

# The Impact of Government Debt on Economic Growth in Nigeria

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## Research

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# Abstract

The study investigated the effect of public debt on Nigeria's economic growth using annual time series data from 1980-2018. In collecting, evaluating and interpreting secondary data relating to the study objective, the quantitative and ex-post facto research design was adopted. The Autoregressive Distributed Lag method was applied to assess the short and long-term linkages between economic growth and public debt indicators. The empirical results showed that external debt stock constituted an impediment to long-term growth but a short-run growth-enhancement effect. Domestic debt accretion had a noteworthy positive impact on long-term output growth, while its short-term effect was negative. In the long and short-term, debt service payments led to growth retardation, although the amount of foreign reserves greatly improved growth both in the long and short-run. The diagnostic tests results indicated no problems with non-normality, serial correlation, heteroscedasticity and error in the predicted model specification. The findings of this study suggest that concerted efforts should be made to boost domestic revenue generation and execute fiscal transformations that reduce public debt and deficit financing to a sustainable level, while ensuring that borrowed funds are deployed to support growth through productive and self-liquidating investments in principal sectors of the economy.

## 1: Introduction

The difference between most governments' revenue and expenditures might not always be zero. This raises the question of other sources of financing for the requisite government expenditures, including borrowing from individuals, countries, multinationals, and others. When conventional revenue sources are inadequate to cover government expenditures, public debt becomes inevitable. Because of the need to bridge the gap between their savings and investment and the resources required to finance the anticipated level of economic growth are in short supply, governments with large recurring budget deficits can borrow to finance their fiscal deficit (Omotosho et al., 2016). Such borrowing can come from sources that are internal or external. Public debt can be an economic stimulant but when its accretion gets to a very large level, a reasonable proportion of government revenue and foreign exchange earnings would be used to service and repay the debt with high opportunity costs even for future generations. Large debt accretion creates a severe impasse on the path to sustainable growth of nations. This is because servicing debt costs more and the costs will rise beyond the debtor nation's capacity, thus harming the debtor nation's ability to achieve expected monetary and fiscal policy objectives (Akomolafe et al. 2018).

The overall economic performance of Nigeria has been distinctly unimpressive. To finance growing budgetary deficits and reset the economy on a sustainable growth path, the Nigerian government has progressively accumulated massive debts from external and internal sources. Despite the colossal amount of foreign exchange obtained mainly from its oil and gas wealth, economic growth has been slow while the incidence of poverty has increased over the years (Johnny & Johnnywalker, 2018). In the 1970s, buoyant oil revenues provided Nigeria with the basis for substantial yet unsustainable income and public expenditure increases. These led to major structural changes in the Nigerian economy. When oil revenues crashed after the global oil market glut in 1981, the severely disadvantaged economy was

poorly positioned to face a protracted period of low world oil prices. Faced with changing economic prosperities, the government resorted to deficit financing. Fiscal deficits were financed by massive borrowing, drawing-down of foreign reserves and large-scale accretion of foreign trade payment arrears. The debt stock rose steadily from \$4.6 billion in 1980 to \$18.6 billion in 1986 and \$32.9 billion at the end of 1990. There was also a dramatic fall in the country's foreign reserves from \$10 billion in 1980 to \$3.9 billion in 1981 and to a little over \$1 billion in 1986 (CBN, 2018). As bilateral and multilateral aids could not fulfil its needs, the government resorted to the international capital markets for loans. The change in the country's external debt structure resulted in the bunching up of debt service obligations, raising default rates and reckless accumulation of payment arrears. (Ogbe, 1992).

Consequently, by 2005, the cost of refinancing and servicing Nigeria's \$30 billion external debt was generally deemed unsustainable. The 2005 debt relief provided by the Paris Club of creditors led to a reduction in the total external debt from \$30 billion to \$3.4 billion in 2006. Negotiations on debt relief were primarily motivated by the need to free up investment capital and faster economic growth in the country. Sadly, fourteen years later, Nigeria has returned to a greater debt. The external debt of the country has once again increased steadily from \$3.4 billion in 2007 to \$31.15 billion in 2016 (World Bank, 2017).

Similarly, despite its potentially important effect on economic growth, government budgets, macroeconomic stability and private sector lending, much less attention has been given to the problem of domestic debt in developing countries. Indeed, analysts, policymakers and other observers have begun to turn their attention to their domestic economy in recent years, distressed by the rapid increase in domestic public debt after a period of relative stability in the 1980s and early 1990s (Abbas & Christesen, 2007). Domestic public debt is close to, or exceeds, 25 percent of Gross Domestic Product (GDP), especially in highly externally indebted nations like Nigeria. Some of these countries have faced domestic debt servicing difficulties since 1988, forcing them to reschedule domestic government debt on a non-market basis. As this situation gets worse, it becomes increasingly evident that the success or failure of their economic reform programme will also be influenced by how countries manage their domestic and not just their external debts, since both have a claim on government resources (Anyanwu & Erhijakpor, 2015).

