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# Reexamining the Nexus between Domestic Public Debt and Economic Growth in Nigeria

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## Abstract
*This paper reexamines the relationship between domestic public debt and real gross domestic product in Nigeria. The study applies Autoregressive Distributed Lag (ARDL) method. The ARDL Bounds test shows that a long-run relationship exists among the variables. The ADF and PP Unit Root tests on the variables show that all the variables are I(1) process, with exception of interest rate which is I(0). The study uses annual time-series data from 1980-2020 on seven variables – real growth domestic product, domestic debt stock, domestic debt service payment, exchange rate, interest rate, government capital expenditure, and government recurrent expenditure. The results show that domestic debt stock does not have influence on real growth domestic product. Domestic debt service payment and interest rate have a significant negative impact on real growth domestic product in both the short and long run. Exchange rate has a significant negative influence on real growth domestic product in the short run. In the long run, government capital expenditure has a significant positive impact on real growth domestic product, while government recurrent expenditure has a significant positive impact on real growth domestic product in the short run, but negative in the long run. The study, therefore, recommends that the government should curtail excessive domestic borrowing and utilizes other alternative sources of financing such as public-private partnership and concessions; expend more resources on the capital expenditure, cut the recurrent expenditure and interest. The study concludes that public domestic debt does not promote real growth domestic product in Nigeria.*

**Keywords: Debt, Domestic Public Debt, Economic Growth**
**JEL Classification: H60, H74, F43**

## 1. Introduction

In Nigeria, public domestic debt comprises debt-related instruments issued by the Federal Government and they are valued by using the local currency, Naira. In practice, States and Local Governments issue debt instruments which are in the forms of development stocks, treasury bills, and

treasury bonds (Adofu & Abula, 2010). By their nature, development stocks and treasury bills are negotiable and marketable; as for the treasury bonds, they are neither negotiable nor marketable; rather, they are exclusively held by the Central Bank of Nigeria (CBN). If judiciously utilized, domestic public debt could help finance the budget deficit, facilitate execution of monetary policies and, above all, promote the development of financial instruments to improve the overall effectiveness, and efficiency of the financial market (Alison, 2003).

Saungweme, Odhiambo and Camarero (2019) opined that for a country like Nigeria with dysfunctional economic settings, excessive domestic borrowing would constitute huge concerns and drive the country into the debt-overhang condition. According to the Debt Management Office [DMO], 2021, Nigeria spent 1.02 trillion Naira in debt servicing in the first quarter of 2021, representing a 35.7% year-on-year increase compared to 753.7 billion Naira spent in the corresponding period of 2020. Of this figure, 612.71 billion Naira was spent on domestic debt service, while 410.1 billion Naira was expended on servicing external debt. Similarly, as of December 2013, Nigeria's total debt stock stood at 7.421 trillion Naira which totaled the entire public debt to 8.5 trillion Naira if the amount representing the domestic debt, 1.6 trillion Naira, was not included. By June 2014, the amount grew to 7.42 trillion Naira as against 7.18 trillion Naira at the end of the first quarter of the same year. This, therefore, represented a 3.3% increase in borrowing within the period under review.

The domestic increase in borrowing, as described, was attributed to the 200 billion Naira bonds which subsequently amounted to 385 billion Naira. Still, Nigeria's domestic debt stock stood at 7.25 trillion Naira as of 2015; 10.606 trillion Naira by 2016; 12.58 trillion Naira in 2017; 12.83 trillion Naira in 2018; 20.21 trillion Naira, and 20.637 trillion Naira as of 30 March 2020, and 2021 respectively. Nigeria spent about 83% of its revenue on debt servicing in 2020. That means to say, the total revenue earned during the said period stood at 3.93 trillion Naira, while debt servicing stood at 3.26 trillion Naira. Furthermore, Nigeria recorded a 99% debt-service-to-revenue ratio in the first quarter of 2020 by earning 950.56 billion Naira revenue and spending 943.12 billion Naira on debt service. Still, according to the 2021 fiscal budget, the Federal Government of Nigeria spent about 13.588 trillion Naira. Of this figure, the recurrent expenditure consumed 5.6 trillion Naira, capital expenditure swallowed 4.125 trillion Naira and debt servicing consumed 3.324 trillion Naira, while 496.528 Naira was spent on statutory transfers. Despite this huge spending, the growth rate, on average, has not recorded considerable increase throughout the period under review.

The above figures suggest that Nigeria's domestic debt profile is unsustainable. And, it is a pointer that the country is heading into a serious debt crisis. It is apparent that unsustainable public debt discourages investment, lowers economic growth, reduces country's global competitiveness, and increases financial market susceptibility to external shocks (Ogbonna, Ibenta, Chris-Ejiogu & Atsanan, 2019). Debt sustainability can be explained by either utilizing debt to GDP ratio or debt service to revenue ratio. According to the DMO, Nigeria's debt-GDP ratio was estimated to be 35.71% in 2021, and it was one of the lowest in the world. It is also far below the current acceptable threshold of 90%. This means that the country's debt burden is relatively low compared with other countries.

