



## The Debt-Growth Nexus in Nigeria: An Empirical Evidence

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### ABSTRACT

This study examines debt-growth nexus in developing countries, Nigeria, using annual data from 1986 to 2020. The data were sourced from CBN Statistical bulletin and WDI, ARDL techniques were employed to analyse the data. The findings of the study showed that domestic debt outstanding is negative related to growth in the long run though it is growth enhancing in short-run. External debt is negative related to advancement in long run while in short run is positive related. In the long run education is positive connected to growth but negative related to growth in the short run. The findings suggested that the national authority should channel both external and domestic debt to the education and infrastructural expansion which can lunch the economy to be more productive and diversified.

**Keywords:** Debt, Growth, ARDL, Nigeria

**JEL Classifications:** H63, O40, C01

### 1. INTRODUCTION

Government's revenues can fall short of its expenditures which can lead to borrowing (debt). Thus, government used national borrowing as a significant tool to finance fiscal expenditure, especially when raising taxes and cutting government spending is difficult. Over the years, this process has resulted in massive outstanding debts for most governments. Reasonable borrowings for public education and infrastructure development are essential for accelerating economic growth. Excess borrowings, on the other hand, without proper investment planning, can lead to a significant debt burden and interest payments, which can have a number of negative economic consequences (Joy and Panda, 2020; Yusuf and Mohd, 2021).

Ever-increasing government debt is a major concern for countries with fragile economic structures, as it can create vagueness and slows growth and development. Increasing debt-to-ratio of GDP can cause for worry among local and international investors because their impact could be unfavourable on the capital and stock

market and, in the long run, reduce productive investment and employment (Saungweme et al., 2019). The volume of government borrowings in developing nations, mainly Nigeria, has risen as a result of the expansion of social and economic infrastructures, as well as other health amenities required by the citizenry. Most countries around the world raise their debt levels to stimulate the nation emancipation.

Growth in the size of any economy is necessary but not sufficient for economic development. The justification for borrowing by government is based on neoclassical growth models, which state that debt is highly essential for capital-scarce in order to increase capital build-up and balance output per capita levels (Madow et al., 2021).

Worldwide financial crises have caused additional points for nations (particularly developing ones like Nigeria) to accumulate more debts, to solve the problem of declined capital inflows and increased expenditure levels (Ogbonna et al., 2019). Conservative ideology holds that aggregate national borrowing has a short-run direct effect

on national growth and development by increasing aggregate demand and output. Theoretical literature, on the other hand, constantly indicate to a long-run indirect debt-growth relationship due to altering local investment. National borrowing may alter local investment and impend economic growth by raising long-term inflation rate, future distortionary taxation and interest rates (Mhlaba et al., 2019).

Nigeria battles with increasing debt service to revenue ratio during the 2016 recession, as government proceeds fell proportionally due to drop in global oil prices. Nigeria as a national entity spent approximately 2.37 trillion Naira on outstanding-debt service payment in 2019 from aggregate national proceeds of N4.06 trillion, representing a debt overhang service payment to revenue ratio of 59.6%. Nigeria's debt burden has reached a new high, with debt overhang service payment as a proportion of national revenue reaching 82.9% in 2020. This means that 82.9% of national proceeds generated in 2020 will be utilized servicing Government debt, which is concerning. In 2020, the Government spent N1.76 trillion on domestic debt service, compared to a N1.87 trillion budget. Overseas debts cost N552.99 billion, compared to a design budget of N804.75 billion. The fall is most possible due to reduction in foreign borrowing interest rates whilst very limited debt from the overseas debt market this year. Sinking fund must set aside in funding other loans commitment at their maturity in the future. Domestic market witnessed constant government borrowing which distort domestic investor and businesses need for credit to fund many activities were unable to obtain capital for firm growth and expansion (Ogbonna et al., 2019). When a nation uses a large portion of her returns servicing massive amount outstanding, thereby declining fund available for critical infrastructure which slows down development and growth.

Numeral revisions and studies have been steered to examine debt and economic growth; however, no conclusive empirical results have been obtained, and evidence varies depending on the methods used and the countries/regions studied. Nigeria was chosen for this study because of the above-mentioned fiscal operation triggered via reduced revenue generation channel, mounting recurrent budget and expenditure of government, and unbalanced decreased in education spending. The disparity between a hasty upsurge in national debt and debt-service payments and reduce rates of economic expansion besides other macroeconomic indicators in Nigeria in current years has piqued the interest of researchers and policymakers. This volatility impelled this study to investigate whether an ever-increasing debt outline has any significant consequence on national growth in Nigeria, and whether such possible consequence occurs in the short or long run.

