Effect of public debt management on budget implementation performance: evidence from selected states in Nigeria

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Abstract

Purpose: This study investigated the effect of public debt management on budget implementation performance of states in Nigeria. Specifically, the study analyzed the effect of domestic debt management ratio and external debt management ratio on budget implementation performance of selected states in Nigeria.

Methodology: The study captured a total of 18 states randomly selected across the 6 geopolitical zones of Nigeria. Panel based data were collected across the 18 states over a period of 10 years spanning from 2014 to 2023. Data collated were analyzed using correlations estimation, panel pooled OLS estimation, and fixed effect estimation.

Results and conclusion: Result revealed that domestic debt management ratio exerts insignificant negative effect on budget implementation performance of states in Nigeria. External debt management ratio on the other hand exerts positive insignificant effect on budget implementation performance. This study concludes that domestic debt management has insignificant tendency to impede budget implementation performance among states in Nigeria; just as external debt management has insignificant likelihood to improve budget implementation though it does not pose any negative threat. Hence, this study recommends, among others, that state governments should ensure efficient and effective domestic and external debt management systems that create a minimal level of debt relative to total revenue for efficient and effective budget implementation.

Implication of findings: The findings of this study suggest that state governments in Nigeria should take necessary steps to manage their domestic and external debt profiles to enhance their capacities for effective budget implementation.

Keywords: Budget implementation, Domestic debt, External debt, Nigeria, Public debt management.

1. Introduction

Effective budget implementation, however, requires adequate financial resources to meet the planned capital and recurrent expenditures of the government. According to Arogundade and Olaoye (2016), the extent of budget implementation of state governments depends on the revenue generation. Ibadin and Oladipupo (2015) explained that the responsibility shouldered by the government of any nation is enormous, and discharging these responsibilities depends largely on the amount of revenue generated by the government through various means. Edoganya and Ja'afaru (2013) stated that government performance depends on the availability of resources which the state can explore and harness in meeting financial needs of budgeted expenditure that can enhance development. This is confirmed in the words of Ocheni, Ezugwu and Akubo (2017) which stated that poor budget implementation can be associated with the inability of national and subnational government to generate enough revenue to finance their expenditure. In addition, Olaoye and Olugbammiye (2019) identified that budget implementation has to do in one part with the attainment of projected revenue and, on the other part, the achievement of projected revenue in order to achieve the desired goal of the government. Therefore, the states have to ensure and explore all available sources to generate sufficient financial resources that will enhance the implementation of the budget which was earlier planned.

For sufficient public financing, most of the Nigerian states have, over the years, taken public borrowing as the last resort to support government revenue. Ajayi et al. (2021) attested to the fact that most governments borrow to finance public activities because of the inability to be self-dependent which is the consequence of inadequate income. Ijeoma (2013) explained that the government borrowed to

support its meager stock of capital available to meet growth and development demand. This is because it is generally believed that the government can explore debt instruments to augment the available revenue generated to enhance the implementation of plans as stated in the budget. According to Campbell (2019), borrowing is utilized by the government to address the inability to meet expenditures through available revenue as a result of the budget deficit. In line with this, government borrowed to bridge the gap between public revenue and expenditure to enhance budget implementation to encourage growth and development of social and economic activities (Opara, Nzotta & Kanu, 2021).

Public debt becomes an issue when it is difficult to pay back and this is a major problem faced by most developing countries in the world as they tend to use a high percentage of their income to service such debts each year. Although, public debt aims to boost economic growth and development, by enhancing budget implementation, when the debt burden of a country is on the high side, debt servicing becomes difficult. This tends to be a serious threat to economic growth and development since it can hinder the government from performing its fiscal responsibilities to the state. The servicing of debt absorbs budgetary and foreign exchange resources, and the absence of any benefits accruing from the investment of the original loan will have a net negative effect on a government's ability to fund its social expenditure programmes (Ajayi, et al., 2018). Fosu (2010) affirmed that a high level of debt profile increases government debt services which can cause diversion of spending from social services such as agriculture, industry, education, and health among others into repayment of debt obligation. Hence, debt accumulation can lead to low level of budget implementation and a low level of capital formation. Managing public debt is therefore advocated to ensure the adequacy of government activities and performance through budget implementation. Good public debt management can help the government minimize borrowing costs, contain financial risk, and develop a domestic debt market. Public debt management is also believed to ensure debt are acquired for and utilized on capital expenditure since this will enhance the government's capacity to repay debt later. With good management policies, the government will have a better chance of establishing institutions that facilitate quality and effective debt management functioning (Arit, 2013). This idea brought about the establishment of the Debt Management Office in 2000 in Nigeria which is responsible for the management of public debt in the country, even at the state level.

