

Empirical Investigation of the Impact of Public Debt on Economic Growth in Nigeria

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Abstract: *Public debt is the amount of money that is borrowed by the government of a country from individuals, private and public corporations residing inside or outside the country. Debt is incurred by a government when there is a surplus expenditure over revenue and insufficient savings to carry out productive activities that foster economic growth and development. This study examined the impact of public debt on economic growth in Nigeria from 1980-2021. The study utilized the Autoregressive Distributed Lag bounds model to co-integration for analysis. The results showed that external and domestic debts had negative impacts on economic growth in the short-run, but exerted a positive and insignificant impact on economic growth in the long-run. In addition, the result of the first hypothesis showed that there is a significant relationship*

between public debt and economic growth in Nigeria in the short-run, while the result of the second hypothesis revealed that there is no significant relationship between public debt and economic growth in Nigeria in the long-run. Similarly, the result of the third hypothesis showed that there is no significant relationship between inflation and economic growth in Nigeria. The study recommends that public borrowing should be tied to specified productive sectors of the economy that would increase growth in the long-run and enhance the payment of the debts to avoid leaving debt burden to the next generation. Also, government should spend borrowed funds on capital goods and infrastructure that could increase productivity rather than recurrent expenditure that potentially leads to inflation. Furthermore, the government should diversify the sources of revenue by increasing effort on taxation, export goods and promote import substitution strategies that will enhance the consumption of domestic products and reduce reliance on debt to finance its budget.

Keywords: public debt, economy, growth, economic growth

INTRODUCTION

Public debt is the amount of money that is borrowed by the government of a country from individuals, private and public corporations residing inside or outside the country. Debt is incurred by a government when there is a surplus expenditure over revenue and insufficient savings to carry out productive activities that foster economic growth and development. Economic growth is one of the key macroeconomic objectives every developing economy wishes to attain. But to achieve this goal, the government has to incur both capital and recurrent expenditure. The detailed estimate of government expenditure and expected revenues over a period of time is contained in its national budget. When revenue is equal to expenditure, the budget is said to be balanced; when revenue is greater than expenditure, there is a surplus budget, but when there is a short fall in expected revenue and expenditure is greater, it shows a deficit budget. Government may finance its deficit budget through tax revenue, money creation or borrowing from banks or non-banking sources. The act of borrowing which is the option that generates most of the funds creates debt. In Nigeria, like many other countries, it is made up of internal, external, and international debts. Internal debt refers to money borrowed locally within the country using instruments such as bonds and treasury bills purchased by the Central Bank, local pension funds, and other financial or non financial institutions. External debt refers to a portion of national debt that is borrowed from sources outside the country including foreign governments, banks, and financial institutions and these loans are usually paid in the foreign currencies. Therefore, public debt is seen as all claims against government in the economy, either by her citizens or by foreigners, whether interest bearing or not (Anyanwu, 1993). Public debt can be domestic or foreign, short term, medium term, or long term, marketable or non-marketable, interest bearing or non-interest bearing, gross or net (Anyanwu,1993). Reasonable

borrowings to finance public expenditure and infrastructural development are the keys to foster economic growth.

However, excessive borrowings without appropriate plans for investment and repayment may lead to heavy debt burden and interest payment, which in turn may create several undesirable effects for the economy (Joy & Panda, 2020). Investors usually measure the risk to invest in a country by comparing its national debt to its national output (GDP). It is known as debt-to-GDP ratio and it indicates a country's ability to pay off its public debt. As at June 2020, Nigeria's debt-to-GDP ratio stood at 18.2%. Soludo, (2003) explained that countries borrow for two broad macroeconomic reasons, namely, higher investment, higher consumption (education and health) or to finance transitory balance of payments deficits to lower nominal interest rates abroad or to circumvent hard budget constraints. This implies that the government borrows with the aim of boosting economic growth and fostering development. He is also of the opinion that once an initial stock of debt grows to a certain threshold, servicing them becomes a burden, and countries find themselves on the wrong side of the debt-laffer curve, with debt crowding out investment and growth. This seems to be the position of Nigeria today because investment, which will accordingly result to high speed growth with a positive effect on poverty, is moving sporadically in both positive and negative directions (Tajudeen, 2012; Sunday et al,2016). Public debt becomes a burden to countries when contracted loans are not optimally deployed, therefore returns on investments becomes inadequate to meet maturing obligations and also hindering economic growth (Erhieyovwe & Onovwoakpoma, 2013). This study is meant to investigate the effect of public debt on Nigeria's economic growth. The challenging problems of government borrowing include payment of high interest, increase in taxes on the innocent masses, and inflationary pressures among others. As public debt increases, the government would have to service the debt with the accumulated interest and principal including the difference in exchange rate over the period of time to those who hold the bonds. To raise funds, the government could adopt contractionary fiscal policy that means increase in taxes and limiting of government spending as a way to service the debt. This would lead to a decrease in disposable income, greater inefficiencies, and distortions in the economy which will cause people to experience lower standards of living.

