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Public Debt and Private Domestic Investment in Nigeria: An Empirical Investigation

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Abstract

The Nigerian government has been borrowing hugely over the years to finance her budget. However, the patterns of spending have shown to be more on recurrent expenditure and servicing of debt. Such spending pattern tends to caused domestic investment to decline and sometimes unstable. The continuous increase in Nigeria's public debts, it's associated rising debt service and declining/unstable domestic investment, motivated this study. Consequently, the aim of the paper is to investigate how Nigeria's public debts have impacted on the country's private domestic investment using time series data from 1981 to 2021. The data were estimated using the Auto-distributed Lag Model (ARDL) and Error Correction Model (ECM) techniques of analysis. Cointegration test showed that long-run (or equilibrium) relationship exists between public debt and private domestic investment in Nigeria. Findings from the study revealed that public external debt and pubic domestic debt have negative relationship with private domestic investment, while public debt service has positive relationship with private domestic investment. The study concluded that public debt have significant impact on private domestic investment due to the joint result of the Wald test. The paper recommended that the Debt Management Office (DMO) of Nigeria who is vested with the management of the country's debt should advice the federal government to minimize or discourage the collection of debts to fund her budget. Also, the funds borrowed should be channeled into investment on projects that will improve private domestic investment.

Keywords: external debt, domestic debt, debt service, private domestic investment, deficit finance

1. Introduction

The desire of every nation is to achieve a sustainable economic growth and development, due to the crucial role they play in reduction of unemployment, increase in income of the people, as well as reduction of poverty, thereby raising the standard of living of the populace. For growth and development to be achieved in a nation, domestic investment must be taken as priority by the government and the private sector, respectively. The private sector plays an important role in the investment of a country due to its contributions to the provision of employment as well as provision of goods and services to meet daily needs of the people. For a country to enjoy high level of domestic investment there is the need to generate increased revenue through taxes,

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accumulate capital through domestic savings, or to borrow within the country, outside the country or from both sources. However, the continuous decline in international prices of crude oil, pipeline vandalism, oil theft and high cost of petroleum subsidy, amongst others, have resulted in declining revenue for the country. These have drastically affected and reduced the country's earnings that could be used for investment purposes. Furthermore, the rate of Nigeria's capital accumulation is very low due to low domestic savings as a result of high rate of unemployment as well as Nigeria's low saving culture. These constitute a savings constraint as explained by the Dual-Gap theory (Harod & Domar, 1946).

Nigeria has therefore over the years resorted to deficit financing due to shortfalls in revenue thereby borrowing (domestic and external) to augment her revenue in order to achieve the desired investment. According to Ogunjimi (2019), it is believed that incurring reasonable public debt will most likely enhance economic growth through investment. Therefore, Keynes (1936) asserted that public debt helps a recipient country develop, sustain and accelerate its economic growth, and pay back the loans from its returns. However, for the purpose of debt to be achieved, the direction of government spending matters to a large extent. The borrowed funds have to be well managed and the resources channeled to where it will be prudently and efficiently used (Akomolafe, 2015). It then follows that public debt if not properly managed could lead to more harm than good. When a country borrowing to service debt, meet current consumption or to fund recurrent expenditure without investing in productive ventures may not stimulate the economy, but could lead to reduction in domestic private investment, referred to as crowding-out effect. Conversely, borrowing to carry out development projects, increase capital expenditure and rational investment in productive ventures will in the long run lead to economic growth and crowd-in investment (Joy & Panda, 2020). Unfortunately, Nigeria government borrows to service debt, meet current consumption and fund recurrent expenditure without investing much in capital investment (Akomolafe, 2015).This is evident in government's capital and recurrent expenditures from 1987 till date (CBN, 2021). Furthermore, it is believed that most of the borrowed funds are often mismanaged and embezzled, thereby stifling desired domestic investment.

The role of debt servicing in the determination of a nation's domestic investment cannot be overemphasized. High fund allocated for servicing debt could stifle domestic investment because there would not be enough funds left for domestic investment. For instance, Nigeria's debt service-to-revenue ratio was 99% as at Q4 of 2021 (World Bank, 2021.The implication of increasing debt servicing is that little resources will be dedicated for domestic investment, hence not achieving the desired investment purpose and it associated benefits. Many authors have investigated the impact of public debt on private domestic investment through various studies. While some are of the view that public debt crowds-out private investment, others argued that it actually crowds-in private investment. Against this backdrop, the paper seeks to investigate the impact of public debt on private domestic investment in Nigeria. The following formulated hypotheses guided the paper to show the validity of the objective, and they are:

H_{01}: External debt has no significant impact on private domestic investment in Nigeria.
H_{02}: Domestic debt has no significant impact on private domestic investment in Nigeria

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H_{03}: Debt servicing has no significant effect on private domestic investment in Nigeria.