The inadequacy of revenue generated over the years occasioned the increase in the budget deficit, hence the need for raising funds through debt among states in Nigeria. For instance, the debt profile of Lagos (444.2b), Plateau (134.0b), Kano (107.7b), Delta (233.89b) and Ogun (142.28b) in 2019 and stood at around 508.778b, 137.7b, 116.9b, 248.40b and 153.49b in 2020 for the respective states aforementioned (Debt Management Office, 2019, 2020). However, public debt, both domestic and foreign, is associated with unfavourable lending conditions, unstable interest rate and flexible foreign exchange rate. While the external debt can discourage foreign direct investment, the domestic debt diverts investment fund from productive sector to the unproductive public sector which can influence people and business capacity to contribute to government revenue capacity for growth and development in the state, hence the limitation to budget implementation (Akinwunmi & Adekoya, 2018). Meanwhile, despite the establishment of debt management offices, most of these states failed to ensure the utilization of public debt on infrastructural projects that could enhance revenue-generating capacity and create an economy that can handle the repayment of its debt. Rather than capital projects, most of these states finance their recurrent expenditure instead, debt accumulation keeps increasing for these states while revenue generating capacity does not increase proportionately. With this, debt servicing reduces the already inadequate revenue for budget execution. As such, while striving to service debt, the government still incurs additional debt to ensure expenditure implementation. This largely explains the cycle of debt acquisition

and accumulation, debt servicing, and low level of revenue generation while budget performance suffers (Adegboyega, 2021).

Most studies on debt management focused largely on the role of debt accumulation on economic growth at the national level. For instance, Al-Zeaud (2014) examined public debt and economic growth; Hilton (2021) analyzed public debt and economic growth from the purview of contemporary evidence from a developing economy. Oladokun (2015) also analyzed public debts and public expenditure in Nigeria, as well as Onyeiwu (2012) who investigated domestic debt and the growth of the Nigerian economy. All these studies only used aggregated debt stock at the national level with more emphasis on its influence on the economy as a whole. In addition, most of these studies do not capture the management dimension of public debt, given the fact that they are concerned about debt stock either external or internal; as such previous studies had largely considered absolute values of debt which may not be adequate to capture debt management. Hence this study examined specifically the effect of both domestic debt management ratio and external debt management ratio on budget implementation performance of states in Nigeria.

The broad objective of this study is to examine the effect of public debt management on budget implementation in selected states in Nigeria. The specific objectives of the study are to: assess the effect of domestic debt management on budget implementation performance of selected states in Nigeria; examine the effect of external debt management on budget implementation performance of selected states in Nigeria; and make recommendations for effective debt management and budget implementation among selected states in Nigeria.

Hypotheses of the Study include:

H1: Domestic debt management has no significant effect on budget implementation of states in Nigeria.

H2: External debt management has no significant effect on budget implementation of states in Nigeria.

2. Literature review
Public debt management
Public debt management is the process of establishing and executing strategy for managing government debt in order to raise the required amount of funding at the lowest possible cost over medium to long run which is consistent with a prudent degree of risk (International Monetary Fund & World Bank, 2014). It can also be referred to as a process in which policies to enhance government debt acquisition, utilization and repayment are designed and its implementation are coordinated and monitored (Arit, 2013; Shi, Song, and Ramzan, 2025). Public debt represents the total amount of outstanding borrowing obligation or accumulated loans of the government (Adegoroye, 2018). Likita (2000, as cited in Oladokun, 2015) described public debt as a contractual obligation of owing or accumulated borrowing of government which is supported by an agreement to payback at a future date. It can also be referred to as the financial resources or money utilized by government which is not contributed by the government or its ministries, departments and agencies but from entities separated from the government either within the boundary or outside the boundary of the country concerned. In the words of Oyejide (2005), public debt is the amount of money utilized on government spending which is not contributed by the government neither does it belong to its sectors and agencies. For instance, when financial resources or money utilized for budget implementation in Nigeria is acquired from private organization and individuals in the country or from private entities and governments in other countries with an agreement on repayment, this financial resource is public debt for Nigeria. Succinctly, two categories identified in literature are domestic debt and external debt. Domestic debt represents the finance fund raised by

