



THE RESPONSES OF PUBLIC DEBT TO CHANGES IN GOVERNMENT EXPENDITURE IN NIGERIA

Dr. Bosede Olanike Awoyemi

Department of Economics, Afe Babalola University Ado-Ekiti, Ekiti State, Nigeria.
Research Fellow, Macroeconomics and Governance Division, United Nations Economic Commission for Africa.

ABSTRACT: *This study focused on the public debt and government expenditure in Nigeria. Understanding the determinants of total debt stock has become increasingly important based on the need to improve government fiscal and debt sustainability both of which are currently in distress. The study applied the Auto-regressive Distributed Lag (ARDL) models over the periods 1995-2018 to analyze the responses of public debt and debt to GDP ratio to the government recurrent and capital expenditure, primary balance as a ratio of GDP and interest rate. The bound cointegration test was conducted to assess the existence of long run relationship among the variables. The empirical results suggest that recurrent and capital expenditure as ratio of GDP as well as primary deficit to GDP are significant determinants of public debt and debt to GDP ratio in Nigeria with expected signs. Finally, it is concluded that the Nigerian economy can reduce public debt and debt to GDP ratio by increasing the capital expenditure, since increasing capital expenditure often has significant impact on the output and higher output could bring down the Debt-GDP ratio. Therefore, the public debt management strategies and efficient government expenditure management frameworks should be put in place to provide fiscal and debt sustainability and enhance the growth process in Nigeria.*

KEYWORDS: Capital Expenditure, Recurrent Expenditure, Total Debt Stock, Gross Domestic Product (GDP), Fiscal and Debt Sustainability

JEL: E60, H50, H63

INTRODUCTION

Attaining sustainable development goals, agenda 2030 has been the key focus of countries in the world before the arrival of COVID 19 in December, 2019. Given the insufficiency of the revenue base to cope with the targeted level of spending on economic activities due to the ever-increasing demands of the populace, governments of developing countries often engage in deficit financing. To narrow this financing gap, many developing countries have increasingly taken on debt from internal and external sources. From the African Economic Outlook report (20), the IMF's Debt Sustainability Assessment (DSA) report for low-income African countries classified 8 countries in debt distress and 11 countries at high risk of debt distress. This situation stresses the continuous expansionary fiscal stance in these countries. One of the most vital objectives of macroeconomic policy is to reduce public debt and prevent the interest payments on such debt from rising, as well as maintaining sustainable levels of public debts. A debt-to-GDP ratio of 40% is the suggested debt-to-GDP ratio that should not be breached on a long-



term basis for the developing and emerging countries (Chowdhury and Islami, 2010) of which many have breached quite a long time ago. This suggests that crossing this limit will threaten fiscal and debt sustainability. An unsustainable debt profile may also hinder the country from achieving the SDGs and put countries into a worst-case scenario during the post-pandemic periods.

Unfortunately, in Nigeria, the achievement of fiscal and debt sustainability has been proven abortive as the government fiscal deficits is on an increasing trend over a decade. Before the COVID 19 pandemic, the country had been struggling to recover from the 2014 oil price shock, with about 2.3 percent GDP growth in 2019. In February 2020, the International Monetary Funds (IMF) reviewed the 2.5 percent GDP growth rate to 2 percent, because of low oil prices and fiscal space. In addition, the IMF estimate puts the debt service to revenue ratio at 60 percent, which is expected to get worse amid the steep reduction in revenue related with the falling oil prices due to the pandemic. In Nigeria, efforts were already being made to boost aggregate demand through increased government spending and tax cuts for businesses. The public budget increased from 8.83 trillion Naira (\$24.53 billion) in 2019 to 10.59 trillion Naira (\$29.42 billion), about 11 percent of the national GDP in 2020. On the revenue side, small businesses were relieved from company income tax, and for the medium-sized enterprises, the tax rate was reduced from 30% to 20%. The COVID-19 pandemic is causing all components of aggregate demand to fall, except for government expenditure, (Onyekwena and Ekeruche, 2020).