## 2. LITERATURE REVIEW

A few previous studies have looked into the debt-growth connection, and the ultimate point is that when public debt surpasses a certain cut-off point, growth slows, it has unfavourable influence on economic growth. Saxena and Shanker (2018). For instance, it has been revealed that reduced debt levels are linked to elevate growth in developing economies, and that this connection is powered by government borrowing rather than private local debt. Rahman and Islam (2020) found a weedy connexion between

government borrowing and sustainable growth when the debt-to-GDP ratio is <90.3%, but above the threshold, borrowing has an adverse impact on economic growth. Ogbonna et al. (2019) backed up this claim by demonstrating that public borrowing has a powerful impact on growth of economic activities, with the edge level set at 90% in 12 Eurozone countries. When government debt as a percentage of GDP exceeds this threshold, the impact on sustainable growth becomes unfavourable. The study discovered that private domestic investment, domestic saving, and total production level are mechanism via which public borrowing has no linearity relationship on economic growth.

Afonso and Jalles (2013), opined that rising government debt levels of more than 90% are being harmful to economic growth, it is advantageous to growth in production level. The area on which the effect of debt on growth of economic activities originated to worsen is estimated to be 59%. Panizza and Presbitero (2014) tracked down an unfavorable association among obligation and financial development however the impact blurred in the wake of controlling for endogeneity. They arrived at the resolution that the absence of causal connections among obligation and development in the wake of controlling for endogeneity is basic for strategy plan. Adebite et al. (2008) used annual time series data and ordinary least squares and generalized least squares method to investigate the impact of external debt on Nigeria's economic growth from 1975 to 2005. They found an inverse effect of external debt and its servicing obligations on economic growth. Although the external debt has acted positively on growth, it subsequently became negative. In the same year, Ayadi and Ayadi (2008) carried out a study on the effect of external debt and growth in Nigeria and South Africa. Their results showed a negative effect of external debt on growth in both countries although South Africa adheres to better management of external loans than Nigeria. Eberhardt and Presbitero (2015) tracked down no evidence of a typical obligation edge within nations while supporting a negative connection between government borrowing and sustainable economic growth across nations. Government obligation decreasingly affects development as it rises, and that obligation has an adverse consequence later a specific edge level (Chen, 2011).

Earliest studies have discovered an indirect effect of government borrowing on growth of economic activities (Abdelhafidh, 2014; Akhanolu et al., 2018; Kos and István, 2019; Gómez-Puig and Sosvilla-Rivero, 2017; Saxena and Shanker, 2018; Kengdo et al., 2020), but the unfavourable impact of government borrowing on growth of economic activities via the banking system not being systematically evaluated.

Higher interest rates, lower disposable income, and higher wages may result from budget shortfall supporting through local and international borrowing, all of which reduce business performance as a result, private investment may be discouraged or crowded out, lowering an economy's output level (Spilioti and Vamvoukas, 2015). Fiscal expansion, according to Keynesian economists, has the propensity to raise total demand for private-sector goods through the fiscal multiplier, thus motivating private-sector business growth. Government spending that is financed by debt decreases private area reserve funds. This is because of two central point:

First, when monetary strategy is expansionary, individual savers purchase financial instrument of government lower less investible cash to enhance investment speculation. Moreover, expanded public borrowing generally escalate cost of debt, and swarm out local venture investment. Besides that, current obligation crowd out independent investor speculation by changing the problem of debt overhang to looming ages (Gordon and Cosimo, 2018).

Classical economists believe that government borrowing is detrimental to most nation, mainly if it decreases mutually the fiscal correction of the budget implementation, processes and local as well as international investor private sector fund access. The argument here is that government liability settlements, mainly from international entities, stifle growth and economic development by deterring local-private investment and prospective overseas investors. Equivalence hypothesis by Ricardo states that fiscal corrections and stabilization exertions have no effect on growth and economic development. The hypothesis holds that disparities in national revenue and expenditure are harmonised by fluctuations in domestic mobilized savings (Saungweme et al., 2019).

Several empirical studies have been steered on the connection between public-borrowing and growth, with mixed results. These studies' findings tend to support conventional wisdom, suggesting that borrowing below some verge can stimulate economic-growth whereas borrowing far beyond established benchmark can quash nations-growth.

Babu et al. (2015) from 1990 to 2010, the Solow-Swan development model was extended for obligation to dissect the impact of home obligation on monetary development in East African nations. As indicated by the findings, local debt had a huge constructive outcome on growth of economic activities in Eastern Africa economies. Nonetheless, the review's discoveries depend on cross country information, and they cannot be straightforwardly used in developing countries like Nigeria.