government through issuance of debt instruments in the domestic financial market. Domestic debt can also be referred to as funds acquired through treasury bills, certificate and bonds issued to the residents of the country by the apex bank, in the case of Nigeria, The Central Bank of Nigeria. External debt refers to the portion of a country's debt that was borrowed from foreign lenders including commercial banks, governments or international financial institutions (Arnone, Bandiera & Presbitero, 2005, as cited in Oladokun, 2015). These debts can be productive or dead weight in nature. For instance, when government acquired debt to cover expenditure on investment or asset such as acquisition of factories, construction of road, bridges, schools, hospitals, electricity and refineries among others which enhances productive sector and ensure productivity and growth, the debt is referred to as productive debt, since it can produce for its repayment. But, when debt is obtained in order to cater for recurrent expenditure as well as war, for instance in Nigeria, the current issues of insurgencies and insecurity, this type of debt is dead weight, since it is unable to reproduce for its own repayment.

Budget implementation
Budget implementation entails both revenue projections and expenditure framework contained in the approved budget documents which are achieved within the fiscal years. According to Olaoye and Bankole (2019), budget implementation has to do with the execution of budget that depends on the key assumptions and benchmarks that constitute the budget structure. Onyekpere (2018) described budget implementation as a phase of the budget process where approval for fund release is always associated with the adequacy of fund generated within that fiscal year. To Ugoh and Ukpere (2009), budget implementation requires close adherence to the dictate of the budget which depicts what economic and non-economic activities a government wants to undertake with special focus on policies, objectives and strategies for accomplishment that are substantiated with revenue and expenditure projection. Smith and Thomas (2004) depict that budget implementation is the objective accomplishment of program related to objectives and goals within a definite time period as defined in the budget framework.

Relationship between debt management and budget implementation
Efficiency and effectiveness in public debt management enhance the growth and development through implementation of budgeted expenditure and repayment of accumulated debts as and when due (Matiti, 2013). Managing debt ensures that debt is utilized productively such that the economy becomes capable of repayment of debt in order to avoid huge debt accumulation. However, in a situation whereby there is inefficient management of debt, debt may become unproductive and keep accumulating with inadequate revenue capacity while debt servicing reduces capability to implement plan. In line with relationship between public debt management and budget implementation, several studies have been conducted. Al-Zeaud (2014) examined effect of public debt on economic growth in Jordan using data of the period 1991-2010 analyzed with OLS which stated that public debt to gross domestic product has positive effect on per capita growth while debt servicing had negative effect on per capital growth. Another study by Hiton (2021) revealed that there exists unidirectional causality from public debt to gross domestic product in the long run when causal relationship between public debt and economic growth were analyzed with ARDL Granger causality test which covered the period 1978-2018. Opara, Nzotta and Kanu (2021) also revealed that federal and state domestic debt had positive effect on human development index and private investment while debt servicing has negative effect in their study on effect of domestic public debt on economic growth in Nigeria over the period 1981-2018 analyzed with ordinary least square.

On the other hand, Onyeiwu (2012) examined effect of public borrowing on economic growth of Nigeria over the period 1994-2008 analyzed with OLS and result showed that domestic debt has negative effect on economic growth. A study carried out by Oladokun (2015) showed that unidirectional causality from

total domestic debt to budget as well as unidirectional causality from expenditure to domestic debt while no causal relationship was found between budget and external debt in the study of Nigeria data for the period 1981-2012 analyzed with Granger causality test. Another study conducted by Adegoroye (2018) indicated that public debt has negative effect on macroeconomic stability, settlement of accumulation of arrears, investment and employment generation in their study on the effect of public debt on budget implementation using times series data of 2011-2015 as well as survey data of 51 officers analyzed Chi-square and descriptive statistics.