The government, which typically can afford to run budget deficits, would increase spending as it utilize fiscal stimulus measures to offset the drop in consumer spending. Also, the reduction in the global demand for commodities arising from the COVID 19 crisis would suggestively increase fiscal deficits. In Nigeria's case, the year 2020 budget assumes a price of \$57 per barrel and would still have run on a 2.18 trillion Naira (\$6.05 billion) deficit, but in the early April, the price of Brent crude oil was just over \$26 per barrel. Similarly, the decline in the oil prices and demand for oil will unfavorably affect the volume and value of net exports with oil accounting for 90 percent of Nigeria's exports. All these scenarios have necessitated that the Nigerian government cut planned expenditure. In fact, on March 18, the minister of finance publicly announced a 1.5 trillion Naira, about \$4.17 billion, which is close to 1 percent of GDP cut in nonessential capital spending (IMF, 2020). The cut in the capital expenditure is to supplement government recurrent spending, specifically to support healthcare facilities, offer relief to taxpayers, and incentivize employers to retain and recruit workforce during the downturn. Contingency fund was released to Nigeria's Center for Disease Control (NCDC), and an additional funds were distributed to purchase more testing kits, open isolation centers and to provide adequate training for medical personnel. Huge fiscal expenditures, as well as more loans by households and firms, will lead to a sharp increase in internal and external debt in the near future and the bring about debt burdens that may influence both post-lockdown economic recovery and medium-term growth prospects. This study presents evidence of the effects of government spending on the public debt. This paper is structured into five sections, following the introduction, which is covered in section one, literature review and empirical evidence about the impact of government expenditure on debt stock in Nigeria is captured in section two. Section three and four present the methodology and discussion of results respectively. Section five covers the conclusion and recommendations.



LITERATURE REVIEW

The Public Debt in Nigeria

In the Low-Income Countries Debt Sustainability Framework (LIC DSF), public debt is defined as public and publicly-guaranteed (PPG) debt. In the World Economic Outlook, (WEO), public debt is defined as debt of the general or central government for many Low-Income Economies, (LIEs) (IMF Policy Paper, 2020). In Nigeria, the government regularly borrows from the domestic banking system to supplement revenue or meet intertemporal constraints in the budget. Sale of bonds is also becoming popular in helping the government offset its expenditure responsibilities. The overall government balance over the 1980 -1989 decade resulted in an average fiscal deficit of N6.14 billion or 7.1 per cent of GDP (Mordi *et al*, 2013). From figure 1. In 1995-2010, the overall fiscal balance of the Federal Government resulted in an average deficit of N233.4 billion or 1.4 per cent of GDP and was mostly financed from the banking system, particularly, the CBN, while the primary balance on average was 22.8 billion deficit. In 2014 through 2018, the primary balance maintained a deficit stance except in 2014. In 2015, the primary balance showed a deficit of 497.4 billion, or 0.5 per cent of GDP, relative to the surplus of 106.0 billion, or 0.1 per cent of GDP in 2014. The overall fiscal operations of the Federal Government resulted in a deficit of 1,557.8 billion, or 1.6 per cent of GDP, compared with the deficit of 835.7 billion, or 0.9 per cent of GDP, in 2014. The deficit was within the revised WAMZ primary convergence criterion target of 3.0 per cent. It was financed mainly from domestic sources with the banking system accounting for 834.1 billion, or 53.5 per cent of the total financing gap. Also, in 2018, the primary balance recorded a deficit of N1,466.7 billion, or 1.1 per cent of GDP, compared with N1,785.5 billion, or 1.6 per cent of GDP in 2017. Furthermore, the overall fiscal balance of the Federal Government resulted in a deficit of N3,628.1 billion, or 2.8 per cent of GDP, compared with N3,609.4 billion, or 3.2 per cent of GDP in fiscal 2017. This suggests a slight reduction in deficit between 2017 and 2018. The overall analysis suggests a high level of public debt for the country.

From figure 2, the consolidated Federal Government debt stock in 2010 was N5241.7 billion, compared to 1194.6 billion in 1995. This indicates an increase of over 300 percent in the pace of 15 years. This same trend was recorded in the domestic debt stock, while a drastic reduction was recorded for external debt in 2006 because of the debt relief received from the Paris club in 2006. In 2014, it rose to 9,551.9 billion, or 10.7 per cent of GDP, compared with 8,506.4 billion or 10.6 per cent of GDP in 2013. The increase reflected the additional drawdown of multilateral loans to finance infrastructure and the use of domestic loans for the settlement of contractual obligations. Analysis of the debt stock showed that the domestic component constituted 82.7 per cent, while external debt accounted for 17.3 per cent of the total. In 2018, the debt stock has risen to N18,901.4 billion, or 15.2 per cent of GDP, compared with N18,377.0 billion or 16.2% of GDP in 2017. This indicated an increase of 2.9 per cent, reflecting largely, the additional borrowing from both external and domestic sources, to bridge the government financing gap. Figure 1 and 2 present the trend of the primary and fiscal balance, domestic, external and total debt stock in Nigeria between 1995 and 2018.