However, debt-GDP ratio is not considered as the best indicator of debt sustainability for a country like Nigeria with the lowest tax-GDP ratio of about 8% which falls below the minimum 15% pegged by the World Development Indicator [WDI], 2021. Therefore, a better indicator of debt sustainability for Nigeria is debt-revenue ratio – a metric that shows whether the government is generating substantial revenue to service its debt. Since the 2016's recession, Nigeria has been battling with a higher debt service to revenue ratio. For example, in 2019, about 2.43 trillion Naira was spent on debt service out of total revenue of 4.1 trillion Naira. In other words, 59.6% debt service to revenue ratio. The rising cost of debt service as a percentage of revenue rose to 83% in 2020. Despite the revenue shortfalls, government recurrent expenditure – debt and non-debt have remained high. With the economy likely on the path to a Covid-19 and growing insecurity, non-oil revenue could remain depressed.

Similarly, the Russia-Ukraine conflict would also continue to depress the Nigeria's oil revenue. This means that the government would continue to rely on borrowing to fund its operations, pilling more pressure on debt service to revenue ratio. In all, the discord between the rapid increase in domestic debt and debt service payment amidst low level of revenue and economic growth necessitate this study. Thus, this study intends to reexamine whether the rising domestic debt profile has any effect on Nigeria's economic growth and determine whether such effect is either in the short-run or long-run or both short-run and long-run.

## 2. Literature Review

### 2.1 Theoretical Review

#### 2.1.1 Dual Gap Theory

The economic wisdom behind the Dual Gap Theory was championed by Domar (1946) who traced the difference between the required domestic level of investment and the available domestic resources and which

according to Domar could be bridged through borrowing from abroad. Similarly, Rostow (1960) captured this idea in his work – The Stages of Economic Growth. Rostow suggested that attainment of prosperity from underdevelopment to development could be achieved in terms of stages. Restow, further, suggested that mobilization of domestic and foreign savings is one of the major components of development that could generate economic growth. According to him, the necessary condition for development was that there must be an increase in investment between the ranges of 5-10 percentages of income. In other words, if domestic resources were inadequate to stimulate economic growth, the gap could be filled with foreign aid or external borrowing.

In the same vein, Chenery and Strout (1966) augmented the Domar's Financing Gap theory with the acknowledgement of the need for enhanced national savings. They pointed out the need for foreign resources in promoting economic growth. Chenery and Strout described a typical sequence of the saving-investment gap which was in the form of export-import gap and which must be filled if developing countries aspire to achieve an accelerating economic growth. They, furthermore, pointed out that development is a direct function of investment, and investment depends on savings which also depends on available resources. To fill the inherent gap, they used national income accounting to indicate the excess of investment over domestic savings and which was equivalent to the surplus of imports over exports. It is of importance to note that if the available domestic income is inadequate to achieve a target growth rate, the savings-investment gap is said to exist. On the other hand, if imports that are required to achieve a specified growth target exceed exports, then the exports-imports of exchange gap exists.

### 2.1.2 Debt Laffer Curve

Debt Laffer Curve suggests that borrowing affects investment and economic growth positively up to a certain threshold level, but beyond that level, the effect becomes negative. In other words, this idea focuses on the nonlinear relationship between debt and economic growth. Debt Laffer Curve was first introduced by Jeffery (1989) in the context of debt overhang argument, while Krugman (1988) formalized the actual derivation of the curve and the underlying logic behind it. The ability of countries to repay their actual levels of debt was documented by Krugman in his study on Market-Based Debt-Reduction Schemes. That is, the obligation of servicing debt would act like a high marginal tax rate when a country has accumulated too much debt or when its obligation exceeded the amount it is likely to pay. The upshot of this situation would be a disincentive for any government to

improve its performance because many benefits from growth would go to creditors rather than the country itself. Besides, the financing of debt would be at the expense of tax payers through the taxation of capital that would further discourage investment.

Similarly, a theoretical model developed by Calvo (1998) showed that the impact of debt on growth was nonlinear which depended on the magnitude of the initial debt stock. His model consists of three distinct areas. In the first area, growth is an increasing function of debt, the second area shows an intermediate region where economic growth can either be high or low, and the third area indicates that growth is a decreasing function of debt. Specifically, the economy will exhibit high growth equilibrium for a lower debt-GDP ratio. The higher growth equilibrium is when there is a modest cut in debt that leads to high growth. The lower growth equilibrium is due to the higher debt service payments when there is a high debt. In order to service debt, a high tax rate on capital would be needed leading to a lower rate of return on capital, thus lowering investment and economic growth.