Successive governments' in Nigeria have raised debt at an unprecedented pace. Nigeria is currently plagued by severe budget crisis within which they have problems to repay their short and long-term liabilities. Government expenditure in Nigeria has been largely financed by domestic and foreign borrowing for many decades. The federal government and most States must borrow heavily to finance the implementation of capital projects, unable to cover their recurring spending and loan commitments as a result of weak revenue generation. Total borrowing as a percentage of GDP is around 21 percent and a debt-to-revenue ratio of 67 percent in 2019, with public debt rising astronomically as a result of low revenue generation. Debt servicing costs that have risen astronomically over the past decades have become a sour point in Nigeria's budgetary process. About 22 percent of the size of the 2016 budget and 75 percent of the size of the capital expenditure allocation are committed to servicing public debts. Debt servicing was assigned to 25 percent of the N8.8 trillion 2019 budget size amounting to N2.14 trillion, which is greater than the total amount of N2.03 trillion allocated to capital expenditure. Of the N2.14

trillion allocated in the 2019 budget for debt servicing, 70 percent of this amount was for domestic debt servicing while 30 percent was for external debt servicing. The government's incessant domestic borrowing prevented private businesses that need credit from determining financing for business expansion and growth (Ogunjimi, 2019). Currently, the Nigerian government spends more money servicing debts than it does on education and health. The economy is over-burdened by massive government debt and debt service costs that consume more than half of the actual revenues generated. By 2024, the IMF estimated that the country's debts could rise to almost 36 percent of GDP and interest payments could gulp about 74.6 percent of government revenue if no concerted effort was made to boost revenue generation. When a country spends large part of its revenue on servicing massive public debts, it will have very little resources left to finance durable infrastructures that supports inclusive growth.

Growing public debt in the midst of lower growth rates and rising poverty levels have continued to raise concerns among policymakers and analysts about the implications and extent of debt accumulation that is conducive to sustained economic growth. Without major structural policy reforms and revenue driven fiscal consolidation aimed at boosting private investment and stimulating growth, there will be limited resources available to finance the budget and provide critical infrastructures that supports growth in Nigeria. This study therefore investigated the short and long-run impact of government borrowing on economic growth in Nigeria using the autoregressive distributed lag approach. The findings of the study will serve as a helpful guide for policymakers to devise an optimal debt management strategy for the economic growth objectives of Nigeria. The paper is organised into five sections. Following the introduction, section two presents the overview of the related literature, while section three addresses the methodological issues and research materials. The empirical results are presented and discussed in section four while section five concludes the study and offers policy recommendations based on findings.

## **2: Literature Review**

Two main opposing strands of discussion exist in the literature on the efficacy of government debt in the promotion of economic growth: the Classical and the Keynesians. Public sector borrowing does not create any burden for the Keynesian interventionism proponents, either for future generations or for present generations due to the investments it generates (Prasetyo, 2020). The Keynesian and neoclassical models of optimal policy proposed that countries should run deficits, and accumulate debt, in hard times and surpluses in good times. If growth shocks continue, the existence of counter-cyclical fiscal policy will generate a long-term negative association between public debt and growth, where low growth causes high debt and not the other way around (Akos & Istvan, 2019). Classical economists, however, perceived public debt as a burden likely to jeopardise capital accumulation, current and future consumption. Comparing public debt to a potential tax, they attribute a negative connotation to state interference in economic activity.

Appropriate borrowing levels, whether domestic or external would fuel economic growth in a developing country. Countries have a limited stock of capital at their early stages of development and are projected

to have investment prospects with return rates higher than those in advanced economies (Nguyen, 2020). As Akos & Istvan (2019) have observed, as long as these countries are using borrowed funds for productive investment and do not suffer from macroeconomic instability, policies that distort economic inducements or major adverse shocks, growth should increase and allow for timely debt repayment. Nonetheless, the stylized facts in Nigeria have shown that, despite the steady increase in public debt in recent years, economic growth has remained low with widening level of poverty. The relationship between public borrowing and economic growth is clarified by several theories that serve as a credible basis on which this study is based. The debt overhang hypothesis and debt crowding out hypothesis are two of these theories outlined in this study.

## **2.1. The Debt Overhang Hypothesis**

The debt overhang hypothesis posited that large borrowing leads to high indebtedness, debt traps and slowing down of economic growth. According to Krugman (1988), rapid rise in public debt leads in higher taxes (tax disincentive) on future production and this crowds-out private investment and growth. This implies that potential investors will be discouraged due to large debt stocks on the assumption that by applying high taxes, government funds its debt service obligations and that this will further delay the nation's growth. Reinhart & Rogoff (2010) argued that the resources used to service massive public debt represent resource drain that should have been available to invest, thus slowing growth. The cost of servicing huge public debts could take a greater part of government revenue leading to distortions and lower levels of developing countries' economic growth. Debt overhang is a primary cause of stunted economic growth in highly indebted countries. As stated by Sachs (1989) in the context of poor countries, the expected debt service payment is so high that the possibility of a return to growth path is dim, even if the countries implement strong adjustments programmes. Debt overhang prevents private investment initiatives due to the uncertainty and negative opportunities it produces along the way.

## **2.2. Debt Crowding-out Effect**

When government increases borrowing to fund higher spending, or reduce taxes, it crowds-out private sector investment through higher interest rates. If increased borrowing leads to higher interest rates by creating higher demand for money and loanable funds and thus higher prices, the interest-rate-sensitive private sector will likely reduce investment due to lower rate of returns. A fall in business-fixed investment will hurt long-term supply-side economic growth, that is, potential production growth. This crowding-out effect is weakened by the fact that government spending through the multiplier increases the demand for private sector products, thereby stimulating fixed investment (via the acceleration effect) (Ngoc, 2019). When debt services grow, foreign creditors essentially remove most of the profits accruing from investment in the local economy. Accompanying this removal is the complete discouragement of new foreign investment. This will impede capital formation. Indeed, debt servicing shifts wealth from the domestic arena to the international arena, generating some dramatic accelerator multiplier effects that

minimise the ability of the economy to grow while simultaneously improving its dependence on foreign debts. In the monetarist view, rising government expenditure after a relatively short period of change displaces an equivalent amount of private expenditure (Prasetyo, 2020). Businesses compete with government in bond markets for a limited amount of funds. Increasing government expenditure without any improvement in money supply increases production, profit and transaction demand for money. Given a constant money supply, increased transaction demand for money and increased in supply of debt in the market, drive up interest rates. The increase in interest rates reduces business spending and perhaps even some state and local government expenditures. The net result of the crowding-out hypothesis is that government sector growth inevitably comes at the expense of the private sector of the economy, unless the money supply rises during the process (Rais & Anwar, 2012).