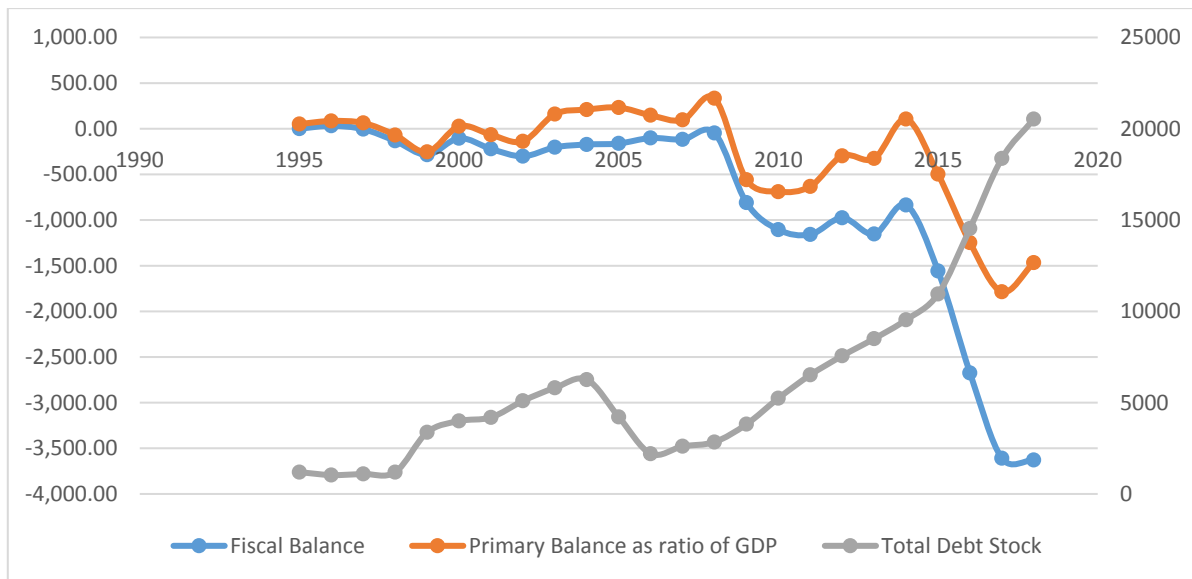


Fig. 1. Government Fiscal and Primary Balance 1995-2018

Source: CBN Statistical Bulletin, 2018

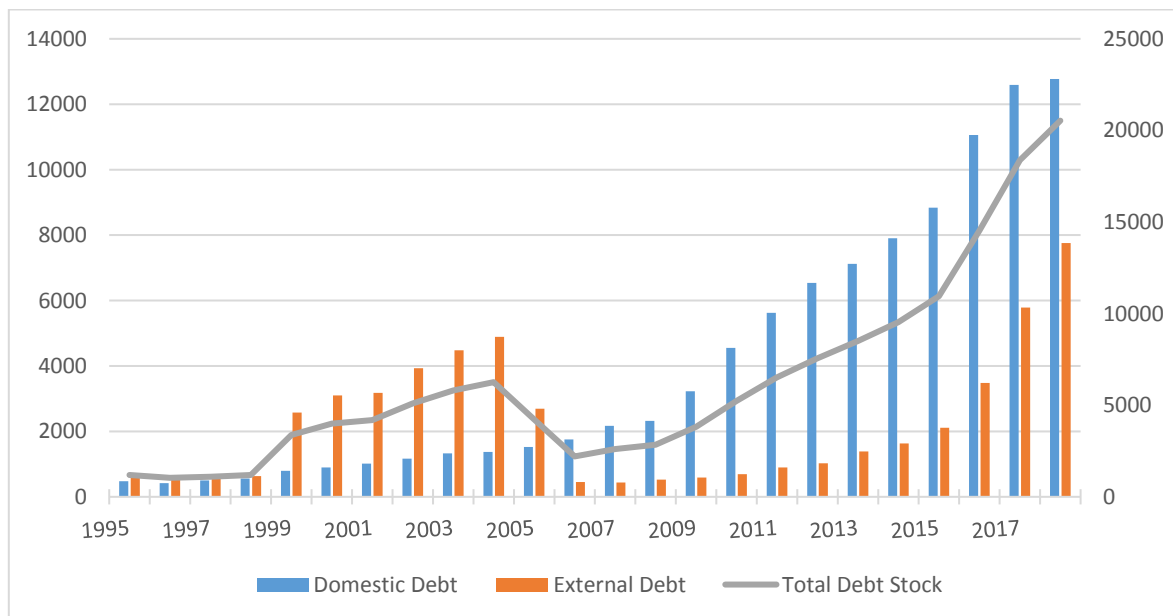


Fig. 2. Debt Stock in Nigeria 1995-2018

Source: CBN Statistical Bulletin, 2018



Recurrent and Capital Expenditure in Nigeria

The government expenditure is broken down into recurrent and capital expenditure, the two types of public spending are further decomposed into four categories; General Administration, Social and Community Services, Economic Services and Transfers. Recurrent expenditure is public spending on goods and services (other than capital assets) used in the process of production within a fiscal year it included Interest on loans. Figure 3 presents the trend of capital and recurrent expenditure in Nigeria between 1995 and 2018. Recurrent expenditure rose by 11.8% above the level in 2014 and accounted for 76.8% of the total, reflecting the substantial increase in overhead cost in 2015. A functional classification of recurrent expenditure showed that the outlay on administration rose by 23.8 per cent and constituted 32.1% of the total. Similarly, expenditure on social and community services increased by 4.2 per cent to 807.6 billion and accounted for 21.1% of the total. Expenditure on the economic sector, at 275.4 billion, rose by 3.4 per cent and accounted for 7.2 per cent of total recurrent expenditure. Transfer payments rose by 9.1 per cent above the level in 2014 to 1,520.0 billion. In 2015, capital expenditure rose by 4.5 per cent above its level in 2014 to 818.4 billion, and accounted for 16.4 per cent of total expenditure. As a percentage of GDP, it was 0.9 per cent, the same as in the preceding year, reflecting the lower capital budget implementation due to the shortfall in revenue. A functional analysis of capital expenditure showed that the outlay in the economic sector accounted 42.6 percent of the total, compared with 50.2 per cent in 2014. Expenditure on administration was 226.8 billion, or 27.7 per cent, while public investment in social and community services amounted to 83.0 billion, or 10.2 per cent of the total. Within the social and community services sector, education and health constituted 36.6 per cent of the total apiece. Transfer payments amounted to 159.8 billion, or 19.5 per cent of total capital spending. In 2018, recurrent expenditure stood at N5,675.2 billion or 4.4 per cent of GDP, rose by 18.7 per cent above the level in 2017. Capital expenditure rose by 35.4 per cent to N1, 682.1 billion, above the level in 2017 constituting 21.5 per cent of total expenditure. As a percentage of GDP, capital expenditure was 1.3 per cent, compared with 1.1 per cent in 2017.