## 2.2 Empirical Review

Adofu and Abula (2010) investigated the relationship between domestic debt and economic growth in Nigeria. Using applied ordinary least squares regression, the study found that domestic debt reduced economic growth. Egbetunde (2012) used annual time series data from 1970-2010 and applied the Vector Autoregressive model. They investigated the relationship between public debt and economic growth in Nigeria and found a bi-directional causality between disaggregated components of public debt and economic growth in Nigeria.

Udeh, Ugwu and Onwuka (2016) used annual time series data spanning from the period 1980-2013 and applied Ordinary Least Squares. They examined the effect of external debt on economic growth in Nigeria. The study regressed GDP as a function of external debt stock, debt service payment and exchange rate. The results from the study showed that external debt stock and debt service payments had a negative influence on economic growth, while exchange rate indicated a significant positive influence.

Akhanolu, Babajide, Tolulope and Godswill (2018) utilised an annual time series data for a period coverage of 1982-2017 and applied the Two-Stage Least Square methods; the study captured GDP as a dependent variable, while domestic debt, external debt, savings, and capital expenditure were used as independent variables. Results from this study indicated that external debt has a significant negative effect on economic growth, while domestic debt showed a significant positive influence on the GDP.

Essien and Ndalo (2017) studied the impact of public debt on economic growth in Nigeria by using a time-series data from 2014-2018. The regression result showed that public debt has negative influence on GDP growth rate. Onyele and Nwadike (2021) examined the impact of national debt burden on economic stability in Nigeria. By using time-series data and applying ARDL technique, the study found that debt burden, revenue adequacy, reserve adequacy, and exchange rate have positive impact on economic development.

Igbodika, Jessie and Andabai (2016) studied the relationship between domestic debt and the performance of Nigerian economy by using a time-series data 1987-2014. The result showed that GDP has inverse relationship with interest rate but a positive relationship with a domestic debt. Adam, Sule, Anthony and Ibrahim (2016) studied the impact of domestic debt on economic performance in Nigeria. The result revealed that domestic debt has a negative insignificant influence on GDP and unemployment. Alagba and Eferakeya (2019) examined the impact of public debt on economic growth in Nigeria. The study used a time-series data from 1981-2018. The finding showed that domestic debt has a positive impact on GDP, while external debt has insignificant positive influence on GDP. And, debt servicing has a significant negative influence on GDP.

Ebong, Ogwumike, Udongwo and Ayodele (2016), using VECM, examined the impact of government capital expenditure on economic growth in Nigeria by utilizing a time-series data spanning from 1970-2012. The result indicated that capital expenditure has a significant positive impact on economic growth in both the short and long-run. Onifade, Cevic, Erdogan, Asongu and Bekun (2020) used a time-series data (1981-2917) and studied the impact of government recurrent expenditure on economic growth by employing ARDL methods. The result revealed that government recurrent expenditure has a significant negative impact on economic growth while the capital expenditure has a significant positive impact on economic growth. Adegoke, Azeez, Ogiamien and Osasona (2021) investigated the relationship between interest rate and economic growth in Nigeria by using a time-series data and ARDL method. The result revealed a significant negative relationship between interest and economic growth, while exchange rate has a significant positive influence on economic growth.

## 3. Methodology

The paper uses secondary annual time series data from 1980-2020. The data were sourced from the Central Bank of Nigeria (CBN) and Debt Management Office (DMO). The Augmented Dickey Fuller (ADF) and Phillip Peron (PP) tests were employed on the data to check for unit root.

After checking the long-run relationship through the Bound test, Auto Regressive Distributive Lag (ARDL) technique was applied. Post-estimation tests were conducted to test for the presence of spurious estimates. Finally, CUSSUM and CUSSUM of squares recursive coefficient tests were carried out to confirm the stability of the model.

### 3.1 Model Specification

To reexamine the impact of domestic public debt on economic growth in Nigeria, an ARDL model from Yusuf and Mohd (2021) has been modified and adopted to allow for the inclusion of key control variables. This paper adopts Auto Regressive Distribute Lag (ARDL) technique to cointegration. This approach was developed by Pesaran, Shin and Smith (2001) to test for the short-run and long-run associations among variables of interest. The method has some advantages over the traditional cointegration approaches – the single-equation technique and the Maximum Likelihood method developed by Engle and Granger (1991). This method is based on the system equations that require a sample period to be very large. They also require that all the variables under the study should be I(1) process. As for the ARDL model, long-run relationships can be established among the variables of the study irrespective of whether the series is the I(1) or I(0) process. The method is also more efficient in the case of small and finite sample data sizes. Further, it gives unbiased estimates of the long-run model. In functional form, the model is specified below:

$RGDP = f(DDS, DDSP, EXR, IR, GCE, GRE)$ ……..……..……..…1

To make the above mathematical function estimable, it is transformed into a stochastic form in the below equation:

$lnRGDP_t = \beta_0 + \beta_1 lnDDS_t + \beta_2 lnDDSP_t + \beta_3 lnEXR_t + \beta_4 lnIR_t + \beta_5 l_n GCE_t + \beta_6 lnGRE_t + \mu_t$……..…2

Where:

$\beta_0$ = Constant; $\beta_1$, $\beta_2$, $\beta_3$, $\beta_4$, $\beta_5$, $\beta_6$ = Coefficients of the independent variables

$lnRGDP_t$ = Real Gross Domestic Product; $lnDDS_t$ = Domestic Debt Stock; $lnDDSP_t$ = Domestic Debt Service Payment; $lnEXR_t$ = Exchange Rate; $lnIR_t$ = Interest Rate; $lnGCE_t$ = Government Capital Expenditure; $lnGRE_t$ = Government Recurrent Expenditure; $ln$ = Logarithm; $\mu_t$ = Error term.

Therefore, the following ARDL model is specified and estimated to test for cointegration relationship among the variables of interest:

$\Delta lnRGDP_t = C_0 + \delta_1 lnRGDP_{t-1} + \delta_2 lnDDS_{t-1} + \delta_3 lnDDSP_{t-1} + \delta_4 lnEXR_{t-1} + \delta_5 lnIR_{t-1} + \delta_6 lnGCE_{t-1} + \delta_7 lnGRE_{t-1} + \sum_{i=0}^{q} \emptyset_8 \Delta\, lnRGDP_{t-1} + \sum_{i=0}^{q} \emptyset_9 \Delta lnDDS_{t-1} + \sum_{i=0}^{q} \emptyset_{10} \Delta lnDDSP_{t-1} +$

$\sum_{i=0}^{q} \emptyset_{11} \Delta\, lnEXR_{t-1} + \sum_{i=0}^{q} \emptyset_{12} \Delta lnIR_{t-1} + \sum_{i=0}^{q} \emptyset_{13} \Delta lnGCE_{t-1} + \sum_{i=0}^{q} \emptyset_{14} \Delta lnGRE_{t-1} + ECM + \varepsilon_t$ .....3

Where: $\Delta lnRGDP_t$ = Dependent variable (a proxy for economic growth). $lnDDS_{t-1}$, $lnDDSP_{t-1}$, $lnEXR_{t-1}$, $lnIR_{t-1}$, $lnGCE_{t-1}$ and $lnGRE_{t-1}$ = Independent variables of the model.

$C_0$ = Constant; $\delta_1$, $\delta_2$, $\delta_3$, $\delta_4$, $\delta_5$, $\delta_6$, and $\delta_7$ = short-run dynamic coefficients of the respective variables.

$\emptyset_8$, $\emptyset_9$, $\emptyset_{10}$, $\emptyset_{11}$, $\emptyset_{12}$, $\emptyset_{13}$, and $\emptyset_{14}$ = long-run coefficients to be estimated.

$ECM$ = Error correction term which measures the speed of adjustment.

$\varepsilon_t$ = Error term

$t$ = Time trend which consists of years spanning from 1980 to 2020.

$i$ = Lag indicator.

$\Delta$ = The first difference operator.

Base on the intuition behind the economic theory, it is expected that $\emptyset_8$, $\emptyset_9$, $\emptyset_{11}$, $\emptyset_{13}$ and $\emptyset_{14}$ should be positive (>0), while $\emptyset_{10}$ and $\emptyset_{12}$ should be negative (<0).

### 3.2 Variable Measurement

The study uses data on seven macroeconomic variables. The Real Gross Domestic Product ($ln$RGDP) is used as a dependent variable, and it is measured as a proxy for economic growth by dividing it by the number of people in the country (Okwara & Amori, 2017). The independent variables are Government Capital Expenditure ($lnGCE$), Government Recurrent Expenditure ($lnGRE$), Exchange Rate ($lnEXR$), Domestic Debt Stock ($lnDDS$), Domestic Debt Service Payments ($lnDDSP$), and Interest Rate ($lnlR$). $lnGCE$, $lnGRE$, and $lnEXR$ are used as core fiscal policy variables in the study, while $lnDDS$ and $lnDDSP$, and $lnIR$ are used as control variables. $lnGCE$ is proxied by total $lnGCE$ divided by $lnRGDP$; the rate indicates a reflection of $lnGCE$ that goes into promoting $lnRGDP$ (Modebe, Regina, Onwumere & Imo, 2012). $lnGRE$ is also proxied by total $lnGRE$ divided by $lnRGDP$; the rate shows a reflection of $lnGRE$ that promotes the $lnRGDP$ (Modebe et al., 2012). Also, $lnEXR$ is measured as Nigerian Naira to the United States Dollar (Aliyu & Mustapha, 2020). The higher the $lnEXR$, the higher or lower would be the $lnRGDP$. $lnDDS$ and $lnDDSP$ are measured as a percentage of $lnRGDP$, and they depress $lnRGDP$ after a certain thresholds (Omotosho, Bawa & Doguwa, 2016). Finally, as for $lnIR$, the study uses short term interest rate measured by the monetary policy rate as a proxy for interest rate, following the works of Gbadebo and Okunrinboye (2009); Ogunsakin and Awe (2014).