Udeh et al. (2016) employed regression analysis and yearly from 1980 to 2013 were used to examine the effect of government debt on economic-growth in Nigeria. The findings show evidence of causality between the variables of government obligation and expansion of economic activities in Nigeria. The review was built on information that could have been influenced by recent changes in the public authority's obligation spot and did not take into account any control factors. Elom-Obed et al. (2017) used Vector Error Correction Model (VECM) and annual data from 1980 to 2015 were employed to examine the connection between Nigerian foreign borrowing on growth of economic activities. The variables in the study included RGDP, foreign debt, domestic debt, and domestic private savings. The study's findings revealed that foreign and domestic debt have a significant negative impact on Nigeria's economic growth. The study had main factor errors bias and used an incomplete estimation method that did not yield credible coefficient estimates for the study variables.

Using time series data from 1961 to 2013 and the ARDL method, Gómez-Puig et al. (2017) studied the link between government borrowing and national growth in Eurozone-nations. According to

the findings, public debt has a significant negative impact on the long-run growth of Eurozone member countries, while immediate impact may be direct contingent on the economies. The research focused on Euro-countries and laid the groundwork for future research into the impact of public debt on Nigerian economic growth.

Thao (2018) examined the impact of public debt on growth of economic activities in six ASEAN countries from 1995 to 2015: Thailand, Philippines, Malaysia, Indonesia, Singapore and Vietnam. Assessing the effect of public borrowing indicators on economic growth, panel estimation technique was used. The study outcome shows that government debt, GFCF, FDI, and real effective exchange-rate had positive influence on growth in economic activities, population changed had an indirect influence on the growth level of the observed countries. ASEAN- nations data were employed to carried out the study, and the research outcome may not suit Nigeria environment.

Mhlaba et al. (2019) use bound testing technique with data from 2002 to 2016 to evaluate post immediate and immediate impact of government borrowing on change in economic activities in South African economy. GDP was modelled as a function of investment, net and gross borrowing, change in price level, and trade terms. The study outcome showed that, government borrowing has a significant negative effect on economic growth. The study is based on South African data and provides a foundation for investigating the effect of public borrowing on growth in economic activities in Nigeria. Using a multivariate dynamic ARDL approach. From 1979 to 2017, Saungweme and Odhiambo (2019) examine the direction of connection between public borrowing, debt servicing, and economic growth in Zambia. Achieving this goal, RGDP was measured as a function of government debt profile, public expenditure balance, and savings as a percentage of GDP. The empirical findings in Zambia show a non-bi-causal relationship between economic growth and public debt. The empirical outcome of the study is based on the premise that the growth rate of any economy is critical in determining the size of government debt. The analysis was conducted in Zambia, which created a regional lacuna and which cause a need for a single country analysis (Nigeria specific study).

The majority of empirical research on this area has concentrated on the impact of foreign debt on economic growth in emerging economies (Pattillo et al., 2004; Udeh et al., 2016; Kharusi and Ada, 2018; Kengdo et al., 2020). As a result, carrying out research only on a subcategory of the total may not provide a precise and correct picture of the difficult and complicated connection which occurs between government borrowing and economic growth in Nigeria, as overseas borrowing represents for solitary component of the total. Moreover, the large percentage of country specific study such as (Nigerian), empirical studies revised established their objectives and resistor variables haphazardly in representing the connection between public-debt and growth of a nation, ignoring to capture some principal variables stated in the empirical and theoretical literature. This study integrated core variable needed to make the study robust when establishing connection between public borrowing and growth-based variables in order to reduce misspecification errors and prevent against the established lacuna in variables used in earliest studies. As a result, this current-study

shown a multi-dimensional assessment of the relationship amid public borrowing metrics and growth in economic activities in Nigeria, which will aid in suggesting if domestic borrowing or foreign borrowing is more effective in stimulating higher levels of investment and economic activity in Nigeria. In addition, unlike many previous studies, this study employed a moderately extensive and complex data set that spans 36 years. The usefulness of a larger annual data set in any ARDL analysis cannot be overstated. Furthermore, based on the results, this study will make useful, relevant, and functional references for better strategy design.

### 3. METHODOLOGY

#### 3.1. Nature and Sources of Data

Secondary sources were used to collect the data for this study. These were time series data collected from Nigerian Central Bank, the World Bank, and the International Monetary Fund (IMF) statistical databases. Data were collected on the following macroeconomic variables: Infrastructure (INFRA), External Debt Stock (EDS), Domestic Debt Stock (DDS), and Education (EDU) and Real Gross Domestic Product (RGDP). Given the availability of data limitation, variables time frame is 36-year period from 1986 to 2020. Since there is a scarcity of available data on 3-monthly public borrowing, all employed-variables are calculated in nominal terms on an annual basis, using rates found from their various sources. Secondary data was used since it had already been swotted by professionals and other supervisory bodies before publication.

