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ANALYSIS OF THE IMPACT OF PUBLIC DOMESTIC DEBT ON PRIVATE INVESTMENT IN NIGERIA

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Abstract

The study analyze the impact of public Internal debt on private investment in Nigeria using a secondary time series data on components of public Internal debt and private investment, the research was analyzed using ARDL bound testing approach within the framework of Barro-ricardo equivalence theory to investigate the impact of public domestic debt on private investment in Nigeria between the period of 2006Q1 to 2021Q4. The study found that there is a long run relationship among the variables. The ARDL model revealed the existence of long run and short run relationship betwixt banking sector debt, non-banking sector debt and private investment in Nigeria, it disclosed a negative long run and positive short run connections between public banking sector debt and private investment in Nigeria but disclosed a negative short run and long run impact of public non-banking sector debt on private investment in Nigeria. Base on this, the study recommend that the government should completely obliterate banking sector domestic loan and Non-banking sector domestic loans as these two debt will not only compete with private investors but will also chase away private individual from investing because they knew that government can only repay the loan with their future tax

Keywords: Domestic Debt, Banking Debt, Non-banking Debt, Private Investment, ARDL

1. Introduction

Nigeria has experienced a significant increase in domestic debt levels in recent years as the government relies on borrowing to finance its budget deficits and fund developmental projects. However, the relationship between domestic debt and private investment in Nigeria remains a subject of concern and requires closer examination. Domestic debt refers to the total amount of money that a government owes to individuals, institutions, or entities within its own country. It is a form of debt incurred by a government through issuing bonds, treasury bills, or other financial instruments to raise funds from domestic sources. Governments typically resort to domestic borrowing when they need to finance budget deficits, fund infrastructure projects, or meet other financial obligations. Domestic debt can be held by a variety of entities such as banking loan: commercial banks, non-banking loan: pension funds, insurance companies, individuals, and even the central bank of Nigeria.

One potential negative impact of domestic debt on private investment is the crowding-out effect. When the

government borrows heavily from the domestic market, it absorbs a significant portion of available funds, leaving fewer resources for private investors. This can result in higher interest rates and reduced access to credit for private businesses, which can discourage private investment. (Akinbobola, 2018) Private investment refers to the expenditure of funds by individuals, businesses, or organizations into various assets, projects, or ventures with the expectation of generating returns or profits. It involves the commitment of financial resources with the intention of earning income, capital appreciation, or achieving specific strategic objectives. Private investment can take several forms, including: Business Investment, Financial Investment, Real Estate Investment, Venture Capital and Private Equity

The problem at hand is to assess the impact of Nigeria's escalating domestic debt on private investment in the country. Understanding this relationship is crucial as private investment plays a vital role in driving economic growth, job creation, and overall development. Domestic debt can have both positive and negative impacts on private investment in Nigeria. Anyanwu, (2014) assert that domestic debt can also affect private investment through its impact on interest rates. When the government increases borrowing, it puts upward pressure on interest rates, making borrowing more expensive for businesses. Higher interest rates can reduce private investment by increasing the cost of capital and lowering the profitability of investment projects. The level and sustainability of domestic debt can affect private investment. Excessive levels of public debt can create uncertainty and reduce investor confidence, which may discourage private investment. Additionally, high debt service obligations can divert government resources away from critical infrastructure development and other investments that could benefit the private sector (Odedokun, 2017).

Also, domestic debt can contribute to infrastructure development, which can have a positive spillover effect on private investment. Investments in infrastructure, such as transportation, energy, and telecommunications, can enhance productivity, reduce business costs, and attract private investment in related sectors. (World Bank, 2020) The impact of domestic debt on private investment can vary across sectors. Some sectors, such as manufacturing, may be more sensitive to interest rates and overall investment climate, while others, like agriculture or extractive industries, may be more influenced by government policies and infrastructure development. (Adeniyi et al., 2018). Concisely, Several other authors like Apere, 2014), Ogunjimi (2019), Dantama, Gatawa and Galli (2017), Emad and Abdullatif (2006) and Akomolafe, et'al (2015) reported a positive and linear relationship, while Mabula and Mutasa (2019) reported a significant relationship between domestic debt and private investment in Nigeria. Several other authors like paiko (2012), isa (2012), Mutunga(2020), Fredrick and Okeke (2013) Damian and Chukwunonso (2014), Ezeabasili and Nwakoby (2013),