Theoretical framework

Ricardo's theory of public debt: This theory was developed by Ricardo in 1819 and later elaborated by Barro (1974). Ricardo theory centered on the preference for tax financed public expenditure to public loan financed expenditure. The theory suggests that public expenditure can be implemented through funds realized by communities and private economic sectors with idle resources that could cause inequality in the economy. Ricardo opined that government expenditure should not be financed through borrowing and that government should ensure all the existing accumulated debts is cleared out. This is because Ricardo believed that public debt has harmful effect on resources allocation, especially tax revenue sources. The theory explained that public debt can possibly cause the transfer of resources from the economy to other countries and limit capital formation in the debtor economy. The theory also faulted public debt as serious evil which could in one year affects none of government expenditure interest and next year, another expenditure interest through its influence on taxes generated to repay debt. The theory further explained that attempts to stimulate the economy through increase in debt finance may be effective because investors and consumers take debt as a means for government to raise expectation from revenue sources, especially taxes. Based on this, the theory identified that people would save in order to meet future increase in taxes and that this reduces the effect of increase in aggregate demand. In another way, the theory identified that government cannot stimulate economy through public debt because whatever resources gained now will be offset by payment in the future and crowd out private investment

Empirical review

Zahariev *et al.* (2020) evaluated debt management through support vector machines on Italy and Greece, which cover the period 2000 – 2018. Data for the study was obtained through observations from 2000 – 2018. Support Vector Machines was adopted as a tool for econometric analysis in which descriptive analysis was used to analyze the data. Findings revealed that there is a strong correlation between the support vectors obtained with the SVM algorithm which is also due to strict selection of indicators whose correlation by the model algorithm to limit their negative significance for the final result. It also showed that correlation between the factor indicator and debt ratio of Italy indicate a better chance to overcome its debt crisis as a result of Italy diversified economy. The study concluded that both countries would face challenges and critical level of public debt-to-GDP ratio if European central bank abandon zero interest rate policy and set a positive interest rate. Similar study conducted in the context of African countries by Ehikioya, Omankhanlen, Osuma and Inua (2020) explored dynamic relationship between external debt and economic growth. The study employed data if the period 2001-2018 for 43 African Johansen co-integration and system Generalized Method of Moments. Result of the study revealed long run relationship between external debt and economic growth. Results of the study also indicated that effect of external debt was positive on the short run but negative on the long run. Another study by Spyrakis and Kotsios (2021) studied the dynamic connection of public debt with national income and fiscal policy. The study employed data for the period 2006-2018 for 30 countries and analyzed data with

trend analysis. The study showed that fiscal policy has positive effects on national income and negative effects on public debt.

Hilton (2021) examined causal relationship between public debt and economic growth. Variables employed were annual gross domestic product growth rate, total public debt, government consumption expenditure, inflation rate, investment spending, trade openness and population growth. The study used data from 1978-2018 and analyzed data with ARDL Granger causality test. Results of the study revealed unidirectional causality from public debt to gross domestic product in the long run and no causal relationship between public debt and gross domestic product in the short run. Results of the study also revealed negative bidirectional causality between investment spending and gross domestic product in the short run but positive in the long run. Van, Ha, Quyen, Anh and Loi (2020) conducted a study on role of corruption control on the connection between public debt, budget deficit and economic development in developing countries. The study involved data of the period 2004-2015 extracted for 59 developing countries and analyzed with two-step Generalized Method of Moment. Result indicated that public debt and budget deficit had negative effect on economic development. Hence, the study recognized the government should not prioritize public debt and budget deficit increase as a means of enhancing economic development. Efanga, Etim and Jeremiah (2020) assessed the influence of public debt on economic development in Nigeria. Variables utilized were gross fixed capital formation, domestic debt, foreign debt and exchange rate. The study employed data for the period 1981-2018 analyzed with ARDL model regression technique. Results of the study indicated that foreign debt, domestic debt and exchange rate had positive significant influence on gross fixed capital formation. As such, the study concluded that public debt can substantially enhance economic development. Hence, the study recognized that government needs to ensure that public debt is utilized on implementation of national budget as well as enhancement of macroeconomic measures.