Since macroeconomic variables often indicate geometric growth, this necessitates taking their logarithms to linearize the trend in time-series variables and to measure elasticities from equations with logged variables on the right-hand side and left-hand side as long the series are not in negative or decimal values. For this study, the interest rate and exchange rate are neither negative nor decimal values. And, though interest rate can be negative, but the exchange rate cannot be negative, being it a value of one currency in terms of another. Hence, taking its log is appropriate. As reported by Oluremi (2021) that sufficient justifications cannot be established as to why interest rates cannot be logged.

## 4. Results and Discussion

**Table 1: Optimal Lag Length Selection Criteria**

| Lag | Lag L | LR | FPE | AIC | SC | HQ |
|---|---|---|---|---|---|---|
| 0 | -257.5263 | NA | 0.003825 | 14.29872 | 14.60349 | 14.40617 |
| 1 | -13.94084 | 381.8367 | 1.09e-07 | 3.780586 | 6.218732* | 4.640147* |
| 2 | 42.45487 | 67.06517* | 9.80e-08* | 3.380818 | 7.952342 | 4.992494 |
| 3 | 104.2873 | 50.13438 | 1.22e-07 | 2.687174* | 9.392076 | 5.050966 |

Source: Author's Compilation using Eviews 10 (2022)

The table 1 shows all the automatically generated lag selection criteria. The study uses AIC because it has the lowest value among all other lag selection criteria. And, the lower the value, the better the model.

**Table 2: Stationary Tests Results for Variables**

| | ADF Test | | | PP Test | | |
|---|---|---|---|---|---|---|
| Variables | Level | 1st Diff. | Remark | Level | 1st Diff. | Remark |
| $lnRGDP_t$ | $-0.328073^{n}$ | $-3.995512^{**}$ | I(1) | $0.451047^{n}$ | $-3.783079^{**}$ | I(1) |
| $lnDDS_t$ | $0.114796^{n}$ | $-6.201579^{**}$ | I(1) | $0.342915^{n}$ | $-6.202718^{**}$ | I(1) |
| $lnDDSP_t$ | $0.097159^{n}$ | $-6.133330^{**}$ | I(1) | $0.298939^{n}$ | $-6.133770^{**}$ | I(1) |
| $lnEXR_t$ | $2.447327^{n}$ | $-3.858582^{**}$ | I(1) | $2.758123^{n}$ | $-3881684^{**}$ | I(1) |
| $lnIR_t$ | $-3.714430^{**}$ | $-5.352760^{**}$ | I(0) | $-3.133752^{**}$ | $-8.857381^{**}$ | I(0) |
| $lnGCE_t$ | $-1.083245^{n}$ | $-6.357683^{**}$ | I(1) | $-1.083245^{n}$ | $-6.358020^{**}$ | I(1) |
| $lnGRE_t$ | $-1.567430^{n}$ | $-8.390130^{**}$ | I(1) | $-1.405787^{**}$ | $-8.327795^{**}$ | I(1) |

*Note*: *, ** and *** represent significance levels at 10%, 5% and 1% respectively. The letter $n$ denotes no significance.

Source: Author's Compilation using Eviews 10 (2022)

The table 2 indicates that all the variables are integrated of order one I(1) with exception of interest rate which happens to be stationary at level I(0). This condition warrants the application of ARDL method which accommodates series that are either I(1) or I(0) process or the mixture of both. The stationary tests are necessary to guard against spurious regression and to ensure no variable is integrated of order two.

**Table 3: ARDL Bound Test of Cointegration Results**

| Model | F-Statistic | K | Critical Values | | | Decision |
|---|---|---|---|---|---|---|
| $lRGDP = f(lDDS, DDSP, lEXR, lIR, lGCE, lGRE)$ | | | % | Lower Bound I(0) | Upper Bound I(1) | If $H_0$ is rejected, cointegration exists. |
| | 5.611726 | 6 | 1% | 3.15 | 4.43 | |
| | | | 2.5% | 2.75 | 3.99 | |
| | | | 5% | 2.45 | 3.61 | |
| | | | 10% | 2.12 | 3.23 | |

Source: Author's Compilation using Eviews 10 (2022)

Table 3 shows that long-run relationships exist among the variables of the study because the F-Statistic (5.611726) is greater than the lower I(0) and upper I(1) bounds of the critical values at 5% critical value.