Although moderate level of public debt can help bridge the funding gap of government, economists and policymakers generally worry about high debt relative to GDP. This is because unsustainable debt can cause negative effects of debt overhang and crowding-out effects on growth and macroeconomic distortions, as high tax rates are needed to meet the debt interest burden. Several studies on the debt-growth nexus were limited to examining the link between external debt and economic growth (which is only a part of public debt). Thus, conducting a study on just a fraction of a whole does not provide an accurate picture of the complex relationship between Nigeria's public debt and economic growth in as external debt is only a fraction of public debt. In this context, the current study disaggregates public debt into domestic and external debt, using the ARDL methodology to investigate its short and long-term growth impact.

### **3. Research Methods And Materials**

The methodological issues of this study was discussed under the following sub-headings: Research design, nature and sources of data, and model specification.

#### **3.1 Research Design**

The purpose of a research design is to verify that the information gathered allows the researcher to effectively address the research problem as logically and unambiguously as possible. Acquiring information relevant to the research problem in social science research, typically includes determining the type of facts required to test a theory, to evaluate a programme, or accurately characterize and evaluate context related to an observable phenomenon. This study adopted the quantitative method and descriptive research design using already existing data to provide empirical answers to the research problems. Descriptive research designs help provide answers to the questions about who, what, when, where and how connected with a research problem. A descriptive research design cannot conclusively establish answers to the why problems associated with a research. It is used to generate information on the current state of the phenomenon and to explain what exists with respect to variables.

## 3.2. Nature and Sources of Data

The data used in this study were gathered from secondary sources. These data were time series data collected using the desk survey approach from Central Bank of Nigeria (CBN), the Debt Management Office (DMO), World Bank and IMF statistical database. The macroeconomic variables on which data were collected included the Real Gross Domestic Product (RGDP), External Debt Stock (EDS), Domestic Debt Stock (DDS), Debt Service Payments (DSP), Foreign Reserve Position (FRP) all in millions of United States Dollars, effective Interest Rate (INTR), Gross Fixed Capital Formation as a percentage of GDP (GFCF) and Foreign Direct Investment inflow as a percentage of GDP (FDI). All variables were taken on annual basis in nominal terms and in rates running from 1980-2018 making a total of 312 observations. Data on RGDP and INTR were sourced from the Central Bank of Nigeria, EDS, DSP FRP, GFCF and FDI were sourced from the World Development indicators while DDS was sourced from the Debt Management Office.

## 3.3: Econometric Specification.

To investigate the impact of government debt on economic growth in Nigeria, an open multivariate debt-growth model allowing for key control variables was specified following the lead of Gomez-Puig & Sosvilla-Rovero (2017) with slight modifications to suit the requirements of the current study. The model explored the linear relationship between economic growth represented by RGDP and disaggregated components of public debt indicators. This disaggregation was informed by the need to evaluate the individual effects of various indicators of public debt on the long and short-run economic growth of Nigeria. Such a rich environment can overcome variable omission bias, thus allowing for efficient estimates of the test statistics. The ARDL form of the regression equation estimated is specified in equation 1 as follows:

$$\begin{aligned} \Delta \text{LOGRGDP}_t = & \beta_0 + \sum_{i=0}^q \beta_1 \Delta \text{LOGEDS}_t + \sum_{i=0}^q \beta_2 \Delta \text{LOGDDS}_t + \sum_{i=0}^q \beta_3 \Delta \text{LOGDSP}_t + \\ & \sum_{i=0}^q \beta_4 \Delta \text{LOGFRP}_t + \sum_{i=0}^q \beta_5 \Delta \text{INTR}_t + \sum_{i=0}^q \beta_6 \Delta \text{GFCF}_t + \sum_{i=0}^q \beta_7 \Delta \text{FDI}_t + \\ & \phi_8 \text{LOGRGDP}_t + \phi_9 \Delta \text{LOGEDS}_t + \phi_{10} \Delta \text{LOGDDS}_t + \phi_{11} \Delta \text{LOGDSP}_t + \phi_{12} \Delta \text{LOGFRP}_t + \\ & \phi_{13} \Delta \text{INTR}_t + \phi_{14} \Delta \text{GFCF}_t + \phi_{15} \Delta \text{FDI}_t + ECM \dots \dots \dots \text{Equation 1} \end{aligned}$$

Where: RGDP = (Proxy for economic growth) Dependent variable.

EDS, DDS, DSP, FRP, INTR, GFCF and FDI = Independent variables of the model.

$\beta_0$  = Constant.  $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6$  and  $\beta_7$  = Long-run coefficients to be estimated while  $\phi_8$  until  $\phi_{15}$  represent the short run coefficients of the respective variables in the model.

ECM = Error Correction Term which measures the speed of adjustment and  $t$  = time trend consisting of years from 1980 to 2018.

Note: Macroeconomic variables at levels tend to show geometric growth and required taking their logarithms to linearize their movement through time. The study therefore, transformed RGDP, EDS, DDS, DSP and FRP into their natural logarithm functional form specification to reflect the elasticity of the respective variables.