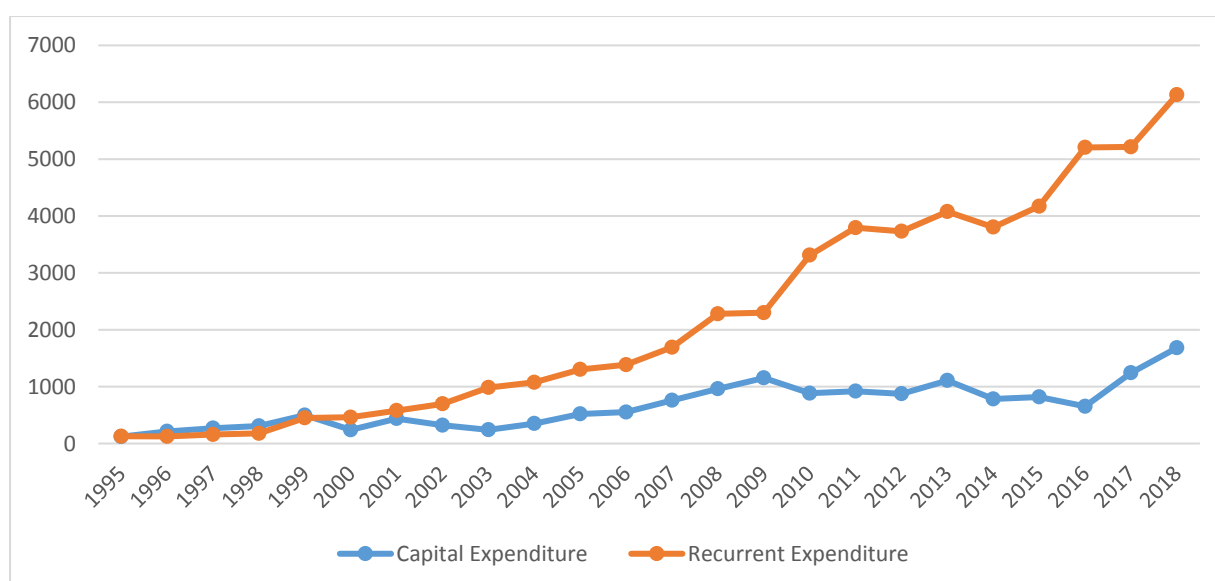


Fig. 3. Capital and Recurrent Expenditure 1995-2018

Source: CBN Statistical Bulletin, 2018



Linking Theory with Empirical Evidence

In order to examine the linkages which exist between the government's fiscal stance and the performance of the macro economy, the applicable framework is the intertemporal budget constraint of the government (Elliott and Kearney, 1988). This framework determines the government's fiscal reaction to the evolution of debt by adjusting primary balances, the intuition is that through fiscal policy reaction functions, the linkages between the government fiscal variables, primary balance, debt and other variables and the mechanism through which they help to achieve fiscal and debt sustainability can be examined (Bohn, 1998). Theoretically, the government should have a fiscal reaction function that is used to determine how it will adjust its primary balance relative to its debt profile. The debt stock is associated directly to the budget deficit, when a government runs a deficit, it finances the deficit by issuing new debt. At any given time, the public debt-to-GDP ratio results from the interest burden of past debt, which is only indirectly dependent on the government's policies, and the present primary deficit, which directly reflects fiscal policy decisions. Mordi *et al* (2013) employ intertemporal budget constraint framework to incorporate a fiscal reaction function models with a view to understanding the relationship among public debt, economic volatility and primary balance. The study reveals that fiscal sustainability could be undermined in the future if the government maintains its current debt policy, even with consistent increase in crude oil prices. In Nigeria, Uguru, (2016) also obtain a significant relationship between government expenditure and public debt with capital expenditure having less effect than recurrent expenditure on debt. Folorunso and Falde (2013) examine the nexus between fiscal deficit and public debt in Nigeria, the Pairwise Granger causality results support a bi-directional relationship between fiscal balance and public debt. Izak, (2009) using samples of 10 post socialist members of EU found that the primary deficit responds positively to changes in debt-GDP ratio, this finding was at variance with Bohn, (1988) proposition. The causal relationship between total public debt and public expenditure in Nigeria was examined and the findings of the Vector Error Correction model imply that the capital and recurrent government expenditure have direct and significant relationship with public debt. The Wald test result shows that unidirectional causality runs from both capital and recurrent expenditure to public debt in Nigeria (Odo, Igberi and Anoke, 2016)