In some cases, the government could respond to the high levels of debt by printing more money. This increases the money supply and causes inflationary pressures in the economy. The high percentage of budgeted fund for the repayment of debt and debt service obligations reduces society's welfare of the debtor nation and hinders the large domestic investment gap that is needed for the nation to achieve her growth and developmental objectives. The lack of judicious use of loaned fund for the betterment of lives of the citizenry by allocating such funds to the productive sectors of the economy affects the aim of stimulation and stabilization effect of deficit financing for the growth of the Nigerian economy. If we consider all the negative long run effects of public debt, we see that it tends to create balance of payment deficits for the country in debt, reduce the size of a nation's private capital which can lead to crowding out of the public

sector, reduce a nation's output, consumption, while increasing inefficiency and government's dependency on other countries. Hence, it is against this background that this study therefore seeks to investigate the impact of public debt on economic growth in Nigeria.

Objectives of the Study

The main objective of this study is to investigate the impact of public debt on the economic growth of Nigeria. However, the specific objectives include:

- a. To determine the short-run impact of public debt on economic growth in Nigeria.
- b. To determine the long-run impact of public debt on economic growth in Nigeria;
- c. To examine the significant relationship between inflation and economic growth in Nigeria.

The following questions would be answered in this study:

- a. What is the short-run impact of public debt on economic growth in Nigeria?
- b. What is the long run impact of public debt on economic growth in Nigeria?
- c. What is the significant relationship between inflation and economic growth in Nigeria?

The study is based on the following hypotheses:

- a. H_{01} There is no significant relationship between public debt and Nigeria's economic growth in the short run.
- b. H_{02} : There is no significant relationship between public debt and Nigeria's economic growth in the long run
- c. H_{03} ; There is no significant relationship between inflation and economic growth in Nigeria.

LITERATURE REVIEW

Concept of Public Debt

As stated by Oyejide (1985), Stephen and Obah, 2012), debt is the resource or money used in an organization that is not contributed by its owner and does not in any other way belong to them. It is a liability represented by a financial instrument or other formal equivalent. Public debt is the total money owed by the Government of a country to various creditors, institutions and individuals' resident in and outside the country.

Overview of Nigeria's Public Debt

According to Central Bank of Nigeria (2019), and Okwy et al, 2016), Nigeria's indebtedness dates back to pre-independence era. The debts incurred before 1978 were relatively small and mainly long-term loans from multilateral and official sources such as the World Bank and Nigeria's major trading partners. The loans were majorly obtained on soft terms and therefore did not constitute a burden to the economy. However due to the fall in oil prices and oil receipts, the country in 1977/78 raised the first jumbo loan to the tune of US\$1.0 billion from the international capital market. The loan was used to finance various medium to long-term infrastructural projects. Domestic debt management in Nigeria had hitherto been carried out by the Central Bank of Nigeria (CBN) through the issuance of government instruments, such as the Nigerian Treasury Bills (NTBs); Nigerian Treasury Certificates; Federal Government Development Stocks (FGDS); and Treasury Bonds. The debt management strategy adopted at that time led to inefficiencies resulting in fundamental challenges. In consideration of these numerous difficulties, the government established an autonomous debt management office in order to achieve efficient debt management practices. The Debt Management Office (DMO) was thus established on October 4, 2000 to centrally co-ordinate the management of Nigeria's debt for all the tiers of government. While the state governments' external borrowing is guaranteed by the Federal Government (FG), their domestic borrowings required analysis and confirmation by the FG based on clear criteria and guidelines that the states can repay based on their monthly allocations from the Federation Account Allocation Committee (FAAC) and internally generated revenue (IGR). The past couple of decades have witnessed an accelerated increase in Nigeria's public debt. The first most significant rise in Nigeria's public debt occurred in 1987 when the total debt rose to ₦137.58 billion. From then, the rise in Nigeria's public debt continued unabated such that as at 2004, total public debt stood at ₦6188.00 billion.