In accordance with economic theory, it is expected that  $\beta_1, \beta_2, \beta_5$  and  $\beta_7$  can either be positive or negative, that is  $>$  or  $< 0$ .  $\beta_4$  and  $\beta_6$  are expected to be positive, that is,  $> 0$  and  $\beta_3$  negative, that is  $< 0$ .

### 3.4: Data Estimation Technique

The study uses the Autoregressive Distributed Lag (ARDL) approach to co-integration proposed by Pesaran & Shin (1999) and Pesaran, Shin & Smith (2001) to empirically analyse the long and short run impact of public debt on economic growth in Nigeria. This method presents three significant advantages over the two alternatives commonly used in empirical literature: the single-equation procedure developed by Engle & Granger (1987) and the maximum likelihood method postulated by Johansen (1991, 1995) which is based on a system of equations. First, the ARDL bounds testing approach allows the analysis of long-term relationships between variables, regardless of whether they are stationary at levels,  $I(0)$ , or first difference,  $I(1)$  or fractionally co-integrated. Second, the ARDL method allows for the simultaneous estimation of the short-run and long-run components, eliminating the problems associated with omitted variables and the presence of autocorrelation. Finally, the short and long-run parameters estimated using this approach are consistent in small samples such as the one used in this study.

## 4: Results And Discussion

### 4.1 Stationarity Test for Study Variables

Before carrying out the ARDL co-integration exercise, the study tested for the order of integration of the variables to ensure that none of the examined variables was stationary at second difference, since the ARDL bounds test fails to provide robust results in the presence of  $I(2)$  variables. The study thus, employed two types of widely recognised unit root tests of Augmented Dickey-Fuller (ADF) and Philips-Perron (PP) to check for the stationarity properties of the study variables in order to guard against spurious regression. Both tests were conducted at levels and first difference. The results of the unit root tests are presented in Table 1

Table 1  
Stationarity Tests Results for Study Variables

Variables	ADF Test			PP Test		
	Level	1st Diff.	Remark	Level	1st Diff.	Remark
LOGRGDP	-0.2765 <sup>n</sup>	-2.9764 <sup>b</sup>	I(1)	0.7257 <sup>n</sup>	-2.9220 <sup>c</sup>	I(1)
LOGEDS	-2.6098 <sup>n</sup>	-4.3209 <sup>a</sup>	I(1)	-2.4950 <sup>n</sup>	-4.3209 <sup>a</sup>	I(1)
LOGDDS	-1.3887 <sup>n</sup>	-6.0363 <sup>a</sup>	I(1)	-2.0167 <sup>n</sup>	-6.1448 <sup>a</sup>	I(1)
LOGDSP	-4.3001 <sup>a</sup>	-5.7071 <sup>a</sup>	I(0)	-4.1965 <sup>a</sup>	-16.6341 <sup>a</sup>	I(0)
LOGFRP	-1.3268 <sup>n</sup>	-5.2298 <sup>a</sup>	I(1)	-0.7567 <sup>n</sup>	-6.9563 <sup>a</sup>	I(1)
INTR	-4.5801 <sup>a</sup>	-4.6246 <sup>a</sup>	I(0)	-3.8730 <sup>a</sup>	-12.9479 <sup>a</sup>	I(0)
GFCF	-3.7111 <sup>a</sup>	-4.8168 <sup>a</sup>	I(0)	-3.2915 <sup>b</sup>	-4.8973 <sup>a</sup>	I(0)
FDI	-2.7419 <sup>c</sup>	-8.8426 <sup>a</sup>	I(0)	-2.6287 <sup>c</sup>	-8.8509 <sup>a</sup>	I(0)

Notes: a, b and c correspond to 1%, 5% and 10% significance level respectively while n denotes Not Significant.

Source: Author's E-Views 9.5 Computations.

From the results presented in table 1, it is manifest that the ADF and PP unit root tests produced similar results with the Log of DSP, INTR, GFCF and FDI achieving stationarity at levels while the Log of RGDP, EDS, DDS and FRP became stationary only after being differenced once. Based on the ADF and PP results, the study can correctly conclude that none of the study variables is integrated of order two. Moreover, the study variables have a mixed order of integration, that is, I(0) or I(1), which underlines the significance of using an ARDL bound testing approach to determine co-integration.

## 4.2: ARDL Bounds Test of Co-integration

The ARDL procedure begins with conducting the bounds test for the null hypothesis of no co-integration. The bounds test procedure is based on the F-test for investigating the presence of long-run linkage between the examined variables and it test for the joint significance of lagged level variables involved in the model. For the F-test, the selection of maximum lag length is very important. The observations in the study are annual and sample size is 39 with 8 parameters. For such a small sample size as suggested by

Pesaran et al. (2001), the study selected a maximum lag length of 3. The estimated bounds and F-test results are summarised in table 2.

Table 2  
ARDL Bounds Test of Co-integration Results

Model	F-Statistic	K	Critical Values		Decision	
LOGRGDP=f(LOGEDS LOGDDS, LOGDSP, LOGFRP, INTR, GFCF, FDI)	9.9123	7	%	Lower Bound I(0)	Upper Bound 1(1)	Reject H <sub>0</sub> and accept H <sub>A</sub> .
			1%	2.96	4.26	
			2.5%	2.60	3.84	Co-integration exists.
			5%	2.32	3.50	
			10%	2.03	3.13	

Based on the results in Table 2, the computed F-statistic value of 9.9123 is greater than the upper bound critical value of 4.26 at one percent significance level describing that there exists a unique co-integration relationship between economic growth and the indicators of public debt. This suggests that these variables co-move in the long-run and any short-run deviation in their relationships would return to equilibrium in the long-run. Having established the presence of co-integrating relationship among the variables, the next step in the ARDL approach was to determine the long run coefficients for equation 1.

