

The Impact of Domestic and External State Debt on State Gross Domestic Product in Nigeria

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Abstract

The impact of state indebtedness, both external and domestic, on the GDP of each state, was investigated in this study utilising panel data gathered from 22 Nigerian states between 2013 and 2017. Past studies conducted on the debt-growth relationship have concentrated on the national level with little attention given to the sub-national level. This study fills that gap with the intention of having a better understanding of the debt-growth relationship at the state level. Using panel regression techniques, results showed that total debt has a non-linear relationship with the state GDP; whereby as total debt increases, the state GDP also increases until it reaches a threshold when a rise in state total debt produces a negative impact on the state GDP. A similar result was obtained while using domestic debt. On the contrary, external State debt was found to have a linear, positive and significant relationship with the state GDP. The implication of this is that external state debt is beneficial to the state GDP. The study recommends that state governments should borrow to finance capital projects or high-yielding investments and not recurrent expenditures. Also, state governments should have a debt threshold which would guide them whenever they incur debts.

Keywords: Gross Domestic Product, Total Debt, Domestic Debt, External Debt, Public Debt

INTRODUCTION

Nigeria has the largest economy in Africa. In 2019, the country's Gross Domestic Product (GDP) amounted to \$444.9 billion (N80.3 trillion) or 18% of the continent's output (IMF, 2020). The Nigerian economy had rapid growth in the 1970s following the oil boom of that era, but the growth was not sustained. Despite the country's dominance in the economy of Africa, it has not had stable macroeconomic fundamentals since 1990. The GDP growth has not been stable, similar to the inflation rate. The performances of major monetary aggregates have not been encouraging in the country; they have grown slowly in most years, declining below targets. The fiscal activities of the government were financed majorly by increased debt (Matthew and Mordecai, 2016).

Debt Management Office (DMO, 2019) records show that Nigeria's total public debt profile is \$85.39 billion, this is worrisome as over N30.35 billion was used to service debts from 2013 till 2017. In spite of the accumulated debt and debt relief of 2005 and 2006, there has been no significant improvement in basic infrastructure, and the poverty level

remained high, hence, the reason for questioning the need for additional external debt.

States borrow when they cannot generate enough domestic savings coupled with low federal allocation to pursue their productive activities and their respective obligations. The funds are borrowed for the purpose of boosting the state's economic growth and development, and to improve the citizens' living standard. State Governments usually borrow through the issue of government bonds, securities and bills through the Central Bank of Nigeria (CBN) and other local financial institutions (DMO 2019).

In 2017, the GDP for the 22 states with accessible data stood at N63.8 trillion or 56% of Nigeria's nominal GDP in that year. The states include Akwa-Ibom, Anambra, and Ebonyi states from the eastern region, Bauchi, Gombe, Jigawa, Kaduna, Kano, Kogi, Niger, and Zamfara states from the northern part of the country, Bayelsa, Cross-River, Delta, and Rivers state from the south, Edo, Ekiti, Ogun, Ondo, Osun, and Oyo from the western zone and the Federal capital territory (Abuja) (NBS, 2019).

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By sectors, 22 out of 36 states accounted for 48%, 77% and 57%, of services, industry and agriculture, respectively (NBS report, 2017). Among the 22 states, the services sector accounted for the larger portion by 67%, industry accounted for 11% and agriculture, 22%. Out of the 22 states, Abuja had the highest GDP at N10.6 trillion or 17% of the total state GDP. In Abuja, agriculture contributed 10% to the GDP, services contributed 81% of the GDP and industry contributed 18%. However, in Akwa-Ibom, agriculture contributed 16%, industry contributed 65% and services contributed 19% of the total state GDP (NBS, 2019).

Researchers have shown fewer concerns about the contributions of different states to an unresolved debt-growth analysis at the sub-national level. This may be due to the unavailability of data on the performance of state(s) economy measured by the GDP. Through this study, the Debt Management Office (DMO) can make a big difference in training the necessary skills and promoting responsible sub-national debt management practices, which will affect the state GDP and significantly contribute to the national GDP instead of focusing only on national debts, even though state governments ultimately have the final say over sub-national debt decisions. This study aims to investigate the relationship between state debt and state economic growth in Nigeria in order to close the knowledge gap on debt-growth analysis at the sub-national level. This study is germane to investigate which states have either positive or negative debt growth.

This research investigates the impact of the funds borrowed (domestic and external) by the 22 states on the GDP in Nigeria from 2013 to 2017. However, this study intends to answer these specific questions at the state level: (i) Does internal public debt affect the state GDP in Nigeria? (ii) Does external public debt impact the state GDP in Nigeria, and (iii) What is the impact of total public debt on the state GDP in Nigeria?

This study seeks to examine the effect of state-level public debt on the GDP of Nigerian states. The specific objectives of the research are to: (i) examine the effect of domestic public debt on the GDP of Nigerian states; (ii) analyse the impact of external public debt on the state GDP in Nigeria, and (iii) examine the impact of total public debt on the state GDP in Nigeria.

This study will cover 22 states out of 36 states in Nigeria. This is due to the unavailability of data for the remaining states not included in the study. The study covers from 2013 to 2017. This study hypothesised that the states' debts (both internal and external) do not significantly impact the performance of the sub-national economy measured by the GDP in Nigeria.

LITERATURE REVIEW

This section presents a review of the literature relevant to this study. The review covers three key issues, namely conceptual review, theoretical review, and methodological review.

Conceptual Issues

Some concepts are central to this study. The concepts are discussed below:

A nation's total market value for all finished goods and services produced inside its borders over a specific time period is its GDP. It represents a monetary assessment of the nation's overall production. (NBS, 2017; SNA, 2008).