The rest of the paper is further structured into material and methods, results and discussion, and then conclusion and recommendation

Literature Review

Conceptual Review

This paper reviewed three concepts which are: domestic debt, external debt, debt service and private domestic investment.

Domestic Debt: According to Nigeria debt management office, DMO (2021), domestic debt referred to debt owed to lenders, nationals or citizens of a country. Domestic debts are classified based on holdings, maturity and instruments. Based on holdings classification, the country's domestic debt outstanding is classified into; Central Bank of Nigeria (CBN), the deposit money bank, and the domestic debt hold by the Non-Bank Public. Based on maturity, the domestic debts are classified as short term debt (I year below), medium term debt (1 to 3 years) and long term debt (3 years and above). Based on the instruments, Nigeria's total domestic debt consist of the federal government bond, Nigeria treasury bills, federal government Savings bond, federal government Sukuk, Green Bond, and the promissory note (CBN, 2021).

External Debt: external debt is the component or portion of a country's debt that is borrowed from foreign lenders, including commercial banks, governments, or international financial institutions. Audu (2004) defines external debt as that part of total debt that is owed to lenders outside the country, and such debt including the interests are usually paid in the currency in which the loan was made. External debt comprised of the multilateral debt, bilateral debt, commercial debt and the Promissory notes. (CBN, 2021).

Debt Service: debt servicing is the regular payment of installment of loans taken by a country from domestic and external sources; and such installment includes interest on debt and a part of the principal (Chinamerem & Anayochukwu, 2013). According to Adesola (2009), debt servicing is the cash that is required for a particular period to cover the repayment of interest and principal on a debt. The IMF (2003), also defined debt service as the set of payments actually made to satisfy a debt obligation, including principal, interest, and any late payment fees.

Private Domestic Investment: private domestic investment measures the amount of money that domestic businesses invest in their own country. Private domestic investment is characterized by gross investment, private investment and domestic investment. It is constituted by non-residential investment (expenditures on things such as machines, computers, tools, land, buildings and other equipment and structures. The residential investment constitutes expenditures by landlords on real estate that is rented by tenants, change in private inventories include goods produced by businesses to be sold later, finished products and raw materials.

Theoretical Framework

Several studies (See, Anoke, Odo and Nnabu, 2021, Thilanka and Ranjith. 2020, Mabula and Mutasa, 2019) were conducted on public debt and private domestic investment based their

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theoretical framework on the debt-overhang theory and the dual-gap theory and other relevant theories. The debt overhang theory explained why companies do not finance their activities with maximum debt because high amount of debt distort the possibility for companies to make optimal investment decision because future earnings goes to the creditors in form of debt payment (Myers, 1977). Krugman (1988) related the theory to a country by stating that if a country's debt level exceeds her repayment ability, some of the returns from investing in the domestic economy are taxed away by the creditors thus discouraging economic growth. The dual gap theory explained that the developments of less developed countries are constraint by two gaps, which are investment-savings gap and foreign exchange gaps. To fill the savings investment gap requires foreign source, while the foreign exchange gap requires foreign aid (Harrod & Domar, 1946).

However, this paper is underpinned by the crowding out theory by the classical economist, Adam Smith in 1776 due to the peculiarity of the theory on the subject of the paper. The theory states that increase in government spending through borrowing would cause a transfer of scarce productive resources from the private sector to the public sector thereby crowding out private investment and reduction in private consumption in an economy. When government borrows from the loanable fund market, it will shift the demand curve rightwards thereby raising the interest rate upward. The increase in interest rate will result to increase in the supply of loanable fund (decrease in spending) by consumers because they will want to save more, thereby decreasing private spending in the economy. Consequently, the demand for loanable fund by private investors will fall due to the hike in interest rate. Hence, increase in government spending will result to decrease in consumer spending and private investment spending. Such increase in government spending will be crowded out by the decrease in private investment and as well as decrease consumer spending among the household and the firm. This is explain in figure 1.

