

## Does Public Debt Determine Economic Growth; Evidence from Nigeria

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### **Authors' contributions**

*This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.*

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### **ABSTRACT**

The study examined the impact of public debt on economic growth of Nigeria with data captured from 1990-2020. Real Gross Domestic Product Growth Rate formed the dependent variable while external debt, domestic debt, exchange rate, inflation and interest rate are the independent variables. The study adopted Ex-post facto research design and also employed Ordinary Least Square analytical method. The findings of the study revealed that external debt had a positive and significant relationship with the real gross product growth rate, internal debt had a positive and significant relationship with the real gross product growth rate and that there was a uni-directional causality relationship between real gross product growth rate and external debt. The study therefore recommended that government should professionally manage the nations rising debt profile so as to avoid future debt trap, they should influence increase in local productivities and access to local financial facilities more and that they should also ensure stable exchange rate value of Naira.

*Keywords: Public debt; economic growth; Nigeria; OLS.*

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## 1. INTRODUCTION

Government borrows when her revenues fall short of her expenditures. Many countries have resorted to borrowing from their fellow countries to settle the fall in their revenue. Public debt being a critical tool for government authority to fund public spending has left many countries with massive outstanding debts. Borrowing reasonably to finance infrastructural and public development are keys to faster economic growth. Excessive borrowing without adequate financial planning for investment will lead a country into long term debt burden which on the long run leads to economic problem [1].

Public debt according to Nzotta [2] is the specific amount of money owned by the apex government to institutions or agencies within the country or outside the country. According to the IMF (2012) in Kui-Wai Li [3] "public debt is defined as the gross general government debt expressed as a percentage of Gross Domestic Product". Public debt can be either external or internal debt. It is referred to as internal debt when the component of the total government debt in a country is owed to lenders within the country while external debt is debt owed to foreign lenders. Public debt as an engine of growth is seen as a process of enabling a developing country increase its rate of real investment. In the sense it increases per capita GNP or its component measures. It acts as a source of capital formation. Foreign public debts supplements domestic debts. By supplementing domestic debts, external debts if properly put into production enhances overall economic development.

Nigeria is currently ranked among Sub-Saharan heavily indebted countries with a stunted GDP growth rate fast dwindling income per capita, high poverty level and retarded export growth rate [4]. Ogunjimi [5] noted that Nigeria's external debt rose from #2.3 billion to #633.1 billion between 1980 and 1990. In 1994, the ratio of total debt to GDP which captures debt burden rose from 108.2% and 19.9% in 1980. In 1995 and 1997, it falls between 53.5% and 32.5% respectively. Between 1998 to 2006 it shows upward movement again. The Paris club debt relief in 2005 reduced the debt burden on Nigeria economy. Nigeria has been struggling with high debt service to revenue ratio since after the recession experienced in 2016. Out of the total revenue of #4.1 trillion realized in 2019, it spent #2.45 trillion in debt servicing. In the year 2020,

83% of revenue generated in Nigeria was used to service its debt obligation.

It is against this background that the study tends to examine the impact of public debt on economic growth of Nigeria with data captured from 1990-2020.

The definition and measurement of public debt burden generally present some peculiar problems. Basically, there is the problem of obtaining reliable economic data for evaluating the various debt burden measurements. There are no comprehensive data on private non-guaranteed and short-term debts which form a sizeable proportion of the aggregate debts of developing countries Nigeria inclusive. The analysis of the debt prospects excludes these variables. There are also the problems of determining at what point the burden of debt is considered excessive. The researcher decided to embark on this study based on the above mentioned problems.

## 2. REVIEW OF RELATED LITERATURE

### 2.1 Conceptual Review

Asogwa Okechukwu And Onyekwelu [6] defined Debt as finance owed by the debtor to the creditor whereby the debtor may be a country, company or an individual and the creditor may be a bank, , payday loan provider or an individual. Anidiobu, Agu and Ezinwa [7] saw debt as the sum of money in use in a country which may or may not be generated by residents. Muhammad, Ruhaini, Nathan and Arshad [8] ascertained that debt is obtained in other to handle expenses that will adversely increase productivity and improve of the growth of the economy.

Public debt is defined as the amount of debt borrowed by government from internal as well as external sources to meet out its deficit. Public debt according to Nzotta [2] is the specific sum owned by the apex government to institutions or agencies within the country or outside the country. The internal debt consists of debt owned by the government to its citizens or financial institutions while the external debt comprises of debt from international financial institutions or other countries of the world.

