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# Effect of Public Debt on Nigeria's Economic Growth

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**Abstract:**
This study evaluated the effect of public debt on Nigeria's economic growth using domestic and external debts as explanatory variables, and gross domestic product at constant prices as the explained variable. The study used time series research design and collected data from CBN statistical bulletin for the period, 1981 to 2022. The study conducted the Descriptive statistics, stationarity and co-integration tests and found out that the variables were stationary in mix order and had long-run relationship. The study therefore adopted the autoregressive distributed lag model for analysis and used the OLS method to test hypotheses. The findings show that domestic and external debts had significant effect on economic growth in the period examined. The study recommended that domestic debt be tied to the provision of domestic oil refining plants to cut down cost of goods and services for households and reduce cost of production for firms operating in Nigeria. Furthermore, government externally contracted loans should be more prudently invested in education and health as these two sectors are the productive base of any economy and will improve the GDP growth rate.

**Keywords**: Public debt, domestic debt, external debt, economic growth.

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EXPLORING THE HEIGHTS

## 1. INTRODUCTION

Most developing nations, including Nigeria, are often constrained by sufficient funds to build basic infrastructure that would set the pace for capital formation and long-run economic growth; hence they often resort to borrowing from domestic and external economies. Public borrowing often helps to bridge the savings-investment gap, provides funds for government and spurs economic growth. Economic scholars like Fatas et al (2019) posit that countries majorly borrow to finance higher levels of consumption, investment and to finance transitory balance of payment deficit and boost economic growth. The provision of essential public goods such as national defense, security, education, health, transport, telecommunications and power provides the base for macroeconomic activity of households and firms operating in the domestic economy.

Public debt could be described as the financial liabilities of the government, used to finance public deficits for the maintenance of government, provision of public services and for macroeconomic stability. The government finances its deficits through the issuance of domestic debt instruments like treasury bills and treasury certificates, development bonds, certificates of deposit, commercial papers, bankers' acceptances and federal government bonds, intermediated by the banking system. These instruments are purchased by banks, local pension funds, and other domestic and foreign investors. Nigeria's external debt on the other hand is primarily from multilateral financial institutions and agencies, the Club, London debt and foreign promissory notes. External borrowing however exposes the economy to external shocks which may affect inflation, exchange rate risks and high debt service payments that might hinder economic growth. Domestic debt which is the easiest means of funding government deficit, on the other hand has the potential of making governments over-leverage on the banking sector, leading to the crowding-out of the private sector (Bikefe et al, 2022). In both cases, public debt could inhibit economic growth.

A country's level of economic wealth is the most important macroeconomic variable reflecting a society's overall performance because it results from producing more goods and services, which leads to improved productivity and employment. Economic growth happens when there is a combination of more educated and efficient workforce; more infrastructure facilities; increased use of new technology; efficient markets to allocate resources and the rule of law to enforce contracts (Osobase et al, 2023). Economic growth is a major determinant of the quality of life the citizens of a country may have.

The relationship between public debt and economic growth still remains controversial among economic policy-makers, researchers and observers. While government domestic borrowing is often thought of as a way to avoid both rise in inflation

and external debt crises, it carries its own dangers if excessively used. Public domestic borrowing reduces the pool of funds available to the private sector, putting pressure on domestic interest rates which are detrimental to capital formation and economic growth. Anytime government engages in fiscal expansion through increased domestic debt, it muzzles up private sector access to credit for investment. Since government debt pricing serves as reference for private sector interest rates, the private sector is left with no option than to borrow at a premium above government interest rates. Where interest rates are controlled, domestic borrowing still leads to credit rationing and crowding out of private sector investment, thereby starving households and firms from consumption and production (Joy & Panda, 2020), and possibly, economic growth.

Loans from the domestic and external economies are not guaranteed to be exclusively used in productive areas and such may severely threaten macroeconomic stability and growth of the borrowing country (World Bank & IMF, 2022). A growing debt to gross domestic product (GDP) ratio raises doubts regarding debt repayment capacity and may cause sudden stops, resulting in a debt crisis. For instance, the gross domestic product of Nigeria at current prices was ₦ 71713.94 billion in 2012 and increased to ₦94144.96 billion in 2015. It further rose from ₦ 127736.8 billion in 2018, ₦152324.1 billion in 2020, and ₦1952204.1 billion in 2022. (CBN, 2023).

Domestic debt outstanding, consisting of debt from CBN ways and means advances, sinking funds and non-bank public debt on the other hand stood at ₦6,537,536.31 in 2012 and increased to ₦1,655,178.71 in 2015. It further rose from ₦16,627,841.75 in 2018, to ₦20,209,896.37 in 2020 and ₦27,548,116.06 in 2022. External debt outstanding, which consist of multilateral debt, the Club debt, London debt, promissory notes and others was ₦1,016,721.69 in 2012, ₦2,111,530.71 in 2015, ₦7,759,229.99 in 2018. It further rose to ₦12,705,618.48 in 2020 and increased to ₦18,702,251.88 in 2022 (DMO, 2023). The above data shows that while economic growth rose in arithmetic progression, public debt which was used to fund economic growth rose in geometric progression, creating public concern on the exact effect of public debt on economic growth.