**Table 4: ARDL Long-run Estimated Results**

| Variables | Coefficients | Std. Errors | t-Statistics | Probability |
|---|---|---|---|---|
| $lnDDS$ | 0.129724 | 0.072074 | 1.799873 | 0.0897 |
| $lnDDSP$ | -0.423321 | 0.085866 | -4.930013 | 0.0001 |
| $lnIR$ | -0.325150 | 0.098150 | -3.312786 | 0.0037 |
| $lnEXR$ | -0.526263 | 0.089031 | -5.910976 | 0.0000 |
| $lnGCE$ | 0.521797 | 0.174331 | 2.993136 | 0.0082 |
| $lnGRE$ | 0.162321 | 0.982852 | 0.165153 | 0.6937 |

Source: Author's Compilation using Eviews 10 (2022)

Table 4 above shows that in the long run, if all other things were held fixed, domestic debt stock ($lnDDS$) has no significant positive impact on real growth domestic product ($lnRGDP$). As for the domestic debt service payments ($lnDDSP$), it has a significant negative impact on the real growth domestic product ($lnRGDP$). This means that a unit increase in $lnDDSP$ would reduce the $lnRGDP$ by 42%. For the interest rate ($lnIR$), it has a significant negative influence on $lnRGDP$. It means that a unit increase in

$lnIR$ would decrease $lnRGDP$ by about 33%. For exchange rate ($lnEXR$), it has a significant negative impact on $lnRGDP$. This means that a unit increases in $lnEXR$ would depress $lnRGDP$ by about 53%. Capital expenditure ($lnGCE$) has a significant positive impact on $lnRGDP$. That means a unit increases in $lnGCE$ would increase $lnRGDP$ by 52%. Finally, recurrent expenditure ($lnGRE$) has no significant positive influence on $lnRGDP$.

The above findings aligned with some of the empirical studies reviewed. Specifically, $lnDDS$ has no significant positive impact on $lnRGDP$. This result is consistent with the findings of Akhanolu et al. (2018); Alagba and Eferakeya (2019). $lnDDSP$ has a significant negative impact on $lnRGDP$ which is consistent with the findings of Udeh et al. (2016); Alagba and Eferakeya (2019). $lnGCE$ and $lnGRE$ correspond with the findings of Ebong et al. (2016) and Onifade et al. (2020) which found $lnGCE$ has a significant positive impact on economic growth, while $lnGRE$ has a significant negative impact on economic growth. The results on the $lnIR$ is in tuned with Adegoke et al. (2021) which found that $lnIR$ has a significant negative influence on GDP, while $lnEXR$ is not in line with the finding of Adegoke et al. (2021) as it showed an opposite result that $lnEXR$ has a significant positive impact on GDP.

**Table 5: Short-run Estimated ARDL Results (3, 1, 0, 1, 3, 0)**

| Variables | Coefficients | Std. Errors | t-Statistics | Prob. |
|---|---|---|---|---|
| $\Delta(lnRGDP(-1))$ | 1.150753 | 0.207999 | 5.532492 | 0.0000 |
| $\Delta(lnRGDP)(-2))$ | 0.337308 | 0.255248 | 1.321489 | 0.2020 |
| $\Delta(lnRGDP(-3))$ | -0.543231 | 0.151574 | -3.583922 | 0.0020 |
| $\Delta(lnDDS)$ | 0.019694 | 0.020145 | 0.977637 | 0.3405 |
| $\Delta(lnDDS(-1))$ | 0.001550 | 0.001394 | 1.111627 | 0.2802 |
| $\Delta(lnDDSP)$ | -0.019602 | 0.020012 | -0.979509 | 0.0096 |
| $\Delta(lnEXR)$ | -0.051836 | 0.024413 | -2.123268 | 0.0471 |
| $\Delta(lnEXR(-1))$ | -0.084042 | 0.039678 | 2.118082 | 0.0476 |
| $\Delta(lnIR)$ | -0.019628 | 0.009442 | -2.078734 | 0.0514 |
| $\Delta(lnIR(-1))$ | 0.003288 | 0.011803 | 0.278572 | 0.7836 |
| $\Delta(lnIR(-2))$ | -0.011880 | 0.011803 | -1.006513 | 0.3268 |
| $\Delta(lnIR(-3))$ | -0.035413 | 0.011978 | -2.956339 | 0.0081 |
| $\Delta(lnGCE)$ | 0.021918 | 0.016823 | 1.302867 | 0.2082 |
| $\Delta(lnGRE)$ | -0.054357 | 0.033126 | -1.640931 | 0.1173 |
| $\Delta(lnGRE(-1))$ | -0.077238 | 0.033318 | -2.318224 | 0.0317 |
| $\Delta(lnGRE(-2))$ | 0.022595 | 0.022452 | 1.006347 | 0.3269 |
| $\Delta(lnGRE(-3))$ | 0.060147 | 0.024907 | 2.414891 | 0.0260 |
| $ECM(-1)$ | -0.055170 | 0.007674 | -7.189364 | 0.0000 |

Source: Author's Compilation using Eviews 10 (2022)

From table 5 above, if all things were held constant, the short run result shows that in the short run, $lnRGDP$ was positively and significantly influenced by its own lag or the previous year's value. For the second year's value, it was positive but not significant. As for the third year, it was negative and statistically significant. As for the current and previous year's of value of $lnDDS$, the result shows $lnDDS$ has a positive insignificant influence on $lnRGDP$. That means, a unit increase in $lnDDS$ increases $lnRGDP$ by about 1.97% and 0.16% respectively. As for $lnDDSP$, it has an insignificant negative influence on $lnRGDP$. A unit increase in $lnDDSP$ reduces $lnRGDP$ by about 1.97%.

