public investment in the current period will be restored at a speed of adjustment of about 96.1 percent in the next period. Put differently, the rate of adjustment of a short-run disequilibrium in private and public investment is very fast as about 96 percent of the divergence in private and public investment as a result of a current period shock will converge towards long-run equilibrium in the next period. Similarly, the error correction term of the FDI model (-0.4561) shows that a shock in FDI will take more than two years for FDI to converge to its long-run equilibrium. This implies that it will take the Nigerian government more than two years to completely recover from the FDI shock in the current period.

Furthermore, Table 5.4 shows that domestic debt improves both private and public investment in the short-run that is, domestic debt crowds-in both private and public investment in the short run as its coefficient is both positive and significant. Specifically, it was found that both private and public investment will increase by about 0.5 percent should domestic debt increase by one percent. However, domestic debt is inversely related to FDI thus, it crowds-out FDI in the short-run such that an increase in domestic debt by one percent results in about 0.3 percent reduction in FDI. This shows that the degree of responsiveness of a change in domestic debt to a change in FDI, private investment and public investment is low. This result is plausible because the money borrowed did not leave the domestic economy and it will be reinvested or spent in the domestic economy thus, increasing the volume of public investment. Although the current period domestic debt does not significantly influence FDI inflow, its previous period value does. Similarly, the long run model result in Table 5.5 shows that domestic debt has a positive and significant relationship with private and public investment in Nigeria but has a positive and insignificant relationship with FDI inflow to Nigeria. This result is against a priori expectation in that it has been proven in the literature that domestic debt crowds-out private investment while it crowds-in public investment (Ebi et al, 2013 and Akomolafe et al, 2015).

Moreover, the results show that external debt has a direct and significant relationship with private investment both in the short-run and the long-run and that the rate of response of the latter to a change in the former is very high (elastic) such that a percent change in external debt will lead, on the average, to more than one percent change in private investment both in the short run and long run. This result is plausible and in line with theoretical expectations. However, there is a significant inverse between external debt and public investment both in the short-run and long-run although the response of public investment to a change in external debt is less than proportional. This result corroborates the finding of Oke and Emmanuel, 2012. In addition, external debt does not have a significant relationship with FDI but its first period lag significantly influences both public investment and FDI positively in the short-run although its impact is greater on public investment than on FDI. This supports the finding of Erhieyovwe and

Onovwoakpoma (2013). It is evident that external debt has a greater influence on all forms of investment in Nigeria than domestic debt.

Additionally, the results reveal that real GDP is significantly and negatively related to private investment both in the short-run and long-run but has an insignificant positive relationship with public investment and FDI. It also shows that when the economy grows by about one percent, private investment will plummet by more than one percent implying an elastic relationship between these macroeconomic variables. This result is against theoretical expectation as basic principles of growth theory suggest that economic growth propels more investment which in turn stimulates economic growth and the cycle continues. However, it was found that real GDP has a positive but insignificant relationship with public investment and FDI in the short-run and long-run. This result is not surprising especially in the Nigerian situation because despite the positive economic growth experienced in the Nigerian economy overtime, the volume of investment still remains low because fund earmarked for developmental project are often siphoned by public office holder and diverted for personal use. This accounts for the high level of decadence in infrastructure as well as the high poverty rate among citizenries.

It is noteworthy that interest rate has a significant positive co-relation with FDI both in the short-run and long-run such that a percent increase in interest rate will raise FDI by 1.14 percent and 7.6 percent in the short-run and long run respectively. This implies that interest rate is one of the determinants of FDI inflow to Nigeria and that FDI responds sharply to a change in interest rate. This is so because an increase in domestic interest rate relative to foreign interest rate will make the economy more attractive to foreign investors thereby increasing the volume of foreign investment in the economy in anticipation of higher returns especially in a country where capital is highly mobile and the existence of a conducive environment where investments thrive is prioritised. The results also show that interest rate has a significant inverse relationship with public investment but a significant positive relationship with private investment.