As of September 2021, Nigeria's domestic debt stood at around 16.5 trillion Nigerian Naira (equivalent to approximately 40 billion US dollars). The domestic debt has been increasing steadily over the years due to the government's borrowing to finance budget deficits and fund infrastructure projects. The debt includes bonds, treasury bills, and other financial instruments issued by the Nigerian government. Moreover Private investment in Nigeria has faced various challenges that could be influenced by domestic debt levels. These challenges include: Limited access to affordable credit, Crowding out effect and Investor confidence

Thus, the main objective of the study is examine the impact of public domestic debt on private investment in Nigeria, specifically, the study intend to

i. To explore the short run and long run impact of banking public debt on private investment in Nigeria.
ii. To ascertain the short run and long run impact of non-banking sector public debt on private investment in Nigeria.

2. Literature Review

2.1 Empirical review

Obviously, table 1 exhibits the summary of a mixed and contradictory empirical literature review on the existing

studies on the relationship between domestic debt and private investment in Nigeria

instance, Apere, 2014), Ogunjimi (2019), Dantama, Gatawa and Galli (2017), Emad and Abdullatif (2006) and Akomolafe, et'al (2015) reported a positive and linear relationship, while Mabula and Mutasa (2019) reported a significant relationship between domestic debt and private investment in Nigeria. Several other authors like paiko (2012), isa (2012), Mutunga(2020), Fredrick and Okeke (2013) Damian and Chukwunonso (2014), Ezeabasili and Nwakoby (2013), Kibet (2013), and King'wara (2014) divulged a negative impact of domestic debt on private investment.but Abubakar and Mamman (2021) reported an asymmetric and negative link between domestic debt private investment. These studies failed to decomposed domestic debt so as to see which of the component of domestic debt compete or/and compliment private investment. In view of the foregoing, the present study fills these gaps by investigating the impact of domestic banking sector debt and domestic non-banking sector debt on private investment in Nigeria.

Table 1: Summary of Empirical Review of Domestic debt (DD) impact on Private Investment

Author(s)	Period	Country	Methodology	Findings	Criticism
Apere,(2014)	1981 – 2012	Nigeria	Regression & bootstrapping	+ Impact	There is Need to decompose DD
Ogunjimi, (2019)	1981-2016	Nigeria	ARDL	+ Impact	There is Need to disaggregate DD
Mabula and Mutasa (2019)	NIL	Tanzania	ARDL	Significant effect exist	No clear direction of significant effect:
Dantama, Gatawa and Galli (2017)	NIL	Nigeria	ADF, PP, co-integration and (ECM)	+ Impact	Sources of finance of the fiscal deficit need to be discussed
Emad and Abdullatif (2006)	NIL	Japanese	NIL	+ Impact	The study was too silent of the methodology used
Paiko (2012)	NIL	Nigeria	NIL	-Impact	There is need to explore more sources of finance
Isa (2012)	1990-2007	Nigeria	OLS	-Impact	It's a one sided study
Mutunga, 2020	1980-2019	Kenya	ARDL	-Impact	There is Need to disaggregate DD
Akomolafe, et'al (2015)	1980 - 2010,	Nigeria	NIL	+ Impact	There is Need to disaggregate DD
Abubakar and Mamman (2021)	1981 to 2018	Nigeria	linear and nonlinear ARDL	asymmetric & negative Impact	There is Need to disaggregate DD
Fredrick and Okeke	NIL	Nigeria	OLS and Granger	-Impact	There is need to explore the components of the budget deficit

(2013)			causality test		finance.
Damian and Chukwunonso (2014)	1970 to 2012	Nigeria	Multiple regression analysis	-Impact	Need for the basic routine diagnostic test before OLS
Ezeabasili and Nwakoby (2013),	1970 to 2006	Nigeria	co-integration and structural analysis technique	-Impact	Sources of financing the fiscal deficit need to be discussed
Kibet (2013)	1984 - 2010	70 nations	GMM	-Impact	There is need to domestic the scope
Albato (2012)	NIL	Saudi Arabia	NIL	-Impact	There is Need to disaggregate DD
King'wara (2014)	1967-2007	Kenya	unit root and co-integration techniques	-Impact	the study is nebulous as it fail to explore the cog of the domestic public debt that crowd out private investment