An evaluation of the public debt data above shows that the rate of increase in the gross domestic product, domestic debt and external are not proportionate as there was a profound increase in public debt, compared to GDP growth rate. This disproportionate increase in debt/GDP ratio defies economic reasoning. Furthermore, the increase in public debt may not have trickled down to improvement in living condition of households as an estimated 88.4 million people live in extreme poverty now as against 2.2million persons in 1981 (IMF, 2022). The huge debt structure of Nigeria may have led to macroeconomic distortions, with negative effects on national output.

Research works conducted on public debt and economic growth include Osobase et al (2023) which found that external debt, debt service payments, gross fixed capital formation and inflation had significant but negative effects on economic growth. In contrast, Opuba (2023) who also evaluated public debt determinants of economic growth and found out that in external debt had significant and positive effect in short-run. However, the effect is negative in the long-run. Further investigation from the work of Yusuf and Saidatulakmal (2023) reveal that external debt had significant and positive effect on economic growth in long-run but significant and negative effect on economic growth in the short-run. The empirical research of Ofurum and Fubara (2022) reveal that external debt has insignificant effect on economic growth, while findings from Hadji (2022) in Sierra Leon found that public debt had significant and negative effect on GDP growth.

In view of the above controversies, there is need to examine the exact effects public debt has on economic growth in Nigeria, using domestic and public debt as explanatory variables.

**The specific objectives of the study are to**:

(i) evaluate effect of domestic debt on the gross domestic product of Nigeria
(ii) determine effect of external debt on the gross domestic product of Nigeria.

**Hypotheses of the Study are:**

$H0_1$: Domestic debt has no significant effect on the gross domestic product of Nigeria.

$H0_2$: External debt has no significant effect on the gross domestic product of Nigeria.

The rest of the paper is structured as follows: literature review which encompasses conceptual, empirical and theoretical literature, methodology, results and discussions, and the conclusion and recommendations.

## 2. LITERATURE REVIEW

### 2.1 CONCEPTUAL FRAMEWORK

#### 2.1.1 Public Debt

Olabode and Usenobong (2023) defined public debt is conceptualized as aggregate debt owed by a country to households, firms and financial institution and governments within the domestic economy and abroad. Public debts typify all forms of government

borrowings at all levels of government. According to CBN (2020), public debt is a stock of liabilities with different tenure accumulated by the government (Federal, state and local governments) activities in the past and due to be repaid fully in the future by the government. Some economic literature posit that public debt usually only refers to national debt, but some countries also include the debt owed by states, provinces, and municipalities. Regardless of what it is called, public debt is the accumulation of annual budget deficits. It is the result of years of government leaders spending more than they take in via tax revenues. Public debt includes money that is owed to individuals, mutual funds, hedge funds, pension funds, foreign governments, etc.

Public debt forms part of the finance approach adopted by governments all over the world, although this approach is often resorted to when all measures have been exhausted, in fact the measure is considered favorable relative to other measures which includes the creation of money and the sale of national assets. This study views public debt as the stock of liabilities with different tenure accumulated by all levels of government from both the private and external sectors of the economy, for the maintenance of the machinery of government, provision of public goods and for boosting economic growth.

### 2.1.2 Domestic Debt

Essien (2024) posits that domestic debt refers to the portion of a country's debt (loans) borrowed from within the confines of the country. These loans are usually obtained from the central bank, deposit money banks, discount houses and other non-bank financial houses. Domestic debts are thus contracted through debt instruments such as treasury bills, treasury certificates and treasury bonds. Others are development stocks, federal government bonds and promissory notes.

In Nigeria, domestic debts are contracted by the Federal Government as well as states and local governments. In principle, states and local governments can issue debt instruments but they are limited in their capacity to do so. Domestic debt instruments issued in the economy consist of government development stocks, bonds and means advances. Government development stocks are marketable and negotiable while bonds and ways and means advances are not, but are rather held solely by the Central Bank of Nigeria. The use of these debt instruments to borrow in order to close the resource gap between savings and investments. This study conceptualizes domestic debt as the portion of a country's debt borrowed from the private sector of the country.

### 2.1.3 External Debt

External debt is that portion of a country's debt that is acquired from foreign sources, such as foreign corporations, governments or financial institutions. External debt is that part of the total debt of a country that is owed to creditors outside the country. Cordelia and Ogechi (2019). This indicates that foreign debt is owed by the government to foreign commercial banks, financial institutions and governments. This denotes that external debt is from the external economy and such funds are often in the currency of the lending country. A similar definition by Udoffia and Akpanah (2016) explained external debt as packages consisting of a combination of financial, technical and managerial requirements emanating from outside the country, aimed at supporting economic growth and development and are repayable at determined future dates in foreign currency.