For$lnEXR$, its current and previous year's value has a significant negative influence on the $ln$RGDP. That means, a unit increase in the current exchange rate decreases the $ln$RGDP by about 52%, while for the previous year's value, it decreased it by 84%. As for $lnIR$, its current value is negatively associated with $lnRGDP$. That means, a unit increase in $lnIR$ depresses $ln$RGDP by about 20%, while the previous year's value influenced $lnRGDP$ positively, but it was statistically insignificant (3%); the second and third year's values decreased $ln$ RGDP by about 12% (statistically insignificant) and 35% (statistically significant) respectively. Similarly, the current value of $lnGCE$ is positively associated with $lnRGDP$, but it is statistically insignificant. That is, a unit increase in $lnGCE$ increased $ln$RGDP by about 22%. For the $ln$GRE, its current value depresses $lnRGDP$ by 54% but it is statistically insignificant. For its previous year's value, it reduced $lnRGDP$ by 77% and it was statistically significant, while the second previous year's value increased $lnRGDP$ by about 23% (statistically insignificant) and the third previous year's value increased $lnRGDP$ by 60% and it was statistically significant.

Finally, the error correction term ($ECM$ (-1)) represents the speed of adjustment which is required to bring the economy back to equilibrium in the dynamic model after the disturbance. This condition follows a priori expectation that it must less than zero, negative, and statistically significant. These three conditions have been satisfied by this model. Its value stands at -0.055170, which implies that a shock to the $lnRGDP$ in the current period would be restored at a speed of adjustment of about 6% in the next period. In other words, the level of adjustment of a short-run disequilibrium in $lnRGDP$ is about 6% of the disturbance in the $lnRGDP$ due to the current period shocks and which would converge towards the long-run equilibrium in the next period.

**Table 6: Short-run Diagnostic Tests Results**

| Test | Null Hypothesis | F-statistics | Prob. Value |
|---|---|---|---|
| Beusch Godfrey Serial Correlation LM Test | No Serial Autocorrelation | 0.825653 | 0.1747 |
| Breusch-Pagan Godfrey | No Hetroscedasticity | 0.613293 | 0.7288 |
| Jarque-Bera | There is normal Dist. | 1.576036 | 0.454745 |
| Ramsey Reset | No Misspecification | 2.739634 | 0.1152 |

Source: Author's Compilation using Eviews 10 (2022)

From table 6 above, In order to confirm the validity or the opposite of the estimates, the model is subjected to serial correlation test. The null hypothesis is that there is no serial correlation in the residuals up to a specified lag order. Therefore, the above result shows that the null hypothesis cannot be rejected because the p-value is greater than the 5% significance level. Thus, the model does not suffer from serial correlation.

In order to test whether the variance of the disturbance term is not the same for all the observations, the heteroscedasticity test has been conducted. The null hypothesis of this test is that the there is no heteroskedasticity. Therefore, the null hypothesis cannot be rejected since the p-value of the chi-square statistics is greater than 5% significance value. Hence, the model is homoscedastic.

As for the Durbin-Watson (DW) test, the value is 1.576036 which lies within the range of 1.5 to 2.5, and which is relatively normal or suggests weak presence of autocorrelation.

Ramsey reset test holds that the F-statistic and the t-statistic test the hypothesis that the coefficients on the powers of the fitted values from the regression are jointly zero. Therefore, the null hypothesis cannot be rejected since the probability values are greater than 0.1. This implies that the model used in this study is well-specified.