#### 3.2. Econometric Specification

Examining the impact of public debt on economic growth in Nigeria, an open multivariate debt-growth model consenting for main control variables was specified below:

$$GDP = f(\text{debt}) \quad (1)$$

Where GDP = Real domestic product  
Debt = total government debt in the economy

Furthermore, the functional specification can also be stated by incorporating other exogenous variables into the function

$$GDP = f(\text{EXTD}, \text{DDO}, \text{EDU}, \text{INFRA})$$

Where DDO = domestic debt outstanding  
EDU = educational spending  
INFRA = infrastructural development

Thus, the functional relationship can be modelled in ARDL

$$\Delta GDP_t = \alpha_0 + \varphi GDP_{t-1} + \sum_{j=1}^{m=3} \varphi_j^* \Delta EXTD_{t-j} + \beta_1 DDO_{t-1} + \beta_2 EDU_{t-1} + \beta_3 INFRA_{t-1} + \varepsilon_t \quad (2)$$

The apriori expectation of the variables are stated below: External debt to be positive or negative, domestic debt outstanding is expected to be negative or positive, educational spending is expected to be positive and infrastructural development is expected to be positive with economic growth.

## 4. RESULTS AND DISCUSSIONS

#### 4.1. Unit Root Test

The results of the stationarity using Augmented Dick Fuller (ADF) and Phillips Perron (PP) test are abridged in Table 1. The analysis indicate that the variables are of H and G.

#### 4.2. ARDL Bounds Testing

The results of the Bounds testing are shown in Table 2. The calculated F-Statistics (26.35) is greater than the upper bound critical value at a 5% error level (4.01). The study predicted that the estimated ARDL models have a long run co-integration relationship based on this. As a result, the null hypothesis that no co-integration exists is rejected.

#### 4.3. Long Run Coefficients using ARDL Approach

The long-run assessment in Table 3 below indicates that, the GDP into two lag periods indicates a positive relationship exists between GDP (-2) and current GDP, which is significant at the 1% level. Essentially, the immediate past of DDO on GDP is positive (0.02) and 1% level significant. Every unit increase in government debt results in a 0.02 increase in economic growth. Nonetheless, the rate of growth is not responding well to debt. At a 1% level of significance, the DDO into two lag periods displays a negative connexion with GDP. This means a unit rise in outstanding domestic debt results in a 0.014 decrease in GDP. DDO into four lag periods also shows indirect connexion with economic-growth, with each unit increase in DDO resulting in a 0.02 reduction in economic growth at the 1% level of significance. The unfavourable effect of DDO on growth of economic activities demonstrated that public debt stock from the Nigerian capital market stifles local-private investment growth via a multiplier-possibilities on private-sector manufacture activities. This implies that the borrowed fund's rate of return on investment could not concealment the burden of debt servicing and the domestic interest rate. Essentially, EDU has direct connection with GDP after a 1-year lag and is significant at the 5% level. As implication, any unit change in EDU results in a 0.07 increase in GDP. EDU has a favourable effect on GDP at a 1% and 5% level of significance at two and three periods, respectively. It means that any one unit change in EDU will result in a 0.24 and 0.08 increase in GDP, whereas EDU in a 4-year lag is negative related to GDP with -0.195 at a 1% level of significance, the implication of which was due to the spill-over effect of external debt to growth, which directly affects education spending and development as a result of the country's increased productive capacity. INFRA is negatively related to GDP after one, two, three, and four lag periods, with -0.245, -0.626, -0.542, and -0.206, respectively. Simply put, any one-unit change in debt causes a -0.245, -0.626, -0.542, and -0.206 drop in economic growth. EXTD in the current year, three lag period, and four lag period is negatively related with 1%, 5%, 1%, and 1% significance-level, correspondingly. The indirect correlations between external debt and GDP validate the debt overhang hypothesis, which states that government borrowing externally has not been resourcefully applied in growing the economy's production network, which will result in long-term economic growth. EXTD in a two-lag period is positively related to 8.32 at a 5% level of significance. This shows that 1%-point