Aigbedion et al (2020) posit that external debt is a major source of public receipts and financing capital accumulation in any economy. External debt is a major source of finance used in supplementing domestic sources of funds in a bid to support the development process as well as other needs of a country. Some of the liabilities which fall within public debt include: currency and transferable deposits, other deposits, short-term bills and bonds, long-term loans (not classified elsewhere), and trade credit and advances.

Loans from other nations of the world and from bilateral and multilateral corporations are expected to be paid back in foreign currency. Domestic inflation in the Nigerian economy has led to an increase in value of the exchange rate resulting in surge of value of the United States dollar which has been the major currency in the international market. This has greatly increased Nigeria's indebtedness to foreign lenders as the US dollar is the currency used for most international settlements.

Much of the burden of this huge debt is left for the next generation of leaders to take over which in some cases are also accumulated. Essien (2024) posits that Nigeria is besieged with debt crisis as foreign loans are not being used for developmental purposes resulting in huge debt service obligations bedeviling the nation. Some of the factors leading to Nigeria's external debt burden can be grouped into inefficient trade and exchange rate policies, adverse exchange rate movements, adverse interest rate movements, poor lending and inefficient loan utilization, poor debt management practices and accumulation of arrears and penalties. Thus, excessive external debt may breed harmful effects to the sustainable economic growth and poverty reduction which developing nations seek.

### 2.1.4 Economic Growth

Economic growth is explained as the steady process by which the productivity of an economy is increased over time to bring about rising levels of national output and

income. Mladen (2015) posits that economic growth includes changes in production during a relatively short period of time, usually one year: An annual increase in material production expressed in monetary value, the rate of growth of gross domestic product or national income. According to Muritala and Taiwo (2012) economic growth is defined as the long-term rise in capacity to supply increasingly diverse economic goods and services to a country's population: Growth rate according to the research is based on advancing technology and institutional and ideological adjustment, which is demand.

Economic growth corresponds to the increase of the country's potential GDP caused by the increase on advanced technology, capital stock and improvement in the quality and level of literacy. Economic growth is essential to every country and particularly to developing countries in order to get out of predicament of prehistoric poverty. This is the increase of country capital stock, the technological advances and the improvement in the quality and level of literacy in the country. The value of goods and services produced in the country tells the growth rate of the country.

## 2.2 EMPIRICAL REVIEW

Essien (2024) evaluated public debt service payments and its effect on economic growth in Nigeria. The specific objectives of this study were to determine the effect of foreign debt servicing on GDP, and to examine the effect of domestic debt servicing on GDP. The model of study was foreign debt service and domestic debt service payments are determinants of economic growth. The study used GDP as its explained variable and adopted the time series approach for its research design. The research period covered was 2005 to 2021. The study conducted the Descriptive statistics, correlations analysis, and stationarity test and adopted the OLS methodology as variables were stationary at level. Findings revealed that both foreign debt servicing and domestic debt servicing have significant effect on GDP. The study concluded that debt servicing in Nigeria be managed with utmost sincerity to stimulate economic growth. This study however did not include foreign debt and domestic debt as determinants of economic growth in its model, leaving gap in variable which the present study fills.

Osobase et al (2023) evaluated the contribution of external debt to economic growth in Nigeria, using data from 1981 to 2020. This study explored the relationship between external debt and economic growth in Nigeria. The macroeconomic variables utilized are economic growth measured using real gross domestic product while the explanatory variables are total external debt, debt servicing, gross fixed capital formation and inflation rate. The main econometric tools are the Autoregressive Distributed Lag Model (ARDL) estimate and Granger causality tests. The ARDL results indicate that total external debt, gross fixed capital formation and inflation rate have negative significant nexus with economic growth in the short-run but insignificant direct effect in the long-

run period. Furthermore, the Granger causality test unveiled bidirectional causation between external debt and real gross domestic product. However, the study period of this research is not very current. Moreover, the study added gross fixed capital formation and inflation which are not directly related to debt as determinants of economic growth in its model.

Opuba (2023) empirically investigated if external debt drove the growth rate of the Nigerian economy for the period of 1981 to 2021. Secondary data was collected from World development indicators and CBN statistical bulletin. Descriptive statistics, unit root test, cointegration test, correlation matrix and error correction model were conducted. Findings revealed that in the long run external debt has a positive effect on economic growth in Nigeria at 5% level of significance. In the short run, external debt also had positive effect on economic growth but not statistically significant at 5% level. Exchange rate and inflation rate responded negatively to economic growth in Nigeria both in the long run and short run at 5% level of significance. Capital stock both in the long run and short run responded negatively to economic growth in Nigeria at 5% level of significance. The result revealed 84.4% speed of adjustment to equilibrium. The study however included exchange rate and inflation rate as explanatory variables, but excluded domestic debt as a determinant of economic growth in its model. This misspecification of variables error is corrected in the present study.