### 4.3: Long-run Impact of Public Debt on Economic Growth in Nigeria

To determine the long-run impact of public debt on economic growth in Nigeria, the study estimated the conditional ARDL long-run model for equation 1. The study used the Akaike Information Criteria (AIC) to guide the choice of the lag length, selecting 3 as the maximum number of lags for both the dependent variable and the regressors. The long and short-run coefficients from equation 1 were therefore estimated using an optimally determined lag length of (3, 2, 3, 3, 3, 2, 3, 3) and the results are presented in table 3.

Table 3  
ARDL Long-Run Estimated Results

Variables	Coefficients	Standard Error	t-Statistics	Probability
LOGEDS	-0.2252	0.0236	-9.5815	0.0001
LOGDDS	0.6139	0.0625	9.8178	0.0001
LOGDSP	-0.1417	0.0388	-3.6491	0.0107
LOGFRP	0.2574	0.0461	5.5839	0.0014
INTR	0.0227	0.0068	3.3139	0.0161
GFCF	0.0135	0.0033	4.0715	0.0066
FDI	-0.1449	0.0147	-9.9670	0.0001
R <sup>2</sup> = 0.9658, Adjusted R <sup>2</sup> = 0.9576 Prob(F-Statistic) = 0.0000, DW stat = 2.1806.				

The long-run coefficient of External Debt Stock (LOGEDS) portrayed a negative relationship with economic growth that was significant at one percent level. Based on the results in table 3, a percentage increase in the stock of external debt other things remaining equal, was associated with about 0.23 percent decline in RGDP. The negative sign of this variable is consistent with a-priori expectation, debt overhang hypothesis and suggests that external debt stock has a deleterious impact on long-term growth. For public policy perspective, the results provide additional arguments for external debt reduction to support longer-term economic growth prospects in Nigeria. Several studies such as Saxena & Shanker (2018) and Kharusi & Ada (2018) found similar results in India, Oman and South Africa respectively. The long-run coefficient of Domestic Debt Stock (LOGDDS) indicated a positive impact on economic growth that was significant at one percent level. From table 3, a percentage increase in domestic debt stock holding other explanatory variables constant triggered an increase of about 0.61 percent in long-term economic growth. An appropriate explanation for the positive impact of domestic debt on economic growth in Nigeria is that the accumulated debt is not oversized and the use of government domestic borrowing to finance increased public spending have a beneficial impact on the nation's productivity through productive investment in infrastructure, thus leading to higher economic growth. The results is consistent with a-priori expectation and extant studies of Khan & Gill (2014) and Thao (2018) who reported a significant positive impact of domestic debt on economic growth of Pakistan and six ASEAN countries respectively in the long run.

The long-run coefficient of Debt Service Payment, consistent with a-priori expectation was accompanied by a negative effect on economic growth and is significant at one percent level. Based on table 3, a percentage point increase in debt service payment was expected to decrease economic growth by approximately 0.14 percent ceteris paribus. The crowding-out hypothesis suggested that public debt has a negative effect on growth in developing countries because the resources used to service the debt

amount to a loss of scarce foreign exchange that could have been used for productive investment in infrastructure hence, retarding growth. The result is consistent with the findings of Saxena & Shanker (2018) who reported a significant negative impact of debt service payment on long-term economic growth in India.

From table 3, the long-run coefficient of Foreign Reserve Position (LOGFRP) consistent with a-priori expectation elicited a positive impact on economic growth and was significant at one percent level. A percentage increase in stock of international reserves, other things remaining equal, enticed an increase of about 0.26 percent in long-term economic growth. This supports the conventional wisdom that the proper management of the stock of international reserves could be a key factor in stimulating long-term economic growth. The result supports the findings of Kashif et al (2017) who reported a significant positive effect of foreign reserves holding on long-term economic growth in Brazil respectively.

The long-run coefficient of effective interest rate (INTR) from table 3 showed a positive impact on economic growth that was significant at five percent level. A percentage increase in interest rate is expected to motivate an increase of about 0.02 percent in economic growth. This supports the McKinnon-Shaw (1973) hypothesis which suggested that a high interest rate would increase savings and bank credit thereby stimulating economic growth. The result confirmed the findings of Hassan et al. (1993), Kengdo et al. (2020) who found a significant positive effect of real interest rate on long term economic growth in 5 Asian countries and Southern African Development Countries (SADC) respectively. The long-run coefficient of Gross Fixed Capital Formation (GFCF) in agreement with a-priori expectation displayed a positive effect on economic growth and was significant at one percent level. Based on table 3, a percentage increase in GFCF ceteris paribus, activated an increase of about 0.014 percent in economic growth. This reflects the fact that the level of domestic investment significantly promote long-term economic growth in Nigeria. The result validated previous empirical studies of Thao (2018), Kharusi & Ada (2018) who reported a significant positive relationship between domestic capital formation and long-term economic growth in six ASEAN countries and Oman respectively.