In 1986, total debt which was hitherto driven largely by the domestic debt witnessed a reversal and was being driven by the external debt. Thus, the dominance of the external debt as well as the steady rise in total debt remained till 2005 when the country was granted debt pardon by the Paris Club. The debt forgiveness saw Nigeria's total debt and external debt plummeting between 2004 and 2006 to ₦2533.47 billion and ₦451.5 billion respectively. Incidentally, as external debt shrunk, domestic debt continued to grow unabated such that by 2011, total debt which was being driven by the domestic debt had exceeded the 2004 level and stood at ₦6519.65 billion. By 2012, Nigeria's total debt had hit an all-time height of ₦7564.4 billion. Between 2006 and 2012, the domestic debt had accounted for 82.2 percent of the total debt. Current debates on fiscal consolidation emphasized the crucial role of prudential limits on public debt-to-GDP ratios. A debt-to-GDP ratio of 60 per cent is quite often noted as a prudential limit for developed countries, while for developing and emerging economies, a ratio of 30 percent was maintained before 2008 and 40 percent was being applied since 2009 (Debt management office DMO,2013). However, these ratios are not sacrosanct as countries are encouraged to adapt different strategies to achieve fiscal consolidation (International Monetary Fund IMF, 2011;

Elom-Obed et al, 2017). Nigeria's public debt was unsustainable between the periods of 1985-1995 and 1998-2004. While brief sustainability was enjoyed in 1996-1998, Nigeria's debt had been below the threshold since 2005. The sustainability of the former was due to astronomical increase in Gross Domestic Product (GDP) whereas that of the latter could be attributable to both GDP growth and debt forgiveness. Though Nigeria's debt had remained sustainable since 2005, it is however noteworthy that both public debt and GDP had been on continuous rise. At 62.41 percent, by the end of 2012 the bulk of Nigerian domestic debt was made up of Federal Government of Nigeria (FGN) bonds. This was followed by the treasury bills at 32.47 per cent. Most of Nigeria's domestic debt which was mostly long-term in 2010 became more of short-term, that is, they had maturity of less than one year. This led to increased debt service burden. As at the end of 2012, the Nigerian total public debt service/GDP ratio stood at 0.5 per cent. With the debt forgiveness in 2005, Nigeria's foreign debt which was hitherto being driven by Paris Club was being dominated by the multilateral debt. The holding of the domestic debt which was 'mostly taken up by the CBN from 1981 to 2003 changed such that the Deposit Money Banks (DMBs) and the Non-Bank organizations surpassed the Central Bank of Nigeria(CBN) and became major players in the domestic debt market with the Deposit Money Banks(DMBs) taking the lead.

Theoretical Reviews:

The Debt Overhang Theory

The expression "debt overhang" originated in the corporate finance literature and indicates a situation in which a firm's debt is so large that any earnings generated by new investment projects are entirely appropriated by existing debt holders, even projects with a positive net present value cannot reduce the firm's stock of debt or increase the value of the firm. The concept of debt overhang migrated to the international finance literature in the mid-1980s, when the debt crisis motivated a series of influential papers by (Sach, 2010; Igbodika et al, 2016) and (Krugman, 1988). These authors contended that, as sovereign governments service their debt by increasing tax burdens on firms and family units, elevated levels of debt suggest an expansion in the private sector's expected future taxation rate. Debt overhang portrays a circumstance where the future debt trouble is seen to be high to the point that it acts as a disincentive to current investment, as investors think that the proceeds of any new project will be taxed away to service the pre-existing debt. This results to lower level of current investment which leads to lower growth with a given lower tax rate, lower government incomes, lower capacity to pay, and lower expected value of the debt. Nations that experience the ill effects of debt overhang will have no net asset flows because of the fact that any new loans that may be given would not be worth as much as its nominal value, and no new creditor will give loan when a deficit is sure. Nations that experience the ill effects of debt shade might be situated on some unacceptable side of the Debt Laffer curve which is described by a circumstance in which partial debt cancellation that reduces the expected tax burden can make both lenders and borrowers better off by increasing investment

and growth as well as tax revenues and the value of debt. Debt cancellation requires a coordination system that forces all creditors to accept some nominal losses. Without such coordination mechanism, each individual creditor will rather hold out while other creditors cancel part of their claims. This project is structured on Debt overhang hypothesis due to its reality in Nigerian economy.