Sources: Authors draft (2023)

3. Methodology

This article adopted Barro-Ricardo equivalence theory to investigate the relationship between domestic debt and private investment in Nigeria, the theory argues that people will save based on their expectation of increased future taxes to be levied in order to pay off the debt this rational expectations will discourage private investment, also the private individual raise capital from bank loan to finance investment, by this notion also government deficit will also compete with individual investors as interest rate will be high and by implication private investors will be discouraged. This study adapt the work of Mutunga (2020) who investigated the effect of public debt on private investment in kenya, his study investigated the effect of domestic debt (Dd_t), External debt (Ed_t), Debt servicing (DS) and dummy variable (DU) on private investment (PI_t) as

$PI_t = f(db_t, ed_t, ds_t, dummy_t,$ (1)

Considering the Nigerian economy, the study extended Equation 1 by disaggregating domestic debt (DD) into further categories. Importantly, the paper recognized the enormous attention given to domestic banking loans and domestic no-banking loans, persistent rise in in inflation The augmented version of Mutunga (2020) model expressed in Equation 1 is given in Equation 2:

$PI_t = F(B_d, N_{bd}\ I_{nf})$ (2)

Taking the natural logarithms of the variables, Equation 2 is expressed in stochastic form as follows:

$\text{In } PI_t = \alpha_0 + \alpha_1 nB_{dt} + \alpha_2 InN_{bdt,} + \alpha_3\ InI_{nft}, + \varepsilon$ (3)

Where PI stand for private investment (Dependent variable) and it is measured by the difference between gross fixed capital formation and total government capital expenditure, B_d stand for Banking sector debt N_{bd} stand for Non-banking sector debt, and I_{nft} stand for Inflation rate (control variable) *ln* denotes natural logarithms, t is time series,

α_0 is intercept, α_1 to α_3 are the slope of the coefficient of independent variables and ε represents the error term, The Barro-ricardian equivalence theoretical a priori expectations are expressed geometrically as α_1, α_2 & α_3 <0 .

3.1 Estimation Techniques

The paper employed descriptive statistics, correlation analysis and Autoregresssive distributive lag model using E-views 10.0 econometric package to examine the characteristic and the dynamic relationship between domestic debt and private investment in Nigeria. Having found that all the variables were integrated of mixed order, the paper determined the optimum lag and proceeded to specify an autoregressive distributive lag (ARDL) model.

Thus the study presented the short run ARDL model in equation 4

$$\Delta LOG(PI_t)=\beta_0+\Sigma\beta_{1i}\Delta LOG(PI_{t-I})+\Sigma\beta_2 i\Delta LOG(Bsd_{tt-1})+\Sigma\beta_3 i\Delta LOG(Nbd_{t-1})+\Sigma\beta_4 i(Inf_{t-1})+\delta ecm_{t-1}+\varepsilon_{t-1} \quad (4)$$

Where:

PI = Private Investment

Bsd = Banking sector debt

Nbd = Non-banking sector debt

Inf = Inflation rate

Ecm_{t-1} = The error correction mechanism lagged for one period. LOG = Logarithm function

δ = The coefficients for measuring speed of adjustment ε_t= Stochastic error term.

β_1 - β_4 = coefficients of the variables and β_0 = *constant.* On a-priori ground $\beta_2, \beta_3,$ and $\beta_4 < 0$

3.2 Data Sources

The study sourced for annual time series data for 16 years (64 quarters.) covering the periods 2006Q1 to 2021Q4 from the Central Bank of Nigeria Statistical Bulletin, debt management office and World Bank Development Indicators. This time frame is considered because it captured the post Paris club relieve era and the fact that federal government of Nigeria pays more attention to private investment in Nigeria.

4. Results and Discussion

Descriptive statistics presents the data extracted in a summarized and justifiably manner in terms of the mean, median, maximum, minimum, standard deviation skewness, and kurtosis Descriptive statistics is a statistic that describes the dependent variable, independent variables and control variables for this study. Table 4.1 reports the descriptive statistics, the Jarque-Bera statistics suggested that LBSD, LY and INF are normally distributed as table 4.1 divulged its probability values of 0.1122, 0.1188 and 0.5026 respectively, that shows non rejection of the normality assumption. Furthermore, table 4.1 also revealed that LPI and LNBD is not normally distributed as it reported 0.0007 and 0.0342 as probability value of Jarque-bera statistics.