According to table 3, the long-run coefficient of Foreign Direct Investment (FDI) in conformity with a-priori expectation showed a negative relationship with economic growth and was significant at one percent level. A percentage increase in FDI inflow, holding other explanatory variables constant retarded economic growth by about 0.14 percent. Although FDI tends to boost economic growth via the spill over effect on total factor productivity and technology transfer, the results suggest the opposite effect of displacing or crowding-out domestic investment and hence long-term economic growth in Nigeria if maintained over time. The result corroborates the findings of Fantessi (2015) who found a significant negative relationship between FDI inflow and long-term economic growth in ECOWAS countries.

## **4.4: Short-run Effects of Public Debt on Economic Growth in Nigeria**

To determine the short-run impact of public debt on economic growth in Nigeria, the study proceeded to estimate an Error Correction Model (ECM) associated with the long-run relationship from equation 1 using the optimally determined lag length. Table 4 presents the short-run coefficients of the impact of public debt on economic growth in Nigeria.

Table 4  
Short Run Estimated ARDL Results

Variables	Coefficients	Standard Error	t-Statistics	Probability
D(LOGRGDP(-1))	- 1.1533	0.1699	-6.7862	0.0005
D(LOGRGDP(-2))	- 0.8460	0.1201	-7.0453	0.0004
D(LOGEDS)	0.1034	0.0089	11.6239	0.0000
D(LOGEDS(-1))	- 0.0377	0.0056	-6.6730	0.0005
D(LOGDDS)	- 0.1743	0.0171	-10.1696	0.0001
D(LOGDDS(-1))	0.0146	0.0167	0.8781	0.4137
D(LOGDDS(-2))	0.0475	0.0151	3.1523	0.0198
D(LOGDSP)	-0.0124	0.0040	-3.0841	0.0215
D(LOGDSP(-1))	0.1066	0.0089	12.0197	0.0000
D(LOGDSP(-2))	0.0509	0.0065	7.8020	0.0002
D(LOGFRP)	0.0860	0.0077	11.2294	0.0000
D(LOGFRP(-1))	-0.1059	0.0097	-10.8807	0.0000
D(LOGFRP(-2))	0.0342	0.0076	4.4774	0.0042
D(INTR)	-0.0120	0.0012	-9.7322	0.0001
D(INTR(-1))	0.0019	0.0007	2.8359	0.0297
D(GFCF)	0.0077	0.0007	11.6302	0.0000
D(GFCF(-1))	-0.0022	0.0008	-2.7782	0.0321
D(GFCF(-2))	-0.0022	0.0007	-3.2637	0.0172
D(FDI)	0.0188	0.0036	5.1685	0.0021
D(FDI(-1))	-0.0034	0.0039	-0.8511	0.4274
D(FDI(-2))	0.0116	0.0026	4.3659	0.0047
Constant	7.9710	0.6087	13.0961	0.0000
ECM(-1)	- 0.6323	0.0482	-13.1077	S0.0000

The error correction term ( $ECM(-1)$ ) representing the speed of adjustment needed to restore equilibrium in the dynamic model after a disturbance, follows a priori expectation as it was both negative and statistically significant at one percent level. Its value of  $-0.6323$  implies that a shock to economic growth in the current period will be restored at a speed of adjustment of about 63.23 percent in the next period. Put differently, the rate of adjustment of a short-run disequilibrium in economic growth was moderately fast as about 63 percent of the divergence in economic growth as a result of a current period shock will converge towards long-run equilibrium in the next period.

From table 4, the current year value of RGDP was significantly affected by the lagged or previous years' value of RGDP. Specifically, a percentage increase in one year lagged value of RGDP ( $D(RGDP(-1))$ ) showed a negative effect on current year value of RGDP and was significant at one percent. Similarly, a percentage increase in two years lagged value of RGDP ( $D(RGDP(-2))$ ) retarded the current level of economic growth and was significant at one percent level. The coefficient of present level of external debt stock ( $D(LOGEDS)$ ) in contrast with the long-run results exhibited a significant positive relationship with the current rate of economic growth and was significant at one percent level. Thus, a percentage increase in the present level of external debt, holding other explanatory variables constant, inspired an increase in current level of RGDP by approximately 0.10 percent. The result supports the proposition by Barro (1990) which suggested that while external debt stock may crowd-out capital and reduce output in the long run, in the short-run, it can stimulate aggregate demand and output but also that a tipping point exists, above which an increase in external debt stock has a detrimental effect on economic performance. However, the coefficient of the one year lagged measure of external debt stock ( $LOGEDS(-1)$ ) in agreement with the long-run result indicated a negative effect on the current rate of economic growth that was significant at one percent level.

The estimated coefficient of present level of domestic debt stock ( $D(LOGDDS)$ ) in contrast with the long-run results was negatively related to the current rate of economic growth and significant at one percent level. Based on table 3, a percentage increase in the present level of government domestic debts, holding other explanatory variables constant, inspired a fall in current level of RGDP by approximately 0.17 percent. The result indicated that government accumulation of domestic debt results in higher tax on future output and thus crowds-out private investment and retards growth in the short-run. However, the coefficient of one year lagged measure of domestic debt stock ( $LOGDDS(-1)$ ) in agreement with the long-run result showed a negligible positive effect on the current rate of economic growth while a percentage increase in the two years lagged value of domestic debt,  $D(LOGDDS(-2))$  was associated with a positive effect of increasing the current rate of RGDP by about 0.05 percent that was significant at five percent level.