Table 5.5 reports the values of the Adjusted R-squared which indicates that about 94 percent, 98 percent and 88 percent of the variation in private investment,

public investment and FDI respectively are explained by domestic debts, external debts, real GDP and interest rate. The F-statistics of the three models show that the explanatory variables of each model jointly influence their respective dependent variables. The value of Durbin-Watson also shows the absence of autocorrelation in the three estimated model. Table 5.5 also presents the post-estimation diagnostic tests, the purpose of which is to ensure that the estimated equations do not violate the Classical Linear Regression Model (CLRM) assumptions of no serial correlation, normal distribution, homoscedaticity, and correct specification, among others. The results show the three models are normally distributed, correctly specified and devoid of serial correlation and heteroscedasticity. Figure 5.1, 5.2 and 5.3 also reveal that the plots of the CUSUM and CUSUMSQ statistics of the three estimated models stay within the critical bounds of 5 percent level of significance hence, the models pass the stability test and are adjudged stable. Hence, the results of this study qualify to be useful for policy formulation and prescriptions.

Table 5.4: Results of ARDL Short-Run Model

Variables	Private Investment Model	Public Investment Model	Foreign Direct Investment Model
D(LFDI(-1))	-	-	-0.5109 (0.0109)
D(LDDBT)	0.5109 (0.0109)	0.5109 (0.0338)	-0.3422 (0.5694)
D(LDDBT(-1))			1.5911(0.0062)
D(LEXDBT)	1.3744 (0.0000)	-0.3422 (0.0171)	0.2907 (0.1535)
D(LEXDBT(-1))	-	1.5911 (0.0000)	0.5020 (0.0073)
D(LRGDP)	-1.5911 (0.0000)	0.2907 (0.5223)	1.1410 (0.0587)
D(INT)	0.2907 (0.0000)	-0.1551 (0.0000)	1.1410 (0.0000)
D(INT(-1))			-1.1410 (0.0000)
ECT (-1)	-0.9610 (0.0000)	-0.9610 (0.0000)	-0.4501 (0.0564)

Source: Author's computation using Eviews9
Probability values are in parenthesis

Table 5.5: Results of ARDL Long-Run Model

Variables	Private Investment Model	Public Investment Model	Foreign Direct Investment Model
LDDBT	0.1756 (0.0221)	0.5316 (0.0078)	-1.2415 (0.1746)
LEXDBT	1.4302 (0.0000)	-0.5815 (0.0001)	1.4165 (0.0850)
LRGDP	-1.6556 (0.0000)	0.3025 (0.5417)	2.5349 (0.1103)
INT	0.3025 (0.0000)	-0.1614 (0.0000)	7.6046 (0.0576)
CONSTANT	-0.1613 (0.9318)	0.5223 (0.8976)	2.5349 (0.8371)
Adjusted R^2	0.9410	0.9777	0.8796
F-Stat.	91.35 (0.0000)	208.07 (0.0000)	21.09 (0.0000)

Durbin Watson	2.09	2.13	1.52
POST-ESTIMATION DIAGNOSTIC TESTS			
Normality Test	1.2953 (0.5233)	1.7698 (0.4128)	1.5714 (0.4558)
Serial Correlation LM Test	0.6257 (0.4289)	2.2882 (0.3185)	3.3012 (0.0692)
Heteroscedasticity Test (ARCH)	0.0112 (0.9159)	0.3875 (0.5336)	1.0085 (0.3153)
Ramsey RESET Test	0.1565 (0.6955)	3.6941 (0.0661)	0.2027 (0.6574)

Source: Author's computation using Eviews9
Selected Model: ARDL (1, 1, 0, 0, 0), (1, 0, 2, 0, 0) and (2, 2, 2, 0, 2) respectively.
Model selection method: Akaike Info Criterion (AIC)
Number of selected lags: 2 period lags
Probability values are in parenthesis
*, ** and *** represent 1%, 5% and 10% significance level respectively