Following Myers, (1977), the theoretical Framework of this study was structured on Debt Overhang Hypothesis. Debt overhang is the situation in an institution (business, government, or family) that has accumulated debt so much that it finds it difficult to borrow additional money, even when that new borrowing is in fact a high-quality investment that would more than pay for itself. This problem emerges, for example, if a company has a new investment project with positive Net Present Value, NPV, but will not utilize the opportunity due to high level of accumulated debt, the equity holders will not be willing to invest in such a venture because nearly all the profits will be taken by the debt holders who will not be willing to finance the new project. This situation renders the NPV of the new project negative. The result of having excessive debt is that any earnings generated by new investment projects are partially appropriated by existing debt holders. This problem was first discussed by Myers (1977). The concept of debt overhang has been applied to sovereign governments, predominantly in developing countries (Krugman, 1988). It narrated a condition where the debt of a country exceeds its future capacity to repay it. The relationship between a country's foreign debt and growth has mostly been based on the negative effects of debt overhang.

Krugman (1988) explains debt overhang as a condition in which the expected repayment on foreign debt falls short of the contractual value of debt. If the external debt of a country exceeds its capacity to repay, the expected debt service is likely to be an increasing function of the country's output level. Thus, larger part of the country's domestic earnings is effectively taxed away by existing foreign creditors and economic growth is discouraged. The concept of debt overhang theory centres on the negative effects of foreign debt on investment in physical capital. A high level of external debt can hamper government's ability to execute structural and fiscal reforms, since larger part of earnings from both domestic and foreign investments are used to repay foreign creditors. This condition has severe adverse effects on low-income countries, where accelerated structural reforms are needed to sustain rapid economic growth. Debt overhang also depresses investment and growth by increasing uncertainty. As the size of the public debt increases, there is increasing uncertainty as regards the measures government will resort to meet its debt service obligations, with negative effects on investment. In particular, as external debt accumulates, expectations are that government will increase tax in order to service its debt obligations (Freytag and Pehnelt, 2009). Excessive debt can also lead to capital flight if the private investors fear imminent devaluation and/or increases in taxes to service the debt (Abrego and Ross, 2001). The theoretical literature suggests that external debt has a positive effect on investment and growth up to a certain threshold level; away from this level, however, its effect is adverse. As indicated in Cohen (1997), the relationship linking the face value of

external debt and investment can be represented as a kind of Laffer curve, as accumulated debt increases beyond a threshold level, the expected repayment starts to fall due to the adverse effects explained above. The implication is that an increase in the face value of debt gives rise to an increase in repayment burden up to the threshold level, along the wrong side of the debt Laffer curve. Given the positive effects of capital accumulation on economic activity, a similar type of Laffer curve linking foreign debt and growth could also be expected. The key macroeconomic variables which public debts impact on are; (i) Gross Domestic Product (GDP) and (ii) Investment.

Ricardo's Theory of Public Debt

In his principles, Ricardo premised the treatment of public debts by a statement that the ordinary and extraordinary expenditures of the state were chiefly payments made to sustain unproductive labourers, and he pointed out that any saving from the expenses of the government would be added to the income if not to the capital of the contributors. David Ricardo was so convinced about the wastefulness of public expenditure that, in a letter to McCulloch in 1816, he showed great concern that his writings should be construed as giving encouragement to Ministers to be profuse in the public expenditure. To secure himself against such misconception, he re-read his *principles* with a view to finding out those passages which in McCulloch's estimation tended to encourage Ministers to levy taxation; and he actually re-wrote one passage in order to make clear his view that taxation should be at a minimum. In Ricardo's theory of public loans, he emphasized on the fact that the wasteful nature of public expenditure rather than methods adopted to finance expenditure was the primary burden of the community. His view regarding financing public expenditure was that the requisite funds would ultimately have to be drawn from the liquid resources of the community and that in the point of the economy, it would make no great difference whether such funds were raised by taxes or by loans. Indeed, he argued that payment of interest on public debt deals with a transfer of wealth from one pocket to another within the society, thus, when countries borrow, it is uncertain whether the loan would be used productively or unproductively. If the loan is used productively, it leads to growth, but if it is used unproductively, it deters economic growth in the economy.