Opara, Nzotta and Kanu (2021) explored effect of domestic public debt on economic growth in Nigeria. Two regression models used in the study contained private investment (credit to private sector) and human development index as dependent variables respectively, domestic debt servicing, federal domestic debt and state domestic debt as explanatory variables. Data for the study covered 1981-2018 and were analyzed with Johansen co-integration approach and Ordinary Least Square. Results of the study showed that no long run relationship exists among the variables in the two models employed. Debt servicing has negative effect on the dependent variables. Result also indicated that federal and state domestic debt had positive effects on private investment and human development index, but the effect of federal domestic debt on human development index was insignificant. Hence, the study recommended that there is need for government to constrain the debt policy in order to avoid huge debt service that could undermine growth and development. Ajayi and Edewusi (2020) explored how public debt influence economic growth in Nigeria. Variables used were external debt, domestic debt and gross domestic products. The study employed data for the year 1982-2018 and analyzed data with Johansen co-integration. Results of the study indicated that external debt had negative influence on gross domestic products. Results also revealed that domestic debt had positive influence on gross domestic product. As such, the study recommended that government should ensure that public debt is utilized for enhancing investment in the productive sector. Reed, Najarzadeh and Sadati (2019) investigated connection between budget deficit, current account deficit and government debt sustainability in Iran. Variables used in the study were budget deficit, current account deficit, and government debt sustainability, dummy variable during the war year, dummy for exchange rate unification in 1993 and dummy for exchange rate unification in 2002. The study engaged data which covered 1974-2015 and analyzed data with Vector Autoregressive (VAR) approach. Results of the study indicated that there existed long run

stable relationship among the variables. As such, the study recommended that government should ensure reduction in budget deficit and current account deficit in order to enhance debt sustainability in the country.

Amani (2018) investigated the impact of government debt on macroeconomic objective indicators of G7 and ASEAN countries. Variables utilized were macroeconomic indicators (GDP per capita, human development index, gross capital formation, foreign direct investment), trade openness, inflation, population growth, health expenditure, education expenditure, interest rate, government spending, and government debt. The study employed data for the period 1995-2015 for G7 and ASEAN countries and analyzed data with panel regression method. Results of the study revealed that government debt has positive significant effects on GDP per capita, human development index, gross capital formation and foreign direct investment in G7 countries but negative in ASEAN countries. Results of the study also indicated that government spending and institutional quality have positive effect on human development index in the two categories. The study, however, recognized that difference in the impact of government debt can be explained through threshold, allocation, governance and crowding in/crowding out effects.

Equiza-Goni, Faraglia and Oikonomou (2018) analyzed the impact of government debt maturity in currency union in union debt management. Descriptive analysis was adopted for the study. The findings suggested that real bonds are a commitment device against inflating away public debt, though; long term inflation indexed bonds have a hedging value for government in a currency area. The study concluded that budget is insulated from the effect of spending shocks and taxed smoothed. Biondi and Boisseau-Sierra (2018) analyzed the relationship between financial sustainability and public debt management in central government. Discussion method was adopted for the study. The study found that absolute or relative debt level is not sufficient to examine financial sustainability of governments. It further noted that public debt does not involve only the capacity to sustain its burden of interest charges and capital installment through tax revenues but also the capacity to both monetize the burden of monetary base management and place it with resident and foreign debt – holders. It also revealed that public debt capacity and financial sustainability invite default situation with a view to intergenerational solidarity and redistribution. In light of this, the study concluded that debt restructuring terms and conditions may be addressed in the same spirit considering the specificity of public debt management.

Saungweme and Odhiambo (2018) checked influence of public debt service on economic growth using discursive methods. The study is based on the previously conducted empirical literatures and indicated that most literatures confirmed negative relationship between public debt service and economic growth while few showed insignificant relationship between the two variables. However, the study explained that relationship between public debt service is determined by size, structure and composition of domestic and external debt. As such, the study recognized the need for government to ensure the level and rate of debt is maintained at a point where debt servicing facilitates reduction in economic, social and political cost. Adegoroye (2018) studied effect of public debt on budget performance in Osun state. The study employed data of the period 2011-2015 as well as primary data collected from 51 officers and analyzed data with descriptive statistics and Chi-square statistics. Results of the study indicated that public debt has negative effect on macroeconomic stability, settlement of accumulation of arrears, investment and employment generation. As such, the study concluded that public debt has negative influence on budget performance.