Ogba (2014) defines debt as a contractual commitment to return money borrowed under a contract at a later time. Debt, according to Winifred (2014) is the act of borrowing, either domestically or from external sources. A debt is a sum of money owed, as well as the state of being in debt. The Borrower can be an individual, a sovereign state or country, a local government, or a corporation. Typically, Debt is contractual with terms governing the timing and amount of principal and interest repayments (Butt, 2019).

According to Erhieyovwe & Onovwoakpoma (2013), Public debt refers to the funds borrowed by the government, either from domestic sources or from international markets. Furthermore, Olalekan (2012) emphasizes that Nigeria borrows to bridge the gap between investment and savings and to finance the deficit in the budget. The study compares this to Rosenstein-'Big-Push' Rodan's theory of economic growth and development, which holds that some amount of resources must be invested in government-intensive projects in order for the goal to be met. A country's public debt comprises both internal and foreign debt, and it is incurred occasionally when the economy is required to cater for large fiscal deficits (Edo, 2002). As a result, public debt is borrowing by a country's government to fund government expenditure. Olalekan (2012) defined Nigeria's internal debt as federal government debt instruments denominated in local currency, primarily Nigerian Treasury Certificates (NTCs), Nigerian Treasury Bills (TBs), Federal Government Development Stocks (FGDSs), and Treasury Bonds (TBs) (see; Ojulape, Yusuf, Alabi, and Oladipupo, 2015).

Loganathan, Sukemi, and Sanusi (2010) defined foreign debt as money borrowed from abroad and they pointed out that as it grows, it can stifle a country's growth rate. Because of globalisation and current technological advancements in banking and fund transfer across national borders, the two major concepts may be misunderstood. It is important to note, however, that the main difference is the vulnerability to foreign interest rates.

Theoretical Review

Debt Overhang Theory: A large debt load may lead to debt overhang, which deters investment and growth due to the expectation of debt payback. According to this argument, a nation's debt level should not be allowed to rise above a particular point because doing so would make investment in industrial ventures and other productive activities less attractive to both foreign and domestic investors Krugman (1988). An increasing debt load poses a dangerous barrier to a country's ability to grow economically, despite some economic theories suggesting that reasonable public debts, both external and domestic, are necessary, especially for low-income countries to improve living standards and spur economic growth (Saungweme and Odhiambo, 2019).

Neoclassical Growth Theory: Solow (1956) implies that investments supported by debt may be advantageous if they result in profitable ventures since capital accumulation is a prerequisite for growth. Debt can, however, discourage investment and impede growth if it is employed inefficiently

or results in heavy repayment responsibilities. This theory claims that modest levels of public debt can boost economic growth like the debt Laffer curve. Government debt only gets in the way of economic growth when it gets out of control. The endogenous growth model states that improper management of government debt used to finance expenses or purchase capital assets may have negative effects. Quite a number of existing theoretical and empirical work supports the claim that unsustainable public debt lowers a country's competitiveness and increases its financial markets' susceptibility to external shocks (Mhlaba and Phiri 2019).

One key advantage of the neoclassical theory of income determination is its uniform treatment of interest, wages, and rents, unlike earlier theories that offered different explanations for each. However, profits do not align as neatly within the neoclassical framework. A second benefit is the theory's integration with production theory. Additionally, the neoclassical theory of distributive shares can be expressed in a relatively straightforward mathematical form, which serves as a third advantage (Roth, Settele, and Wohlfart, 2021).

One of the difficulties in assessing neoclassical theory is defining and measuring labour, capital, and land, and more specifically assessing differences in quality. In macroeconomic reasoning, one typically deals with the labour force, regardless of the workers' skills, which results in massive statistical discrepancies. The best approach is to treat each type and quality of labour, as well as capital, as a separate productive factor. When the historical development of production is examined, it is concluded that most of the output growth is due to advancements in the quality of labour and capital rather than increases in their quantity. Capital goods stock is viewed as a series of vintages, each with its own productivity. A significant portion of production growth is due to improved quality of input, resulting in significant flexibility in the distribution of national income, and explanation for profits.

According to the framework of endogenous growth theory, internal variables rather than external ones are primarily responsible for economic growth (Romer, 1993). This theory argues that investments in innovation, human capital, and knowledge are essential for fostering economic growth. It highlights the significance of positive externalities and spillover effects inherent in a knowledge-based economy, which ultimately promotes sustained economic development (Romer, 1993). A fundamental tenet of endogenous growth theory is that the long-term growth rate of an economy is influenced by policy interventions. For example, subsidies aimed at research and development, or education can boost growth rates in various endogenous growth models by improving incentives for innovation.

Public debt has a negative impact on growth in the long run in the endogenous growth models (Barro, 1990). Alternatively, it may be argued that the best way to pay off debts is to reduce government expenditure or apply unfair taxes, both of which hinder economic progress. Bohn (1998), Lo and Rogoff (2015), and Mendoza and Ostry (2008) demonstrated that the government reacts to an increase in public debt by raising primary surplus or lowering deficits. Solow's neoclassical growth model fails to adequately

account for the observed patterns of actual economic growth. This limitation stems from the model's assertion that per capita output converges to a steady-state trajectory growing at a constant rate. Consequently, the long-term national growth rate is seen as being determined independently of consumer preferences, various components of the production function, and policy interventions.

Ball and Mankiw (1996) present the debt fairy parable, a back-of-the-envelope calculation of the burden of public debt in the Solow model. Elmendorf and Mankiw (1998) assert that there exists a negative long-term relationship between public debt and economic growth. In traditional overlapping generations growth models, public debt leads to increased interest rates, which in turn diminishes savings and capital accumulation, ultimately hampering economic growth (Blanchard, 1987; Diamond, 1965; Modigliani, 1961).

