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Impact of Public Debt on Economic Growth in Nigeria: A Disaggregated Analysis

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Abstract

Since the economic recession of the early 1980s, Nigeria embarked on both domestic and foreign borrowing as a way to shore up funds for economic growth and to promote performances of other macroeconomic However, no significant improvement has been recorded on the side of economic growth and poverty reduction amidst a rising debt profile. Hence, this research work examined the impact of public debt on economic growth in Nigeria using data from CBN, and covering 1985 to 2020. Using gross domestic product as a proxy for economic growth, while domestic debt, external debt, and total debt servicing a measure of public debt profile, it was discovered that a mixed order of integration existed, hence we adopted the autoregressive distributed lag (ARDL) model. The results showed that external debt had a significant and positive impact on GDP in Nigeria. However, domestic debt had a positive and insignificant impact on GDP. It also showed that total debt servicing payment exerted negative and significant impact on GDP in the short-run and negative and insignificant impact on GDP in the long-run. Based on the findings, the study recommended for efficient utilization of domestic debt in financing fiscal deficits in Nigeria. This could be done by issuing more federal bonds, treasury bills, treasury certificates; the government should continue to utilize external debt in financing investment deficits in the economy as this can result to improvement in economic growth of the nation even in the long-run.

Keywords: *Public debt, Internal debt, External debt, Debt service payments, ARDL, Nigeria*

Background to the Study

Since the dawn of history, the policy priority of every economy – whether developed or developing, has been to promote sustainable economic growth and development. To achieve this paramount objective, every government requires a considerable amount of capital to finance investment expenditures especially on productive segments. However, due to low levels of savings mobilization necessary for productive investment, most countries resort to borrowing, so as to mitigate the effect of economic growth challenges and strengthen their growth prospects (George, Chioma & Edet, 2020). This is as a result of the fact that economic growth of a country is a direct function of investment; and when these domestic savings needed to finance such investment is not adequate, financial assistance in form of borrowing is required to ensure the proper growth and development a country (Gbosi, 2015). This financial assistance in the form of borrowing is known as debt and in this work, our focus is on public debt disaggregated into domestic debt and external debt and its servicing known as debt servicing payments. Domestic debt is debt owed to internal creditors while external debt is debt owed to foreign creditors. Debt service is the amount of money required to pay back interest and principal amounts on any outstanding debt.

Public debt is an important measure for bridging the financing gaps of the government. Prudent utilization of public debt leads to higher economic growth and adds to capacity to service and repay external and domestic debts. It also helps the government to accomplish its social and developmental goals (Bonga, Chirowa, &Nyamapfeni, 2015).

Nigeria contracted its first external debt in 1959 when it borrowed US$ 28 million from the World Bank, to finance railway construction. Due to Nigeria's developmental plans and financial excesses of the government, her external debt outstanding increased to US$1 billion in 1971 and rose further to US$13.1 billion in 1982 (Olasode & Babatunde, 2016; George, Chioma & Edet, 2020). The surge in external debt continued due to a fall in oil price and balance of payments deficit which compelled the country to adopt the Structural Adjustment Programme (SAP) in 1986, as was packaged by the International Monetary Fund (IMF) as a way of revamping the Nigerian economy (Ayadi & Ayadi, 2016). External debt further rose to US$28.7 billion in December 1988 from US$23 billion in 1987 (Gbosi, 2015). Figure 1 summarizes Nigeria external debt and its components from 1981-2022.

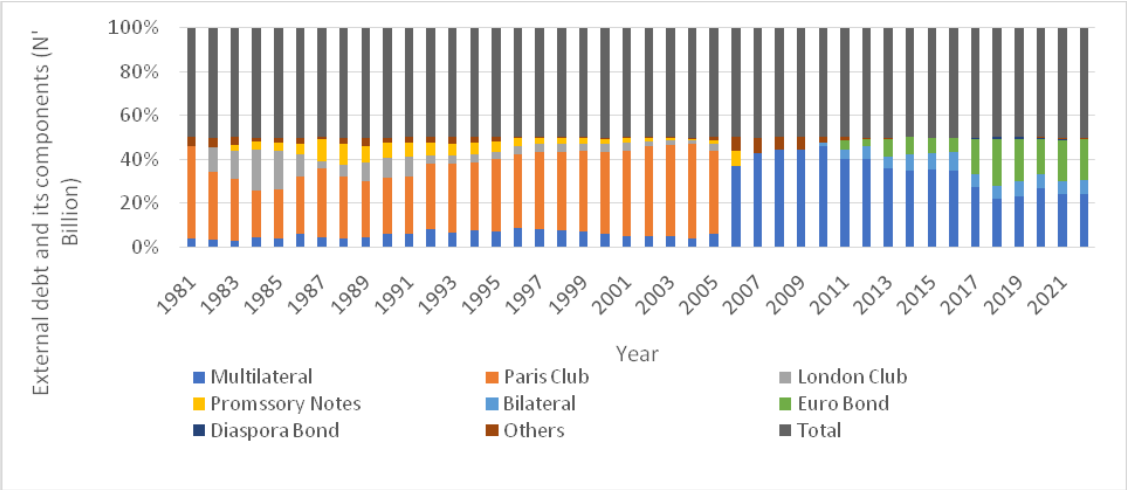

Figure 1: Nigeria's External Debt and its Components (1981 – 2022)
Source: CBN (2022)