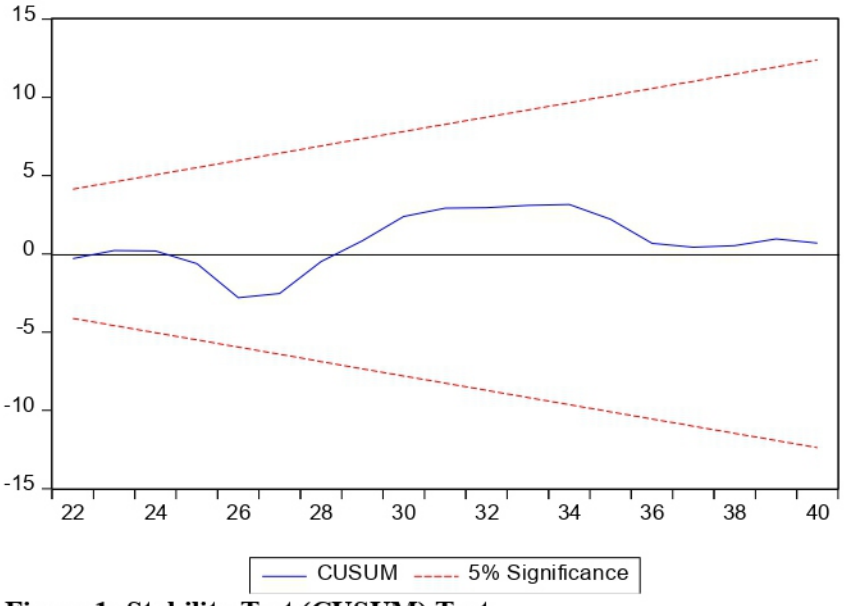


**Figure 1: Stability Test (CUSUM) Test**
Source: Author's Compilation using Eviews 10 (2022)

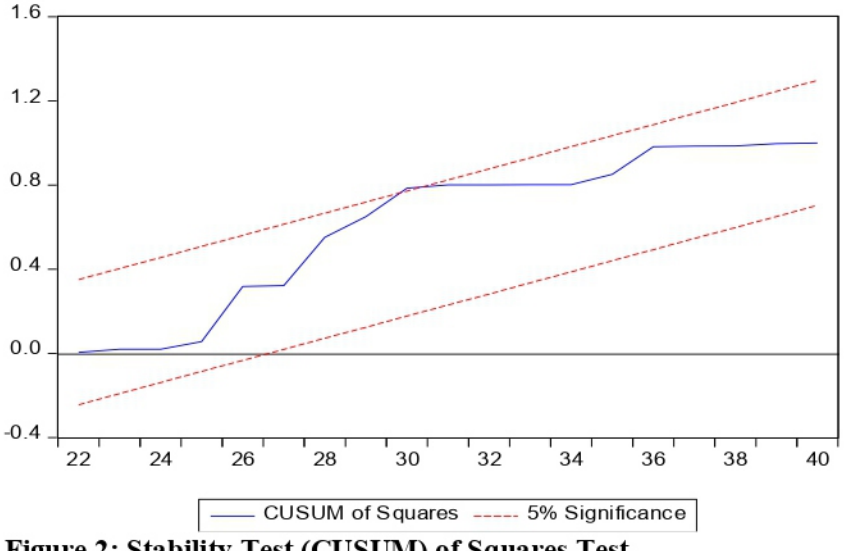


**Figure 2: Stability Test (CUSUM) of Squares Test**
Source: Author's Compilation using Eviews 10 (2022)

The above CUSUM and CUSUM of Square plots fall within the critical bounds at 5% significance level. This suggests that the model is

structurally stable based on the sample used in the study and the findings from this study could be relied upon.

## 5. Conclusion and Recommendations

This paper reexamines the relationship between domestic public debt and economic growth in Nigeria by using annual time-series data spanning from 1980-2020. The paper uses a growth-model function and captures components of public debt and certain control variables such as debt service, exchange rate, interest rate, government recurrent expenditure, and government capital expenditure. The study utilizes the ARDL approach to cointegration. Findings from this study indicate that in the long and short run, domestic debt has no significant impact on real growth domestic product. Domestic debt service payments significantly reduces real growth domestic product in the long and short run. Similarly, the exchange rate has no significant impact on real growth domestic product in the long run, while the current value is growth-depressing and statistically significant. Interest rate is significantly and negatively associated with real growth domestic product both in the short and long run. Capital expenditure improves real growth domestic product in the long run, but it does not influence it in the short run. Recurrent expenditure significantly reduces real growth domestic product in the long run, but it promotes it in the short run.

Based on these findings, the study recommends that the level of domestic borrowings should be reduced since it depresses the real growth domestic product through crowding out effect. Hence, emphasis should be more on external borrowing. Also, since debt service dwarfs real growth domestic product, it is recommended that borrowing levels should be within sustainable limits. Given this, the amount to be contracted as loans by the Nigerian government should be determined by the debt-to-revenue ratio as against the current policy of debt-to-GDP ratio which the Nigerian government uses and which is apparently misleading, unrealistic, and unsustainable. As for the exchange rate, it is recommended that the Nigerian government should encourage local production to discourage the massive importation of imported goods which often increases the level of exchange rate. Furthermore, the government should maintain a moderate interest rate that would not increase the cost of borrowing and discourage local and foreign investors. Finally, the government of Nigeria should strictly channel the borrowed funds to financing the capital projects which are growth-promoting drivers and inject fewer funds on recurrent expenditure.

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