Keynesian Theory of Public Debt

The Keynesian theory of public debt was developed partly as a result of the economic crisis created by the great depression of the 1930s. In the theory, constant unbalanced budgets and rapid increase in public debt affect the nation's financial stability. It conceived that huge public debt is a national asset rather than a liability and hence, continuous deficit spending is very essential to the economic growth of nations because, it leads to full employment (Precious, 2015). The Keynesian theory postulated that the economy tends to equilibrium at full employment, which was an attack on the classical principles of budgeting and public finance. Keynes assumed that if there were resources that the private sector could not employ, they could

be put to use by adopting an unbalanced budget. Accordingly, Keynes upheld that a rise in public debt via the multiple effects would raise the National Income. It linked public borrowing with deficit financing and urges the government to borrow for all purposes in order to increase effective demand in the economy, which would, in turn, result in increased employment and output. Lerner (1955), opined that due importance should be given to certain advantages of public borrowing while considering burden thesis of public debt. The economic effect of public debt is assessed in the consideration of the nature of the expenditure for which debt is incurred and in terms of the income generating potentialities. In modern theory, adequate importance was given to the net burden of public debt. Furthermore, the theory postulated that additional flow of income generated by increased debt to finance expenditure leads to the payment of taxes to service the debt. During the period of unemployment, public debt increase contributes to current capital for the nation. More so, the theory stated that public borrowing promotes the development of more and more institutionalized sources of savings like stock, capital market, insurance companies, and Banks.

The Dual-Gap Theory

This theory is proposed on the condition that, to achieve a reasonable level of development in an economy, investment is a key player. Such investment cannot be successively achieved without huge domestic savings meaning that for a country to achieve a sustainable level of development, investment and huge domestic savings is required. However, in attaining comprehensive growth, this domestic savings and investment is not sufficient enough hence there is need to borrow fund from abroad. This implies that the combination of domestic savings, investment and borrowed fund is a function of economic development as opted by this theory.

Empirical Reviews

Traum and Yang (2010) estimated the crowding out effects of government borrowings for the U.S. economy using a New Keynesian model which includes the following variables: real aggregate consumption, investment, labour, wages, nominal interest rate, gross inflation rate, and fiscal variables such as capital, labour, consumption tax revenues, real government consumption and investment, and transfers. The result of the estimates revealed that whether private investment is crowded in or out in the short term depends on the fiscal shock that triggers borrowing accumulation. Higher borrowings can crowd in investment despite a higher real interest rate for a reduction in capital tax rates or an increase in productive government investment (Abula et al, 2016). Distortionary financing to retire borrowings also showed that the degree of crowding out depends on the monetary authorities' responses to inflation and output fluctuations.

Adofu and Abula (2010) using Ordinary Least Squares (OLS) regression technique explored the relationship between internal borrowings and economic growth in Nigeria. The result showed that internal borrowings affected the growth of the economy negatively. They recommended that

government internal borrowing should be discouraged and that increasing the revenue base through tax reform programs should be encouraged.

Ezike et al, (2011) in their study investigated the relationship between Nigeria's external borrowings and economic growth, between 1975 and 2006 using Johansen Co-Integration approach, Error Correction Method and granger causality test. The result of error correction estimates revealed that external borrowings have negative relationship with economic growth in Nigeria. For example, a one percent expansion in external borrowings brought about a 0.027 percent reduction in GDP; while a one per cent increase in total borrowings service resulted in 0.034 per cent (decrease) in GDP. These relationships were both found to be significant at the ten per cent level. In addition, the pair wise Granger Causality Test revealed that unidirectional causality exists between external borrowings service payment and economic growth at the ten percent level of significance. Statistical interdependence was however found between external borrowings and economic growth. Based on the findings, the researchers recommended that borrowings accumulation must be matched with timing of repayment while the portfolio of borrowings must be diversified in terms of sources and types to avoid harmful concentration and a reoccurrence to the past among others.

Udoka and Ogege (2012) examined the extent of public borrowings crisis and its consequences on economic development using data on the Nigerian economy for the period 1970 to 2010. They employed the Error Correction Model (ECM) framework with co-integration techniques to test the relationship between per capita GDP and other macroeconomic variables (foreign reserve, borrowings stock, investment, and borrowings service payment). The test revealed that political instability may reduce the rate of development and other independent variables were responsible for the underdevelopment of the country. Hence, they recommended that, to avoid the crisis of economic development in Nigeria, public borrowings should be reduced to minimal level as to validate the belief that public sector borrowing spurs growth.

A study by Ekperiware and Oladeji (2012) examined the effect of external borrowings relief on economic growth in Nigeria using regression technique on quarterly time series of external borrowings, external borrowings service and real gross domestic product. Applying Chow- test to the regression result, they found that there was a structural break in the relationship between economic growth and external borrowings in Nigeria during the period 1975 to 2005. The study concluded that the external borrowings relief made more resources available for economic growth in Nigeria and recommended a shift towards discretionary and concessional borrowing.