Several factors were responsible for the trend. The main factor was rapid growth in public expenditures particularly capital projects. Other factors include borrowing from the international community at no concessional interest rates, decline in oil earnings and emergence of trade arrears. Hence, Nigeria started to re-accumulate and record upward movement in external debt from 2008 in a bid to foster the required economic growth and a support to fiscal deficits. National Bureau of Statistics (2017) reports that Nigeria's debt to foreign creditors in 2016 stood at US$15.05 billion and N14.06 trillion to domestic creditors (George, Chioma & Edet, 2020). The increase continued as Nigeria's external debt outstanding witnessed a surge to US$54.2 billion, US$60.05 billion and US$70.57 in 2018, 2019 and 2020 respectively (CBN, 2020). Consequently, Nigeria's public debt rose from US$37955.090 billion to US$39969.190 billion (CBN,2022) from October 2021 to January, 2022; while that of domestic debt increased from N85.0 trillion in 2021 to N88.4 trillion in March, 2022 (CBN, 2022). Figure 2 summarizes Nigeria's domestic debt and its components from 1981 to 2022.

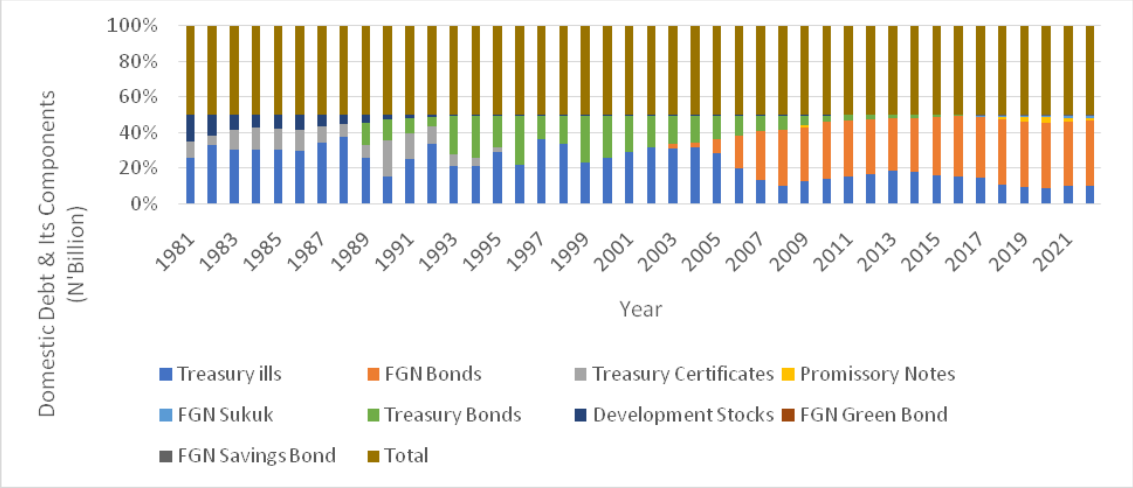

Figure 2: Nigeria's Domestic Debt and its Components (1981 – 2022)
Source: CBN (2022)

According to CBN (2022), Nigeria witnessed negative growth rates of -0.55, -1.58 and -1.92 in 1991, 2016 and 2020 respectively whereas poverty headcount ratio increased from 47.8 in 1985 to 52.4 in 1992 and rose further to 58.4 in. 1996.That is why borrowing in Nigeria has become a source of worry, as the ratio of debt to gross domestic product (GDP) has been on the increase, without a corresponding increase in GDP.

Considering Keynesian theory of debt which holds the view that increases in public debt would raise economic growth or national income. Contrary to this theory, using trend analysis, we observed that the ratio of domestic debt increased from 3.3% to 4.4% and up to 6.1% in 1985, 1990 and 1995 respectively; in these periods, external debt rose from 2.8% to 5.6% and up to 6.5% respectively, while that of debt servicing consequently increased from 22.1% to 24.0% and up to 24.4% within the respective periods and within those periods, that of GDP though increased from 5.9% to 11.7% from 1985 to 1990, but decreased to 0.07% in 1995. Similarly, domestic debt and debt servicing increased from 6.8% to 7.3% and from 26% to 27.7% between 2000 to 2005 respectively, that of external debt decreased from 8% to 7.8% and GDP increased from 5.02% to 6.44%. Within these periods, although that of GDP growth rate increased considerably alongside the domestic debt and servicing, but it was not on the corresponding ratio. The same was also observed between 2010 and 2015 where domestic debt, external debt and debt servicing increased from 8.4% to 9.0%, 6.5% to 7.67.6 and 25.9% to 26.4% from 2010 to 2015 respectively; while that of GDP decreased from 8.01% to 2.65% with the same periods. Lastly, within 2016 to 2019 and 2020, domestic debt increased from 9.3% to 9.5% and to 35% respectively, while that of external debt rose from 8.1% to 8.9% and decreased to 7.8% in the respective years. However, within the observed periods, though that of GDP slightly increased from 1.62% to 2.21% from 2016 to 2019 respectively, it decreased to 1.79% in 2020 (CBN, 2020; DMO, 2020).

From the trend analysis, it is observed that borrowing money especially from external sources to finance national programmes and projects do not necessarily put a wedge to slow national economic development. Hence, the lack of knowledge of the terms and conditions is the problem of external debt as it limits the country from meeting up with the debt service. Most developing nations are entrapped in the situation, Nigeria inclusive. The resultant effect of this debt service burden creates additional problems for the nation particularly the increasing fiscal deficit which is driven by higher levels of debt servicing. This poses a great threat to the economy as a large chunk of the nation's hard-earned revenue is being eaten up.