Moreover, high stocks of public debt, above the 30-40% debt/GDP threshold was found to limit the government expenditure and affect resources available for developing human capital. This finding indicates that government expenditure has a positive role to play in developing human capital and sustainability, but this link seems ambiguous for nations that have fiscal constraints (Kgakge-Tabengwa, 2014). Sinha, Arora and Bansal (2011) examined the determinants of public debt for middle- and high-income countries using panel data regression and revealed that government expenditure, long term interest, real GDP growth rate, inflation and FDI are significant determinants of public debt. Specifically, for the middle-income countries, the autoregressive model result shows that the total debt is negatively related to GDP growth, while current account is positively related to total public debt. However, for the high-income countries, only GDP growth rate significantly influences the total debt. In another study by Oni, Aninkan and Akinsanya (2014), capital and recurrent expenditures have positive effects on economic growth in Nigeria. Mah, Mukkudem-Petersen, Miruka and Petersen (2013) show that a significant and positive relationship exists between gross government debt and gross national expenditure in Greece.



METHODOLOGY

This study employed annual time-series data from 1995 to 2018 sourced from the CBN statistical bulletin and annual reports. Auto-regressive Distributed Lag (ARDL) technique was applied to capture the short and long run dynamics of the model. The choice of ARDL is premised on the robustness of the technique which performs well with fewer data observations and the stationary status of the model variables. The results are significant at 5% level of significance. To determine the stationarity of the variable series and avoid spurious results, the Augmented Dickey Fuller (ADF) unit root test was conducted the variables in log form. The bound cointegration test was conducted to determine the long run relationship among the variables, while VAR lag selection criteria were used to obtain the optimal lag length for the model. To establish the validity of estimated equation, the normality test (normal distribution of the residual), Serial correlation, heteroskedasticity tests were conducted. To prevent over and under fit model, model specification tests; Ramsey RESET, redundant and omitted variable tests were conducted. The empirical model of public debt and government expenditure was expressed as;

$$TDS = f(TDS(-1), REX_GDP, CEX_GDP, PB, INT)$$

$$\ln TDS_t = \delta_0 + \delta_1 TDS(-1)_t + \delta_2 REX_GDP_t + \delta_3 CEX_GDP_t + \delta_4 PB_t + \delta_5 INT_t + \varepsilon_{10}$$

Debt-GDP Ratio

$$TDSY = f(TDSY(-1), REX_GDP, CEX_GDP, PB, \varepsilon)$$

$$\ln TDSY_t = \omega_0 + \omega_1 TDSY(-1)_t + \omega_2 REX_GDP_t + \omega_3 CEX_GDP_t + \omega_4 PB_t + \varepsilon_t \text{ Where}$$