**Table 1: Unit root test**

$V_t$	ADF null ( $H_0$ ): Non-stationary				Phillips-Perron null ( $H_0$ ): non-stationary				
	$ADF_\alpha$				$PP_\alpha$				
	$T_{cat}$	1%	5%	Prob.	$T\tau$	1%	5%	Prob.	
Intercept without time trend									
GDP	-3.68	-3.64	-2.95	0.09	-3.57*	-3.64	-2.95	0.01	
DDO	-7.04	-3.64	-2.95	1.00	-7.20	-3.64	-2.95	1.00	
EXTD	-1.41	-3.65	-2.95	0.57	-0.79	-3.64	-2.95	0.81	
EDU	-1.59	-3.64	-2.95	0.99	4.44	-3.64	-2.95	1.00	
INFRA	1.06	-3.65	-2.96	0.99	-0.23	-3.64	-2.95	0.93	
$\Delta$ DDO	-0.69	-3.66	-2.96	0.83	-1.52	-3.65	-2.95	0.51	
$\Delta$ EXTD	-4.31	-3.64	-2.95	0.00	-4.23	-3.65	-2.95	0.00	
$\Delta$ EDU	-4.78	-3.65	-2.95	0.00	-4.70	-3.65	-2.95	0.00	
$\Delta$ INFRA	-6.87	-3.65	-2.96	0.00	-9.82	-3.65	-2.95	0.00	
Intercept with time trend									
GDP	-3.58*	-4.25	-3.55	0.05	-3.44	-4.25	-3.55	0.05	
DDO	-2.07	-4.25	-3.55	1.00	3.21	-4.25	-3.55	1.00	
EXTD	-0.85	-4.25	-3.55	0.95	-0.85	-4.25	-3.55	0.95	
EDU	-0.94	-4.25	-3.55	0.94	-0.15	-4.25	-3.55	0.99	
INFRA	-3.60*	-4.25	-3.55	0.04	-3.57	-4.25	-3.55	0.04	
$\Delta$ DDO	-4.29**	-4.27	-3.56	0.01	-3.94	-4.26	-3.55	0.00	
$\Delta$ EXTD	-4.44**	-4.26	-3.55	0.01	-4.35	-4.26	-3.55	0.01	
$\Delta$ EDU	-5.39**	-4.26	-3.55	0.00	-10.26	-4.26	-3.55	0.00	
$\Delta$ INFRA	-12.13**	-4.26	-3.55	0.00	-6.39	-3.70	-3.13	0.00	

$ADF_\alpha$  MacKinnon (1996) one-sided P values;  $PHP_\alpha$  Phillip-Perron (1996); \*Significant when all others are not; \*\* Stationary at 5%; Authors' calculation.  $H = I(0)$  and  $G = I(1)$

**Table 2: ARDL bounds testing**

Test statistic	Value	K
F-Statistic	26.35	4
Significance	I0 Bound	I1 Bound
10%	2.46	3.54
5%	2.88	4.02
2.5%	3.26	4.48
1%	3.73	5.09
Z: 26.35	Lag (K) = 4	
G: (5%) <sup>4</sup>	I (0): 2.86, I (1): 4.01	

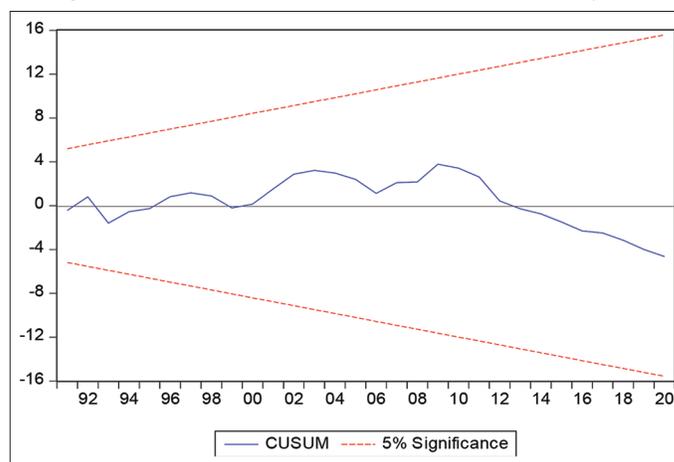
Author's computation, 2022. Z: Computed F-statistic, G: Critical bound value

increase in EXTD results in an 8.32%-point increase in GDP. The long-run ARDL model validates the debt overhang hypothesis, which states that the greater the gap between existing debt and debt service payment, the greater the fall in the rate of growth, that is also constrained by macroeconomic and political uncertainties in emerging markets, as well as the immediate presence of declining investment prospects in developing markets. In Nigeria, however, devious, dishonest political leaders and administrators routinely transfer public debt from the country to developed nations, reducing available funds for infrastructure development and having a negative impact on the economy. The underlying ARDL equation's regression fits very well ( $R^2 = 98\%$ ), while the adjusted R-square is 90%. After establishing the existence of a long as well as the short run dynamics must be estimated to control the rate of modification between GDP and other independent variables.