Li and Li (2017) evaluate the impact of local government debt expenditure based on debt budget management. Discussion method was used in the study. The findings revealed that formation of debt

risk is the difficulty to fulfill its debt service liability, due to the existence uncertainty factors of government contingent liabilities. It also revealed that money market and the capital market in the gradual market-oriented operation of the reform process ultimately complete the transformation of the main body of the economy to independent economic status. Ulgenturk (2017) analyzed the role of public debt managers in contingent liability management. Data for the study was obtained from surveys conducted within the countries. Findings revealed that government credit guarantees are the sub-category of contingent liabilities and the DMOs most actively engage. It also revealed the effect of the global financial crisis on their contingent liability management practice through their increasing role in the financial sector support program. The study also revealed that DMOs were responsible for the management of the financial sector guarantee program. The study recommended program loan guarantees should have clearly-stated objectives and a set of rules or a code of conduct for granting and also contingency reserve funds, whether actual or notional, is a useful tool to increase the governments' ability to cover possible future losses and monitor their financial position vis-à-vis the existing guarantees.

3.   Methodology

The study employed quantitative research design for its data analysis using an additive model which is in tandem with panel data/variables of study. The population of this study covered all the States in the Federal Republic of Nigeria cutting across the six geopolitical zones of the country. Specifically, the population included the 36 states in Nigeria, with Federal Capital Territory (FCT), Abuja. This study made use of multistage sampling techniques. In the first stage of the sampling process, the study made use of stratified sampling techniques to categorize all the States in the Federation into strata based on the geographical location of each State. At this stage, all the States were stratified into the geopolitical zones they belong, namely, South-West, South-East, South-South, North Central, Northeast and Northwest. In the second stage, three States each were randomly selected from each of the geopolitical zones. Thus, in total, this study covered 18 States with three states each randomly selected from each of the six geopolitical zones of the Federation

This study specified two models based on the framework of Ricardo's theory, (cited in Churchman, 2001) that public debt has effect on state performance. In adapting Ricardo's framework, the study specified budget implementation performance (BIP) as a function of domestic debt management ratio (DDMR) and external debt management ratio (EDMR), alongside control variables such as statutory allocation (STA); State population size (SPS), and governance continuity of states (GC) as shown in equation 1 and equation 2 below:

Model 1: Domestic Debt management and Budget Implementation

$$lnBIP_{it} = \beta_0 + \beta_1 lnDDMR_{it} + \beta_2 lnSTA_{it} + \beta_3 lnSPS_{it} + \beta_4 lnGC_{it} + e_{it} ---- (1)$$

Model 2: External Debt management and Budget Implementation

$$lnBIP_{it} = \beta_0 + \beta_1 lnEDMR_{it} + \beta_2 lnSTA_{it} + \beta_3 lnSPS_{it} + \beta_4 lnGC_{it} + e_{it} ---- (2)$$

This study used secondary data sourced from various database including the annual budgets of each state, Debt Management Office of Nigeria, National Bureau of Statistics. Data were collected for samples from each of the sampled 18 states that were randomly selected across the six geopolitical zones of the country from the website of selected States, publication and data portal of both the Debt Management Office of Nigeria and the National Bureau of Statistics. This study made use of inferential statistics including descriptive statistics correlation analysis, and static panel data analyses including pooled OLS

estimator, fixed effect estimator, alongside post-estimation tests such as restricted f-test, Hausman test, Wald heterogeneity test, Wooldridge autocorrelation test, and Pesaran cross sectional dependence test.

4. Results and discussion
Descriptive analysis of the variables

Table 1: Descriptive statistics result

Variable	Obs	Mean	Std. Deviation	Minimum	Maximum
BIP	180	72.80397	19.8433	25.33	149.14
IGR	180	48.20331	103.2833	2.991	651.2
DDMR	180	.8318603	.4067935	.089	2.049
EDMR	180	.2812737	.2672733	.03	1.755
STA	180	56.19115	42.92504	12.293	294.378
SPS	180	5.21881	2.265404	2.376	12.773
GC	180	.8659218	.3416921	0	1
DBS	180	175.7436	209.7426	15.107	1337.109

Source: Researcher's Computation (2024).