TDS= Total debt stock, this is the domestic and external debts

TDS(-1)= Total debt stock as a function of its own lag

TDSY=Ratio of Public Debt to GDP

REX_GDP= recurrent expenditure as a ratio of GDP

CEX_GDP= capital expenditure as a ratio of GDP

PB=primary balance as a ratio of GDP

INT=Real Interest Rate

\square = Error term



RESULTS AND DISCUSSION

The Unit Root and Descriptive Analysis

The ADF Unit root results as presented in table 1 largely indicated that the series are I(0) and I(1) meaning that they are integrated of order zero and one. This result informs the decision to apply the ARDL estimation technique. From the descriptive statistics results in table 2, the average value of the series, the standard deviation and other measures of series symmetry are presented. From the skewness results, many of the variables are positively skewed to the right and close to 1, this indicates that their average values are likely to be more than the median values. Also, the standard deviation also indicates a considerable spread in the dispersion of the series from their mean. Larger values of the kurtosis also indicate that most of the series are highly peaked as they are more than 1. The Jarque-Bera probability value that is more than 0.05 shows that the most of the series are normally distributed.

Table 1. The Augmented Dickey-Fuller Unit Root Test

Variable	ADF				Remark
	constant	Trend	constant	trend	
	Level	level	1st Diff	1st Diff	
LNTDS	-1.356(0.584)	-2.434(0.354)	-3.548(0.016)	-3.446(0.071)	I(1)
PBY	-3.274(0.028)	-3.605(0.036)	-5.559(0.000)	-4.618(0.001)	I(0)
INT	-3.411(0.022)	-4.288(0.014)	-5.419(0.000)	-2.306(0.411)	I(0)
LNTDSY	-1.377(0.575)	-3.279(0.099)	-3.616(0.017)	-5.227(0.003)	I(1)
REX_GDP	-1.963(0.300)	-2.755(0.226)	-6.773(0.000)	-6.867(0.000)	I(1)
CEX_GDP	-1.625(0.693)	-6.559(0.000)	-3.466(0.022)	-3.534(0.066)	I(0)

Source: Computed by Author from the data compiled by the CBN Annual Report 2018

Table 2. The Descriptive Statistics

	TDS	TDSY	CEX_GDP	REX_GDP	INT	PBY
Mean	6279.670	24.15380	0.029226	0.051300	4.532779	-0.002459
Median	4659.932	16.11638	0.021647	0.047209	6.137378	-0.004098
Maximum	20533.60	63.53780	0.093838	0.084724	18.18000	0.022518
Minimum	1037.296	7.261792	0.006440	0.032888	-31.45257	-0.047907
Std. Dev.	5257.427	17.61592	0.022606	0.012917	9.830778	0.015028
Skewness	1.406769	0.884755	1.359007	0.946210	-2.056869	-0.825565
Kurtosis	4.248696	2.458386	4.043222	3.225265	8.538860	4.605122
J-Bera Stat	9.475242	3.424515	8.475911	3.632001	47.60181	5.302648
Probability	0.008759	0.180458	0.014437	0.162675	0.000000	0.070558
Observations	24	24	24	24	24	24

Source: Computed by Author from the data compiled by the CBN Annual Report 2018



The ARDL Results and Discussion

Following the unit root results in Table 1, the series of the variables are integrated of different order I (1) and I (0), on this note, the study employed ARDL bound co-integration tests to investigate the presence of long-run relationships among the variables. From the results in table 5, the calculated F-statistic values for all the models exceed the upper critical bound values. This suggests the rejection of null hypothesis (H₀) of no cointegration at 1% significance level and conclude that there is cointegration. After the co-integration test, the short-run dynamic model estimated in this study shows that ECT(-1) value is -0.874. The ECT (-1) value is negative and significant at 5 per cent level. Also, it shows that the speed of adjustment of disequilibrium in the short run towards long run equilibrium is about 87.4 percent. The one-period lag of the debt stock and the primary balance turned out to be statistically significant in the short run. The parsimonious model showed that the one-period lag of the debt stock, recurrent and capital expenditure and the primary balance turned out to be statistically significant except real interest rates in the long run as shown in table 3b. The one-period lag turned out positive, confirming the hypothesis of the persistence of Nigeria's debt. This implied that government debt policy always takes into cognizance the level of debt attained in the previous period. Recurrent and capital expenditure surprisingly came up significant and positive, implying that a unit increase in recurrent and capital expenditure would lead to 28.4% and 69.9% increase in total debt. Primary balance was also significant with a negative coefficient (-7.80). This inverse relationship suggested that the government had deliberately lowered its debt accumulation whenever its primary deficit increases, by resorting to other non-debt creating financing, such as drawdown on its excess crude oil savings, privatization and divestment of shareholdings. Debt stock also increased with higher interest rate.