**4.4. Short Run Coefficients using ARDL Approach**

Table 4 below shows the short-run dynamic coefficients related with the long-run associations obtained from the ECM equation. In the long run, the signs of the short-run dynamic effects persist. The equilibrium correction coefficient, estimated at -0.8011 (0.001122), is highly significant with a predictable sign, indicating a speedy change in symmetry following a shock. In

**Figure 1: Cumulative sum of recursive residuals (stability test)**



the current year, approximately 80% of the imbalances from the previous year's shock converge back to the long-run equilibrium.

The regression for the basic ARDL model allows for investigational assessments against functional form misspecification, serial correlation, non-normal errors, and passed the heteroscedasticity test at 5%. The stability of the error corrections model should always be graphical investigated (Pesaran, Shin and Smith, 2001). Figures 1 and 2 show a schematic representation of the Cumulative Sum (CUSUM) and the Cumulative Sum of squares (CUSUMSQ). The cumulative sum (CUSUM) and cumulative sum of squares (CUSUMSQ) plots are shown in stability tests 1 and 2, indicating that the coefficients have remained stable over the sample period.

The regression for the underlying ARDL model passes the diagnostic tests against serial correlation, and passed the heteroscedasticity test at 5%. The conditional and unconditional test also indicates a P-value of 28% for the observed  $R^2$  denoting

**Table 3: Long-run estimation using ARDL-approach**

Variable	Coefficient	Std. error	t-statistic	Prob.*
GDP (-2)	0.394852	0.112625	3.505892	0.0127
DDO (-1)	0.020805	0.0027	7.704386	0.0003
DDO (-2)	-0.014341	0.00216	-6.639184	0.0006
DDO (-3)	0.007252	0.003069	2.362865	0.0561
DDO (-4)	-0.015704	0.003745	-4.193766	0.0057
EDU (-1)	0.071314	0.025093	2.842007	0.0295
EDU (-2)	0.24922	0.043038	5.790653	0.0012
EDU (-3)	0.086875	0.029607	2.934248	0.0261
EDU (-4)	-0.195397	0.045631	-4.282134	0.0052
INFRA (-1)	-0.244619	0.050353	-4.858109	0.0028
INFRA (-2)	-0.626218	0.077549	-8.075158	0.0002
INFRA (-3)	-0.542801	0.061528	-8.821986	0.0001
INFRA (-4)	-0.20588	0.030399	-6.772594	0.0005
LOG_EXTD	-11.80861	3.126204	-3.777299	0.0092
LOG_EXTD (-2)	8.320241	3.347898	2.485214	0.0475
LOG_EXTD (-3)	-19.99573	3.745162	-5.339083	0.0018
LOG_EXTD (-4)	30.3038	3.850979	7.869117	0.0002
C	1379.686	185.8183	7.424921	0.0003
R-squared	0.980845	Mean dependent VAR	4.341822	
Adjusted R-squared	0.904227	S.D. dependent VAR	4.081692	
S.E. of regression	1.263172	Akaike info criterion	3.275804	
Sum squared resid	9.573614	Schwarz criterion	4.432245	
Log likelihood	-25.77496	Hannan-Quinn criter	3.652775	
F-statistic	12.80166	Durbin-Watson stat	2.15353	
Prob. (F-statistic)	0.002183			

Authors computation, (2022)

**Table 4: Estimated short run coefficients**

Variable	Cointegrating form			
	Coefficient	SE	t-statistic	Prob.
D (EDU [-1])	-0.24922	0.043038	-5.790653	0.0012
D (EDU [-2])	-0.086875	0.029607	-2.934248	0.0261
D (EDU [-3])	0.195397	0.045631	4.282134	0.0052
D (DDO [-1])	0.014341	0.00216	6.639184	0.0006
D (DDO [-2])	-0.007252	0.003069	-2.362865	0.0561
D (DDO [-3])	0.015704	0.003745	4.193766	0.0057
D (INFRA [-1])	0.626218	0.077549	8.075158	0.0002
D (INFRA [-2])	0.542801	0.061528	8.821986	0.0001
D (INFRA [-3])	0.20588	0.030399	6.772594	0.0005
D (LOG_EXTD)	-11.808607	3.126204	-3.777299	0.0092
D (LOG_EXTD [-1])	-8.320241	3.347898	-2.485214	0.0475
D (LOG_EXTD [-2])	19.99573	3.745162	5.339083	0.0018
D (LOG_EXTD [-3])	30.303802	3.850979	7.869117	0.0002
CointEq (-1)	-0.821151	0.201841	-4.068307	0.0066

Cointeq = GDP-(0.2552\*EDU + 0.0038\*DDO -1.9092\*INFRA -69.6650, \*LOG\_EXTD+1680.1867), Authors computation, (2022)