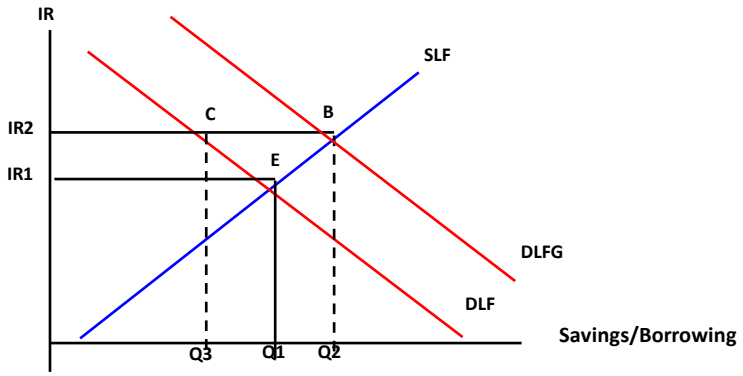

Figure 1: Loanable Fund Market

Figure 1 shows a market for loanable fund. The curve (DLF) is the initial demand curve for loanable fund, where **Q1** of fund was demanded at an interest rate of **IR1** at equilibrium **E**. If the government decided to enter and borrow from the loanable fund market, the demand curve for loanable fund will shift outward to **DLFG** at equilibrium **B**, indicating an increase in the demand for loanable fund. Such increase will lead to increase in interest rate **to IR2**. At the high interest

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rate (IR2), the supply of loanable fund by consumers will increase to **Q2,** thereby reducing consumer spending. Also, at high interest rate (**IR2**), the demand for loanable fund by private investors will shift backward (decrease) to **Q3**. Such decrease in private investment due to high interest rate as well as decrease in consumer spending is called crowding out effect which will consequently decrease the overall private domestic investment in the country.

Empirical Review

Anoke, Odo and Nnabu. (2021) investigated the relationship between public debt and domestic private investment in Nigeria from 1980 to 2018. The paper employed the vector error correction model and the Granger causality for the analysis. The variables used by the author are domestic private investment, external debt, domestic debt, debt servicing, interest rate and foreign direct investment. The result shows that both external debt and domestic have negative but significant impact on the domestic private investment. Debt servicing has a negative and insignificant impact on domestic private investment. Therefore, the researcher concluded that public debt crowds out domestic private investment in the long run within the period under review. The study recommended that the debt management office of Nigeria should review its credit policies to be in favour of the private sector. Also, that all foreign direct investment should be channeled to critical sectors of the economy. The study used the right technique which is VECM to analyze the data because they are all integrated at first difference. However, the study failed to specify the VECM model that was used for the study.

Magumisi (2021) examined the impact of public debt on private investment in Zimbabwe, using quarterly time series data from 2009 to 2017. The variables used for the study are external debt, interest rates, political risk, trade openness and household consumption. The Vector Error Correction Model (VECM) was used as the estimation techniques. The study found that external debt has a negative impact on private investment in the long run. This means that Zimbabwe's external debt is crowding out private investment. The study recommends the Zimbabwe's government to invest its external debt into investment ventures like education, health and infrastructure which could potentially stimulate future investment. The study used political risk as one of the independent variable. Using a proxy for political risk could differs from country to country due to political differences.

Eric, Ndayizeye and Barthélémy (2021) analyzed the effect of domestic public debt on domestic private investment in Burundi between 1980 and 2020 using univariate, bivariate and multivariate analyses. The variables used were Credits to the Private Sector which was the dependent variable, Internal State Credits, Gross Domestic Product, Money Supply level; Interest Rate and the Real Exchange Rate were the independent variables. The findings revealed that in the long run increase in domestic public borrowing did not lead to a reduction in private sector investment, That is, there is no crowding out effect. The result thereby invalidated the hypothesis that domestic public debt has a negative effect on private investment. The study recommends government to place particular emphasis on implementing legislative measures to increase and mobilize economic actors in the informal sector to migrate to the formal sector. The introduction of the study is not comprehensively outlined. It failed to reviewed relevant theories as well as the

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theoretical framework. No clear indication of the technique of analysis used in the study. Also, the model for the study was not specified, and the study failed to make recommendations.

Thilanka and Ranjith (2020) evaluated the impact of public debt on private investment in Sri Lanka using the annual data for the period 1978-2015. The study used the Johansen co-integration test and the Vector Error Correction Model (VECM) to find out the long-run impact. The variables used are private investment, domestic debt, external debt and Real Gross Domestic Product. The study found evidence for the presence of crowding-in effect of public debt on private investment in the long-run. The study further revealed that real GDP also has positive effect on private investment. Hence, it was recommended that policies with regard to fiscal operations should be aimed at the well-managed borrowing for the purpose of boosting private investment further. The study did not include the objectives of the study. Theoretical review and framework were not captured in the study. The study failed to include the probability value of the error correction term in the result. The probability value determines the significant of the error correction term.