Studies like Adebisi (2010), Ademola, Tajudeen and Adewumi (2018); Ibrahim and Shazida (2019); and Nestor and Ebikela (2020) have investigated the impact of public debt on economic growth in Nigeria producing mixed results. These researchers had used many parameters to proxy the effect of public debt on economic growth. For instance, Adebisi (2010) used debt payments to multilateral financial creditors, Paris club creditors, London club creditors, promissory notes holders and Other creditors to proxy debt and GDP for economic growth; Ademola et al (2018) used external debt; Ibrahim and Shazida (2019) employed domestic debt while Nestor and Ebikela (2020) utilized both domestic and external debts. However, these studies employed different control variables like interest rate and total government revenue. However, the frontline measures of public debt could be traced to debt service payments and its rate of exchange as their relative contributions to economic growth must not be undermined. This study therefore fills these knowledge gaps by estimating the impact of domestic debt, external debt, debt servicing payments and important control variables like exchange rate and inflation rate on economic growth in Nigeria from 1981 to 2022

Review of Related Literature

Debt is the money borrowed. It is also seen as a contractual obligation of owing or accumulated borrowing with a promise to payback at a future date (Likita 2000). Every economy requires an amount of capital to generate production and sustain development. Capital, being a factor of production is particularly important but relatively scarce, and the dearth of capital is much mo re prevalent in less developing countries to which Nigeria belongs. Internal debt alternatively known as domestic debt is the part of the total government debt in a country that is owed to lenders within the country. Internal debt complements external debt. Commercial banks and other financial institutions constitute the sources of funds for the internal debt. The government borrows from the citizens through the issuance of bonds and treasury bills. This variable theoretically should exert positive relationship with economic growth provision. The higher the amount of domestic debt sourced by the government, the greater the expenditure that would be committed to the provision of economic growth for the citizenry while the reverse is true (Choong, Evan, Venus & Puah, 2010). External debt otherwise known as foreign debt is that part of the total debt that is owed to lenders outside the country. It can be obtained from foreign commercial banks, international financial institutions like International Monetary Fund, World Bank, African Development Bank and International Bank for Reconstruction and Development. This variable is expected to be positively related with economic growth provision in Nigeria.

Debt service payment is defined as the regular payment of instalments of loans taken by a country from domestic and external sources. An instalment includes interest on debt and a part of the principal. For servicing debt, a country or corporate organization should have those timely cash flows. If a country is unable to honour its debt service obligations in the absence of required funds, the country is said to be unable to service her debt. This variable is expected to be inversely related with economic growth provision. This is because, the higher the amount of money required in servicing the existing debts, the amount of fund available for provision of qualitative and quantitative economic growth. According to Adesola (2009), debt servicing is defined as the cash that is required for a particular time period to cover the repayment of interest and principal on a debt. He further noted that debt servicing results to acute decline in the standard of living, gross social and economic overhead depreciation, high external dependence, currency depreciation, balance of payment disequilibrium, exchange rate depreciation and rising inflationary rate. Exchange rate is the price at which the domestic currency is exchanged for foreign currencies. It is the rate at which one currency will be exchanged for another, that is, the value of a country's currency in terms of another. This variable theoretically should exert a negative impact on economic growth provision in Nigeria. The continuous depreciation of the value of naira against foreign currency would have adverse effect on economic growth provision (Mohammed & Ahmed, 2005).

Theoretical Frame Work

Keynesian and Modern Theory of Public Debt

Keynes view fiscal policy as the best policy that brings about growth in any economy since it acts in the interest of the general public. According to Keynes in 1936, when the government embark on public borrowing to finance its expenditure, unemployed funds are withdrawn from the private pockets such that the consumption level of private individuals remains unaffected. This funds when injected back into the economy by the government leads to a multiple increase in aggregate demand causing an increase in output and employment. Hence, public borrowing can be used to influence macroeconomic performance of the economy (Mathew & Mordecai, 2016). In the same vein, the modern theory of public debt of 1930s, is an addition to Keynesian theory of modern economics. The modern theory of public debt which is concerned with macro level economics assumes that the whole economy is a single unit. The proponents of this theory believe that domestic public debt does not bring any burden to residents since it belongs to them and resources remain within the country but only changes through transfer from tax payers to bond holders. Modern theory of public debt believes that more income facilitates payment of taxes and interests of the debt. Churchman (2001) argued that the according to modern theory of public debt, deficit financed spending has a much greater final impact on the economy than spending financed by taxes since taxes reduces disposable income that would have otherwise been invested. This theory further assumes that increased public borrowing leads to development of banks, stock market and capital markets and insurance companies. This theory is supported by Buchana (1958) who argued that public debt leaves "future" generations with a heritage of both claims and obligations but with no aggregate real burden because they cancel each other especially for domestic public debt. Buchana (1958) further affirmed that "future" generations are obligated to pay sufficient taxes to service the public debt, but he was quick to state that these

revenues collected in form of taxes are returned to this same generation in the form of interest payments on debt instruments held by individuals within the same economy.