This shows that, the independent variables, banking sector debt, and the control variable Inflation rate are normally distributed and are very fit in any model but the trend of dependent variable, Private investment and independent variable non-banking sector debt does not follow normal distribution. Thus, this calls for further pre-estimations and diagnostic test if appropriate and optimal policy recommendation is to be achieved at the end of this analysis

Table 2: Descriptive Statistics and Correlation Coefficients

	Descriptive Statistics				
Variable(s)	LPI	LY	LBSD	LNBD	INF
Mean	23.644	11.274	8.2841	7.7122	12.156
Median	23.518	11.355	8.4832	8.0677	12.066
Maximum	24.320	12.064	9.4104	9.0023	18.453
Minimum	23.349	10.445	6.9464	5.6904	4.3660
Std. Dev.	0.2762	0.5226	0.7451	1.0642	3.4067
Skewness	1.1555	-0.2049	-0.3642	-0.4474	-0.1534
Kurtosis	3.2424	1.8043	1.9465	1.6851	2.3506
Jarque-Bera	14.398	4.2605	4.3746	6.7460	1.3756
Probability	0.0007	0.1188	0.1122	0.0342	0.5026
Sum	1513.2	721.56	530.18	493.58	777.98

Sum Sq. Dev.	4.8084	17.212	34.976	71.354	731.17
Observations	64	64	64	64	64

Source: Author's Computation using E-view 10, 2023

Table 3: Correlation Analysis

Correlation coefficients					
Variable(s)	LPI	LY	LBSD	LNBD	INF
LPI	1.0000				
LY	0.7216	1.0000			
LBSD	0.6666	0.9869	1.0000		
LNBD	0.6074	0.9697	0.9572	1.0000	
INF	0.3359	0.4497	0.4610	0.3720	1.0000

Source: Author's Computation using E-view 10, (2023)

Correlation matrix provides insight into the extent, strength, and direction of the relationship between two or more variables (Gujarati, 2004). Base on this, this paper exhibits the result of the correlation coefficients between the dependent and independent variables. The value of the correlation ranges from -1 to 1. The sign of the coefficient indicates the direction of the relationship (positive or negative) while the density of the value of the correlation coefficient indicates the extents of the relationship. The correlation shows weak, moderate or strong relationship between the variables. Generally, the coefficient on the main diagonal is 1.000, because each variable has a perfect positive linear relationship with itself. The result in Table 4.3 divulged a positive and moderate link connecting LPI and LY, LBSD, LNBD as well as a positive and weak connection with INF with a correlation coefficient of 0.7216, 0.6666, 0.6074, and 0.3359 respectively, the coefficient of correlation between LY and LBSD, LNBD and INF shows a positive and strong link with coefficient values of 0.9869, 0.9697 and 0.4497. These values are below the threshold as suggested by Hair et al. (2014), that the correlation coefficient of less than 0.7 could not pose severe Multicollinearity problems.

4.1 Pre-estimation Test

To examine the stationary of the all the variables, the study conducted Augmented Dickey Fuller (ADF) test, Phillip-Perron (PP) test and Kwiatkowski-Phillips-Schmidt-Shin (KPSS) unit root test, and the results were presented in table 4 below. In Table 4, the results of un-trended and trended ADF, PP as well as KPSS test divulged that the variables of study are of mixed order as some variable of order one while one of the variables are of order zero.