Several studies attempted to assess the empirical basis of Ricardian equivalence. According to Buiter (1988), the case for debt neutrality is not well established. Feldstein (1976 and 1998) argued that, though paying social security benefits is tantamount to issuing bonds, empirical evidence on the effects of social security on wealth suggests that the debt burden is shifted through lower saving ratios (Seater, 1993). While several studies challenged Ricardian equivalence, Holcombe, Jackson, and Zardkoohi (1981) supported the prediction that debt and deficit have no effect on relevant economic variables

Empirical Review

The empirical literature's findings on the relationship between public debt and GDP are inconclusive (Yusuff and Moh, 2023). Mbaye, Badia and Chae (2018) examined the determinants and consequences of debt accumulation in developing countries, including the impact on economic performance. The study finds that high debt levels can lead to reduced economic growth which follows the theoretical view mentioned in this study (see, Saungweme and Odhiambo 2019). Studies (see, Diamond, 1965; Modigliani, 1961; Saint-Paul, 1992), maintained that an increase in public debt contributes to economic growth. This was also supported by Ezike and Mojekwu (2011), who established that foreign debt had a positive effect on economic growth in Nigeria. The reason for this was that debt capital contributes to capital formation and has a positive impact on economic growth.

Sulaiman and Azeez (2012) investigated the effect of Nigeria's external debt on economic growth. The results of the error correction model depict that external debt has benefited the Nigerian economy. In contrast, many other studies produced results that differed or contradicted those of the previous studies. Chinaemerem and Anayochukwu (2013) concluded that debt financing is inversely linked to economic growth. Ezeabasili, Isu and Mojekwu (2011) also analysed the link between Nigeria's foreign debt and economic growth. The error correction estimates showed that foreign debt has an inverse relationship with Nigeria's economic growth. They stated that Nigeria needs to focus on absorptive capacity, noting that low debt service/GDP capacity ratios could serve as a guide for debt negotiations in the future because of the country's low debt to the GDP.

Furthermore, Charles and Abimbola (2018) investigated how Nigeria's economy was impacted by its external debt. The findings show that there is an inverse link between the GDP and external debt and external debt service. Obisesan, Akosile, and Ogunsanwo (2019) investigated the effect of Nigeria's external debt on economic expansion. The cointegration test and the error correction test were used in Nigeria to investigate the problem between 1980 and 2012. The results of this investigation confirmed the conventional wisdom that there is a negative correlation between growth and external debt.

Matthew and Mordecai (2016) examined how Nigeria's economic progress is impacted by governmental debt. The findings of the Johansen co-integration test show a long-term association between the variables, which include the amount of debt outstanding, the amount being paid back domestically, the amount being paid back externally, and economic development as measured by Nigeria's GDP per capita. The results of the Error Correction Model (ECM) indicate that Nigeria's economic progress is somewhat correlated negatively with the service of foreign debt and the stock of external debt. On the other hand, there is a strong positive correlation between economic progress and domestic debt stocks.

However, more recent research has revealed something other than the two opposing findings. Patillo, Poirson and Ricci (2004) established that low levels of government debt are beneficial to economic growth while high levels are detrimental (Schclarek, 2004). In contrast, Kumar and Woo (2010) discovered a negative relationship between the two variables after controlling for other factors that influence growth. Mitze and Matz (2015) discovered a long-run negative relation between regional government debt intensities and output for German federal states from 1970 to 2010.

Makinde, Ph, Sule, and Abu (2015) analysed the effects of public debt on Nigeria's economic growth from 1986 to 2013. The study concluded that the influence of government debt on economic growth during this period was minimal, with the substantial accumulation of foreign debt contributing only insignificantly to the real GDP.

Ndoricimpa (2017) investigated the effects of debt thresholds on African economic growth using both dynamic and non-dynamic panel methods. Results showed that the estimated debt threshold varies just as the method of estimation and the control variables for economic growth vary. It is impossible to deny the existence of non-linearities in the debt-growth relation. The study showed that debts that are not high are either neutral or beneficial to growth, while debts that are high are consistently unfavourable to growth in all cases studied.

Egbe and Alfred (2015) examined the effect of international debt on Nigeria's economic growth. Through a two-stage data analysis, the findings indicate that the correlation between external debt and economic growth in Nigeria is weak. Consequently, international debt is not a reliable predictor of economic growth in the country, meaning that fluctuations in the GDP cannot be anticipated based on changes in foreign debt levels. To foster growth in Nigeria

through debt utilisation, it is essential for policymakers to practice fiscal discipline with public funds.

Eberhardt and Presbitero (2015) analysed the relationship between government debt and growth heterogeneity and non-linearity among African countries. It found evidence of a negative association between government debt and long-term growth; however, the results did not indicate a uniform debt threshold applicable to all the nations.

At a glance, one can see that the findings of the various studies are split into 3. Some empirical studies revealed that public debt has a negative effect on economic growth, while some showed a positive effect and others showed insignificant results, depending mainly on several factors such as the model employed, the period of study, countries specified, term and the aspect of public debt (domestic or external) considered, etc. It can then be concluded that the effect of public debt on the GDP is unclear.

All the above-reviewed papers contributed to the literature. However, there are some limitations. Firstly, since no general agreement exists on the direction of the relation on the debt-growth nexus, the reviewed papers failed to consider regional or subnational debt-growth relationships despite their massive contribution to the growth of the country's economy.

Secondly, quite a number of the studies used either domestic debt or foreign debt impact on growth, especially on the external implication, while little or scarce literature was found on total debt. Therefore, this study contributes to the literature, by concentrating on the neglected sub-national levels and total debt (both external and internal) and analysing the implication of state debt on state GDP in Nigeria.