Empirical Review

The issue of public debt and Nigeria's economic growth has attracted wide range of empirical studies, both foreign and domestic. These empirical reviews will be organized into three subsections: domestic debt and economic growth; external debt and economic growth; and debt servicing payments and economic growth.

Aiyedogbon, et al (2022) examined the short- and long-run impact of public debt profile on economic growth in Nigeria using time series data from 1990 to 2020. The model was estimated using autoregressive distributed lag (ARDL) model. The study specified real gross domestic product (GDP) as a function of external debt stock, domestic debt, debt service payment and exchange rate. ARDL bounds test to cointegration indicated a long-run relationship among the variables which necessitated estimation of both short-run and long-run impacts of the independent variables on GDP. Findings indicate that external debt stock and debt service payments impacted negatively and significantly on GDP while domestic debt and exchange rate impacted positively and significantly on GDP in the short-run. In the long-run, external debt, domestic debt and exchange rate had positive and significant impact on GDP whereas debt service payment had negative insignificant impact on GDP.

Nestor and Ebikela (2020) investigated the effect of domestic debt on economic growth in Nigeria from 1981to 2016 using time series data and ARDL estimation technique. The model used real gross domestic product growth as a proxy for economic growth while domestic debt, external debt and interest rate represent the explanatory variables. The results indicated that both domestic debt and external debt impacted negatively and insignificantly on GDP though external debt at lag 1 and interest rate were insignificantly positive.

Lotto and Mmari (2018) studied the effect of domestic debt on economic growth in Tanzaniafor the period 1990 - 2015 applying the ordinary least square (OLS) regression method. The specified model expressed real gross domestic product (RGDP) growth rate as a function of domestic debt, inflation, gross capital formation, foreign direct investment, export, and government expenditure. The outcome of the study shows that there exists negative but insignificant relationship between domestic debt and the RGDP annual growth of Tanzania. Researchers agreed that the negative relationship between domestic debt and RGDP is caused by increase in domestic borrowing, government lenders' profile dominated by commercial banks and non -banks financial institutions which promotes the "crowding out" effect, the nature of the instruments used by the government and inappropriate use of borrowed Hindi.

Bakare, et al (2016) examined the effects of domestic debt on Nigerian economic growth from 1981 – 2012.The study which employed OLS technique, views the relationship between gross domestic product, domestic debt, budget deficit, interest rate and domestic credit to private sector. It observes that there exists a positive and significant relationship between

domestic debt and economic growth while that of budget deficit was insignificantly negative. Interest rate and domestic credit to private sector related insignificantly positively on GDP.

George, Chioma and Edet (2020) examined the impact of external debt on economic growth in Nigeria from 1980 to 2017. Secondary data on real gross domestic product, external debt, external debt service and exchange rate were sourced from CBN statistical bulletin. The Autoregressive Distributed Lag technique was used as the main analytical tools. The result of the ARDL Bounds test revealed the existence of long run relationship among the variables. Furthermore, the result revealed that external debt and external debt service have negative and significant relationship with economic growth in Nigeria both in the long run and short run; while exchange rate has positive and significant relationship with economic growth in Nigeria during the period of study both in the long run and short run.

Saungweme and Odhiambho (2019) explored the causal relationship between government debt, debt servicing and economic growth in Zambia for the period 1979 to 2017 using a dynamic multivariate ARDL approach. To achieve this objective, annual growth rate of RGDP per capita was modelled as a function of percentage of public debt in GDP, percentage of domestic public debt in GDP, percentage of foreign public debt in GDP and savings as a share of GDP among other control variables. Result of the first equation indicates that the percentage of public debt in GDP made positive and significant impact on RGDP per capita in both long-run and short-run. Result of the second equation which disaggregated public debt into domestic and foreign debt reveals domestic debt made negative impact on RGDP per capita in both long- and short-run with the former being significant whereas foreign debt made significant positive impact on RGDP per capita in the long-run which corroborates its lag 1 impact in the short-run. The study findings supported the hypothesis that the pace of economic growth matters in defining the level of public sector indebtedness.

Adeleye and Mudasiru (2016) examined the effects of domestic debt on Nigerian economic growth from 1981 – 2012.The study which employed OLS technique, views the relationship between gross domestic product, domestic debt, budget deficit, interest rate and domestic credit to private sector. It observes that there exists a positive and significant relationship between domestic debt and economic growth while that of budget deficit was insignificantly negative. Interest rate and domestic credit to private sector related insignificantly positively on GDP. This brings policy implication, that if domestic debt increases to certain level and used appropriately, then there will be increases in economic growth.

Ademola, Tajudeen and Adewumi (2018) investigated the impact of external debt on economic growth in Nigeria for the period 1999 to 2015. The study employed econometric techniques including Johansen Co-integration and Vector Error Correction Mechanism. Results showed thatexternal debt has a negative effect on economic growth in Nigeria. Odubuasi, Uzoka and Anichebe (2018) used Granger Causality test and Error Correction Mechanism (ECM) to investigate the effect of external debt on the economic growth of Nigeria from 1981 to 2017. It statistically used external debt stock, external debt service cost and government capital expenditure as indices for independent variable and gross domestic

product as the dependent variable. The outcome of the research showed that foreign debt stock and government spending on capital projects have positive and significant effect on economic growth in Nigeria. However, in explaining economic growth in Nigeria, foreign debt service cost is not significant.