**Table 5: Breusch-Godfrey serial correlation LM test**

F-statistic	2.945482	Prob. F (2, 4)	0.1635
Obs "R" squared	18.46331	Prob. Chi-square (2)	0.0001

Authors computation, (2022)

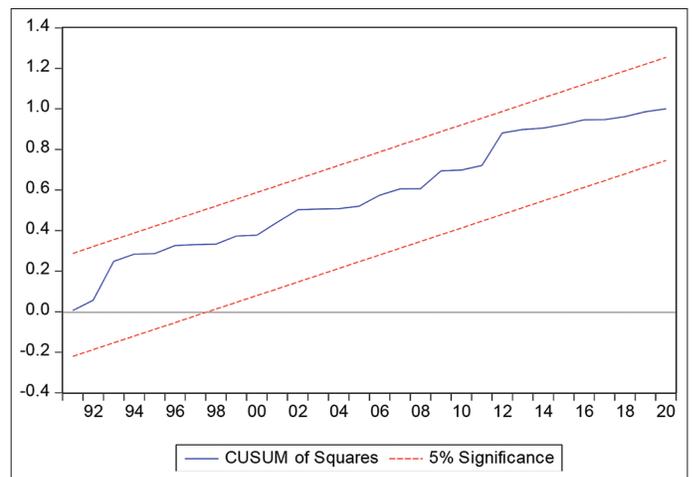
**Table 6: Heteroskedasticity test: Breusch-pagan-godfrey**

F-statistic	1.949938	Prob. F (24, 6)	0.2074
Obs "R" squared	27.47717	Prob. Chi-square (24)	0.2827
Scaled explained SS	1.688087	Prob. Chi-square (24)	1.0000

Author's Computation, (2022)

that the null hypothesis that the residuals have no AR-CH effect cannot be overruled. All tests confirmed that the model is appropriate for forecasting policy.

**Figure 2:** Plot of cumulative sum of square of recursive residuals (stability test)



The serial correlation L-M test shows a P-value of 1% for the observed R<sup>2</sup> which signify the relevance of the null hypothesis that the residuals are not serially correlated using the Breusch-Godfrey (Tables 5 and 6).

## 5. CONCLUSION AND RECOMMENDATION

Utilizing annual data for the period of 1986-2020, this study examined the post and immediate effects of public debt on economic growth in Nigeria. To achieve this aim, a growth model function was stated and appraised utilizing anonymised elements of government borrowing and similarly a group of control variables such as domestic debt outstanding, education spending, and infrastructure spending. After achieving data stationarity, the ARDL cointegration approach

was used for data analysis. The empirical findings shown that foreign borrowings slowed-down economic growth in a long run whereas boosting it in the short run. Domestic borrowing had an inverse effect of slowing long-run economic growth and an indirect effect of promoting short-run growth. Education promotes growth in both the long and short run, whereas external debt slows growth in the long run while boosting growth in the short run. The coefficient of co-integrating equation showed a fast adjustment speed parameter of 82% convergence to long-run equilibrium after a shock, while parameter stability and robustness checks demonstrated that the model's estimated parameters are structurally and dynamically stable.

In terms of policy suggestions, investible projects that will be funded by public debt should be carefully assessed and their practicality, commercial viability, and monetary attractiveness determined before resources are allocated and can help to stabilize monetary limitation and reduce misallocation and unproductive control of government led-debts. Internal-debt, moderately preferred than international borrowing, which can propel Nigeria's economy forward. This is because repaying the actual amount borrowed and paying interest on such locally sourced borrowing is a channel of promoting economy growth and development, which can enhance growth of domestic investment in the economy.

Foreign debt, on the other hand, would necessitate more capitals to refund and service the obligation, undermining the anticipated positive effect on economic-growth. Economic as well as fiscal restructurings that broaden the proceeds base, improve tax capacity, and reduce wasteful government spending must be designed. Also, ensuring foreign and local borrowing are subjected to conditions that yield productive and continuous sustainable borrowing and ensure profitable investment of borrowed fund is an essential element for the government to consider which can validate long term productive and employment growth in the economy.