MATERIALS AND METHODS

This section contains a brief introduction of the study area, the conceptual and theoretical framework adopted by this study, model specification, data requirements, estimation techniques, and evaluation methods.

Theoretical Framework

Theoretically, this study adopts Keynes's income determination model. According to Keynes, national income (Y) or the GDP of an open economy comprises five basic components which are private consumption spending (C), aggregate demand for capital goods by the private sector (I), government expenditure (G), export of goods and services (X) and import of goods and services (M) and it is stated below:

$$Y_t = C_t + I_t + G_t + X_t - M_t \quad (1)$$

In order to make the equation in (1) more explicit, each of the expressions on the right-hand side is stated as follows:

$$C_t = a + bY_d t \quad (2)$$

$$I_t = I_0 + ir_t \quad (3)$$

$$G_t = G_0 \quad (4)$$

$$X_t = X_0 \quad (5)$$

$$M_t = M_0 + mY_t \quad (6)$$

$$T_t = T_0 + tY_t \quad (7)$$

$$Y_t^d = Y_t - T_t \quad (8)$$

Where a is autonomous consumption, b is the marginal propensity to consume, Y_d is disposable income, I_0 is an autonomous investment, r is the rate of interest, i is the marginal propensity to invest, G_0 is government spending, X_0 is export, T_0 is autonomous tax, t is the tax rate, and m is the marginal propensity to import.

Incorporating (2) to (8) into (1) yields the aggregate demand given as

$$Y_t = a + bY_t^d + I_0 + ir_t + G_0 + X_0 - M_0 - mY_t \quad (9)$$

Incorporating (7) and (8) into (9) produces

$$Y_t = a + bY_t - bT_0 - btY_t + I_0 + ir_t + G_0 + X_0 - M_0 - mY_t \quad (10)$$

Solving for Y gives

$$Y_t = 1/(1 - b + bt + m)(a - bT_0 + I_0 + ir_t + G_0 + X_0 - M_0) \quad (11)$$

By implication,

$$Y = y(r) \quad (12)$$

This is because the other variables in equation 11 are parameters.

However, Equation (13) is the equilibrium level of national income within the simple Keynesian macroeconomic framework which links GDP with only interest rate. The relation fails to link national income or GDP with public debt. In order to incorporate public debt into the relation, the government budget constraint is introduced following the work of Modigliani and Sterling (1986). The government budget constraint is given as;

$$T_t = G_t + rB_{t-1} - D_t \quad (13)$$

Where D_t is the government fiscal deficit, r is the interest rate, B_{t-1} is the public debt in the previous period, and T_t is the government tax revenue receipt in the current period.

Replace equation 7 with equation 13, then the solution will be as follows:

$$Y_t = a + bY_t - bG_0 - rbB_{t-1} + bD_t + I_0 + ir_t + G_0 + X_0 - M_0 - mY_t \quad (14)$$

$$Y_t = 1/(1 - b + m)(a - bG_0 + I_0 + G_0 + X_0 - M_0 + ir_t - rbB_{t-1} + bD_t) \quad (15)$$

Thus, the national income is expressed in functional form as

$$Y_t = y(r_t, B_{t-1}, D_t) \quad (16)$$

Equation (15) is the modified equilibrium level of national income within a simple Keynesian framework which relates the national income or the Gross Domestic Product (GDP) with public debt (B), interest rate (r) and the budget deficit (D).

Model Specification

In line with the theoretical framework presented in the immediately preceding subsection, the GDP level is a function of government debt, interest rate and budget deficit which is expressed as;

$$GDP = f(INT, PDEBT, BDEF) \quad (17)$$

Where:

- GDP is measured by nominal gross domestic product
- INT is interest rate
- PDEBT is public debt
- BDEF is budget deficit

Since this study used sub-national data where each state faces the same level of interest rate, it would be sensible to use another proxy of interest rate. For this study, the number of bank branches (CBB) in each state is used in place of interest rate since it determines the accessibility to financing in each state. In addition, there is a limitation to state-level data on the budget deficit. This study proxies it with the Federal Accounts Allocation Committee (FAAC) allocation to each state. Therefore, it is assumed in this study that GDP at the state level is a function of government debt, commercial bank branches and FAAC allocation.

$$GDP = f(INT, PDEBT, BDEF) \quad (18)$$

It should be noted that PDEBT consists of domestic and external debt. Therefore, public debt is measured in three ways: internal debt, international debt, and total debt.

Thus, the model is re-specified in econometric form as:

$$GDP_{i,t} = \alpha + \beta_1 PDEBT_{i,t} + \beta_2 CBB_{i,t} + \beta_3 FAAC_{i,t} + \theta_i + \epsilon_{i,t} \quad (19)$$

Using components of public debt produces two sets of equations, each for total debt, and external and domestic debt. That is:

$$GDP_{i,t} = \alpha + \beta_1 TDEBT_{i,t} + \beta_2 CBB_{i,t} + \beta_3 FAAC_{i,t} + \theta_i + \epsilon_{i,t} \quad (20)$$

$$GDP_{i,t} = \alpha + \beta_1 EDEBT_{i,t} + \beta_2 DDEBT_{i,t} + \beta_3 CBB_{i,t} + \beta_4 FAAC_{i,t} + \theta_i + \epsilon_{i,t} \quad (21)$$

In the specifications above, a linear or one-way relationship between GDP and public debt is assumed.

Furthermore, the study estimates a non-linear model where a quadratic relationship is assumed between GDP and public debt. With this, it is possible to show if government debt has a two-way impact on GDP.