Yusuf and Saidatulakmal (2023) investigated the effect of public debt on Nigeria's economic growth using annual data and the Autoregressive Distributed Lag technique. The specific objectives of the study were to determine effects of external and domestic debt on economic growth in Nigeria. The research design used in the study is time series. Results show that external debt constituted an impediment to long- term growth while its short-term effect was growth-enhancing. Domestic debt had a significant positive impact on long-term growth while its short-term effect was negative. In the long term and short term, debt service payments led to growth retardation confirming the debt overhang effect. The study suggested that government direct borrowed funds to the diversification of the productive base of the economy. While this study used external debt, domestic debt and debt service payments as explanatory variables, the current study evaluates only domestic and external debt as determinants of economic growth in its model of study.

The research conducted by Ofurum and Fubara (2022) looked at the impact of Nigeria's national debt on the country's economic growth from 1980 to 2019. The study adopted the time series research design and collected data from CBN statistical bulletin for the various years. The Autoregressive Distributed Lag (ARDL) test results show that the process of repaying foreign debt has a limited but negative effect on the growth of real GDP. According to the aforementioned study, external debt has no statistically significant

effect on real GDP. This study is critiqued on the basis that its set of explanatory variables are different from that of the present study.

Hadji (2022) conducted a supplementary investigation examining the relationship between foreign debt of Sierra Leone and its economic growth over the years 1973 to 2021. The findings of the Ordinary Least Squares (OLS) analysis indicated a negative association between Sierra Leone's economic development and its external debt within the examined time frame. This implies that the nation's trajectory of sustained economic expansion is negatively impacted by increased debt, hence substantiating the country's predicament of excessive debt burden. Therefore, the research suggests that it is imperative to reassess the nation's debt management approach in order to implement more resilient methods that would guarantee the sustained effectiveness of public debt in the long run. This research was conducted in a different economy and findings may not apply to Nigeria as a result of macroeconomic differences.

Omimakinde and Onifade (2022) examined the relationship between domestic debt and economic growth in Nigeria. The explanatory variables of the study were domestic debt, lending rate and foreign reserves, while the explained variable was gross domestic product growth rate in Nigeria. The study adopted the time series research design and collected data from Nigeria's central bank for the period, 1988 to 2018. The study conducted the descriptive statistics, stationarity test and adopted the ARDL methodology for its analysis. Findings suggest that domestic debt had no significant impact on economic growth in the short run but had significant negative impact in the long-run. However, it is noticed that the time period examined in this study is not as current as that of the present study. Moreover, the study included and foreign reserves, which is not debt-related as an explanatory variable in its model. Moreover, it added it included lending rate as a determinant of economic growth.

Onyele and Nwadike (2021) determined the impact of the national debt burden on economic stability in Nigeria. The explanatory variables used in the model where debt burden are total debt-GDP ratio, short-term external debt-to-reserves ratio and debt service cost-to-government revenue ratio with exchange rate as a control variable, while economic stability is measured with real GDP growth rate. The study adopted the ex post facto research design and collected data from CBN statistical bulletin for the period 1981 to 2019 and analyzed by the Autoregressive Distributed Lag (ARDL) model. The ARDL estimation shows that the explanatory variables collectively cause a diminishing impact on economic stability in the long run with revenue adequacy having a negative and significant impact. In the short run, all the components of debt burden, except debt overhang, have a negative and significant impact on economic stability. However, this

study included many non-debt related variables in its model, thereby increasing the coefficient of determination and reducing the quality of findings.

Ayuba and Khan (2019) researched on the relationship between domestic debt and the fiscal policy of economic growth in Nigeria in the period from 1981 to 2013 owing to government reforms in the financial system, particularly due to the establishment of the Debt Management Office (DMO) in 2000 and a new fully funded pension fund scheme, both of which resulted in a resurgence of the debt market. The study had four models and used domestic debt, tax revenue, total savings, financial development and government expenditure as exogenous variables in the study. The study employed the autoregressive distributed lag (ARDL) approach and the bounds test, anchored on the perspective of the endogenous growth theory. The results reveal that although overall the adverse negative domestic debt hurts the economy, it has a positive effect on the total aggregate government revenue and economic growth in Nigeria in the research period. Furthermore, the paper develops a system to assess the speed of the adjustment mechanism coefficient in an error correction model (ECM). This study also added many non-debt related variables in its model. This increases the coefficient of determination and reduces the quality of findings got from the study.

## 2.3 THEORETICAL FRAMEWORK

This work adopts the Ricardo's theory of public debt for its theoretical framework.

### 2.3.1 The Ricardo Theory of Public Debt

The theory was postulated by Ricardo in 1819. David Ricardo maintained the view that the expected and unexpected expenditures of government basically include payments approved to maintain economic balance despite the ineffectiveness of most laborers in the economy. In a letter sent to McCulloch by Ricardo in 1986, he asserted that public expenditure was an unproductive economic activity implemented by the state. Following this identified fiscal gap, Ricardo's theory was focused on the increasing burden stemming from the society, which is a product of unproductive public expenditures (Onyele & Nwadike, 2021).