It also identified external borrowings relief as a good option for poor unsustainable indebted countries as a way of making resources available for economic growth with the real sector being the focal point where value is created rather than impeding it with mismanagement and servicing borrowings.

Literature Gaps

This empirical study is an extension of other studies carried out on the topic of public debt and economic growth across the globe including Nigeria. From the studies reviewed, huge gaps were discovered ranging from geographical to wrong applications of analytical methods and time scopes. The studies associated with the geographical or locational gaps include Panagiotis (2018), Alejandro and Ileana (2017), Traum and Yang (2010), Isaac and Rosa (2016), Precious (2015), etc, most of which were carried out in the developed economies such as Greece, Mexico, United States, etc, and geographically, what obtains there may not obtain here. Some other studies reviewed applied wrong methods of analysis which this study would correct to achieve accurate results at the end of this research. A few studies employed OLS in their analysis but failed to carryout unit root test, while others used co-integration test and VECM. Thus, the above gap and the desire to contribute to knowledge in literature is the motivation for this research.

METHODOLOGY

This study utilized annual time series data of the variables from 1980 to 2021 in order to accomplish the objectives of the study. The data was sourced from the Central Bank of Nigeria statistical bulletin. The study employed secondary data from already existing publications on the impact of public debt on economic growth in Nigeria. To ascertain the causal relationship between public debt and economic growth, Onyeiwu (2012), work was followed with modification regarding augmentation of explanatory variables for Nigeria. The utilization of this model was based on the premise that it was utilized for a related study in Nigeria. Hence, a general empirical model of public debt on Nigeria's economic growth can be specified as:

$$RGDP_t = \alpha_0 + \alpha_1 ED_t + \alpha_2 DD_t + \alpha_3 EXC_t + \alpha_4 INFL_t + \varepsilon_t \quad 3.1$$

Where:

$\alpha_0, \alpha_1, \alpha_2, \alpha_3, \alpha_4 =$ Parameters in the model

$RGDP_t =$ Real GDP per capita

$ED_t =$ External Debt Stock

$DD_t =$ Domestic Debt Stock

$EXC_t = \text{Exchange Rate}$

$INFL_t = \text{Inflation Rate}$

$\varepsilon_t = \text{error term}$

A priori: $\alpha_1 < 0; \alpha_2 < 0; \alpha_3 > 0$ and $\alpha_4 < 0$

Real GDP is in logarithm form. It was logged because of its high values. Restating equation 3.1 as an Autoregressive Distributed Lag (ARDL) model in line with the framework of Pesaran, Shin, and Smith (2001), we have:

$$\begin{aligned} \Delta RGDP_t = & \alpha_0 + \sum_{i=1}^n \alpha_{1,i} \Delta RGDP_{t-i} + \sum_{i=1}^n \alpha_{2,i} \Delta ED_{t-i} + \sum_{i=1}^n \alpha_{3,i} \Delta DD_{t-i} \\ & + \sum_{i=1}^n \alpha_{4,i} \Delta EXC_{t-i} + \sum_{i=1}^n \alpha_{5,i} \Delta INFL_{t-i} + \alpha_6 RGDP_{t-1} \\ & + \alpha_7 ED_{t-1} + \alpha_8 DD_{t-1} + \alpha_9 EXC_{t-1} + \alpha_{10} INFL_{t-1} \\ & + \varepsilon_t \end{aligned} \quad 3.2$$

Where Δ denotes the difference operator, α_0 is the drift component, ε_t is the error term, $\alpha_1, \alpha_2, \alpha_3, \alpha_4$ and α_5 are coefficients of short-run dynamics while $\alpha_6, \alpha_7, \alpha_8, \alpha_9$ and α_{10} represent long-run relationship. The trend characteristics were eliminated through differencing. The lag length for each of the variables is represented. This study utilized the Autoregressive Distributed Lag (ARDL) Bounds test for Co-integration proposed first by Obademi (2012) and advocated by Nassir (2016) to account for the presence of endogeneity. The computations involving the use of the above statistical techniques was facilitated by access to E-views 10 Econometric software. For a guide to an appropriate specification of the regression equation, the characteristics of the time series data used for estimation of the model was examined to avoid spurious regression, which results from the regression of two or more non – stationary series. Statistical properties of any regression analysis using non – stationary time series have been considered as being spurious. The data was tested for unit root (non – stationarity) by employing the unit root tests developed by Obademi (2012), and Naeem (2015). The joint use of both tests tries to overcome the common criticism that unit root tests have limited power in finite samples to reject the null hypothesis of non-stationarity.