Thus, the two equations above are re-specified as

$$GDP_{i,t} = \alpha + \beta_1 TDEBT_{i,t} + \beta_2 TDEBT_{i,t}^2 + \beta_3 CBB_{i,t} + \beta_4 FAAC_{i,t} + \theta_i + \epsilon_{i,t} \quad (22)$$

$$GDP_{i,t} = \alpha + \beta_1 EDEBT_{i,t} + \beta_2 EDEBT_{i,t}^2 + \beta_3 DDEBT_{i,t} + \beta_4 DDEBT_{i,t}^2 + \beta_5 CBB_{i,t} + \beta_6 FAAC_{i,t} + \theta_i + \epsilon_{i,t} \quad (23)$$

Where:

- θ = state fixed effects
- ϵ = the error term
- α = the constant term
- β = the coefficients of independent variables
- i = state
- t = year

The Data

This study used data from the Central Bank of Nigeria's (CBN, 2019) statistical bulletin and annual reports for state debt profile to assess the impact of state public debt on the GDP of 22 states between 2013 and 2017, state gross domestic product (SGDP) data and the data on commercial bank branches per state and FAAC allocation for each state. Due to data constraints, this study had to stop in 2017.

Estimation Techniques

In this study, panel data techniques are adopted to determine the effect of state debt on state economic performance and other economic output indicators in the 22 states under consideration in Nigeria. In the unlikely case that the cross-sections contain some distinguishing characteristics, the panel data estimate successfully draws attention to individual heterogeneity. As such, compared to time series, the propensity to bias is reduced. This is because time series do not take heterogeneity into account because some distinguishing factors may change over time. Other merits of using panel data techniques include less collinearity, estimation being more efficient and higher precision in capturing the impact of individual samples as a result of available data that is large.

Evaluation Methods

Three basic evaluation methods, namely economic or apriori criteria, statistical criteria and econometric criteria are used in this study. Apriori, the study expects a negative impact of total debt, internal debt and external debt on state GDP, while a positive impact is expected of budget deficit proceed by federal allocation to states and interest rates proxied by commercial bank branches on GDP in terms of statistical tests. However, the study examines the individual significance of the variables using p-value, which could be significant at 1 per cent if less than 0.01, 5 per cent if less than 0.05 and 10 per cent if less than 0.1. At the same time, the overall fitness of the model is ascertained using R-squared. The econometric criteria which assess compliance with the model assumption are also examined. For the test of multicollinearity, a simple correlation matrix is used, while the heteroscedasticity test is ascertained using the Breusch Pagan test.

RESULTS AND DISCUSSION

The results consist of the descriptive analysis under which the results of the summary statistics and correlation

coefficients are presented, and the panel regression results under which the results of the linear and non-linear impact of the debt on GDP under alternative panel regression techniques are presented. The study implores both linear and non-linear to see the impact of the dependent variable on the independent variables' indifferent functional form and to have a robust result and make more inferences.

Table 1 captures the summary statistics. The results indicate that the average GDP of the states for the period considered is 2,367,470 million naira with a standard deviation, minimum and maximum of 1,816,664, 701,047 and 10,627,398 million naira, respectively. The estimated mean domestic debt is 70,628.46 million naira with a standard deviation of 58079.95 million naira. It equally has a minimum and maximum of 1,569.942 and 321,000 million naira, respectively. The external debt has a mean and standard deviation of 14,785.38 and 12,495.55, respectively, with a minimum and maximum of -10,451.80 and 70,973.01 million naira. The average total debt is estimated to be 85,413.83, with a standard deviation of 59,827.94. The minimum total debt is 7,233.095, while the maximum total debt is estimated to be 328103.5 million naira. However, the Jarque-Bera normality test result showed that data of all variables in the model are not normally distributed with the probability values of 0.0000, which is less than 0.05 significant level.

The results obtained from the correlation analysis are presented in Table 2. The estimated correlation coefficient of 0.455 shows that GDP is moderately positively correlated with internal debt, while the estimated coefficient of -0.048 indicates that GDP is moderately negatively related to GDP. The estimated coefficient of 0.432 indicates that total debt is moderately positively related to GDP. In addition, the estimated coefficient of 0.734 shows that GDP is highly positively correlated with CBB, and 0.346 shows that GDP is moderately positively correlated with FAAC.

Table 1: Descriptive statistics

	SGDP	FAAC	CBB	EDEBT	DDEBT	TDEBT
Mean	2367470.	19752.71	134.1909	14785.38	70628.46	85413.83
Median	1906236.	7315.768	102.0000	10581.28	53307.06	74084.20
Maximum	10627398	143614.9	437.0000	70973.01	320605.7	328103.5
Minimum	701047.1	2402.551	30.00000	-10451.80	1569.942	7233.095
Std. Dev.	1816664.	26451.13	96.95544	12495.55	58079.95	59827.94
Skewness	2.806803	2.380199	1.220645	2.191696	1.384526	1.113674
Kurtosis	11.88184	9.408369	3.966595	8.876357	5.599498	4.691378
Jarque-Bera	505.9983	292.0894	31.59842	246.3344	66.11480	35.85010
Probability	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
Sum	2.60E+08	2172798.	14761.00	1626391.	7769130.	9395522.
Sum Sq. Dev.	3.60E+14	7.63E+10	1024639.	1.70E+10	3.68E+11	3.90E+11
Observations	110	110	110	110	110	110

Source: Authors' computation, 2024

Table 2: Correlation results

Variables	(1)	(2)	(3)	(4)	(5)	(6)
(1) SGDP	1.000					
(2) DDEBT	0.455	1.000				
(3) EDEBT	-0.048	0.034	1.000			
(4) TDEBT	0.432	0.978	0.242	1.000		
(5) CBB	0.734	0.297	0.088	0.307	1.000	
(6) FAAC	0.346	0.452	0.186	0.478	0.156	1.000