Erhieyovwe and Onovwoakpoma, [9] opined that when loans are not optimally used, public debt will become a burden to countries, therefore income on investments becomes insufficient to meet maturing debts thereby hindering economic growth. Loans when not economically injected

into viable projects, the repayment of both the principal and agreed interest becomes difficult. This is the position where Nigeria is today because investments that will accordingly result to high-speed growth with a positive effect on poverty, is moving sporadically in both positive and negative directions. This situation has resulted to broadening of savings-investments gap and debt accumulation which requires a large proportion of government revenue and reduction of foreign reserves to service [10]. In Nigeria, deficit financing has led to borrowings from richer countries, multinational finance institutions, such as the International Monetary Fund (IMF), the World Bank, African Development Bank (ADB), China amongst others. Unfortunately, the rising national debt in Nigeria has begun to outweigh the country's revenue generation capacity and drawing down on foreign reserves, hence stifling the much-needed public capital investments and economic productivity.

**2.1.1 Conceptual framework**

The research is made up of two independent variables and one dependent variable.

**2.2 Theoretical Framework**

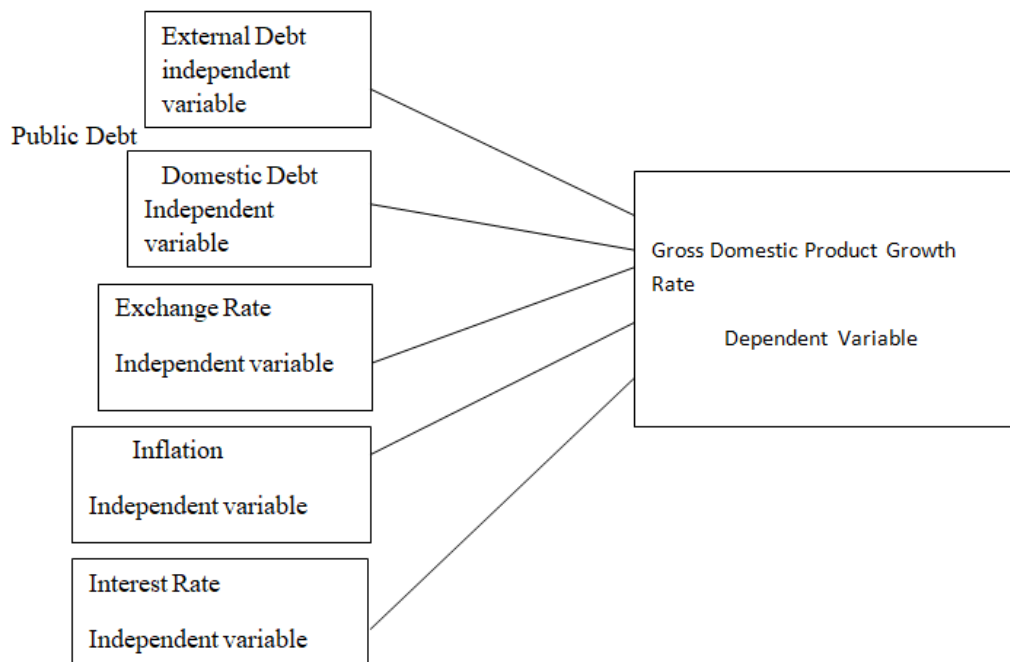
The following theories were reviewed in this study:

**2.2.1 Debt overhang theory**

Howard propounded the debt overhang theory in the year 1972. Debt overhang is defined as a situation whereby a government or an organization finds it difficult to borrow new loan because of its existing debts.

This problem of debt overhang emerges, in a situation whereby a company has the opportunity to embark on a new investment but cannot be able to cease such opportunity because it has previous debt that is higher than the new investments expected return. This will make the shareholders very reluctant to invest more money in such an investment because the proceeds from the investment will be taken by the debt holders.

The expected debt service in Nigeria economy is seen as an increasing function to her output Asogwa Okechukwu And Onyekwelu [6]. This ugly situation has led to increased uncertainty in the economy thereby discouraging foreign investors from investing. Some researchers are of the opinion that if government bought toxic assets or common stock in troubled banks, it will help to correct the debt overhang problem because countries or firms facing debt overhang cannot issue new debt as default is likely to occur.