Plot of Cumulative Sum (CUSUM) and Cumulative Sum of Squares (CUSUMSQ)

Figure 5.1: Private Investment Model Plot of CUSUM and CUSUMSQ of Recursive Residuals

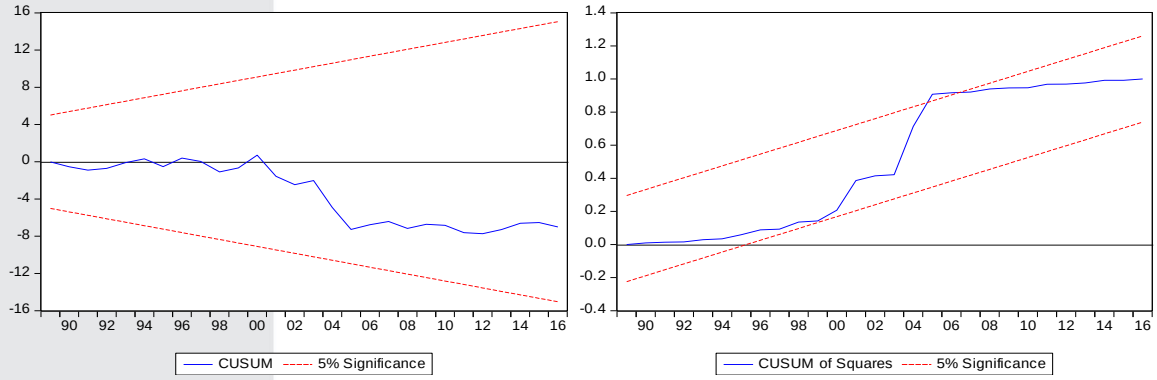


Figure 5.2: Public Investment Model Plot of CUSUM and CUSUMSQ of Recursive Residuals

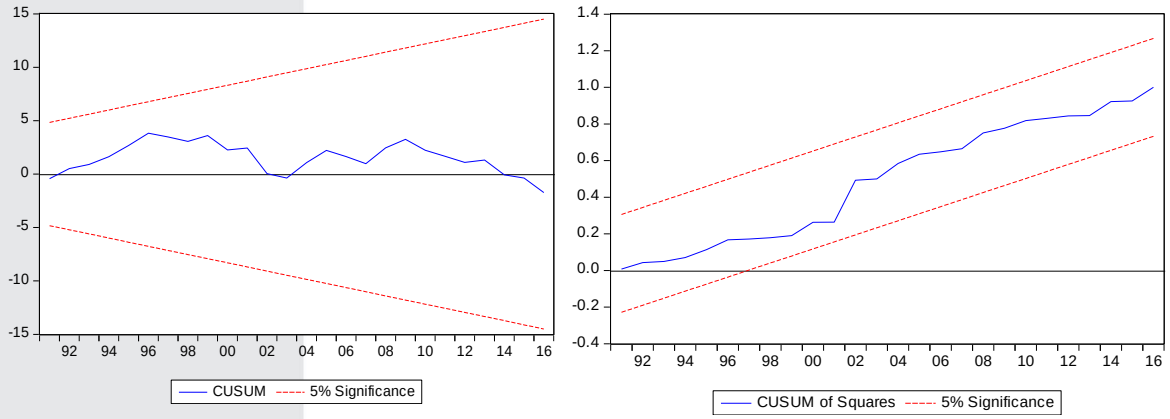
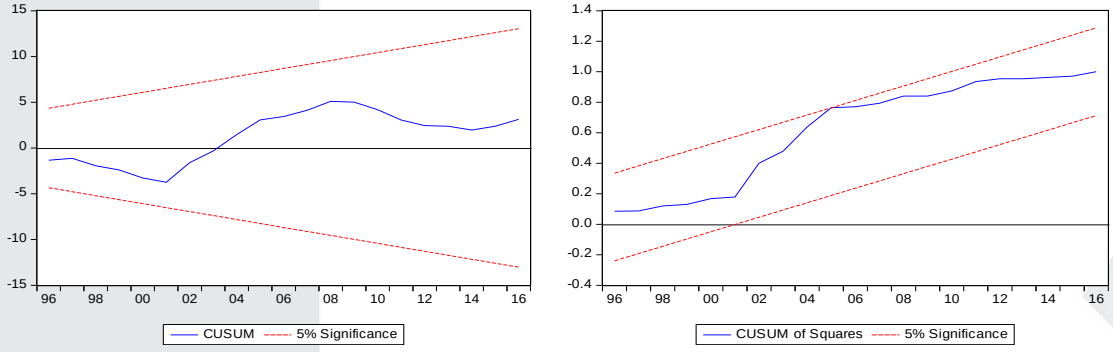