The Ricardo's theory of public debt suggests that financing public expenditure could be productively attained by sourcing funds from sectors and communities with excess economic resources so as to reduce inequality. He stated that the reason for this is because the prioritization of a certain sector for the settlement of public expenditure does not impact positively on the growth of the economy but rather it impoverishes the state despite large amount of public debt and taxes raised (Ricardo, 1819). In a similar way, the author argued that the payment of interest of debt extorts significant amount of wealth from the society to a different economy thereby impoverishing the state.

## 3. METHODOLOGY

The research design of this work is *ex post facto*. Data on domestic debt, domestic debt service payments and economic growth in Nigeria were collected from Debt Management Office and CBN statistical bulletin for the period, 1981 to 2022. The population of the study consists of the statistical or stochastic variables, the data generating process (GDP) that generated these macroeconomic variables for Nigeria. Each value of the variable depends on the economic and political climate prevailing in one time-period, as explained by Gujarati (2003).

### Model Specification

The bounds testing approach implies estimating the following autoregressive distributed lag model for public debt is stated as follows:

$$\Delta GDP_t = \pi_0 + \pi_1 DD_{t-1} + \pi_2 EXD_{t-1} + \pi_5 DD_{t-1} \sum_{k=1}^{p} \varphi_k \Delta DD_{t-k}$$

$$+ \pi_5 EXD_{t-1} \sum_{k=1}^{p} \varphi_k \Delta EXD_{t-k} + + u_{1t}$$

$u_{1t}$ *and* $u_{2t}$ are white noise error terms

$\pi_i s, \varphi_k s, \beta_j s, \gamma_j s, \eta_i s, \alpha_j s$ *and* $\rho_j s$ are parameters to be estimated

p = (1,2, …, k) are lag lengths to be determined empirically using Akaike information model selection criteria.

**Measurement of Variables Table**

| Variable | Type | Measurement | Content Validity |
|---|---|---|---|
| Real Gross Domestic Product (RGDP) | Dependent | Aggregate value of all goods and services produced in Nigeria deflated by inflation | Utomi and Okeke (2019) |
| Domestic debt (DD) | Independent | The portion of a country's debt (loans) borrowed from within the domestic economy | Ndubuisi and Abdul (2018) |
| External Debt (EXD) | Independent | Public debt borrowed from within the international governments and multilateral institutions. | Sikandar et al., (2019); Ndubuisi and Abdul (2018) |

Source: Author's compilation, 2024

### Results and Discussion

This section evaluates the statistical properties of variables, method of analysis and test of hypotheses for the variables under study.

**Table 1: Descriptive Statistics**

| | GDP | DD | EXTD |
|---|---|---|---|
| Mean | 41867.84 | 4920.492 | 2730.184 |
| Median | 11383.66 | 1166.000 | 689.8375 |
| Maximum | 194834.0 | 26915.77 | 17148.54 |
| Minimum | 147.5700 | 15.01000 | 8.819400 |
| Std. Dev. | 55208.01 | 7365.683 | 4174.237 |
| Skewness | 1.278544 | 1.583342 | 2.213735 |
| Kurtosis | 3.499004 | 4.334208 | 7.247868 |
| Jarque-Bera | 11.59566 | 20.17201 | 64.31340 |
| Probability | 0.003034 | 0.000042 | 0.000000 |
| Observations | 41 | 41 | 41 |

Source: E-views computation, 2024

Table above shows that the statistical properties of the explained and explanatory variables of the study. The mean of GDP, domestic debt and external debt are 41867.84, 4920.492 and 2730.184 respectively. This indicates that external debt constituted about 54 percent of domestic debt for the period under review, while total debt constituted about 18.27 percent of GDP.

The maximum and minimum values of GDP for the period are 194834.0 and 147.57 respectively. This shows that the range between the highest and lowest values of GDP is far. The maximum value of GDP is greater than the minimum value by about 1320.281 times. The maximum value of domestic debt is greater than its minimum value by about 1793.19 times, while the maximum value of external debt is greater than its minimum value by about 1944.41 times. This indicates that external debt has the highest range of values among in the data set.

The Jarque-bera statistics indicates the normality of data distribution and the probabilities for the variables in the Descriptive statistics suggest that the data are not normally distributed as they are less than 0.05 percent.

**Table 2: Correlation Analysis**

| | GDP | DD | EXTD |
|---|---|---|---|
| GDP | 1 | | |
| DD | 0.5879 | 1 | |
| EXTD | 0.5324 | 0.5777 | 1 |

Source: E-views computation, 2024

The table 2 shows the relatedness of the variables in the model, with values above 70 indicating multi-collinearity. None of the variables has a coefficient above 60 in the Correlations table.