Elom-Obed, Odo and Anoke (2017), carried out study on public debt and economic growth in Nigeria covering a period of 1980 – 2015. The study employed the use of Vector Error Correction Model (VECM) approach of Econometric data analysis. The following were the variables used: real gross domestic product (RGDP), Foreign Debt, Domestic debt and Domestic private savings. The results of the finding indicated that external debt has significant negative impact on economic growth within the period under study. It equally revealed that domestic debt has negative relationship with economic growth.

Anning, Ofori, and Affum (2016), studied the Impact of Government Debt on the Economic Growth of Ghana: A Times Series. The study investigates the impact of government debt on the economic growth of Ghana from 1990 – 2015, and applied Ordinary Least Square (OLS) Model on variables including: private consumption expenditure (pcon), investment expenditure inv.exp, domestic savings DS, Import (Im), inflation (Inf), National Savings (NS), Domestic Debt (DD), External Debt (ED), etc. The research outcome revealed that there is a negative relationship between debt (Domestic and External) and growth in the economy of Ghana. It recommends among others, that government debt borrowing should be discouraged and efforts be intensified to increase revenue base through taxation reforms.
Momodu (2020) investigated the impact of external debt servicing on Nigeria's economic growth through a time-series data between 1985 to 2018 with auto regressive distributive lag (ARDL) model. Results of the study indicated that in the long-run, external debt servicing will negatively affect economic growth. That is, an increase in external debt servicing lead to a decline in economic growth. The study suggests that debt service requirement should not be allowed to increase above the debt stock and, the contracted loan should be devoted to infrastructure development through efficient and judicious utilization.

Ogiemudia and Igbinovia (2018) examined the impact of external debt and external debt servicing on economic growth in Nigeria using error correction model and annual time series data spanning 1981 to 2017. The study modelled real gross domestic product (RGDP) as a function of external debt and external debt servicing, external reserves, foreign direct investment (FDI) and exchange rates. Findings indicate that in the long-run, external debt impacted negatively and significantly on RGDP while external debt servicing impacted positively and significantly on RGDP. Control variables of FDI and exchange rates made positive impact on RGDP with the former being significant while external reserves made significant negative impact on RGDP. Short-run result reveals that external debt at lag 1 and external debt servicing lag 2 made significant positive impact on RGDP whereas external reserves, FDI and exchange rates at lag made negative and significant impact on RGDP except the later the is insignificant.

Masoga (2017) investigated the impact of public debt on economic growth in South Africa using co integration technique and time series data covering 1995 to 2016. The study specified gross domestic product as being dependent on public debt, investment and government deficit. Johansen co integration test revealed existence of long-run relationship among the variables. Again, the vector error correction model was applied and complemented by other econometric tests such as Granger causality, impulse response function and variance decomposition. Findings indicate that in the long-run, public debt and government deficit made positive and insignificant impact on GDP whereas investment made negative and insignificant impact on GDP. Short-run result indicates that public debt and government deficit made negative and significant impact on GDP whereas investment made positive and significant impact on GDP. Granger causality test reveals bidirectional causality between public debt and GDP; unidirectional causality from GDP to budget deficit; and from investment to GDP.The variance decomposition reveals that variance of the forecast error in GDP is attributable to innovations to its own innovations, as well as to public debt, government deficit and investment

Methodology

Ex Post Facto Research Design was adopted. The series of the variables were subjected to unit root test; for the stationarity of the data so as to avoid spurious results, while autoregressive distributive lag model (ARDL) test was adopted for effect examination of both short and long run impact the variables-for efficient and effective policy formulations. The estimation covers the period between 1985 and 2020 while secondary data obtained were analyzed using E-view 9.

Model Specification

The theoretical framework of this model is anchored on Keynesian and modern theory of public debt public debt which consider public debt as an essential means of boosting economic growth. In order to determine the impact of public debt on economic growth in Nigeria, the study adopted and modified the model by Elom-Obed, Odo and Anoke (2017). These researchers proposed that gross domestic product (GDP) is a function of foreign debt, domestic debt and domestic private savings. We modify this model by bring in debt servicing payment, exchange rate and inflation rate which have direct effect on economic growth. Hence, our model is stated as thus:

$$GDP = f(DD, EXD, DSP, EXR, INFR) \quad 1$$

Where;
GDP is the gross domestic product,
DD is the domestic debt,
EXD is the external debt,
DSP is the debt servicing payments,
EXR is the exchange rate
INFR is the inflation rate.

The linear functionis specified thus:

$$GDP = \beta_0 + \beta_1 DD_t + \beta_2 EXD + \beta_3 DSP_t + \beta_4 EXR_t + \beta_5 INFR_t + \varepsilon_t \quad 2$$

In log function, it is expressed as:

$$logGDP = \beta_0 + \beta_1 DD_t + \beta_2 EXD + \beta_3 logDSP_t + \beta_4 EXR_t + \beta_5 INFR_t + \varepsilon_t \quad 3$$

Where; LGDP is the explained variable; whereas LDD, LEXD, LDSP, EXR and INFR are the explanatory variables; ε_t = stochastic variable; β_0 = constant term; L is the log function, whereas β_s are the coefficients of the regression equation. The model represents the relationship between public debt and economic growth in Nigeria. The log function was used because; the data are not in the same unit of measurement. Thus, log function is estimated to achieve the same unit of measurement among the time series employed in the research. In this case, EXR and INFR is not logged in the model because the condition for logging variable indicates that variables in growth rate or negative value are not logged while conducting estimation using econometric packages in which the above variable mentioned belongs to. The inclusion of the variables (exchange rate and inflation rate) is due to the fact that they are proximate determinants of economic growth in the Nigerian economy. Theoretically, it is expected that domestic debt and external debt would have positive association with gross domestic product while debt servicing Payment and exchange rate are expected to assume negative relationship with the gross domestic product in Nigeria. The behaviour of the a priori expectation of the variables in terms of their parameters are:

$\beta_1>0, \beta_2>0, \beta_3>0, \beta_4>0$ or $<0, \beta_5>0$ or <0.