**Fig. 1. Conceptual framework**

## 2.2.2 Keynesian school on public debt

Keynes argued that demand determines supply in the economy. In Keynes view, deficiencies in demand lead to unsold goods and thus lead to unemployment of factors of production. He attributed unemployment, poverty and even depression to insufficient demand which leads to downward curl. Keynes' solution to these instances was to trigger demand by using fiscal policy measure which includes increase in government spending and reduction in taxes using deficit budgeting as a tool which will lead to debt accumulation, this will encourage the public to increase spending to close the gap leading to depressions. The idea is expansionary fiscal policy measure which encourages the public or government to increase spending which ultimately affect the economy. To eliminate public debt, Keynes in his wisdom advocated surplus budgeting as a tool to lower or eliminate public debt in time of prosperity.

## 2.3 Empirical Review

Ugwuanyi, Ugwuanyi, Efanga and Agbaeze [1] investigated on external debt management and economic development in Nigeria. The researchers employed Ordinary Least Square multiple regression method. The findings of the study revealed that external debt management has positive and significant impact on economic development in Nigeria.

Eke and Akujuobi [11] investigated public debt and economic growth in Nigeria: An empirical investigation with data captured from 1981-2018. The study employed Philip-Peron unit root test, co-integration and Vector Autoregressive Model (VAR) for the data analyses. The findings of the study revealed that there is a significant short-run relationship between Nigeria's public debt and economic growth.

Opara, Nzotta and Kanu [12] analyzed Nigeria's domestic public debts and economic development with data captured from 1981-2018. The study employed Ordinary Least Square regression tools for the data analyses. The findings of the study revealed that domestic debt has significant impact on economic development of Nigeria.

Hilton [13] empirically examined public debt and economic growth: Contemporary evidence from a developing economy (Ghana). Dynamic multivariate Autoregressive- Distributed Lag

(ARDL) based Granger-causality model was used to test the causal relationships between public debt and economic growth from 1978-2018. The findings of the study revealed that public debt has no causal relationship with Gross Domestic Product in the short-run but there is unidirectional Granger causality running from public debt to Gross Domestic Product in the long-run.

Gorge-Anokwuru and Inimino [14] examined external debt and economic growth in Nigeria with data captured from 1980-2017. Autoregressive Distributed Lag techniques and Augmented Dickey-Fuller unit root test were employed for the study. The findings of the study stated that external debt and external debt service has negative and significant effect with economic growth in Nigeria.

Bossou and Duke [15] researched on the effect of domestic debt on economic growth of Nigeria 1981-2016. The analytical tools for the study were Ex-post Facto research design and Autoregressive Distributed Lag model. The findings of the study revealed that domestic debt has significant effect on economic growth of Nigeria.

Ajayi and Edewusi [16] analyzed the effect of public debt on economic growth of Nigeria: an empirical investigation with secondary data spanning from 1982-2018. The findings of the study revealed that external debt has negative effect on economic growth of Nigeria while domestic debt has positive effect on economic growth of Nigeria.

Ayuba and Shazida [17] examined domestic debt and economic growth in Nigeria: an ARDL bounds test approach. The study employed Autoregressive Distributed Lag (ARDL) approach and bound test as proposed by Narayan. The findings of the study revealed that domestic debt has a positive effect on the total aggregate government revenue and economic growth in Nigeria for the period of research which is 1981-2013.

Khaled and Mohammad [18] investigated the impact of external debt on economic growth in Jordan between the periods of 2010-2017. The methodology employed was Ordinary Least Square regression method. The findings of the study revealed that there is a negative and significant impact of external debt on economic growth between the periods of review.

Orji [19] studied the effect of foreign debt on economic growth of Nigeria. They employed Ordinary least square method. The findings of the study revealed that there is a positive but insignificant relationship between foreign debt stock and gross domestic product.

**2.3.1 Summary of empirical review**

This table below shows the summary of empirical reviewed by identifying the author and year, area of study, title, the methodology used in the analysis and findings.

**2.4 Gap in Empirical Literature**

The foregoing review of empirical studies indicated that the relationship between public debt and economic growth have been mixed and inconclusive ranging from geographical location to wrong applications of analytical methods and time frame. The irregularities in the empirical review gave birth to the need for fresh empirical evidences on the relationship between public debt and economic growth of Nigeria. More specifically, the research will use Real Gross Domestic Product Growth Rate (GDPGR), proxies for economic growth and external debt, domestic debt, exchange rate, inflation and interest rate as the variables for the research with Ordinary Least Square technique which has not been done so in all the research work reviewed [20-24].