Table 4.Unit Root Test of Variables of the Study

	Test I			Test II			Test III		
	ADF			PP			KPSS		
Variables	Level	1st diff	Order	Level	1st diff	Order	Level	1st dif	Order
InPI	0.5528	-8.0333*	I(1)	0.6611	-8.0367*	I(1)	0.6420	0.3870***	I(1)
InBsd	3.7265	-23988**	I(1)	3.6842	-6.8591*	I(1)	0.9980	0.0829*	I(1)
InNbd	2.5736	-32895*	I(1)	3.6842	-6.8591*	I(1)	0.9514	0.1983*	I(1)
Inf	-3.031*		I(0)	-2.1543-	-45938*	I(1)	0.3320*		I(0)
InY	-1.6027	-0.4569***	I(1)	-0.42717	-12.3082	I(1)	1.0047	0.1287*	I(1)

Source: Authors Computation using E-view 10, (2023)

The result of Table 4 reveled that all the variables were not stationary at levels but became stationary after first differencing indicating that all the variables are of order one (i.e. I(1)) except for Inflation rate (INF) that appeared stationary at level. Hence, the research concluded that all the variables are integrated of mixed order .The findings of ADF was affirmed by PP in phase II and re-affirmed in test III of the table by KPSS.

In table 4, [b] indicates a model with constant and deterministic trend while others without super script [b] are the model with constant but without deterministic trend. *, **, *** imply that series is stationary at 1%, 5% and 10% respectively. ADF, PP and KPSS represents, Augmented Dickey Fuller, Phillip-Perron and Kwiatkowski-Phillips-Schmidt-Shin unitroot test respectively. The null for ADF and PP is that an observable time series has unitroot (is not stationay) while the null for KPSS test is that series is stationary.

4.2. Lag Selection Criterion

Prior to the estimation of the ARDL bounds testing approach, it is important to identify an appropriate lag to calculate the F-statistics. The ARDL model is sensitive to the lag order. The AIC (Akaike information criterion) as it provides better results compared to other lag length criteria (Lütkepohl, 2006).

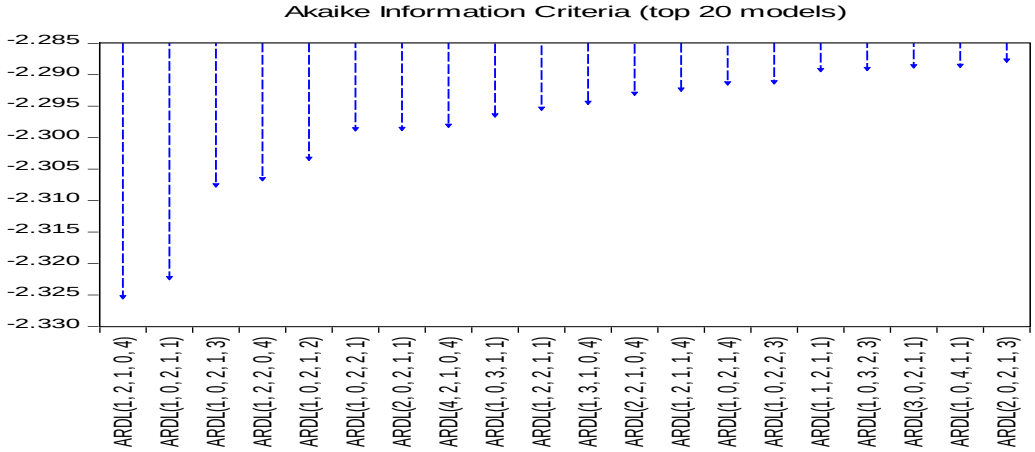

Figure 1: Optimal Lag Selection

Source: Authors Computation using E-view 10, (2023)

In figure 1, a summary of the top twenty (20) best models have been chosen by this method. For undoubtedly, all the selected models cannot be readily estimated, however the first best model as manifested in figure 1 has been selected which is ARDL (1,2,1,0,4)), meaning that the optimal lag for the dependent variable (LPI) is 1, and the optimal lag length for the independent variables (LBSD, LNBD, LY and INF) are 2, 1, 0 and 4 respectively. Hence ARDL (1,2,1,0,4) is the model used for determining the short-run and long-run relationship among private investment , banking sector debt, Non-banking sector debt Output and Inflation using bound testing approach with the critical values provided by Peasaran et al (2001) which is suitable for large sample data.

4.3 The ARDL Co-integration Analysis

From the results of the ARDL bounds testing approach to co-integration, it is clearly confirmed that the computed F-statistic of 6.112762 exceed any of the lower and upper critical bound at 1%, 5% and 10% once PI is used as predicted variable. This confirms the presence of co-integration between the variables over the period of 2006Q1-2021Q4.