The study employs annual time series data covering 1981 to 2022. The description and sources of these data are indicated in Table 1.

Table 1: Data Description and Sources

Variables	Description	Source
GDP	Gross domestic product at current basic prices (₦'Billion)	Central Bank of Nigeria Statistical Bulletin, 2022
DD	Total federal government domestic debt outstanding (₦'Billion)	
EXD	Total Nigeria's public external debt outstanding (₦'Billion)	
DSP	Public debt servicing (N' Billion)	
EXR	Official exchange rate of the Naira to US dollar (₦/US$1.00)	
INFR	inflation, consumer price index (annual %)	

Source: Authors' compilation from CBN, 2022

Results

Table 2: ADF Unit Root Testat Levels (Trend and Intercept)

Variables	ADF Statistic	5% Critical Value	P-Values	Order of Integration	Remarks
LGDP	-3.271888	-2.948404	0.0241	I(0)	Stationary
LDD	-1.978180	-2.948404	0.2946	I(0)	Not Stationary
LEXD	-2.486646	-2.951125	0.1275	I(0)	Not Stationary
LDSP	-1.557075	-2.976263	0.4901	I(0)	Not Stationary
EXR	-3.465389	-2.948404	0.0151	I(0)	Stationary
INFR	-2.334535	-2.971853	0.1688	I(0)	Not Stationary

Sources: Researcher's computation from E-view 9

Table 3: ADF Unit Root Testat First Differencing (Trend and Intercept)

Variables	ADF Statistic	5% Critical Value	P-Values	Order of Integration	Remarks	Rank
LGDP	-3.271888	-2.948404	0.0241	I(0)	Stationary	I(1)
LDD	-4.522866	-2.951125	0.0010	I(1)	Stationary	I(1)
LEXD	-4.179648	-2.951125	0.0025	I(1)	Stationary	I(1)
LDSP	-3.553852	-2.976263	0.0140	I(1)	Stationary	I(1)
EXR	-3.465389	-2.948404	0.0151	I(0)	Stationary	I(1)
INFR	-4.691264	-2.976263	0.0009	I(1)	Stationary	I(1)

Sources: Researcher's computation from E-view 9

The augmented Dickey-Fuller (ADF) unit root test presented in Tables 2 and 3 above revealed that the gross domestic product and exchange rate were stationary at level whereas domestic debt, external debt, debt servicing payment and inflation rate were stationary at first difference. This unit root test result therefore revealed the existence of a mixed order of integration among the variables of the study. The mixed order of integration from the unit root test results implies the possibility of long-run relationship among the variables of the study, though further investigations using ARDL – Bound test result will reveal if actually long run relationship exist among the variables of the study.

Table 4: ARDL Bounds Test

Null Hypothesis: No long-run relationships exist		
Test Statistic	Value	k
F-statistic	25.72118	5
Critical Value Bounds		
Significance	I0 Bound	I1 Bound
10%	2.26	3.35
5%	2.62	3.79
2.5%	2.96	4.18
1%	3.41	4.68

Source: Researchers' compilation from E-view 9

The results of the ARDL bounds test presented in Table 4 shows that a long-run relationship exists between public debt and economic growth in Nigeria within the periods of the study. The result also disclosed that the computed *F*-statistic exceeds the upper critical value at 5% level of significance, which implies that public debt and economic growth in Nigeria are co integrated in the long run at 5% level of significance. This is as a result of the fact that the value of the F-statistic as presented in table 3 above which has the value of 25.72118 is greater than the value of the upper bound boundary of 3.79at 5% level of significance. To this end, the hypothesis of no long-run relationship existing between public debt and economic growth is rejected at a 5% level of significance.

Table 5: ARDL Short-run Coefficients Test (Dependent Variable: GDP)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LDD)	0.019295	0.051066	0.377853	0.7102
D(LEXD)	0.005629	0.026583	0.211747	0.8348
D(LEXD(-1))	0.083419	0.027680	3.013627	0.0078
D(LDSP)	-0.137310	0.031049	-4.422332	0.0004
D(LDSP(-1))	-0.123040	0.021788	-5.647177	0.0000
D(EXR)	-0.131208	0.061061	-2.148803	0.0463
D(EXR(-1))	-0.083251	0.053862	-1.545639	0.1406
D(INFR)	0.002017	0.000816	2.473056	0.0242
D(INFR(-1))	0.002179	0.000887	2.458057	0.0250
CointEq(-1)	-0.134549	0.043615	-3.084951	0.0067

R^2 = 0.999803; F-stat = 6156.962, and Prob(F-stat) = 0.000000, DW stat = 2.064830

Source: Researchers' compilation from E-views 9

Table 5 indicates the short-run results of the ARDL model. The results indicated that domestic debt at lag zero has a positive and insignificant effect on gross domestic product