Table 4 showed evidence of a significant negative relationship between the present level of debt service payment ( $D(LOGDSP)$ ) and the current rate of economic growth at the five percent level of significance, suggesting that a percentage increase in the present level of debt service payment will, other things

remaining equal, produce a decrease of about 0.012 percent in the current rate of RGDP growth. In contrast with the long run result however, the one period lagged value of debt service payment  $D(\text{LOGDSP}(-1))$  demonstrated a positive relationship while the two years lagged value of debt service payment  $D(\text{LOGDSP}(-2))$  also showed a positive effect on current level of RGDP and were both significant at one percent level. In conformity with the long-run results, the present level of foreign reserve holding  $D(\text{LOGFRP})$  was associated with a positive effect on current rate of economic growth that was significant at one percent level, indicating that a percentage increase in current level of foreign reserve holding, motivated about 0.9 percent increase in current rate of RGDP growth. The one year period lagged value of the variable  $D(\text{LOGFRP}(-1))$  showed the opposite effect of discouraging the growth of current RGDP that was significant at one percent level while the two years lagged value of the variable  $D(\text{LOGFRP}(-2))$  revealed a positive relationship with the current RGDP growth that was significant at one percent level.

In contrast with the long run result, the current interest rate  $D(\text{INTR})$  was associated with a negative effect on current level of economic growth that was significant at one percent level, supporting the neoclassical view that low interest rate promotes investment and economic growth. Low interest rates encourage economic agents to undertake investment activities thereby stimulating growth. The one year lagged value of interest  $D(\text{INTR}(-1))$  indicated a positive effect on current rate of economic growth that was significant at five percent level. The coefficient of present level of domestic capital formation  $D(\text{GFCF})$  in conformity with the long-run results exhibited a significant positive effect on the current rate of economic growth and was significant at one percent level. The result suggests that domestic investment was an important factor which promoted economic growth in Nigeria during the reviewed period. The lagged values of the variable however demonstrated the opposite effect of retarding the current rate of RGDP growth that was significant at five percent level at one and two years lagged level respectively. Unlike the long run result, table 4 showed evidence of a significant positive impact of present level of FDI inflow  $D(\text{FDI})$  and the current rate of economic growth at one percent level of significance, suggesting that a percentage increase in present level of FDI inflow will generate an increase of about 0.02 percent in the current rate of RGDP *ceteris paribus*. The one year lagged value of FDI inflow  $D(\text{FDI}(-1))$  showed a negligible negative effect on the current rate of RGDP while the two year lagged value of FDI inflow ( $D(\text{FDI}(-2))$ ) exposed a positive relationship that was significant at one percent level.

## 4.5: Short-run Diagnostic Tests

The study adopted various diagnostics tests such as the Jarque Bera, Breusch-Godfrey Serial Correlation LM, Breusch-Pagan-Godfrey and the Ramsey RESET tests to check the adequacy of the estimated model. The respective diagnostics checking statistics reported in table 5 failed to reject the null hypothesis, thus indicating no evidence of non-normality, serial correlation, heteroscedasticity and misspecification. Similarly, the parameters stability test conducted via CUSUM and CUSUM of squares tests (Figure 1) indicated that the parameters of the estimated model are within the critical bounds at a significant level of 5 percent suggesting that the estimated model is dynamically stable and the estimated results are reliable for further analysis and prediction.

Table 5  
Short-run Diagnostics Tests Results

Test	Null Hypothesis	F-Statistic	Prob. Value
Jarque-Bera	There is Normal Distribution	1.4867	0.4755
Breusch Godfrey	No Serial Auto-Correlation	5.5859	0.0695
Breusch-Pagan-Godfrey	No Heteroscedasticity	1.0499	0.5261
Ramsey RESET	No misspecification	0.1571	0.7081

## 5: Conclusion And Recommendations

The Nigerian economy has witnessed considerable deterioration of public finances as a result of the fundamental structural deficiencies produced by the over dependence on crude oil for foreign exchange and government revenue. The financial and economic crisis triggered by volatile oil revenue which in most cases are not momentary has led to increasing budget deficits financed mainly by government borrowing. Motivated by the fact that government has relied on extensive borrowing to finance its budgetary deficits for several decades, this study was conducted using annual time series data covering the period 1980–2018 to determine the long and short-run effects of public borrowing on economic growth in Nigeria. To accomplish this task, a growth model function was specified and estimated using disaggregated components of public debts and a set of control variables such as debt service payment, foreign reserve position, effective interest rate, gross fixed capital formation and FDI inflow to test their individual impacts on RGDP. A long-run relationship was estimated and analysed by performing unit-root test, co-integration test, conditional ARDL long-run model and the error correction model associated with the long-run relationship.

The empirical results indicated that external debt stock retarded long-term economic growth while its short-run effect was growth-enhancing. Government domestic borrowing showed a significant effect of promoting long-term economic growth but an opposite effect of growth-retardation in the short-run. Debt service payment significantly retarded growth in the long and short-run while the level of foreign reserves accelerated growth both in the long and short-run. Interest rate was projected to enhance long-term growth while high interest rate constituted an impediment to growth in the short-run. Gross domestic investment significantly motivated growth in the long and short-run. Foreign Direct Investment inflow had a crowding-out effect on growth in the long-run while its short-run effect showed it boosted economic growth. The coefficient of co-integrating equation revealed that 63.23 percent of the short-run deviations from long-run equilibrium was corrected each year.