Figure 5.3: FDI Model Plot of CUSUM and CUSUMSQ of Recursive Residuals



Source: Author's Computation from Eviews9

6.0 Conclusion and Policy Recommendations

The main thrust of this study was to empirically examine the impact public debts (domestic and external debt) have on the various types of investment (domestic investment [private investment, public investment] and foreign investment [foreign direct investment]) in Nigeria over the period, 1981-2016. Put differently, this study aimed at testing the validity of the crowding-out and crowding-in effect of public debt on investment in Nigeria. This study specified three investment equations with domestic debt, external debt, real GDP and interest rate as the explanatory variables. Employing the Autoregressive Distributed Lag (ARDL) framework, the Bounds test result shows the existence of a long-run relationship among the variables in the public investment and foreign direct investment model while the result for the private investment model was inconclusive even though this long-run relationship was confirmed by the error correction term of the estimated short-run ARDL model. The results show that domestic debt crowds-in both private and public investment in the short run and long run but it does not significantly influence FDI both in the short-run and long run. On the other hand, it was found that external debt has a direct and significant relationship with private investment both in the short-run and the long-run and that the rate of response of the latter to a change in the former is very high. However, there is a significant inverse between external debt and public investment both in the short-run and long-run. The results show that external debt impacts the various types of investment in Nigeria than domestic debt. It was also found that interest rate is a determinant of all forms of investment in Nigeria while real GDP influence only private investment and not public investment and FDI. Therefore, this is study concludes that both domestic and external debts crowds-in investment but crowds-out foreign direct investment in Nigeria, a phenomenon which has led to a significant decline in FDI inflow to Nigeria in recent time.

In view of these empirical findings, this study recommends that policy makers formulate and implement appropriate policies that will ensure that public debts are effectively used for the purpose for which they were borrowed and also make concerted efforts towards effectively managing debt so as to tremendously increase the volume of investment in the country and achieve the desired level of

economic growth. Embezzlement and misappropriation of funds should be adequately checked and ensure that public debts are put to optimal use to further stimulate investment and economic growth in Nigeria. Also, external debt should be favoured over domestic debt as it has more positive impact on all form of investment in the country. policy makers need to ensure debt are contracted not for selfish or political reasons but to stimulate the economy through investment in capital formation and other social overhead capital. Lastly, the prevailing interest rate (monetary policy rate) should be adequately adjusted to favour investment in the economy.

References

Akomolafe, K.J., Bosede, O., Emmanuel, O. and Mark, A. (2015). Public Debt and Private Investment in Nigeria. *American Journal of Economics, 2015, 5(5): 501-507*.

Anyanwu, J. C. (1998). Do large Fiscal deficits produce high Interest rate?: The case of Nigeria, Ghana, and The Gambia, 1987:3-1995:4. CBN *Financial Economic Review*, 36(1): 51-84.

Apere, O.T. (2014). The Impact of Public Debt on Private Investment in Nigeria: Evidence from a Nonlinear Model. *International Journal of Research in Social Sciences*, Vol. 4, No.2

Asogwa, S.O. and Okeke I.C. (2013). The Crowding Out Effect of Budget Deficits on Private Investment in Nigeria. *European Journal of Business and Management,* Vol.5, No.20.