Mabula and Mutasa (2019) evaluated the effect of public debt on private investment in Tanzania, using secondary data for the period 1970 to 2016. The study used private investment as the dependent variable while domestic debt percentage of GDP, external debt percentage of GDP, debt service percentage of total export and private consumption expenditure percentage of GDP were used as the explanatory variables. The Autoregressive Distributed Lag (ARDL) bound test was sued to test for cointegration among the variables. The study found that significant evidence of nonlinear long run and short run relationship between external debt and private investment but the relationship is rather a co-movement than causal based on the Granger causality test. The study recommends the government of Tanzania to adopt strict policies on project implementations to ensure positive returns of borrowed funds and closely monitoring of public debt, particularly external debt on which private investment is more responsive than domestic debt and debt service, despite its sustainability at present. The study adopted the work of Apere 2014 but did not specify it in his study.

Ogunjimi (2019) examined the impact of public debts on investment in Nigeria from 1981 to 2016 using the Autoregressive Distributed Lag (ARDL) technique of analysis. The study used the variables private investment; public investment, foreign direct investment and public debt in the study. The result revealed that domestic debt improved both private and public investment in the short-run and long-run. In order words, domestic debt crowded-in both private and public investment, but does not attract foreign direct investment (FDI). The study further revealed that external debt crowded in private investment both in the short-run and the long run, crowded-out public investment, but does not influence FDI. The study recommends that policy makers formulate and implement appropriate policies to ensure public debts are put to optimal use to stimulate investment. The study also recommends that external debt should be more favored over domestic debt because of its impact on investments. Ogunjimi used the right technique of data analysis. However, it failed to review relevant theories as well as theoretical framework for the study.

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Chinanuife, Eze and Nwodo (2018) evaluated public debt spiral and domestic investment in Nigeria using Auto-Regressive Distributed Lag model to estimate quarterly time series data from 1981 to 2016. The study used public investment as the dependent variable while public debt, real interest rates, financial development, debt service and inflation were used as the independent variables. The result of the study shows that public debt has negative relationship with public investment but has statistical significant impact on public investment in Nigeria during the period under review. The study therefore recommends that greater percentage of public debt should be invested in order to reduce future borrowing in Nigeria. Furthermore, that government should borrow domestically rather than borrowing externally in other to overcome exchange rate fluctuations problem. The introduction of the study is not broad enough to capture the relevant variables of the study. Relevant theories related to debt and domestic investment was not reviewed. Also, the theoretical framework which the theory is based on was not captured in the study. The scope of the study ends at 2016 which needs to be updated.

Ogbaga and Udede (2018) examined the relationship between deficit financing and private sector investment in Nigeria from 1986 to 2016 using autoregressive distributed lag model. The variables used are gross private domestic investment, domestic deficit financing, interest rate, domestic credit to the private sector and gross domestic product. The study found that domestic debt financing, interest rate, domestic credit to the private sector and gross domestic product have a positive and statistically significant impact on the gross private investment in Nigeria during the period under study. The implication of the outcome is that domestic deficit financing ruled out a crowding out tendency of domestic private investment but rather crowds in private investment in Nigeria. The study recommends that government should continue in deficit financing and also formulate monetary policies that will enhance private sector access to credit in order to boost investment. The theory employed econometric approach without stating the type of techniques used for the study. Although, the ARDL technique was used for the study, the model was not specified. Also, the study reviewed related theories but could not choose any for the theoretical framework. Furthermore, the study made use of four objectives but only made two recommendations. The scope of the study ends at 2016 hence not up to date.

Nwaeze (2017) studied the possibility of crowding out effect of public borrowing on private investment in Nigeria using the vector auto-regression techniques for the analysis. The study used growth rate of domestic credit to the private sector as proxy for private domestic investment, while the overall fiscal deficits, domestic borrowing debt stock, external debt stock and interest rates are used as the independent variables. The study found the existence of long run relationship among the variables. Also, a positive relationship was found between private investment and domestic borrowing. The study therefore concludes that domestic borrowing crowds out private investment in Nigeria. The study recommended that the Nigerian government should discourage the rising trend of using domestic debt to finance public expenditure.