Considering the fact that Nigeria is an emerging economy, the findings of this study suggests that Nigeria needs public debt to bridge its resource gap with sound management of such funds. A more dynamic, innovative and effective debt management strategy that takes into account not only the country's debt-servicing capacity, but also its structural economic problems and investment needs is required to

accelerate growth. Projects to be financed with government borrowing should be properly appraised and their technical feasibility, financial viability and economic desirability asserted before the funds are committed. This would help to restore financial discipline and curtail the misapplication and inefficient management of public debts. The policy implication of this result is that domestic debt rather than external debt will stimulate higher rate of economic growth in Nigeria. This is because the repayment of the principal and interest on such domestic debt is a reinvestment into the economy which would usually have a multiplier effect on domestic investment in the economy. But with respect to external debt, more resources would be needed to repay and service the debt and this would weaken the anticipated positive effect of this debt on economic growth. Thus, the paper recommends that government should rely more on domestic debt in stimulating growth rather than external debt. Also, the study recommended that deliberate policies be put in place to ensure that the accumulation of debt in Nigeria is consistent with the country's growth objectives. In order to address the imperatives of fiscal consolidation and the reduction of public debt, government must move decisively to embark on a comprehensive reforms that tackle both the expenditure and revenue side of the budget. Fiscal reforms that boost revenue generation, efficient tax collection and administrative machinery to increase domestic resource mobilization should be instituted while also reducing government deficit financing. Furthermore, government borrowing must be done not only on terms that are consistent with entrenching debt sustainability but also on terms that yields growth dividends to the country in the long run. Government should ensure that borrowed funds are channelled into the value-added sectors of the economy and used in a positive manner to influence growth performance. This is necessary if the country is to outgrow its debt problem, restore creditworthiness and achieve sustainable growth.

As in every empirical analysis, the results must be regarded with caution since they are based on a country specific characteristic, data spanning a certain period of time and a given econometric methodology. This is particularly true of the comparison of the results with those of previous papers, since the study adopted a time series analysis instead of a panel data approach. Although the present study offers fresh insights on the impact of government debt on economic growth, it is subject to some limitations related essentially to data availability and the econometric methodology. Extensions from the present research might take a number of directions. First, it would be interesting to examine possible non-linear effects of public debt on economic growth in Nigeria using a time varying modelling technique such as the Quantile ARDL. A second natural extension to the analysis presented in this paper would be to explore the main determinants of observed differences in the relationships between public debt and economic growth across Sub-Saharan African countries using the panel data analysis.

## **Declarations**

### **Authors Declaration**

The authors of this paper wish to declare as follows:

## Availability of Data:

the study uses secondary data sources obtained publicly from the Central Bank of Nigeria, <http://www.centbank.gov.ng.org>, Debt Management Office, <https://www.dmo.gov.ng> and World Development Indicators statistical database. <https://data.worldbank.org/indicator>

## Competing Interests:

Abdulkarim Yusuf declares that he has no conflict of interest. Saidatulakmal Mohd. declares she has no conflict of interest and the paper has not been previously published or presently under review elsewhere.

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## Authors' Contributions:

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Formal Analysis and Investigation: Abdulkarim Yusuf.

Writing: Original Draft Preparation: Abdulkarim Yusuf.

Writing: Review and Editing: Abdulkarim Yusuf.

Supervision: Associate Professor, Dr. Saidatulakmal Mohd.

Both authors contributed to the study conception and design. The first draft was written by Abdulkarim Yusuf. Both authors commented on previous versions of the manuscript, read and approved the final draft of this manuscript.

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## Authors' Information:

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## Compliance with Ethical Standards:

this article does not contain any studies with human participants or animals performed by any of the authors. The study uses secondary data sources obtained publicly from the Central Bank of Nigeria, Debt Management Office and World Development Indicators statistical database and is not sensitive in any way to any vulnerable group(s).

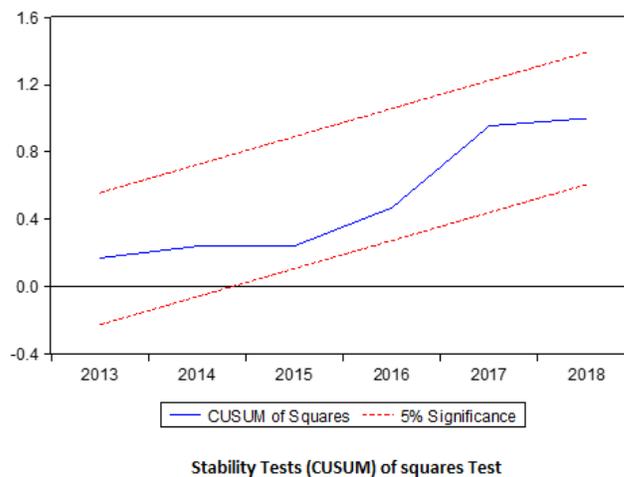
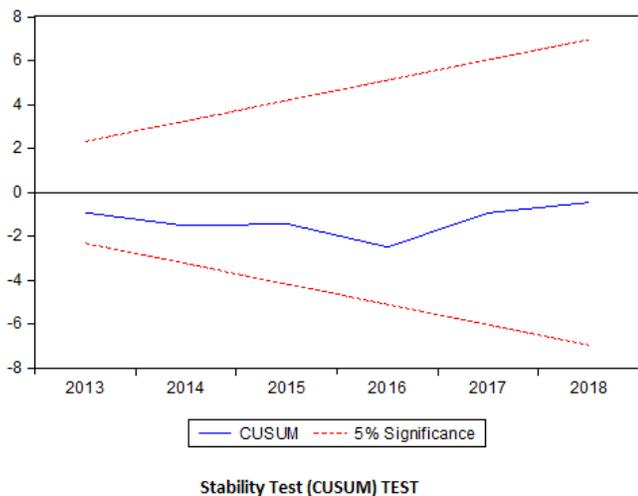
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## Figures



**Figure 1**

Stability Test (CUSUM) TEST Stability Tests (CUSUM) of squares Test