Clements, B., Bhattacharya, R and Nguyen, T.Q. (2003). External Debt, Public Investment, and Growth in Low-Income Countries. *International Monetary Fund Working Paper, WP/03/249.*

Ebi, B.O., Abu, M. and Clement, O.D. (2013). The Relative Potency of External and Domestic Debts on Economic Performance in Nigeria. *European Journal of Humanities and Social Sciences*, Vol. 27, No. 1

Egbetunde, T. (2012). Public Debt and Economic Growth in Nigeria: Evidence from Granger Causality. *American Journal of Economics,* 2(6): 101-106.

Ekpo, U.N. (2016). Determinants of Private Investment in Nigeria: An Empirical Exploration. *Journal of Economics and Sustainable Development,* Vol.7, No.11, 2016.

Erhieyovwe K.E. and Onovwoakpoma O.D. (2013). External Debt Burden and its Impact on Growth: An Assessment of Major Macro- Economic Variables in Nigeria. *Academic Journal of Interdisciplinary Studies, Vol. 2, No. 2.*

Ezeabasili, V.N. and Nwakoby, C.I.N. (2013). Fiscal Deficits and Private Investment: Econometric Evidence from Nigeria. *International journal of Innovative Research in Management, Issue 2, Volume 3.*

Harris, R. and Sollis, R. (2003). Applied Time Series Modelling and Forecasting. *Wiley, West Sussex*

Iyoha, M.A (1997). An Econometric Study of Debt Overhang, Debt Reduction, Investment and Economic Growth in Nigeria. *Ibadan, National Centre for Economic Management and Administration (NCEMA)*, Monograph Series No. 8

Narayan, P.K. (2005). The Saving and Investment Nexus for China: Evidence from Cointegration Tests. *Applied Economics*, 37: -1979–1990.

Obudah, B.C. and Tombofa S.S. (2013). Effects of Interest Rate and Debt on Equity Investment. *American Journal of Humanities and Social Sciences, Vo1. 1, No, 2, 2013, 31-36.*

Ogunjimi, J.A. and Amune, B.O. (2017). Impact of Infrastructure on Foreign Direct Investment in Nigeria: An Autoregressive Distributed Lag (ARDL) Approach. *Munich Personal RePEc Archive, Paper No. 75996. Retrieved from*: https://mpra.ub.uni-muenchen.de/75996/

Oke, M.O. and Sulaiman, L.A. (2012). External Debt, Economic Growth and Investment in Nigeria. *European Journal of Business Management,* 4(11).

Paiko, I.I. (2012). Deficit Financing and Its Implication on Private Sector Investment: The Nigerian Experience. *Arabian Journal of Business and Management Review* (OMAN Chapter), Vol. 1, No.10; May 2012.

Pereira, A. and Xu, Z. (2000). Export Growth and Domestic Performance. *Rev. Int. Econ*., 8: 60-73. Retrieved from: http://ideas.repec.org/a/bla/reviec/v8y2000i1p60-73.html

Pesaran, M. and Shin, Y. (1999). An Autoregressive Distributed Lag Modeling Approach to Cointegration Analysis, in S. Strom, (ed) Econometrics and Economic Theory in the 20th Century: *The Ragnar Frisch centennial Symposium, Cambridge University Press, Cambridge*.

Pesaran, M.H. and Smith, R.P. (1985). Evaluation of Macroeconometric Models. *Economic Modelling*, 2(2): 125-34

Sánchez-Juárez, I. and García-Almada, R. (2015). Public Debt, Public Investment and Economic Growth in Mexico. *International Journal of Financial Studies*.

Sanni, H.T. (2007). Fiscal dominance: Its impact on Economic Management in Nigeria. *A Paper presented at the course on issues in Economic Management organized by the Central Bank of Nigeria (CBN) Learning centre, Lagos*.