(LGDP) as a unit increase in it led to 0.019 unit increases in LGDP. This result conforms to a priori expectation and supports the findings of Ibrahim and Shazida (2019) for Nigeria but contradicts those of Nestor and Ebikela (2020) for Nigeria and Lotto and Mmari (2018) for Tanzania; and Anning, Ofori, and Affum (2016) for Ghana. Similarly, the results indicated that external debt at lag zero has a positive and insignificant effect on gross domestic product while at lag one, external debt (LEXD)(-1) has a positive and significant effect on gross domestic product in the short-runas 1 percent increase in LEXD and LEXD(-1) generated 0.0056 unit and 0.083 unit in LGDP respectively which is in line with a priori expectation. This finding supports the result of Bakare, Ogunlana, Adeleye and Mudasiru (2016) for Nigeria but contradicts those of Aiyedogbon, Zhuravka, Korneyev, Banchuk-Petrosova and Kravchenko (2022) and George, Chioma and Edet (2020) for Nigeria; and Saungweme and Odhiambho (2019) for Zambia. It is crucial to note that, despite the fact that the above results include different lags; the research only considers the lags that satisfied the goals of the study based on its significant status or meeting the a priori expectation of the variables in question. The estimated results as well indicated that debt service payment (LDSP) at lag zero and lag one, has a significant negative impact on gross domestic product (LGDP) as 1 percent increase in LDSP at lag zero and one reduced LGDP by 0.13 unit and 0.12 unit respectively. This result conforms to a priori expectation but undermines the findings of Ayadi and Ayadi (2008) for South Africa and Adesola (2009) for Nigeria. The control variable of exchange rate (EXR) at lag zero exert negative and significant impact on gross domestic product but at lag one, exchange rate (EXR)(-1) has a negative and insignificant effect on gross domestic product in the short-run in Nigeria. that is 1 percent increase in EXR and (EXR)(-1) depressed LGDP by 0.13 unit and 0.083 respectively; More so, the results show that inflation rate (INFR) at lag zero and lag one, has a positive and significant impact on gross domestic product (LGDP) as 1 percent increase in INFR and its lag one increased LGDP by 0.0020 unit and 0.0021 unit respectively.

Similarly, the results indicated that external debt at lag zero has a positive and insignificant effect on gross domestic product while at lag one, external debt (LEXD)(-1) has a positive and significant effect on gross domestic product in the short-run 1 percent increase in LEXD and LEXD(-1) generated 0.0056 unit and 0.083 unit in LGDP respectively which is in line with a priori expectation. It is crucial to note that, despite the fact that the above results include different lags, the research only considers the lags that satisfied the goals of the study based on its significant status or meeting the a priori expectation of the variables in question. The estimated results as well indicated that debt service payment (LDSP) at lag zero and lag one, has a significant negative impact on gross domestic product (LGDP) as 1 percent increase in LDSP at lag zero and one reduced LGDP by 0.13 unit and 0.12 unit respectively. The control variable of exchange rate (EXR) at lag zero exert negative and significant impact on gross domestic product but at lag one, exchange rate (EXR)(-1) has a negative and insignificant effect on gross domestic product in the short-run in Nigeria. that is 1 percent increase in EXR and (EXR)(-1) depressed LGDP by 0.13 unit and 0.083 respectively; More so, the results show that inflation rate (INFR) at lag zero and lag one, has a positive and significant impact on gross domestic product (LGDP) as 1 percent increase in INFR and its lag one increased LGDP by 0.0020 unit and 0.0021 unit respectively.

The results also indicated ECT value of -0.134549 and p-value of 0.0067, which is significant at 5 percent critical value. The ECT result depicts speed of adjustment which is in tandem with the granger representative theorem in which it upholds that a negative and significant speed of adjustment is a required condition for a significant long-run association while the negative sign of the coefficient satisfies the second-order condition, and the significant status of the ECT satisfies other condition necessary for the utilization of econometric packages in the research. The above result shows that the R^2 is 0.999803, which implies that the model explains about 99.9803% of the total variations in gross domestic product (GDP) are explained by the independent variables (domestic debt, external debt, debt servicing payment, exchange rate and inflation rate) during the period of the study. While the remaining 0.0197% variations are as a result of other explanatory variables that are not captured in the model. The Prob(F-statistic) being 0.000000, implies that the joint influence of the explanatory variables is statistically significant as it is less than 0.05 at 5% level of significance. Again, Durbin Watson statistic being 2.064830 which is approximately 2, shows the absence of serial auto correlation in the model.

Long Run Results

The long run impact of public debt on economic growth proxy by GDP in Nigeria is accessed by the lower part of the result of autoregressive distributed lagged (ARDL). The result is presented in the Table 6.