Table 5: ARDL Bound Test

F-Bound Test	No levels (Longrun) relationship

Test Statistics	Value	Significant level	I(0) bound	I(1) bound
F-Statistic	6.112762	10%	2.2	3.09
K	4	5%	2.56	3.49
N	64	2.5%	2.88	3.87
		1%	3.29	4.37

Source: Authors Computation using E-view 10, (2023)

However, since, we have large sample, we make use of the critical values provided by Peasaran et al (2001). The critical value for the upper bound in Peasaran's table is 4.37 and for the lower bound 3.29 at 1%. The f-statistics for this bound test which is 6.112762 which is greater than both 4.37 and 3.29. Therefore, the null hypothesis of no long run relationship is strongly rejected even at the 1% level of significance. As such, this finding shows that there is long-run relationship between Private Investment (PI), Banking Sector debt (Bsd), Non-banking Sector (Nbd), output (Y) and Inflation rate (Inf) over the study period of 2006Q1– 2021Q4 in the case of Nigeria.

4.4 ARDL Long Run Regression Analysis

Having established the fact that, there is a long-run relationship between the variables using the ARDL bounds testing approach to co-integration. The next step is to estimate the Long-run relationship between the co-integrating variables. The table 4.4 below presents the Long-run estimates of variables.

Table 6: ARDL Long-Run Estimates

Dependent Variable: LPI				
Selected Model: ARDL(1, 2, 1, 0, 4)				
Variable(s)	Coefficient	Standard Error	t-statistics	Prob
LPI(-1)	0.592892***	0.078367	7.565586	0.0000
LBSD(-2)	-0.298068**	0.136619	-2.181749	0.0342
LNBD	-0.141263**	0.058667	-2.407890	0.0200
LY	1.146339***	0.219735	5.216923	0.0000
INF(-4)	-0.019272**	0.008439	-2.283594	0.0270
C	0.744762	1.077159	0.691413	0.4927
R-squared	0.952427	Prob(F-statistic)	0.000000	

*Note: *** Statistical significance at the 1 per cent levels**Statistical significance at the 5 per cent levels. *Statistical significance at the 10 per cent levels,*

Source: computed by the author using E-views. Version 10 (2023)

The result shows the impact of Banking sector debt, Non-banking sector debt, national output and inflation rate on private investment in Nigeria. The first objective of the study was achieved, going by the result presented in table 4.9, the sign of the coefficient of banking sector debt (LBSD) is negative and statistically significant at 5% at lag 2, its coefficient value of -0.298068 implies that over the study period a hike in LBSD by 1% will leads to an approximately 0.29% drop in LPI in the long run. The out outcome of this finding contradicts with the findings of Apere (2014), Emad and Abdullatif (2006), Ogunjimi (2019), (Mabula & Mutasa, 2019) and Dantama, et'al (2017). However, this result is order with the theoretical and empirical expectations, and conforms with findings of Paiko (2012), Fedrick and Okeke (2013) Kibet (2013), Damian and Chukwunonso (2014), Akomolafe, et'al (2015) who assert that there is a negative relationship between domestic debt and private investment .

Also, the second objective was equally achieve as the result in table 4.6 revealed a negative and statistically significant impact of Non-banking sector debt (LNBD) on private investment in Nigeria, the implication of this findings is that a unit upswing in

LNBD will make the private investment in Nigeria to plummet by -0.14% in the long-run at 5% level of significance. This result is highly in conformity with the a priori expectation as private investors face a serious competition with the government each time a non-banking sector loan is taken. the outcome of this findings corroborate the findings of Kibet (2013), Damian and Chukwunonso (2014), Akomolafe, et'al (2015) who assert that there is a negative relationship between domestic debt and private investment and contradict the outcome of Ogunjimi (2019), (Mabula and Mutasa,(2019) and Dantama, et'al (2017) who argued that a positive impact of domestic debt exist on private investment.

The long-run ARDL result presented in table 4.6 also revealed that there is a positive and significant impact of national output on private investment as well as a negative and significant impact of inflation rate on private investment in Nigeria in the long. The long-run analysis also reported that the model is generally fit as the probability value of the F-statistic is significant even at1% level of significant with an odd of 0.0000, This indicates the model has a robust fit and it is statistically significant, that means there is a relationship between the dependent variable and the independent variables.. The coefficient of determination reported a rich model as it shows that LBSD, LNBD, LY and INF explained the variability in LPI by 95% while the remaining 0.05% has been captured by the error term

4.5 ARDL Short-Run Regression Analysis

After analyzing the long-run relationship between the variables, the study further estimates the short-run relationship between the variables. The short run results are illustrated in Table 7 below with delta sign showing the changes the effect on the dependent variable.