**3. METHODOLOGY**

**3.1 Sources of Data**

The data {External Debt (EDEBT), Domestic Debt (DDEBT), Exchange Rate (EXCH), Inflation (Infl) and Interest Rate (INT)} used in this research are from secondary sources. All the data employed were sourced from central bank of Nigeria statistical bulletin 2020. Eviews 9 econometric software will be utilized for the analysis.

**3.2 Model Specification**

The functional relationship of the model is stated as follows:

$$GDPGR = f(DDEBT, EDEBT, EXCH, INFL, INT) \dots \dots \dots (1)$$

The econometric model is specified as follows:

$$GDPGR_t = \beta_0 + \beta_1 LDDEBT_t + \beta_2 LEDEBT_t + \beta_3 EXCH_t + \beta_4 Infl_t + \beta_5 INT_t + \mu_t \dots \dots \dots (2)$$

Where:

- GDPGR=Real Gross Domestic product Growth Rate
- LDDEBT=Log of Domestic Debt
- LEDEBT=Log of External Debt
- EXCH=Exchange Rate
- Infl=Inflation
- INT(prime)=Interest Rate
- $\beta_0, \beta_1, \beta_2, \beta_3, \beta_4$  and  $\beta_5$  = parameters and  $\mu$  = Stochastic Error term
- Apriori expectations are:  $\beta_1, \beta_2$  and  $\beta_4 > 0$ , &  $\beta_3$  and  $\beta_5 < 0$ .

**3.3 Description of Variables**

In analyzing the research project, we adopted the OLS method, real Gross Domestic Product Growth Rate (GDPGR) is the dependent variable, while domestic debt (DDEBT), External Debt (EDEBT), Exchange rate (EXCH) Inflation (INFL) and Interest Rate (INT) are the independent variables.

**3.4 Methods of Data Analysis**

The research will utilize regression analysis method on four analytical procedures; firstly the unit root properties of the variables will be tested to determine the stationarity of the variables, it will show if the variables are stationary at level form or after the first difference. Secondly, the Co-integration test will be conducted to determine the long run relationship of the variables. Thirdly, the short run dynamism of the model will be determined using Error Correction Mechanism (ECM). Fourthly, the predictive power of the variables over each other will be tested using Granger Causality test.

**4. PRESENTATION AND ANALYSIS OF RESULTS**

**4.1 Unit Root Test**

To test for the unit root or the stationarity of the variables, we will employ Augmented Dickey Fuller Test (ADF).

From the Table 1, all the variables are stationary at 5 percent level of significance with. Therefore, the variables, Real Gross Domestic product Growth Rate (GDPGR) and Interest Rate (INT) are integrated at I(0), while Domestic Debt (DDEBT), External Debt (EDEBT), Exchange Rate (EXCH), and Inflation (Infl) are integrated at first order, I(1). Hence, Pasaran Bound testing cointegration approach will be used to determine

the cointegrating equations. This is because the bound testing cointegration can be used irrespective if the variables are stationary at different orders.

#### 4.2 Test of Cointegration

The Bound test reveals that there is a long run relationship between the dependent and independent variables. The f-statistic (4.355026) is greater than the upper bound test value of 2.62 and lower bound test values of 3.79 at the 5% chosen level of significance (Table 2).

- From the Cointegration Equation and the Long Run form of 4.2.2, domestic debt (LDDEBT) has a Positive relationship with the Real Gross Domestic product Growth Rate (GDPGR). In both the short run and long run, a unit change in domestic debt (LDDEBT) will lead Real Gross Domestic product Growth Rate (GDPGR) to increase by 1.816899 in the short run and by 1.960211 in the long run (Table 3).
- In External debt (LEDEBT), the estimate also shows a positive relationship between the regressor and the regressand, therefore, a change in External debt (LEDEBT) leads to Real Gross Domestic product Growth Rate (GDPGR) to increase by 2.852036 in the short run and by 3.076997 in the long run.
- In exchange rate (EXCH), there is negative relationship both in the short run and the long run. a unit change in exchange rate(EXCH) leads Real Gross Domestic

product Growth Rate (GDPGR) to decrease by 0.148581 in the short run and by 0.050724 in the long run

- Inflation(INFL) also have negative relationship with Real Gross Domestic product Growth Rate (GDPGR) from the estimation result,a change in inflation causes the Real Gross Domestic product Growth Rate (GDPGR) to decrease by 0.102003 in the short run and 0.110049 decrease in the long run
- Interest rate(INT) shows a positive relationship between the dependent and independent variable, a unit change in Interest rate(INT) leads the Real Gross Domestic product Growth Rate (GDPGR) to increase by 0.138799 in the short run and also increase by 0.149747 in the long run
- ECM which is the Error Correction mechanism is -0.926889 (CointEq(-1) - 0.926889), it means that the speed of adjustment is 93%. This is a prerequisite for acceptance of a model since the error correction coefficient is negative, fractional and significant, the model is stable.