Akomolafe et al. (2015) looked at the effect of public borrowing on private investment in Nigeria from 1980 to 2010. The study separated public debt into external debt and domestic debt. The Johansen Co-integration test and Vector Error Correction Model (VECM) were used for data analysis. The result revealed that domestic debt crowded out domestic investment in both short

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run and long run. It further revealed that external debt crowded in domestic investments in the long run. The study recommends that government should try to make efforts to reduce her debt profile by improving her revenue base through diversification of the economy. Also recommended was that any new borrowing by the government should be properly utilized for the purpose why the debt is been taken. This study did not review relevant theories for the study; and no theoretical framework. The empirical review is too scanty as only five literatures were empirically reviewed by the author. Also, no post estimation tests in the study to ascertain the presence of autocorrelation as well as the presence of heteroscedasticity.

Methodology

Research Design

The ex-post facto research design was used for the paper, and secondary data were sourced from the Central Bank of Nigeria (CBN) Statistical Bulletin 2021, and the Nigeria Debt Management Office Annual Report, 2021. Unit root test was conducted for each of the variables to ascertain their level of stationarity and to avoid spurious regression results. The unit root results indicated that all the variables were integrated after first difference except PRINV which was found to be integrated at levels. Consequently, the Auto-regressive Distributed Lag (ARDL) technique of analysis was employed. The ARDL - bound test results revealed the existence of cointegration among the variables. Hence, the Error Correction Model (ECM) model was employed to capture the long and short run impact of public debt on private domestic investment the data. The Wald test was used to test the hypotheses of the study.

Model Specification

The functional form of the model for the paper is specified thus,

$PRINV = \alpha_0 + \alpha_1 PUEXD + \alpha_2 PUDMD + \alpha_3 PUDSV + \mu$ ---------- *1*

While the Auto-regressive Distributed Lag Model (ARDL) is specified thus;

$$\Delta PRINVt = \alpha_0 + \sum_{i=1}^{p} \alpha_1 \Delta PRINV_{t-i} + \sum_{i=1}^{q} \alpha_2 \Delta PUEXD_{t-i} + \sum_{i=1}^{q} \alpha_3 \Delta PUDMD_{t-i} +$$

$$\sum_{i=1}^{q} \alpha_4 \Delta PUDSV_{t-i} + \alpha_1 PRINV_{t-1} + \alpha_2 PUEXD_{t-1} + \alpha_3 PUDMD_{t-1} + \alpha_4 PUDSV_{t-1} +$$

$$\varepsilon_t -- 2$$

W

here:

PRINV = Private Domestic Investment (measured in billion naira).
PUEXD = Public External Debt (measured in billion naira).
PUDMD = Public Domestic Debt (measured in billion naira).
PUDSV = Public Debt servicing (measured in billion naira)
α_0 is the intercept.
$\alpha_1 - \alpha_3$ are the parameters to be estimated, and
ε_2 is the error term.

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3. Results

This section presents the empirical results of the paper ranging from descriptive statistics, unit root tests, co-integration tests, the estimated error correction model and the test for hypotheses.

Table 1: Summary of Descriptive Statistics of the Study Variables

Variable	Mean	Std. Dev.	Skewness	Kurtosis	JarqueBera	Probability	Obs
PUINV	8637.714	1979.142	1.266885	5.599679	22.51298	0.000013	41
EXD	2311.985	3497.686	2.342756	8.358839	86.56325	0.000000	41
DMD	3594.826	5162.039	1.536557	4.246979	18.78994	0.000083	41
DSV	560.5500	950.0759	2.341862	8.097373	81.86417	0.000000	

Source: Author's Computation from Eview-10

Table 1 showed positive skewness of the four variables. This means the variables are all skewed to towards the right. The kurtosis of the four variables are leptokurtic, meaning they are peaked relative to the normal distribution. Also, the values of the Jarque-Bera showed that the variables are not normally distributed because their probability values are less than 0.05.

Unit Root Test Result

In order to estimate the trend of series and its direction so as to ensure that the data for the variables used in the model do not fluctuate unnecessarily, unit root test was conducted to ascertain the stationary status of the variables using Augmented Dicker-Fuller technique. The results of the unit root tests are presented in Table 2.

Table 2: Summary of ADF Unit Root Test Results

Variables	**ADF Test Statistics**	**Critical Values**	**Order of Integration**
PRINV	-7.041691	-3.533083	I(0)
PUEXD	-4.863582	-2.938987	I(1)
PUDMD	-4.699981	-2.938987	I(1)
PUDSV	-5.445117	-2.941145	I(1)

Source: Author's Computation from Eview-10

The ADF unit root test results in Table 2 show that PRINV was stationary at level while PUEXD, PUDMD and PUDSV were found to be stationary at first difference; and at 5 percent level of significance. Consequently, the ARDL bounds approach was used due to the mixed order of integration.