Data Presentation and Analysis

The results of Augmented Dickey- Fuller (ADF) and Phillips-Perron (PP) unit root tests on series is depicted in Table 1.

Table 1: ADF Unit Root Tests Results

Variable	Augmented Dickey-Fuller (ADF)		
	T-Stat	Critical Values	Order of integration
RGDP	-6.6717	-4.2268 1% -3.5366 5%	I (1)
DD	-5.1432	-4.2050 1% -3.5266 5%	I (1)
ED	-7.3736	-4.2118 1% -3.3297 5%	I (1)
EXC	-5.9301	-4.2268 1% -3.5366 5%	I (0)
INFL	-5.3170	-4.2050 1% -3.5266 5%	I (1)

The ADF unit root tests results are shown in Table 1 and the results revealed that the variables were integrated of order I(0) and I(1), thereby meeting the requirement for ARDL estimation

Results of the Bounds Test for Co-integration

Table 2: Bounds Tests for the Existence of Co-integration

Test Statistic	Value	Lag	Significance Level	Bound Critical Values*	
				Lower Bound	Upper Bound
<i>F</i> -statistic	11.1224	2		I(0)	I(1)
			10%	2.2	3.09
			5%	2.56	3.49
			1%	3.29	4.37

Critical value bounds for the F-statistic at 95% confidence level from Pesaran, Shin, and Smith (2001).

Source: Authors Compilation

The Bounds tests results for the existence of co-integration is shown in Table 2, which reveal that the result of the computed *F*-statistic is 11.12241 and greater than the lower and upper critical values at a 5% level of significance, indicating that there is a long run relationship between the variables. The presence of a long-run link among the variables in these models supported the estimation of the short-run dynamic and long-run coefficients using the ARDL method.

DISCUSSION OF RESULTS

Results of the Long-run Model

Table 3: Estimated Long-run Results

Dependent Variable: RGDP				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
DD	95.72644	2581.532	0.037081	0.9710
ED	0.003230	0.009233	0.349780	0.7321
INFL	-3274.411	7625.877	-0.429382	0.6747
EXC	725.4813	1763.583	0.411368	0.6875
EC = RGDP + 95.7264*DD + 0.0032*ED -3274.4112*INFL + 725.4813*EXC -7582.4810				

Source: Extract from E-views econometric software

The long-run estimates of the nexus between public debt and economic growth are depicted in Table 3. External and Domestic debts had the expected signs. They both exerted a positive and not significant impact on economic growth in Nigeria in the long-run. The long-run effect of inflation on economic growth was negative and insignificant. The result means that if inflation is increased by one-unit, economic growth would decrease by 3274 percent. The results further revealed that exchange rate had a positive and insignificant relationship with economic growth.

Results of the Short-run Model

Table 4: Estimated Short-run Results

Dependent Variable: RGDP				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(RGDP(-1))	0.8473	0.1566	5.4112***	0.0001
D(RGDP(-2))	-6.4739	7.0253	-0.9215	0.3736
D(RGDP(-3))	-48.0932	6.3269	-7.6014***	0.0000
D(DD)	-2170.253	2643.947	-0.8208	0.4265
D(DD(-1))	2939.168	2392.200	1.2286	0.2410
D(DD(-2))	12144.75	2685.713	4.5220***	0.0006

D(DD(-3))	11265.34	2458.771	4.5817***	0.0005
D(ED)	-0.0021	0.0010	-2.1966**	0.0468

***, **, and * indicate significance at 1%, 5% and 10% levels respectively

Source: Extract from E-views econometric software

The results of the short-run dynamic estimates are shown in Table 4. Change in the real GDP per capita had a positive and significant impact on economic growth in the first lag. Change in domestic and external debts had a negative and significant relationship with economic growth. The negative link implies that public debt does not contribute to economic growth in the short-run in Nigeria.

Table 5: Diagnostic Results for ARDL Model

Test	Type of statistics	Test of Statistics	P-Value
Breusch-Godfrey Serial Correlation LM Test	X^2	7.2581	0.0098
Heteroskedasticity Test	X^2	0.5994	0.8628
Ramsey RESET Test	F	39.0978	0.0000
Jarque-Bera Normality Test	X^2	1.3051	0.5207

Source: Authors Compilation

The diagnostic results is presented in Table 5. There was presence of serial correlation in the ARDL model due to the significance of the F-statistic. Under the Ramsey Regression Equation Specification Error Test (RESET) test, the null hypothesis for linearity or correct specification was rejected due to the statistical significance of the f-statistic and t-statistic. Under the normality test, a Jarque-Bera value of 0.5207 which was less than 5.99 showed that the errors were normally distributed. Again, the non-significance of the Jarque-Bera statistic confirmed it. It resulted in the acceptance of the null hypothesis of normal distribution. Under the ARCH test, the null hypothesis of heteroskedasticity was accepted as a result of a probability value of 0.5994.