Source: Authors' computation, 2024

Regression Results for the Impact of Total Public Debt on GDP

The Generalised Least Square estimated panel regression results on the impact of debt on GDP are presented in Table 3. So far, the Jaque Bera normality test ascertained the non-normal distribution of all variables data included in the model. The study employed GLS regression analysis. The results were obtained with the assumption of linear and non-linear relationships. The linear model results indicate that total debt has a direct and significant impact on GDP at a 5% level of significance given the estimated coefficient and p-value of 4.447 and 0.0378, respectively. However, the results of the non-linear regression depict that total debt has a significant positive impact on GDP, while the square of the total debt has a significant negative impact on GDP. The results imply that the state's total debt has an inverted U-shaped relationship with the GDP. The GDP increases with debt up to a certain amount where it reaches a turning point and then falls with increases in debt. Therefore, from the results, total debt is beneficial for the GDP if it is moderate and does not go beyond a certain threshold among the states in Nigeria. The findings in this study partially contradict the theoretical and empirical submissions, which state that debt is detrimental to growth and development (Charles & Abimbola, 2018b; Chinaemerem & Anayochukwu, 2013; Ezeabasili et al., 2011; Obademi & Okubanjo, 2013). Therefore, the results align with previous empirical works that reported an inverted U-shaped relationship between debt and GDP, such as in Israel Shahor (2018) and a sample of 152 countries (Butkus & Seputiene, 2018).

Table 3: Generalised linear square regression results for total debt

Variables	Linear	Non-Linear
TDEBT	4.447** (0.0378)	12.35** (0.0166)
TDEBTSQ		-3.24e-05* (0.0928)
FAAC	11.85** (0.0111)	11.21** (0.0153)
CBB	12,402*** (0)	12,257*** (0)
Constant	89,332 (0.681)	-201,694 (0.464)
Observations	110	110
Number of sid	22	22

Source: Authors' Computation, 2024

Note: pval in parentheses - *** p<0.01, ** p<0.05, * p<0.1

The Impact of Domestic and External Debt on GDP

The estimated GLS panel regression results on the impact of domestic debt on GDP are presented in Table 4.4. The results were also obtained with the assumption of linear and non-linear relationships separately. The findings, based on the assumption of a linear relationship between GDP and domestic debt, indicate that domestic debt has a positive and statistically significant effect across all conventional significance levels, as evidenced by the estimated coefficient of 5.936 and a p-value of 0.005. This implies that a rise in domestic debt leads to a rise in GDP.

The result of the non-linear regression indicates that domestic debt has a significant positive impact on GDP while domestic debt square has a significant negative impact on GDP. The results imply that state domestic debt has an inverted U-shaped relationship with the GDP. The GDP increases with debt up to a turning point where further increases in debt lead to a reduction in GDP. Therefore, domestic debt is beneficial for GDP. However, the government at the state level must exercise caution since an increase in domestic debt beyond the inflexion point will negatively affect the GDP.

Table 4: Estimated generalised least square panel regression result for domestic debt

Variables	Linear	Non-Linear
DDEBT	5.936*** (0.00540)	15.69*** (0.00121)
DDEBTSQ		-4.27e-05** (0.0258)
FAAC	10.86** (0.0165)	9.681** (0.0300)
CBB	12,229*** (0)	12,108*** (0)
Constant	92,610 (0.650)	-200,918 (0.401)
Observations	110	110
Number of sid	22	22

Source: Authors' Computation, 2024

Note: pval in parentheses - *** p<0.01, ** p<0.05, * p<0.1

Furthermore, the GLS panel regression results for the impact of external debt on GDP with the assumption of linearity and non-linearity are presented in Table 4.5. The linear model results with a coefficient of -23.12 and p-value of 0.008 indicate that external debt has a negative and significant impact on GDP. This implies that state GDP decreases with increases in external debt. Foreign debt could have an impact on economic growth either through a debt overhang or through crowding out. The findings from the non-linear

regression analysis show that external debt exerts a significant negative effect on GDP, whereas the squared value of external debt has a positive but statistically insignificant effect on GDP. This suggests that the relationship between states' foreign debts and GDP follows an inverted U-shaped pattern.

Table 5: GLS panel regression results for the impact of external debt on GDP with the assumption of linearity and non-linearity

Variables	Linear	Non-Linear
EDEBT	-23.12*** (0.00819)	-52.77** (0.0277)
EDEBTSQ		0.000519 (0.185)
FAAC	18.21*** (1.23e-05)	18.64*** (6.88e-06)
CBB	13,236*** (0)	13,218*** (0)
Constant	573,356*** (0.00877)	812,102*** (0.00397)
Observations	110	110
Number of sid	22	22

Source: Authors' Computation, 2024

Note: pval in parentheses - *** p<0.01, ** p<0.05, * p<0.1

However, Tables 3 and 4 show the linear and non-linear models for FAAC and BCC. The linear model result indicates FAAC and CBB have a positive and significant impact on GDP with coefficient and probability values of 11.85 and 0.011, respectively. Similarly, the results of the non-linear regression also indicate that FACC and BCC have a positive and significant impact on state GDP. The results imply that GDP increases as FAAC and BCC increase.

CONCLUSION

There is no doubt that the provocative debate on how public debts affect GDP, particularly for the West African nations and the nature of the relationship, has remained quite inconclusive. Several studies and series of analyses conducted on relationships are more concentrated on the national level. However, little attention has been given to the sub-national level. Therefore, this study focused on the sub-national level analysis and established the effect of domestic, external, and total debts on the GDP in 22 states in Nigeria.