The ARDL Bounds Cointegration

The hypothesis for bound test for the existence of long run relationship is H_0: $\alpha_1 = \alpha_2 = \alpha_3 = 0$, and was tested against the alternative hypothesis H_1: $\alpha_1 = \alpha_2 = \alpha_3 \neq 0$. The result of the ARDL Bounds Cointegration Test is presented at Table 3.

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Table 3: Summary of Bounds Test Results

F-Bounds Test	Null Hypothesis: No Levels Relationship			
Test Statistic	**Value**	**Significance**	**I(0)**	**I(1)**
F—statistic	18.09039	10%	2.72	3.77
K	6	5%	3.23	4.35
		1%	4.29	5.61

Source: Authors Computation, 2023 (from Eviews-10)

The Criteria for cointegration to exist is that the value of the F-statistics must be greater than the value of the upper and lower bounds at 5 percent critical level. The cointegration test result in Table 3 shows that, the F-statistic's value of 18.09039 is greater than the lower (I (0)) and upper bound (I (1)) critical values of 3.23 and 4.35 respectively at 5% significance level. Thus, the null hypothesis of no long-run equilibrium relationship is rejected and the alternative hypothesis of existence of long-run equilibrium relationship is accepted. It can therefore be concluded that the variables are co-integrated, hence the existence of long run equilibrium relationship between PUEXD, PUDMD, PUDSV and public investment PRINV.

Table 4: ARDL Long-Run Results

Variables	**Coefficient**	**Std error**	**t-Statistics**	**Prob**
PUEXD	-0.023014	0.024833	-.0926738	0.3626
PUDMD	-0.025971	0.064211	-0.404462	0.6892
PUDSV	0.120350	0.072360	1.663220	0.1083

Source: Authors Computation from Eviews-10

Table 4 shows that the public external debt and public domestic debt have negative relationship with private domestic investment while public debt service has positive relationship with private domestic investment. The probability values shows that in the long run, the variables have insignificant impact on public domestic investment due to their probability values being greater than 0.05.

ARDL - Error Correction Model (ECM)

The ARDL - ECM shows the long and short run relationship between the dependent variable and the independent variables, as well as the coefficient of the Error Correction Term (ECT), which must be negative, less than unity and statistically significance at 5 percent level. The results of the ARDL – ECM regression result is presented at Table 4, while the model is specified thus

$$\Delta PRINVt = \alpha_0 + \sum_{i=1}^{p} \alpha_1 \Delta PRINV_{t-i} + \sum_{i=1}^{q} \alpha_2 \Delta PUEXD_{t-i} + \sum_{i=1}^{q} \alpha_3 \Delta PUDMD_{t-i} +$$

$$\sum_{i=1}^{q} \alpha_4 \Delta PUDSV_{t-i} + \lambda ECT_{t-1} + \varepsilon_t - - - -3$$

λi

= speed of adjustment parameter with a negative sign.

ECT_{t-1} = the error correction term,

μit = residuals or stochastic

Table 4: ARDL – ECM
Dependent Variable: D (PRINV)

ARDL-ECM				
Variable	**Coefficient**	**Std Error**	**t-Statistics**	**Prob.**
C	6.678440	0.742772	8.991243	0.0000
D(PRINV (-1))	0.124322	0.086722	1.433567	0.1636
D(PRINV(-2))	-0.281076	0.078809	-3.566532	0.0014
D(PUEXD)	-0.057013	0.026402	-2.159396	0.0402
D(PUEXD (-1))	0.119085	0.035173	3.385656	0.0023
D(PUDMD)	0.089556	0.079152	1.131440	0.2682
D(PUDSV)	-0.041104	0.032983	-1.246226	0.2238
D(PUDSV(-1))	-0.121239	0.026973	-4.494863	0.0001
CointEq(-1)*	-0.760650	0.084668	-8.983928	0.0000
R-square	0.813415			
Adjusted R-square	0.761943			
F-statistics	15.80316			
Prob(F-statistics)	0.000000			
Durbin-Watson stat	1.931618			