**Table 3: Unit Root Test Summary**

Augmented Dickey-Fuller Unit Root Test Table 3: Augmented Dickey-Fuller Unit Root Test

| | At Level | | | At First Difference | | | |
|---|---|---|---|---|---|---|---|
| Variable | ADF Test Stat @ % | Critical Value | Prob-Value | ADF Test Stat @ % | Critical Value | Prob-Value | Order of Integration |
| GDP | -3.012363 | 6.258195 | 1.0000 | -2.945842 | 2.491970 | 1.00 | 1(1) |
| DD | -3.029970 | -2.945842 | 1.0000 | | | | 1(0) |
| EXTD | -2.938987 | -2.963972 | 0.9711 | | | | 1(0) |

Source: E-views computation, 2024

The null hypothesis that GDP has a unit root is accepted at level. However, GDP became stationary at first difference. Domestic debt and external debt were stationary at level, thereby providing the basis for testing the long-run co-movement among the time series.

**Table 4: Co-integration Result**

| Unrestricted Co-integration Rank Test (Trace) | | | | |
|---|---|---|---|---|
| Hypothesized No. of CE(s) | Eigenvalue | Trace Statistic | 0.05 Critical Value | Prob.** |
| None * | 0.653890 | 62.12821 | 29.79707 | 0.0000 |
| At most 1 | 0.455300 | 24.99323 | 15.49471 | 0.0014 |
| At most 2 | 0.101090 | 3.730047 | 3.841466 | 0.0534 |
| Unrestricted Cointegration Rank Test (Maximum Eigenvalue) | | | | |
| Hypothesized No. of CE(s) | Eigenvalue | Max-Eigen Statistic | 0.05 Critical Value | Prob.** |
| None * | 0.653890 | 37.13498 | 21.13162 | 0.0001 |
| At most 1 | 0.455300 | 21.26318 | 14.26460 | 0.0034 |
| At most 2 | 0.101090 | 3.730047 | 3.841466 | 0.0534 |

Source: E-views computation, 2024

The Johanson co-integration test above indicates from the Trace statistic and Maximum Eigen value that there is long-run relationship amongst the variables under review as revealed by the probability values (of At most 1 and At most 2).

Since the explained and explanatory variables of this study are stationary in mix order of 1(0) and 1(1), and are co-integrated, the study therefore adopts the autoregressive redistributed lag (ARDL) model.

## Lag Selection

The lag selection indicates the lag time between time series that the study is evaluating. It indicates the number of time periods that one variable is shifted backwards or forward to measure its relationship with another variable.

**Table 5: Lag Selection Result**

VAR Lag Order Selection

| Lag | LogL | LR | FPE | AIC | SC | HQ |
|---|---|---|---|---|---|---|
| 0 | -49.53236 | NA | 0.002969 | 2.693967 | 2.821934 | 2.739881 |
| 1 | 139.5791 | 339.4308 | 2.90e-07 | -6.542517 | -6.030651* | -6.358864* |
| 2 | 150.7761 | 18.37454* | 2.61e-07* | -6.655183* | -5.759419 | -6.333790 |
| 3 | 157.7932 | 10.43577 | 2.96e-07 | -6.553498 | -5.273835 | -6.094366 |

Source: E-views computation, 2024

The lag selection criteria above suggest from the (LR), (FPE) and (AIC) that lag 2 is best fit for the ARDL model as it gives the best result.

**Table 6: Bound Test**

**Null Hypothesis: No long-run relationships exist**

| **Test Statistic** | Value | k |
|---|---|---|
| **F-statistic** | 8.2779 | 2 |

**Critical Value Bounds**

| **Significance** | Io Bound | I1 Bound |
|---|---|---|
| **10%** | 3.17 | 4.14 |
| **5%** | 3.79 | 4.85 |
| **2.5%** | 4.41 | 5.52 |
| **1%** | 5.15 | 6.36 |

Source: E-views computation, 2024

The calculated F-statistic of 8.2779 exceeds the upper critical bounds value of 4.14 (10%), 4.85 (5%), 5.52 (2.5%) and 6.36 (1%) so the null hypothesis that there is no co-integration is rejected.

**Table 7: VEC Model**

| Cointegrating Eq: | CointEq1 | | |
|---|---|---|---|
| DD(-1) | 1.000000 | | |
| EXD(-1) | -0.258665 | | |
| | (0.08256) | | |
| | [-3.13295] | | |
| GDP(-1) | -1.321404 | | |
| | (0.10655) | | |
| | [-12.4014] | | |
| C | 0.427130 | | |
| Error Correction: | D(DD) | D(EXD) | D(GDP) |
| CointEq1 | - 0.069399 | -0.839819 | -0.032100 |
| | (0.08715) | (0.14204) | (0.02791) |
| | [ 0.79633] | [ 5.91274] | [-0.11502] |
| D(DD(-1)) | 0.267981 | -0.650295 | 0.167390 |
| | (0.20306) | (0.33094) | (0.06503) |
| | [ 1.31973] | [-1.96499] | [ 2.57415] |
| D(DD(-2)) | -0.032320 | -0.204892 | 0.149385 |
| | (0.20803) | (0.33904) | (0.06662) |
| | [-0.15536] | [-0.60432] | [ 2.24236] |
| D(EXD(-1)) | 0.039741 | 0.001557 | 0.041582 |
| | (0.03914) | (0.06378) | (0.01253) |
| | [ 1.01548] | [ 0.02441] | [ 3.31782] |
| D(EXD(-2)) | 0.023479 | 0.173770 | 0.014368 |
| | (0.04202) | (0.06848) | (0.01346) |
| | [ 0.55875] | [ 2.53738] | [ 1.06770] |
| D(GDP(-1)) | -0.466006 | -1.655896 | 0.165447 |
| | (0.48510) | (0.79061) | (0.15535) |
| | [-0.96064] | [-2.09445] | [ 1.06501] |
| D(GDP(-2)) | 0.526450 | -1.133625 | 0.310398 |
| | (0.42169) | (0.68727) | (0.13504) |
| | [ 1.24842] | [-1.64946] | [ 2.29851] |
| C | 0.008839 | 0.055139 | -6.21E-05 |
| | (0.00598) | (0.00974) | (0.00191) |
| | [ 1.47837] | [ 5.65855] | [-0.03245] |