Table 6: ARDL Long-run Coefficients Test (Dependent Variable: GDP)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LDD	0.143408	0.347408	0.412793	0.6849
LEXD	-0.159131	0.138527	-1.148734	0.2666
LDSP	-0.125962	0.270393	-0.465846	0.6472
EXR	1.106661	0.384945	2.874856	0.0105
INFR	0.005771	0.010118	0.570369	0.5759
C	7.219714	1.488923	4.848951	0.0002

Source: Researcher's compilation from E-view 9

Table 6 reveals the long-run results of the ARDL model for which the variables under consideration were estimated. The result shows that domestic debt had a positive and insignificant impact on gross domestic product as 1 percent increase in LDD led to 0.143 unit increase in LGDP. This result is in line with the LDD short-run result of the study and supports a priori expectation External debt had a negative and insignificant impact on gross domestic product as 1 percent increase in LEXD reduced LGDP by 0.159 unit. The result indicated that debt servicing payments had a negative and insignificant impact on gross domestic product as 1 percent increase in LDSP reduced LGDP by 0.1259 unit. The lends credence to a priori expectation and findings of Okwu, Obiwuru, Obiakor and Oluwalaiye (2016) and Momodu (2020) for Nigeria but disagrees with the result of Ogiemudia and Igbinovia (2018) for Nigeria. The result further reveal that the control variables of exchange

rate and inflation rate had positive impact on gross domestic product in the long-run with the former being significant. Precisely, 1 percent increase in EXR and INFR increase LGDP by 1.10 units and 0.0057 units respectively.

Public debt should be a public virtue when it is productively invested and efficiently managed. This is because it will be able to generate adequate revenue for the servicing of the debt and its repayment at maturity. Thereafter, the investment continues to yield dividends for re-investment. This will have multiplier effect on the economy and the additional investments create additional employment, output and income which lead to transition of the economy to higher growth and development. So, to the economist, borrowing for productive ventures is good as it generates capital for industrialization and other growth catalysts. However, public borrowing becomes a public vice when the borrowed fund is not productively utilized and efficiently managed. The implication is that it will not be able to generate funds to service the debt and to pay off the debt at maturity. This leads to debt rescheduling and with time the economy becomes heavily indebted and enters into a debt trap. Findings of this study especially the long-run result indicates that the Nigerian governments over the years have not productively utilized and efficiently managed public debt in Nigeria. This is exemplified by the insignificant positive impact of domestic debt and negative impact of external debt and debt servicing payments on economic growth in Nigeria as indicated by the long-run result of this study. The policy implication is that public debt in Nigeria should be productively utilized and efficiently managed, henceforth. The government should have a clear vision and blue print of the areas the funds should be invested or utilized fruitfully before contracting the debt and also ensure that the funds are strictly channelled into the designated projects and programmes when the loan is secured. The practice of borrowing funds for sharing or other selfish ambitions by some corrupt public office holders should be discontinued.

Table 7: Post Estimation Test Results

Test	**F-statistic**	**DF**	**p-value**
Breusch-Godfrey Serial Correlation LM Test	0.179698	2,15	0.8373
Heteroskedasticity Test	0.414014	14,17	0.9490
Normality Test (Jarque-Bera Statistics)	0.125095		0.939369
Ramsey RESET Test	0.335898	1, 16	0.5703

Sources: Researcher's computation from E-view 9

The results of post estimation test in Table 7 above revealed that there was no presence of serial correlation, because the probability value of F-statistic is higher than 5 percent level of significant. Similarly, the Breusch-Pagan-Godfrey test of Heteroskedasticity also revealed that the residual is homoscedastic, because the probability of F statistic is higher than 5 percent level of significant. The p-value of Jarque-Bera statistics is more than 0.05 indicating that the data used for the analysis is normally distributed. Similarly, the probability of Ramsey RESET Test is greater than 0.05 suggesting that the residual is normally distributed at 5 percent level of significant.

Conclusions

Emphatically, the summary of findings of this research is drawn from the results estimated via the application of the ARDL model employed in the investigation, which are typically based on the objectives of the study. The empirical analysis of the study makes the following revelations:

1. Domestic debt had a positive and insignificant effect on economic growth in Nigeria at both short- and long-run periods.
2. External debt had a positive impact on economic growth in Nigeria in the short-run with its lag one being significant and an insignificant negative impact on economic growth in the long-run.
3. Debt servicing payments had a negative impact on Nigeria's economic growth in both short- and long-run period with the short-run impact being and significant.

Based on the findings the study concludes the public debt influences economic growth in Nigeria to a great extent and recommends as follows:

Recommendations

1. Since the study discovered that domestic debt exerts positive and insignificant effect on economic growth in Nigeria both in the short-run and the long-run; government should efficiently utilize domestic debt in financing fiscal deficits in the economy. This can be done by issuing more federal bonds, treasury bills, treasury certificates, promissory note, treasury bonds, development stocks, federal government green bond, and federal government savings bond in the economy. In so doing, the domestic debt will continue to impact positively on economic growth of the nation and significantly.
2. Since the analysis revealed that external debt has a positive and significant effect on economic growth in the short-run; and in the long-run, it exerts negative and insignificant influence on gross domestic product proxy for economic growth, government should continue to utilize external debt in financing investment deficits in the economy as this can result to improvement in the economic growth of the nation even in the long-run. This can be realized by investing radically, the contracted external loans on productive investments devoid of financial corruption in the economy.
3. Having unravelled that debt servicing payments had a negative and significant impact on gross domestic product proxy for economic growth in Nigeria at the short-run and negative and insignificant impact at the long run, government should re-structure its debt servicing payments strategies as the present structure is negatively and significantly affecting economic growth of the nation. This can be achieved by channelling the loan contracted domestically to productive investments such as agricultural activities like irrigation, cropping, cash cropping, mechanized agricultural equipment, agro-allied industries and other productive industries; and as well, guides the funds against misappropriation and embezzlements by some corrupt public office holders. In so doing, the servicing of the domestic and external debts would not affect the growth of the economy negatively and insignificantly.

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