## REFERENCES

- Yusuf, A., Mohd, S. (2021), The impact of government debt on economic growth in Nigeria. *Cogent Economics and Finance*, 9, 29-50.
- Abdelhafidh, S. (2014), External debt and economic growth in Tunisia. *Panoeconomicus*, 6, 669-89.
- Adebite, E.O., Ayadi, F.S., Ayadi, O.F. (2008), The impact of Nigeria's external debt on economic development. *International Journal of Emerging Market*, 3(3), 285-301.
- Afonso, A., Huart, F., Jalles, J.T., Stanek, P. (2019), Assessing the sustainability of external imbalances in the European Union. *World Econ.* 42(2), 320-348.
- Akhanolu, I.A., Babajide, A.A., Akinjare, V.A., Tolulope, O., Godswill, O. (2018), The effect of public debt on economic growth in Nigeria: An empirical investigation. *International Business Management*, 12(6), 436-441.
- Åkos, D., István, D. (2019), Public debt and economic growth: What do neoclassical growth models teach us? *Applied Economics*, 51(29), 104-121.
- Ayadi, F.S., Ayadi, O.F. (2008). The impact of external debt on economic growth: A comparative study of Nigeria and South Africa. *Journal of Sustainable Development in Africa*, 10(3), 234-63.
- Babu, J.O., Kiprop, S., Kalio, A.M., Gisore, M. (2015), Effect of domestic debt on economic growth in the East African community. *American Journal of Research Communication*, 3(9), 73-95.
- Chen, S.W. (2011). Current account deficits and sustainability: evidence from the OECD countries, *Economic Model*, 28(4), 1455-1464.
- Elom-Obed, F.O., Odo, S.I., Elom-Obed, O., Anoke, C.I. (2017), Public debt and economic growth in Nigeria. *Asian Research Journal of Arts and Social Sciences*, 4(3), 1-16.
- Gordon, L., Cosimo, M. (2018), Government debt in EMU countries. *The Journal of Economic Asymmetries*, 18(C), 1-14.
- Gómez-Puig, M., Sosvilla-Rivero, S. (2017), Public Debt and Economic Growth: Further Evidence for the Euro Area. Working Paper. University of Barcelona: Research Institute of Applied Economics. p1-37.
- Joy, J., Panda, P.K. (2020), Pattern of public debt and debt overhang among BRICS nations: An empirical analysis. *Journal of Financial Economic Policy*, 12(3), 345-363.
- Kharusi, S.A., Ada, M.S. (2018), External debt and economic growth: The case of emerging economy. *Journal of Economic Integration*, 33(1), 1141-1157.
- Kengdo, A.A.N., Ndeffo, L.N., Avom, D. (2020), The effect of external debt on domestic investment in Sub-Saharan African regions. *The Economic Research Guardian*, 10(2), 69-82.
- Madow, N., Nimonka, B., Brigitte, K.K., Camarero, M. (2021), On the robust drivers of public debt in Africa: Fresh evidence from Bayesian model averaging approach. *Cogent Economics and Finance*, 9(1), 1860282.
- Mhlaba, N., Phiri, A., Nsiah, C. (2019), Is public debt harmful towards economic growth? New evidence from South Africa. *Cogent Economics and Finance*, 7(1), 1603653.
- Ogbonna, K.S., Ibenta, S.N., Chris-Ejiogu, U.G., Atsanani, A.N. (2019), Public debt services and Nigerian economic growth: 1970-2017. *European Academic Research*, 6(10), 22-34.
- Panizza, U., Presbitero, A. (2014). Public debt and economic growth: Is there a causal effect? *Journal of Macroeconomics*, 12(1), 110-128.
- Pattillo, C., Poirson, H., Ricci, R. (2004), What are the channels through which external debt affects growth? *Review of Economics and Institutions*, 2(1), 1-30.
- Pesaran, M.H., Shin, Y., Smith, R.J. (2001), Bounds testing approaches to the analysis of level relationships, *Journal of Applied Econometrics*, 16, 289-326.
- Rahman, M., Islam, A. (2020), Some dynamic macroeconomic perspectives for India's economic growth: Applications of linear ARDL bounds testing for co-integration and VECM. *Journal of Financial Economic Policy*, 12(4), 641-658.
- Saungweme, T., Odhiambo, N.M., Camarero, M. (2019), Government debt, government debt service and economic growth nexus in Zambia: A multivariate analysis. *Cogent Economics and Finance*, 7(1), 1622998.
- Saxena, S.P., Shanker, I. (2018), External debt and economic growth in India. *Social Sciences Asia*, 4(1), 15-25.
- Spilioti, S. Vamvoukas, G. (2015), The impact of government debt on economic growth: An empirical investigation of the Greek Market. *The Journal of Economic Asymmetries*, 12, 34-40.
- Thao, P.T.P. (2018), Impacts of public debt on economic growth in six ASEAN countries. *Retsumeikan Annual Review of International Studies*, 17(1), 63-88.
- Udeh, S.N., Ugwu, J.I., Onwuka, I.O. (2016), External debt and economic growth: The Nigeria experience. *European Journal of Accounting Auditing and Finance Research*, 4(2), 33-48.