Source: E-views computation, 2024

The first null hypothesis of this study states that domestic debt has no significant effect on economic growth in Nigeria. This hypothesis is accepted as the probability value of domestic debt in the ECM result is 0.167391 and is greater than the 5 percent level of significance of the study. Therefore, the alternative hypothesis that domestic debt has significant effect on economic growth in Nigeria is accepted.

The second null hypothesis of this study holds that external debt has no significant effect on economic growth in Nigeria. This hypothesis is also rejected as the probability

value of external debt in the ECM result is 0.041582 and is less than the 5 percent level of significance of the study. The alternative hypothesis that external debt has significant effect on economic growth in Nigeria is therefore accepted.

The first finding of this study agrees with findings from the work of Omimakinde and Onifade (2022) which examined the relationship between domestic debt and economic growth and found that domestic debt had negative effect on real GDP of Nigeria. One negative effect domestic debt has is that it may 'crowd-out' or 'conscript' the private sector. The crowding-out hypothesis suggest that government borrowing from banks in the domestic economy reduces credit to private sector, thereby shrinking private sector output in the economy. The private sector which is usually more productive may become starved of funds, leading to a decline in its productivity and a decrease in GDP growth.

The second finding of this study partially agrees with that of Yusuf and Saidatulakmal (2023) who found out that external debt is an impediment to long- term growth while its short-term effect is growth-enhancing. The negative effect on long-run growth may be due to external debt service payments which subtract from the pool of funds available for provision of public goods in the power, education and health, transport and tele-communication sectors of the economy. A priori expectation is that debt service payment will impede economic growth in the long-run as it is a leakage from the domestic economy. Furthermore, where governments borrow and engage in ostentatious spending, external debt may not enhance growth in the long-run. Rather, it may result in debt overhang wherein, amount of debt owed to multinational bodies and governments become too big to be managed. In both long and short run, debt service payments usually lead to growth retardation. This view is supported by Ofurum and Fubara (2022) who examined Nigeria's national debt on the country's economic growth from 1980 to 2019 and found that foreign debt service payments have negative effect on the growth of real GDP

As expected, the error correction term of gross domestic product is negative (-0.032100) and statistically significant at 5 percent level of significance. The coefficient reveals the average speed to adjust to equilibrium when there is disequilibrium in the system.

The standard error indicates the variability and uncertainty of the sample mean and tells how reliable the variable is for prediction and forecasting. The standard error for lag 1 period of domestic debt on gross domestic product (0.06503) indicates that the sample mean is likely to vary by approximately 0.06503 units from the true population. In lag 2 period, the standard error indicates a variability from the mean by 0.06662 units.

The standard error for lag 1 period of external debt on gross domestic product (0.01253) indicates that the sample mean is likely to vary by approximately 0.01253 units from the true population. In lag 2 period, the standard error indicates a variability from the mean by 0.01346 units.

**Table 8: ARDL Model**

ARDL Long-Run Estimates

| Variable | Coefficient | Std. Error | t-Statistic | Prob.* |
|---|---|---|---|---|
| GDP(-1) | 1.153967 | 0.173676 | 6.644359 | 0.0000 |
| GDP(-2) | -0.243351 | 0.157038 | -1.549636 | 0.1314 |
| DD | 0.051295 | 0.095081 | 0.539491 | 0.5934 |
| DD(-1) | 0.196610 | 0.141489 | 1.389583 | 0.1746 |
| DD(-2) | -0.188482 | 0.100249 | -1.880144 | 0.0695 |
| EXD | -0.036938 | 0.037691 | -0.980006 | 0.3347 |
| EXD(-1) | 0.042800 | 0.049785 | 0.859710 | 0.3965 |
| EXD(-2) | 0.029402 | 0.033437 | 0.879335 | 0.3860 |
| C | 0.115094 | 0.065809 | 1.748892 | 0.0902 |
| R-squared | 0.87004 | Mean dependent var | | 3.935423 |
| Adjusted R-squared | 0.85747 | S.D. dependent var | | 1.023039 |
| S.E. of regression | 0.036210 | Akaike info criterion | | -3.603847 |
| Sum squared resid | 0.040646 | Schwarz criterion | | -3.223849 |
| Log likelihood | 81.07694 | Hannan-Quinn criter. | | -3.466452 |
| F-statistic | 3887.460 | Durbin-Watson stat | | 2.387229 |
| Prob(F-statistic) | 0.000000 | | | |