Source: Authors Computation from Eviews-10

Table 4 revealed the lagged value of the Error Correction Term (ECT) met the necessary conditions of being negative, less than unity and statistically significance. The ECT coefficient value of -0.760650 indicates that once there is disequilibrium in the system, it will take an average speed of 76.07 % to adjust from short run to long run equilibrium. The coefficient of determination (R-square) with value of 0.813415 indicates that PUEXD, PUDMD and PUDSV collectively accounted for about 81.34% variation or changes in PRINV in Nigeria during the period under review, while the remaining 18.66% was captured by the error term. The adjusted R-square used to measure goodness of fit with value of 0.761943 indicates that the model is reasonable fit for prediction. Furthermore, the value of the F-statistics (15.80316) with its corresponding probability value of 0.000000 indicates that the parameters of the estimated model are jointly or simultaneously statistically significant at 5% level. Furthermore, the Durbin-Watson (DW) statistics value of 1.931618 indicates that there is no evidence of serial correlation in the model.

4. Discussion of Findings

Table 4 shows that public external debt and public domestic debt have negative relationship with private domestic investment, while public debt service has positive relationship with private domestic investment. The coefficient of public external debt of -0.023014 means that when public external debt increases by 1 billion naira, private domestic investment will decrease by

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approximately 2.3 billion naira, holding other variables constant. The corresponding probability value of 0.3626 indicated that in the long run, public external debt has insignificant impact on private domestic investment. Public domestic debt has coefficient value of -0.025971, indicating an inverse relationship with private domestic investment. This signifies that 1 billion naira increase in public domestic investment will lead to a decrease of approximately 2.6 billion naira in private domestic investment while holding other variables constant. Its corresponding probability value of 0.6892 indicates that public domestic debt has insignificant impact on private domestic investment in the long run. The coefficient of public debt service of 0.120350 showed that there is a positive relationship between public debt service and private domestic investment. Increase in public debt service by 1 billion naira will results to corresponding increase in private domestic investment by 12.0 billion naira. This is in contrast with the a priori expectation. Public debt service drains away funds that could be used for domestic investment purposes. Its corresponding probability value of 0.1083 indicates that in the long run, public debt service has insignificant impact on private domestic investment.

Test of Hypotheses

The Wald test is used to test the causality of the independent variables on the dependent variable. The Wald test for individual hypothesis is presented in table 5.

Table 5: Wald Test Results

Test Statistic	F-statistics Value	Df	Probability
C(3)=C(4)=0	7.617624	(2, 26)	0.0025
C(5)=0	7.982769	(1, 26)	0.0090
C(6)=C(7)=0	5.508538	(2, 26)	0.0101

Source: Authors Computation from Eviews-10

The decision rule is that if the probability value of the F-statistic is less than 0.05, it implies that the variable is statistically significant; hence we reject the null hypothesis that there is no significant impact and accept the alternative. **Hypothesis 1 ($H0_1$)** states that public external debt (PUEXD) has no significant impact on private domestic investment (PRINV). From Table 5, the probability value of $H0_1$ which is 0.0025 is less than 0.05; hence the null hypothesis is rejected while the alternative is accepted that PUEXD has a significant impact on PRINV. Likewise, **hypothesis two** ($H0_2$), states that public domestic debt (PUDMD) has no significant impact on private domestic investment (PRINV). Since the probability value of $H0_2$ which is 0.0090 is less than 0.05 then $H0_2$ is rejected and the alternative hypothesis accepted that PUDMD has significant influence on the PRINV. Furthermore, **hypothesis three** ($H0_3$), states that public debt service (PUDSV) has no significant impact on private domestic investment (PRINV). Its probability value of 0.0101 indicated that the null hypothesis is conveniently rejected while the alternate hypothesis is accepted that PUDSV has a significant impact on PRINV.

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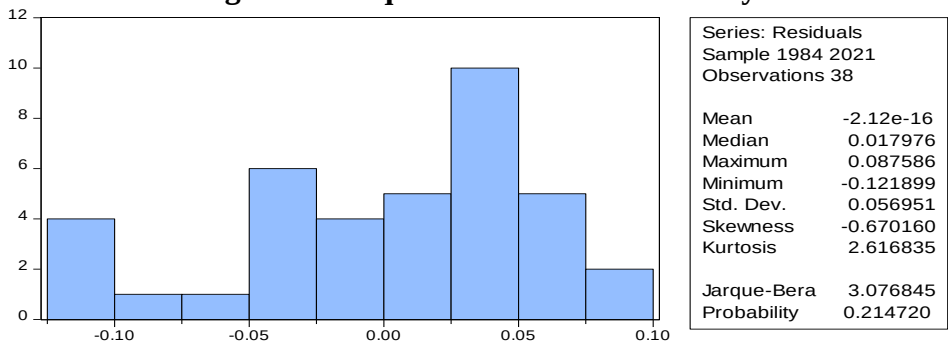
Post Estimation Tests