Table 7: ARDL Short-Run Estimates

Dependent Variable: ΔLPI				
Selected Model: ARDL(1, 2, 1, 0, 4)				
Variable(s)	Coefficient	Standard Error	t-statistics	Prob
Δ(LBSD(-1))	0.298068**	0.111399	2.675669	0.0102
Δ(LNBD)	-0.141263***	0.052581	-2.686591	0.0099
Δ(INF)	0.015157**	0.007511	2.018092	0.0493
ECM(-1)	-0.407108***	0.063909	-6.370112	0.0000
R-squared	0.483752			

*Note: *** Statistical significance at the 1 per cent levels**Statistical significance at the 5 per cent levels. *Statistical significance at the 10 per cent levels,*

Source: computed by the author using E-views 10. Version 10 (2023)

In table 7, the first objective of the study was fully adhere to as the table shows that here exist a positive and statistically significant short run relationship betwixt LBSD and LPI at 5% level of significance. This implies that a unit increase in LBSD in the short run will amount to leap of 0.29% on LPI, this result is in conformity with the studies of Apere (2014),Emad and Abdullatif (2006), Ogunjimi (2019),) and Dantama, et'al (2017) who reported an enhancing impact of internal debt on private investment in Nigeria but this finding contrast with the finding of Kibet (2013) and Damian and Chukwunonso (2014) that reported a degrading impact of internal debt on private investment in Nigeria

The second objective of the study was not left unaddressed as the result from table 4.10 reported a negative and statistically significant short run association betwixt LNBD and LPI at 1 % level of significance, this implies that a unit hike in LNBD in the short run will leads to a decline of 0.14% on LPI. This study is in conformity with a priori expectations and closely confirm the findings of Damian and Chukwunonso (2014) and Akomolafe, et'al (2015), but disconfirm the findings of Ogunjimi (2019), (Mabula and Mutasa,(2019) and Dantama, et'al (2017). Also, the result from table 7 also shows a 5% statistically significant short run relationship between inflation and private investment in Nigeria

The estimate of ECM(-1) term is negative and significant at 1% level corroborating the proven long run association between Private Investment (LPI), Banking sector debt(LBSD), Non-banking sector debt (LNBD), and Inflation rate (INF) over the study period of 2006Q!– 2021Q4 in the case of Nigeria. The estimate of ECM_{t-1} term is -0.407108, which implies that the deviations from short-run towards long-run are corrected by 40.71% speed in each quarter to reach the stable log-run equilibrium path in level of private investment Nigeria. This empirically implies that for any disequilibrium in the system, the system will automatically adjust itself back to the equilibrium at the speed of 40.71%.

The R^2 measures the goodness of fit of the estimated model. The R^2 measure the proportion of total variation in the regresors and explained by the regression model. From the ARDL regression result the R^2 is 0.483752. This means that the model explain about48% of the total variation in LPI explained by the explanatory variables LBSD LNBD and INF.

4.6 Diagnostic Tests

It is appropriate to conduct a diagnostics test to examine if the estimated short-run model as met the assumptions of the Classical Linear Regression Model (CLRM). The table 8 below summarizes the diagnostics test carried to see if the model had met the CLRM assumptions.

Table 8: Diagnostics Analysis

Diagnostic test	Null Hypothesis	Statistic	P-value
Normality test	Normality	Jarque-Bera (2.3332)	0.311
Serial Correlation LM	No Serial Correlation	F-Statistic (0.9648)	0.3888
Heteroskedasticity ARCH	Homoskedasticity	F-Statistic (1.0381)	0.3126
Ramsey RESET tests	No specification error	t-statistics (1.1719)	0.2940
		F-statistic (1.37353)	0.2941

Source: computed by the author using E-views 10. Version 10 (2023)

Furthermore, the results of diagnostic tests suggest that the short run model passes all the test that is required in the classical linear regression model (CLRM) such as normality of the error term, serial correlation, autoregressive conditional heteroskedasticity as well as white heteroskedasticity.