Source: E-views computation, 2024

The long-run estimates above show the specific effects of domestic and external debt on economic growth for lag 1 and lag 2. Current period of domestic debt has no significant effect on economic growth. Lag 1 period has insignificant and negative effect on economic growth, while lag 2 has insignificant and positive effect on economic growth. Current period of external debt has insignificant and negative effect on economic growth. However, in the lag 1 and lag 2 periods, the effect of external debt on economic growth is insignificant but positive.

The Durbin Watson statistic is a above 2.0 suggesting that there is no autocorrelation in the study.

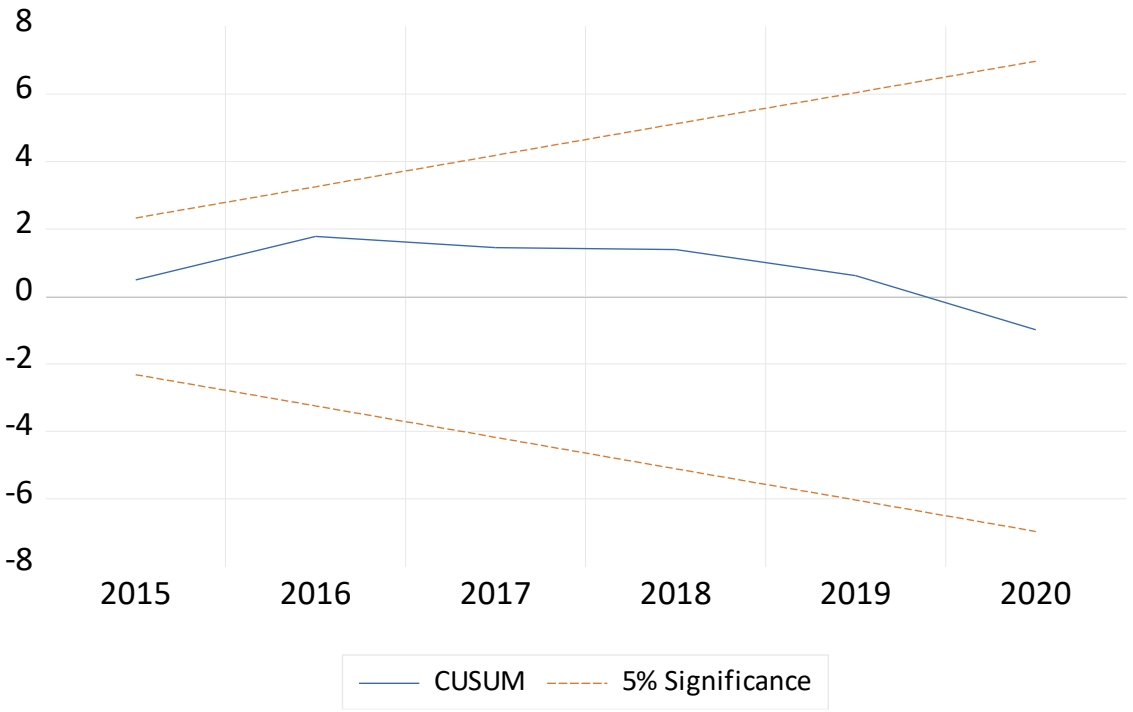
**Table 9: Heteroskedasticity and Serial Correlations Test**

| LM-Stat | Prob |
|---|---|
| 21.60508 | 0.0602 |
| df | 0.0714 |
| 21.60508 | |

Source: E-views computation, 2024

The result as presented in the above table revealed that there were no evidences of heteroskedasticity and serial correlation in the VAR result, as the estimated VAR result has p-values of 0.0602 and 0.0714 respectively which are greater than the 5 percent level of significance.

**Fig 1: CUSUM Stability Test**



The stability of the model was checked using the CUSUM test and it shows that the model is stable as it is within the 5% boundary.

## 4. CONCLUSION AND RECOMMENDATIONS

This study found out evaluated the effect of public debt on Nigeria's economic growth using domestic and external debt as explanatory variables as determinants of economic growth in its model. Findings reveal that while domestic debt has a direct relationship with economic growth, external debt is inversely related to economic growth in the short run. The effect of domestic and external debt on economic growth in Nigeria for the period under study is significant as shown by the probability values in the OLS and VAR results. The study therefore made the following recommendations:

(i) The use of domestic debt should be tied to the provision of domestic oil refining plants to cut down cost of goods and services for households and reduce cost of production for firms operating in Nigeria.

(ii) Government externally contracted loans should be more prudently invested in education and health as these two sectors are the productive base of any economy. Furthermore, investments in these sectors are expected to create positive ripple effects on the economy, thereby increasing the GDP growth rate.

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