Figure 1: Jarque–Bera Test of Normality



Source: Authors extract, 2023 (from Eviews-10)

The null hypothesis under the normality test states that the residuals or error terms are normally distributed if the probability value of the Jarque-Bera (JB) is greater than 5%. From figure 1, the JB probability of 21.4720% indicates that the residuals are normally distributed.

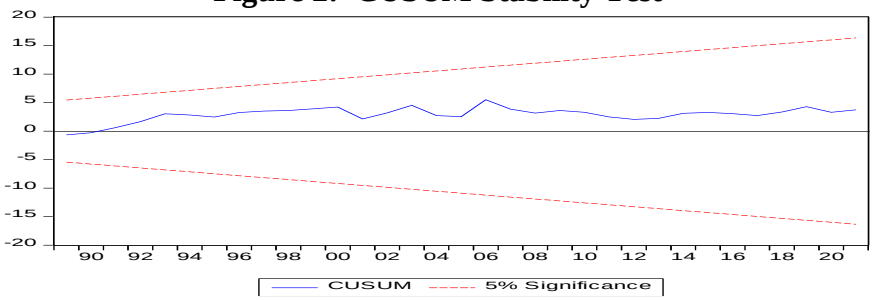
Table 6: Summary of Serial Correlation Test and Heteroskedasticity Test

Type of Test	**F-Statistics (Prob)**	**Observed R* Square**
Serial Correlation LM Test(Breusch-Godfrey)	0.4398	0.2477
Heteroskedasticity Test (Breusch-Godfrey-Pagan)	0.9006	0.8466

Source: Authors Computation from Eviews-10

The null hypothesis for serial correlation states that there is no serial correlation in the model provided the probability value is greater than 5%. Table 6 indicates that the residuals of the model are not serially correlated because the probability value of the F-statistic and also the value of the Observed R* Square are greater than 5%. Likewise, the null hypothesis for heteroscedasticity states that there is no Heteroscedasticity in the model. In table 6, the probability value of the 0.9006 and the observed R*square value of 0.8466 indicate that the model is free from heteroscedasticity because they are greater than 5%. Therefore, the model is homoscedasticity.

Figure 2: CUSUM Stability Test



Source: Authors extract from Eviews-10

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Figure 2, shows that the CUSUM series lies between the upper and the lower critical boundaries at 5%. This is an indication that the estimated model is stable. So, it can be concluded that the model is stable and the estimated results are reliable, and can therefore be used for further analysis and prediction as well as for policy.

4. Conclusion and Policy Recommendations

The paper examined Nigeria's public debt and private domestic investment, using the ARDL and the Error Correction model analysis to analyse the data. The result of the analysis indicated that public external debt and public domestic debt both have negative relationship with private domestic investment and are statistically insignificant. Public debt service on the other hand is positively related to private domestic investment but also insignificant. The Wald test showed that public external debt, public domestic debt and Public debt service influences private domestic investment in the period under review. Consequently, the paper conclude that public debt have significant impact on the private domestic investment. The paper is in line with the study of Chinanuife, Eze and Nwodo (2018). The study suggest that future research could include variable that captures insecurity in the model as a control variable because Nigeria is faced with the problem of insecurity. Based on the findings, the following recommendations are profiled;

i. Based on the findings of the paper which indicated negative relationship between external debt, domestic debt and private domestic investment, the Debt Management Office (DMO) of Nigeria who is vested with the management of the country's debt should advice the federal government to minimize or discourage the collection of debts to fund her budget. Also, the funds borrowed should be channeled into investment on capital projects that will enhance private domestic investment.

ii. The federal government should as a matter of urgency seeks for alternative source of generating revenue by bringing policies that will reduce recurrent spending, and improve development project which will increase domestic investment

iii. The DMO in conjunction with the Central Bank of Nigeria (CBN) should tackle the issue of debt service very seriously due to the positive relationship it has with private domestic investment. The federal government through the Federal Inland Revenue Service should sought for other sources for raising fund in order to improve the country's debt service- to-revenue ratio which was 119%as at Q2, 2022. By so doing, enough funds will be available to be channeled into domestic investment purposes**.**

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