From table 4a and b, the debt-GDP ratio, which measures the ability of a country to pay off its debt was expressed as a function of its lag value, recurrent and capital expenditure as a ratio of GDP and primary balance as a ratio of GDP. The short-run dynamic model estimated in this study shows that ECT (-1) value is -0.014. The ECT (-1) value is negative and significant at 5 per cent level. This negative and significant value confirms the stability of the model, implying that the speed of adjustment of disequilibrium in the short run towards long run equilibrium is about 1.4 percent. From table 4b, all the variables are statistically significant except recurrent expenditure as ratio of GDP. The one-period lag is positive, indicating that government debt policy always takes into cognizance the level of debt-GDP ratio attained in the previous period. Capital expenditure as a ratio of GDP is significant and negative meaning that increasing capital expenditure could lead to lower debt-GDP ratio. The understand in this case is that increasing capital expenditure often has significant impact on output and higher output could bring down the Debt-GDP ratio. Primary balance was also significant with a positive coefficient. This direct relationship suggested that debt-GDP ratio increases as primary deficit widened.

**Table 3a. ARDL Co-Integrating and Long Run Form of the Public debt and Government Expenditure**

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
D(LNTDS(-1))	0.787119	0.252378	3.118805	0.0098
D(REX_GDP)	0.524726	0.336687	1.558496	0.1474
D(CEX_GDP)	0.982373	6.806148	0.144336	0.8878
D(PBY)	-9.041680	4.704949	-1.921738	0.0809
D(INT)	0.144840	0.134557	1.076422	0.3048
ECT(-1)	-0.874859	0.368879	-2.371672	0.0370

R-Squared (0.966), Adjusted R-Squared (0.954), D-W(1.49)

Source: Computed by Author from the data compiled by the CBN Annual Report 2005-2018

Table 3b. The ARDL Long Run Coefficients

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
LNTDS(-1)	0.637622	0.130004	4.904625	0.0002
REX_GDP	0.284193	0.102844	2.763343	0.0138
CEX_GDP	0.699972	0.278494	2.513419	0.0162
PBY	-7.803027	3.797672	-2.054687	0.0566
PBY(-1)	-5.183817	3.063231	-1.692271	0.1100
INT	0.160023	0.149277	1.071991	0.2996
INT(-1)	0.240970	0.163666	1.472328	0.1603

R-Squared (0.966), Adjusted R-Squared (0.954), D-W(1.49)

Source: Computed by Author from the data compiled by the CBN Annual Report 2018

Table 4a. ARDL Co-integrating and Long Run Form of Debt-GDP ratio and Capital Expenditure

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
D(LNTDSY(-1))	0.053546	0.060537	0.884516	0.3904
D(REX_GDP)	-1.610815	1.979051	-0.813933	0.4284
D(CEX_GDP)	2.839155	1.695485	1.674538	0.1147
D(PBY)	-0.588351	1.611579	-0.365077	0.7202
ECT(-1)	-0.014052	0.000888	-15.81668	0.0000

R-Squared (0.967), Adjusted R-Squared (0.964), D-W (2.280)

Source: Computed by Author from the data compiled by the CBN Annual Report 2018

**Table 4b. The ARDL Long Run Coefficients**

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
LNTDSY(-1)	0.985948	0.029051	33.93884	0.0000
REX_GDP	-0.206316	1.521403	-0.135609	0.8938
REX_GDP(-1)	-3.513756	1.561842	-2.249752	0.0389
CEX_GDP	-0.366676	0.156356	-2.345140	0.0442
PBY	0.338929	0.140253	2.416554	0.0395

R-Squared (0.967), Adjusted R-Squared (0.964), D-W (2.280)

Source: Computed by Author from the data compiled by the CBN Annual Report 2005-2018

Diagnostic and Specification Testing

To validate the ARDL model, Breusch-Godfrey serial correlation LM test and Breusch-Pagan-Godfrey test for Heteroskedasticity were conducted. The Breusch-Godfrey serial correlation LM test results for the models as presented in table 5 indicate that the F-statistic with the associated p-values are insignificant. This indicates the acceptance of (H₀) null hypothesis of no serial correlation at significance level of 5%. Also, the Breusch-Pagan-Godfrey Heteroskedasticity test reported that the F-statistic with the associated p-values are insignificant for all the models. These statistically insignificant values suggest the acceptance of null hypothesis of no Heteroskedasticity of the error term and conclude that the ARDL model is homoscedastic. The normal distribution of the error term test indicates that the Jarque-Bera test statistics and the associated p-values are not significant for all the models, therefore, the study accepts the null hypothesis of normal distribution and concludes that the error terms are normally distributed. In addition to the validity tests, this study also performed CUSUM and CUSUMSQ stability test for the estimated models. This becomes necessary in order to check whether the long and short run relationships among the variables are stable for the entire period of study. The CUSUM test is based on the cumulative sum of the recursive residuals. For the models, the plots of CUSUM falls within the 5% critical bound, thus, providing evidence that the models do not suffer from any structural instability over the period of study.