The normality result shows that with the JB-statistic (X^2) of 2.333293 which is statistically insignificant at 5% level as its p—value shows 0.311, this implies that we do not reject the null hypothesis of normality and therefore conclude that the error terms are normally distributed at 5% level of significance. Also, the result from the Breusch-Godfrey (BG) general test of autocorrelation shows that with F-statistics of 0.964834 which is statistically insignificant at 5% level as its p—value shows 0.3888 , this implies that we do not reject the null hypothesis of no serial correlation. Hence, we conclude that there is no serial correlation associated in the model. In addition, the Autoregressive Conditional Heteroskedasticity (ACH) test to test if the error terms are homoskedastic gave results that showed an F-statistics of 1.038129 which is statistically insignificant at 5%.as its p-values reports 0.3126 This implies that we do not reject the null hypothesis of constant variance of the error term and conclude that there is no presence of Heteroskedasticity in the model. The test of misspecification using Ramsey RESET tests was also carried to test if the model is correctly specified. From the results gave the t-statistics and F-statistics of 1.171980 and 1.373538 respectively and which are statistically insignificant at 5% as they both got a p-value of 0.2940 and 0.2941 respectively., this implies that we concluded that there is no specification error. This confirms that the model is well specified.

4.7 Stability Test

To check dynamic stability of the ARDL model, the study employs cumulative sum of recursive residuals test and cumulative sum of squares.

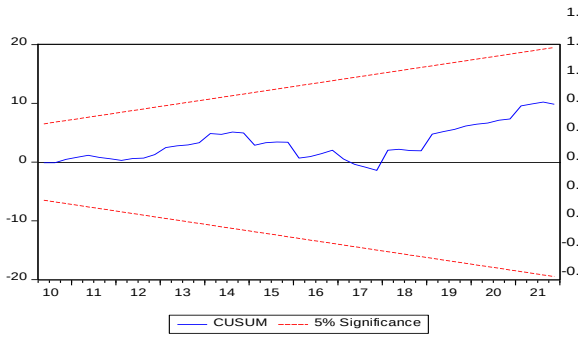

Figure 2: CUSUM Test

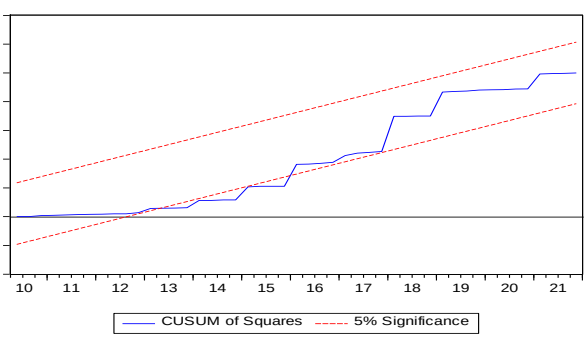

Figure 3 CUSUM of Square Test

Source: plotted by the author using E-views. Version 10 (2023)

Figure 2 and Figure 3 provides the plots of the CUSUM and CUSUMSQ stability tests. It is found that the plots of CUSUM statistics are within the critical bounds at 5% significance level implying that all coefficients in the error correction model are stable over time, but CUSUMSQ statistics is slightly outside the critical bounds at 5% significance level, implying that all coefficients in the error correction model have little structural breaks thus it is dynamically unstable over time. Thus, the model adopted in the study seems to be good enough and robust in estimating the short and long-run relationships between Public debt and Private investment.

5. Conclusion and Recommendations

Going by outcome of the Autoregressive distributive lag (ARDL) model, on the relationship between domestic debt and private investment in Nigeria. Between the period of 2006Q1 to 2021Q4. The study therefore concludes that:

i. Their existence of long run and short run relationship betwixt banking sector debt, non-banking sector debt and private investment in Nigeria.
ii. A negative long run and positive short run connections exist between public banking sector debt and private investment in Nigeria
iii. The also disclosed a negative short run and long run impact of public non-banking sector debt on private investment in Nigeria

Base on this, the study recommend that the government should completely obliterate banking sector domestic loan and Non-banking sector domestic loans as these two debt will not only compete with private investors but will also chase away private individual from investing because they knew that government can only repay the loan with their future tax

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