The study adopted descriptive statistics, correlations analysis and panel regression analysis. Panel regression and correlation methods of analysis were adopted in this study. The study examined the likelihood of both linear and non-linear relationships in the debt-GDP linkage.

The results of the linear and non-linear model indicate that:

- Total debt has a significant positive impact on GDP, while the square has a significant negative impact on GDP.
- Domestic debt has a significant positive impact on GDP, while the square has a significant negative impact on GDP.

- External debt has a significant negative impact on state GDP, while the square has a significant positive impact on GDP.
- FAAC and BCC have a significant positive impact on GDP in both linear and non-linear regression.

The results imply that each state's total debt, domestic debt, and external debt have inverted U-shaped relationships with the GDP. GDP increases with debt until it reaches a turning point, and then the GDP falls with increases in debt. Therefore, from the results, total debt, internal debt, and international debt are beneficial for GDP if it is moderate and does not go beyond a certain threshold among the states in Nigeria.

Recommendations and Policy Implications

This study recommends the following to the state government:

- The state government should borrow to finance the capital project or a high-yielding investment and not recurrent expenditure. This is because the government can service the debt through returns on investment, and money spent on recurrent has gone forever.
- The state government should closely monitor the public debt incurred by the state so as not to go beyond what the state can afford and avoid negative effects when it becomes excessive.
- Debt Management Office (DMO) can make a big difference in training the necessary skills and promoting responsible sub-national debt management practices, which will affect state GDP and significantly contribute to national GDP instead of focusing only on national debts, even though state governments ultimately have the final say over sub-national debt decisions.

REFERENCES

- Ball, L., & Mankiw, N. G. (1996). What do budget deficits do? *National Bureau of Economic Research Working Paper Series*, (No. 5263), 95–120. Retrieved from <http://www.nber.org/papers/w5263>
- Barro, R. J. (1990). Government spending in a simple model of endogenous growth. *Journal of Political Economy*, 98(5, Part 2), S103–S125. <https://doi.org/10.1086/261726>
- Blanchard, O. (1987). Overlapping generations in continuous time. *Handbook of Monetary Economics*, (1965), 443–496.
- Bohn, H. (1998). The behavior of U.S. public debt and deficits. *Quarterly Journal of Economics*, 113(3), 948–963. <https://doi.org/10.1162/003355398555793>
- Buiter, W. H. (1988). Death, birth, productivity growth and debt neutrality. *The Economic Journal*, 98(391), 279–293.
- Butkus, M., & Šeputienė, J. (2018). Growth effect of public debt: The role of government effectiveness and trade balance. *Economics*, 6(4), Article 62. <https://doi.org/10.3390/economics6040062>
- Butt, U. (2019). Debt covenant violation, competition and cost of new debt. *Australian Journal of Management*, 44(2), 163–187. <https://doi.org/10.1177/0312896218805789>
- Charles, O., & Abimbola, O. (2018a). The impact of external debt on the Nigerian economy. *Journal of Economics and International Business Management*, 6(2). https://doi.org/10.33495/jeibm_v6i2.18.110
- Charles, O., & Abimbola, O. (2018b). The impact of external debt on the Nigerian economy. *Journal of Economics and International Business Management*, 6(2). https://doi.org/10.33495/jeibm_v6i2.18.110