One of the assumptions of the OLS is linearity, to examine the linearity of the models, the Ramsey Regression Equation Specification Error Test (RESET) test was conducted for the individual model. From table 5, the null hypothesis that the coefficients of the variables are jointly equal to zero was not rejected at the 5 % level of significance for the two models, the results show that the models are linear. Also, a model should be kept as simple as possible to avoid over fitted problem and prevent violating the Gauss - Markov Assumptions about the mean of the errors. However, an important variable that should be included in the model may be omitted in the process of trying to make the model simple. To avoid these conditions, the omitted variable test was conducted for each model and the models did not reject the null hypothesis that the omitted variables are not significant. This implies that the additional set of variables to each of the models are insignificant. A redundant variance test was conducted to check for the inclusion of unnecessary variables to avoid the problem of over specification. From the results, the null hypothesis of jointly insignificant of variables was rejected at the 5 %



level of significance of the models. This indicates that all the variables introduced in each model are jointly significant.

Table 5. Bounds Cointegration Test

Bound Tests	F Statistics	1%	5%	10%
Total Debt Stock	9.52	3.74(5.06)	2.86(4.01)	2.45(3.52)
Debt as ratio of GDP	40.03	3.07(4.44)	2.26(3.48)	1.9(3.01)
Diagnostic Tests	Serial Correlation	Homoscedasticity	Normality	Cusum
Total Debt Stock	0.068(0.798)	1.59(0.213)	1.81(0.41)	stable
Debt as ratio of GDP	0.133(0.588)	0.89(0.534)	0.697(0.706)	stable
Specification Tests	Linearity	Redundant	Omitted	Correlation
Total Debt Stock	1.71(0.22)	8.20(0.001)	0.79(0.00)	>0.50
Debt as ratio of GDP	0.305(0.323)	187.9(0.000)	0.249(0.806)	>0.70

Source: Computed by Author from Eview 11, 2020

CONCLUSION AND RECOMMENDATIONS

This study examined the response of the public debt and debt to GDP ratio to the government expenditure in Nigeria. The results show that there is a positive relationship between public debt and public expenditure, meaning that an increase in government expenditure will lead to increase in total debt. Also, debt stock reduces as the primary deficit to GDP ratio increases, this suggest that the government had deliberately lowered its debt accumulation whenever its primary deficit increases, by resorting to other non-debt creating financing, such as drawdown on its excess crude oil savings, privatization and divestment of shareholdings. The changes in primary balance as ratio of GDP significantly influence debt-GDP ratio in Nigeria as debt-GDP increasingly respond to variation in primary deficit. An understandable implication of these results is that government borrowing in Nigeria is activated by government deficit, a common situation at both federal and state levels. It therefore becomes necessary that the government budgeting process needs to be re-examined to ensure that allocative efficiency is achieved in our budgeting system and that borrowing to finance budget deficit must be done objectively and realistically.

Capital expenditure as ratio of GDP exert a negative effect on debt-GDP ratio. The understand in this case is that increasing capital expenditure often has significant impact on the output via reduction in primary deficit and higher output could bring down the Debt-GDP ratio. As explained by Taiwo and Agbatogun (2011) capital expenditure among other factors enhances economic growth in Nigeria. Reducing debt stock through non-debt financing sources to finance deficit is another channel through which government can curtail rolling over debts and to keep debt-GDP low and ensure debt and fiscal sustainability. The study revealed that increasing capital expenditure has a more beneficial effect on fiscal and debt sustainability, therefore, the government of Nigeria should make haste to reduce its recurrent expenditure and embark on capital expenditure more for it to achieve the SDGs in 20230. Also, public debt management strategies and efficient government expenditure management frameworks should be put in place to provide fiscal and debt sustenance and enhance the growth process in Nigeria. This study, therefore recommends prudent budgeting approach that seeks to intensify competition for budget resources and consequently aids the realization of government fiscal



policy goals in the economy. Also, the Nigerian government should revisit its fiscal policies in order to reduce its debt and sustain it.

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