BIP= Budget implementation performance (%); IGR= Internally generated revenue (billion naira); STA= Statutory allocation (billion naira); DDMR= Domestic debt management ratio (ratio of domestic debt to total revenue); EDMR= External debt management ratio (ratio of external debt to total revenue); SPS= State population size (no of people in million); GC= Governance continuity (dummy: 1 for continuity of seating governor; 0 for change in seating governor); DBS= Total debt stock (billion naira)

Correlation analysis

Table 2: Correlation matrix

	BIP	*DDMR*	*EDMR*	*STA*	*SPS*	*GC*
BIP	1.0000					
DDMR	-0.0959	1.0000				
EDMR	0.2026	0.0523	1.0000			
STA	-0.0337	-0.0574	-0.2201	1.0000		
SPS	0.0669	-0.1724	0.4640	0.1860	1.0000	
GC	0.0051	0.0020	0.0537	0.0207	0.0052	1.0000

Source: Author's Computation (2025).

Correlation results reported in Table 2 revealed that budget implementation performance has negative correlation with domestic debt management ratio and statutory allocation, but positive correlation with external debt management ratio, state population size, and governance continuity, given the coefficients of -0.0959 for BIP and DDMR, 0.2026 for BIP and EDMR, -0.0337 for BIP and STA, 0.0669 for BIP and SPS, 0.0051 for BIP and GC. In addition, the result depicts that there is relatively weak relationship among the explanatory variables of the study, given the coefficients of 0.0523 for DDMR and EDMR, -0.0574 for DDMR and STA, -0.1724 for DDMR and SPS, 0.0020 for DDMR and GC, -0.2201 for EDMR and STA, 0.4640 for EDMR and SPS, 0.0537 for EDMR and GC, 0.1860 for STA and SPS, 0.0207 for STA and GC, as well as 0.0052 for SPS and GC. Therefore, there is absence of multicollinearity and its associated problems in the model used for this study, hence, regression estimation can be conducted.

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Table 3: Estimation result model 1

Variables	Pooled OLS	Probability	Fixed Effect	Probability
C	1.853005	0.000	**.4841459**	**0.408**
LnDDMR	-.0410149	0.296	**-.0292211**	**0.533**
LnSTA	-.0249905	0.589	**.0333541**	**0.740**
LnSPS	.0351122	0.564	**1.231677**	**0.008**
GC	.0057123	0.834	**.0012115**	**0.955**
R-square	*0.4095*		*0.6988*	
Wald Test	1.7576			
Pesaran Test	1.5445			
Wooldridge Test	1.517			

Source: Author's Computation (2025).

Estimation results reported in column 4 and 5 of Table 3 showed fixed effect estimation with coefficient and probability of -0.0292211 and 0.533 (p > 0.05) for in DDMR, revealing that budget implementation performance reduces by 0.03% whenever there is 1% increase in domestic debt management ratio. This therefore implies that domestic debt management ratio has no significant effect on budget implementation performance when heterogeneity is incorporated as constant term. Result also depicts coefficients and probability of .0333541 and 0.740 (p > 0.05) for LNSTA, 1.231677 and 0.008 (p < 0.05) for LNSPS as well as .0012115 and 0.955 (p > 0.05) for GC which reveal that budget implementation performance increases by 0.033%, and 1.23% whenever there is N 1billion increase in amount received from federation account and number of people in the states respectively and that budget implementation performance rises by 0.12% with the existence of continuity of sitting governors.

Therefore, the result indicates that statutory allocation and governance continuity have insignificant positive effect, while state population size has significant positive effect on budget implementation performance across states in Nigeria when heterogeneity is incorporated into the model as constant term. Notably post estimation test showed that there is no evidence to reject null hypothesis on panel homoscedasticity, null hypothesis of no cross-sectional dependence and null hypothesis of no AR (1) panel autocorrelation, given the reported probability statistics of 1.7576 > 0.05 for Wald test, 1.5445> 0.05 for Pesaran test, and 1.517 > 0.05 for Wooldridge test. Hence it can be established in the study that assumptions of equal variance of residual terms cross sectional independence and absence of serial autocorrelation for the estimated panel-based model is valid.