- Chinaemerem, O. C., & Anayochukwu, O. B. (2013). Impact of external debt financing on economic development in Nigeria. *Research Journal of Finance and Accounting*, 4(4), 92–99.
- Diamond, P. A. (1965). National debt in a neoclassical growth model. *The American Economic Review*, 55(5), 1126–1150.
- DMO. (2019). Debt Management Office: Nigeria 2020.
- Eberhardt, M., & Presbitero, A. F. (2015). Public debt and growth: Heterogeneity and non-linearity. *Journal of International Economics*, 97(1), 45–58. <https://doi.org/10.1016/j.jinteco.2015.04.005>
- Edo, S. E. (2002). The external debt problem in Africa: A comparative study of Nigeria and Morocco. *African Development Review*, 14(2), 221–236. <https://doi.org/10.1111/1467-8268.00052>
- Egbe, I. E., & Alfred, A. (2015). Impacts of external debt on economic growth in Nigeria: A VAR approach. *Journal of Business and Administration*, 3(1), 1–5.
- Elmendorf, D. W., & Mankiw, N. G. (1998). Government debt. *Finance and Economics Discussion Series*, 1998(09), 1–73. <https://doi.org/10.17016/feds.1998.09>
- Erhieyovwe, E. K., & Onovwoakpoma, O. D. (2013). External debt burden and its impact on growth: An assessment of major macroeconomic variables in Nigeria. *Academic Journal of Interdisciplinary Studies*, 2(2), 143–154. <https://doi.org/10.5901/ajis.2013.v2n2p143>
- Ezeabasili, V. N., Isu, H. O., & Mojekwu, J. N. (2011). Nigeria's external debt and economic growth: An error correction approach. *International Journal of Business and Management*, 6(5), 156–170. <https://doi.org/10.5539/ijbm.v6n5p156>
- Ezike, J. E., & Mojekwu, J. N. (2011). The impact of external debt on macro-economic performance. *International Journal of Business and Management Tomorrow*, 1(2), 1–12.
- Hahn, F. R. (2008). A primer on financial system: The economists' view. *Mimeo*.
- Holcombe, G., Jackson, J. D., & Zardkoohi, A. (1981). The debt. *Kyklos International Review for Social Sciences*, 34, 186–202.
- IMF. (2020). World Bank economic outlook. Retrieved from the World Economic and Financial Surveys website: <https://www.imf.org/en/Publications/WEO/weo-database/2020/April>
- Keen, M., Auerbach, A. J., & Kotlikoff, L. J. (1989). Dynamic fiscal policy. *Economica*, 56(222), 123–135. <https://doi.org/10.2307/2554504>
- Kumar, M. S., & Woo, J. (2010). Public debt and growth. *IMF Working Papers*, 06, 1–45. <https://doi.org/10.5089/9781451864465.001>
- Lo, S., & Rogoff, K. (2015). Secular stagnation, debt overhang and other rationales for sluggish growth, six years on. *BIS Working Paper*, 482, 1–27.
- Loganathan, N., Sukemi, M. N., & Sanusi, N. A. (2010). External debt and macroeconomics performance in Malaysia: Sustainable or not? *Global Economy and Finance Journal*, 3(2), 122–132.
- Makinde, O., Sule, A., & Abu, J. (2015). Implications of external debt on the Nigerian economy: Analysis of the dual gap theory. *Journal of Economics and Sustainable Development*, 6(13), 238–249.
- Marshall, A. (1890). *Principles of economics*. MacMillan.
- Matthew, A., & Mordecai, B. (2016). The impact of domestic debt on agricultural output in Nigeria (1985–2014). *British Journal of Economics, Management & Trade*, 13(3), 1–12. <https://doi.org/10.9734/bjemt/2016/24842>
- Mendoza, E. G., & Ostry, J. D. (2008). International evidence on fiscal solvency: Is fiscal policy 'responsible'? *Journal of Monetary Economics*, 55(6), 1081–1093. <https://doi.org/10.1016/j.jmoneco.2008.06.003>
- Mitze, T., & Matz, F. (2015). Public debt and growth in German federal states: What can Europe learn? *Journal of Policy Modeling*, 37(2), 208–228. <https://doi.org/10.1016/j.jpolmod.2015.02.003>
- Modigliani, F. (1961). Long-run implications of alternative fiscal policies and the burden of the national debt. *The Economic Journal*, 71(284), 730–755. Retrieved from <http://www.jstor.org/stable/2228247>
- Ndoricimpa, A. (2017). Threshold effects of debt on economic growth in Africa. *African Development Review*, 29(3), 471–484. <https://doi.org/10.1111/1467-8268.12282>
- NBS. (2017). *National Bureau of Statistics: Nigeria 2018*.
- NBS. (2019). *National Bureau of Statistics: Nigeria 2020*.
- Nigeria, C. B. (2017). *Central Bank of Nigeria: Statistical Bulletin*.
- Obademi, O. E., & Okubanjo, O. O. (2013). External debt and Nigeria's economic growth nexus: Matters arising. *International Journal of Financial Economics*, 1(2), 61–66. Retrieved from <http://www.rassweb.com>
- Obisesan, O. G., Akosile, M. O., & Ogunsanwo, O. F. (2019). Effect of external debt on economic growth in Nigeria. *African Journal of Economics and Sustainable Development*, 2(1), 39–50.
- Ogba, L. (2014). The impact of budget deficit on trade balance in Nigeria: An empirical analysis, 1980–2011. *AFRREV IAH: An International Journal of Arts and Humanities*, 3(1), 145–159.
- Ojuolape, A. M., Yusuf, H. A., Alabi, M., & Oladipupo, A. (2015). The effects of currency devaluation on output growth in developing economies with currency crises. *International Journal of Economic Research*, 12(4), 1143–1157.
- Olalekan, O. (2012). An empirical analysis of the impact of public debt on economic growth: Evidence from Nigeria 1975–2005. *Canadian Social Science*, 8(4), 154–161. <https://doi.org/10.3968/j.css.1923669720120804.350>
- Panizza, U., & Presbitero, A. F. (2013). Public debt and economic growth in advanced economies: A survey. *Swiss Journal of Economics and Statistics*, 149(2), 175–204. <https://doi.org/10.1007/BF03399388>
- Patillo, C., Poirson, H., & Ricci, L. (2004). What are the channels through which external debt affects growth? *International Monetary Fund Working Paper*.
- Romer, P. (1993). Idea gaps and object gaps in economic development. *Journal of Monetary Economics*, 32(3), 543–573. [https://doi.org/10.1016/0304-3932\(93\)90029-F](https://doi.org/10.1016/0304-3932(93)90029-F)
- Roth, C., Settele, S., & Wohlfart, J. (2021). Beliefs about public debt and the demand for government spending. *Journal of Econometrics*. <https://doi.org/10.1016/j.jeconom.2020.09.011>
- Samuelson, P. A. (1958). An exact consumption-loan model of interest with or without the social contrivance of money. *Journal of Political Economy*, 66(6), 467–482.
- Schclarek, A. (2004). Debt and economic growth in developing and industrial countries. *Mimeo*, 46(0), 1–37.
- Seater, J. J. (1993). Ricardian equivalence. *Journal of Economic Literature*, 31(1), 142–190. Retrieved from <http://search.ebscohost.com.proxy-ub.rug.nl/login.aspx?direct=true&db=buh&AN=9305125891&site=ehost-live&scope=site>
- Shahor, T. (2018). The impact of public debt on economic growth in the Israeli economy. *Israel Affairs*, 24(2), 254–264. <https://doi.org/10.1080/13537121.2018.1429547>
- SNA. (2008). *System of National Accounts: Nigeria*.
- Sulaiman, L. A., & Azeez, B. A. (2012). Effect of external debt on economic growth of Rwanda. *International Journal of Social and Economic Research*, 3(8), 71–79. <https://doi.org/10.5958/2249-6270.2019.00001.1>
- Winifred, U. O. (2014). The impact of domestic debt on economic growth of Nigeria 1980–2012. *Asian Research Journal of Arts and Social Sciences*. <https://doi.org/10.9734/arjass/2016/27224>