There is uni-directional causality relationship between Real Gross Domestic product Growth Rate (GDPGR) and external debt (LEDEBT). Hence Real Gross Domestic product Growth Rate (GDPGR) Granger causes external debt (LEDEBT) at 5% level of significance. There is no causality relationship between Domestic debt, exchange rate, Interest rate and Real Gross Domestic product Growth Rate according to the Granger causality result (Table 4).

**Table 1. Augmented Dickey Fuller Test (ADF) test of stationarity for GRGDP, LEDEBT, LDDEBT, INT, INFL and EXCH**

Variables	ADF Test Statistics	5% Critical value	Order of integration
GRGDP	-4.345412	-2.96397	I(0)
LDDEBT	-3.406304	-2.967767	I(1)
LEDEBT	-3.757233	-2.967767	I(1)
EXCH	-4.077683	-3.574244	I(1)
INFL	-4.377561	-3.574244	I(1)
INT	-5.648735	-3.568379	I(0)

**Table 2. ARDL bounds testing result output**

Model	Lags	F-statistic	I(0)		I(1)		Decision
			5%	10%	5%	10%	
$F_G(\text{Ingdppc}/\text{Infdi}, \text{Inmvas}, \text{Innexpo})$	2	4.355026	2.62	2.26	3.79	3.35	co-integration

**Table 3. ARDL long-run output**

Variable	Coefficient	Std Error	t-statistic	Prob
LDDEBT	1.960211	2.768669	0.707998	0.4864
LEDEBT	3.076997	2.151874	1.429915	0.1668
EXCH	-0.050724	0.048498	-1.045894	0.3070
INFL	-0.110049	0.087853	-1.252652	0.2235
INT_PRIME_	0.149747	0.501497	0.298599	0.7680
CONSTANT	-25.529939	27.974856	-0.912603	0.3713

**Table 4. Granger causality test output**

Null Hypothesis	Obs	F-statistic	Prob
LDDEBT does not Granger Cause GDPGR	29	0.05896	0.9429
GDPGR does not Granger Cause LDDEBT		0.09108	0.8009
LEDEBT does not Granger Cause GDPGR	29	0.22404	0.9862
GDPGR does not Granger Cause LEDEBT		8.48718	0.6181
EXCH does not Granger Cause GDPGR	29	0.01395	0.9862
GDPGR does not Granger Cause EXCH		0.49096	0.6181
INFL does not Granger Cause GDPGR	29	0.07946	0.9239
GDPGR does not Granger Cause INFL		0.06551	0.9368
INT_PRIME_ does not Granger Cause GDPGR	29	0.90798	0.4167
GDPGR does not Granger Cause INT_PRIME_		0.82885	0.4487

## 5. SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

### 5.1 Summary of Findings

The work evaluated impact of public debt on economic growth of Nigeria 1990-2020.

1. External debt (LEDEBT) has a positive and significant impact on Real Gross Domestic product Growth Rate (GDPGR).
2. Domestic debt (LDDEBT) has a Positive and significant relationship with the Real Gross Domestic product Growth Rate (GDPGR).
3. There is uni-directional causality relationship between Real Gross Domestic product Growth Rate (GDPGR) and external debt (LEDEBT).

### 5.2 Conclusion

By comparing what a country owes with what it produces, the debt-to-GDP ratio indicates its ability to pay back its debts. Borrowing of funds to finance expansionary fiscal policy measure of a state is not detrimental to the economic viability of such state but when such debts are not properly utilized, it becomes a big problem.

### 5.3 Recommendations

Following from the research findings above, it is recommended that; Government should direct debt acquired from external sources to infrastructural development and invest in non-oil sectors with high employment potential and immense contribution to the nation's GDP.

### COMPETING INTERESTS

Authors have declared that no competing interests exist.

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