Hypotheses Testing

The test of hypothesis conducted here will be an attempt to establish if changes in domestic debt, external debt and inflation will significantly contribute information for the prediction of economic growth in Nigeria.

$H_0: b = 0$ There is no relationship between public debt and Nigeria's economic growth in the short-run.

$H_0: b = 0$ There is no relationship between public debt and Nigeria's economic growth in the long-run.

$H_0: b = 0$ There is no significant relationship between inflation and economic growth in Nigeria.

The test was conducted at 0.05 level of significance.

Decision Rule:

If the P-value is greater than the specified significance level: H_0 is concluded.

If the P-value equals or is less than the specified significance level: H_1 is concluded.

or Reject H_0 if $p - value \leq \alpha$

Where $\alpha = level of significance$

Based on the outcome of the first hypothesis, H_1 was sustained. This is because, the coefficients of domestic debt and external debt used to proxy public debt had p-values of 0.0006 and 0.0468 respectively which were less than the specified significance level. Hence, there is a significant relationship between public debt and economic growth in Nigeria in the short-run. In addition, based on the outcome of the second hypothesis, H_0 was sustained. This is because, the coefficients of domestic debt, external debt had p-values of 0.9710 and 0.7321 respectively which were greater than the specified significance level. Hence, there is no significant relationship between public debt and economic growth in Nigeria in the long-run. Furthermore, based on the outcome of the third hypothesis, H_0 was sustained. This is because, the coefficient of inflation had a p-values of 0.6747 which was greater than the specified significance level. Hence, there is no significant relationship between inflation and economic growth in Nigeria.

Summary of Major Findings

This study examined the impact of public debt on economic growth in Nigeria from 1980 to 2021. The study employed the Auto regressive Distributed Lag (ARDL) model of co-integration. The results revealed that domestic and external debt did not enhance economic growth in Nigeria in the short run. However, in the long-run, external and domestic debts exerted a positive and insignificant impact on economic growth. Furthermore, inflation had a negative and insignificant impact on economic growth in Nigeria. The result of the first hypothesis showed that there is a significant relationship between public debt and economic growth in Nigeria in the short-run. The result of the second hypothesis revealed that there is no significant relationship between public debt and economic growth in Nigeria in the long-run. Finally, the result of the third

hypothesis showed that there is no significant relationship between inflation and economic growth in Nigeria.

CONCLUSION

In the light of the discoveries of this study, we concluded that domestic and external debt did not enhance economic growth in Nigeria in the short run. However, in the long-run, external and domestic debts exerted a positive and insignificant impact on economic growth. The result of the first hypothesis showed that there is a significant relationship between public debt and economic growth in Nigeria in the short-run. The result of the second hypothesis revealed that there is no significant relationship between public debt and economic growth in Nigeria in the long-run. Finally, the result of the third hypothesis showed that there is no significant relationship between inflation and economic growth in Nigeria.

RECOMMENDATIONS

Based on the findings of this study, the following recommendations were proffered:

- a. That further public borrowing should be tied to specified productive sectors of the economy that would increase growth in the long-run and enhance the payment of the debt to avoid leaving debt burden to the next generation.
- b. Changes in general debt can lead to changes in the general price level of goods and services in the country. Therefore, government should channel their expenditure on capital goods and infrastructure that could increase productivity rather than recurrent expenditure that potentially leads to inflation.
- c. Lastly, the government of Nigeria should increase their efforts to diversify sources of domestic revenue by increasing effort on taxation, export goods and promote import substitution strategies that will enhance the consumption of domestic products and reduce reliance on debt to finance its budget.

Suggestion for Further Studies

The impact of public debt on economic growth is a very important and reoccurring phenomenon in the world. Hence, this study can be replicated across other regions of developing countries to ascertain the same relationship. Other methodologies could be employed to confirm or counter the findings of this study with a view to enriching the literature on this issue. Also, a study on the Effect of Debt Burden on Investment and Economic Growth in sub-Saharan Africa could be executed

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