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Table 4: *Estimation Result Model 2*

Variables	Pooled OLS	Probability	Fixed Effect	Probability
C	1.836322	0.000	.6046454	0.298
LnEDMR	.1326646	0.000	-.0117095	0.793
LnSTA	.1039646	0.057	.0254599	0.799
LnSPS	-.1052516	0.128	1.135902	0.016
GC	-.0017507	0.947	.0020706	0.923
R-square	*0.4856*		*0.6977*	
Wald Test	1.7428			
Pesaran Test	0.8479			
Wooldridge Test	1.448			

Source: Author's Computation (2025).

Fixed effect results in Table 4 indicate coefficient and probability of -.0117095 and 0.793 ($p > 0.05$) for InEDMR, revealing that budget implementation performance reduces by 0.12% whenever there is ₦ 1billion increase in external debt management ratio, hence, external debt management ratio has insignificant negative effect on budget implementation performance when heterogeneity is incorporated as constant term. Results also depict coefficients and probability of .0254599 and 0.799 ($p > 0.05$) for InSTA, 1.135902 and 0.016 ($p < 0.05$) for InSPS as well as .0020706 and 0.923 ($p > 0.05$) for GC which reveal that budget implementation performance increases by 0.02%, and 1.14% whenever there is ₦1 billion increase in amount received from federation account and number of people in the states respectively and that budget implementation performance rises by 0.21% with the existence of continuity of sitting governors. Therefore, the results indicate that statutory allocation and governance continuity have no significant positive effect, while state population size exerts significant positive effect on budget implementation performance across states in Nigeria when heterogeneity is incorporated into the model as constant term.

Reported R-square statistics of 0.6977 also reveals that 69.77% of systematic variation in budget implementation performance is explained by variation in external debt management ratio, statutory allocation, state population size and governance continuity, when heterogeneity is incorporated as constant term. The implication is that external debt management ratio exerted insignificant positive effect on budget implementation performance of states in Nigeria while domestic debt management ratio has insignificant negative effect on budget implementation performance of selected states in Nigeria.

Discussion of findings

Results revealed that budget implementation tends to be on the increase if there is decline in the debt management ratio measured as debt to revenue ratio. This implies that decrease in debt relative to revenue, which signifies good domestic debt management can enhance the level of budget implementation performance of state governments, although the finding seems to be limited to period and states covered in the study. Nevertheless, the result proves the possibility of enhancing budget implementation, if there were to be efficient debt management, that is decline in debt to revenue ratio, coupled with effectiveness in the operations of debt management offices and officials as well as adequacy in the utilization and debt among states in the country. It found that domestic debt management ratio

has insignificant negative effect on budget implementation performance of selected states in Nigeria. The result is therefore in tandem with the submission of Adegoroye (2018) which explained that public debt has negative effect on budget implementation performance, most often through influence on macroeconomic stability, settlement of accumulation of arrears, investment and employment generation.

On the other hand, the study noted that external debt management ratio exerted insignificant positive effect on budget implementation performance of states in Nigeria. The result showed there would be increase in budget implementation in the cases of an increase in external debt management proxied by debt to revenue ratio. This result clearly reflects that increase in external debt relative to revenue, an indicator of bad external debt management, may be accompanied by increased budget implementation performance. The possibility of this outcome, however, lies in the utilization of debt in financing budgeted expenditure. However, the result is not significantly relevant for forecast and policy recommendations. Nevertheless, it is noteworthy that the result correlates with the findings of Ajayi and Edewusi (2020), which revealed that external debt significantly improves the capacity of government in achieving growth in the economy, although the study was more concerned with the federal government affairs.

5.   Conclusion

The study focused on the effects of debt management on budget implementation in selected states in Nigeria spread across the six geopolitical zones of the country. It found out that domestic debt management has insignificant tendency to impede budget implementation performance among states in Nigeria and that external debt management has insignificant likelihood to improve budget implementation though it does not pose any negative threat.

In view of the above, the study recommends as follows: state governments should ensure efficient and effective domestic debt management system that creates a minimal level of debt relative to total revenue and take responsible decisions on accumulation of external debts that will benefit budget implementation.

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