



## **EFFECT OF PUBLIC DEBT ON CAPITAL EXPENDITURE IN NIGERIA**

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### **Abstract**

*This study examines the effect of public debt on capital expenditure in Nigeria. Annual time series data for domestic debt, external debt and capital expenditure were collected from Central Bank of Nigeria statistical bulletin between 1981 and 2019. Philip Perron test was used to test the stationarity of the data and the Johansen cointegration test was utilized to determine presence of long run relationship. Vector Error Correction Model (VECM) was used for analysis since cointegration was established in the series. Ordinary least square method was used to test the effect of public debt on capital expenditure in Nigeria. The findings showed that domestic debt is significant and positive driver of capital expenditure in Nigeria. But external debt shows insignificant relationship with capital expenditure in Nigeria. Hence, public debts remain a driver of capital expenditure in Nigeria as the F-statistics show a good fit. It is recommended that government debt should be contracted for productive components of expenditure and not on non-productive components of government expenditure. The government should equally reduce external debt used in deficit financing in order to increase debt from domestic sources of deficit financing.*

*Keywords: Domestic Debt, External Debt, Capital Expenditure, Nigeria*

## INTRODUCTION

Many developing countries run deficit budgets mainly funded through borrowings. Borrowing does not negate any economic principle, so far as its expenditure is channeled into regenerative investments that will guarantee and facilitate the repayment structure, debt liquidation and value addition in terms of supporting the standard of living of the citizens (Ogwuma, Ikenna & Odili, 2015).

Public debt, sometimes also referred to as government debt, represents the total outstanding debt (bonds and other securities) of a country's central government (Arnone, Luca, Presbitero & Andrea, 2015). It may also be defined to include outstanding debts of sub national units. Public debt can be raised both externally and internally, where external debt is the debt owed to lenders outside the country and internal debt represents the government's obligations to domestic lenders (Asogwa, 2018). Public debt is an important source of resources for a government to finance public spending and fill holes in the budget (Alawneh, 2017). Public debt as a percentage of GDP is usually used as an indicator of the ability of a government to meet its future obligations.

Government expenditure in a country can be characterized in two different ways, either as recurrent expenditure or capital expenditure (Cuong, Phu, Amélie & Duc, 2018). This study focuses on the capital expenditure. Government capital expenditure is government money spent on goods that are classified as investment goods or assets. This is an expenditure that is incurred on goods that have long run benefit to nationals, such as building of new health facilities, schools and infrastructure facilities among others (Ayinde & Ayinde, 2012).

The term capital expenditure is defined as a spending on assets. It is the purchase of items that will last and be used time and time again in the provision of good or service. In the case of government, examples would be the building of a new hospital, the purchase of new computer equipment or networks, constructing new roads etc. (IMF, 2017). Also, according to CBN (2019), Government capital expenditure is the money spent on goods that are classified as investment goods. This means spending on assets that produces stream of income overtime. This may include investment in hospitals, schools, power sector, telecommunication, road construction and most recently in the Nigerian railway sector. The Nigerian railway sector has witness huge expenditure starting with the Abuja-Kaduna 186km rail project, Warri-Itakpe narrow gauge 326km rail project and a host of many others. Since the revenue generated by the government cannot cover for the huge public expenditure (both recurrent expenditure and capital expenditure) a gap is created in the annual budget as a result of this deficit. Therefore, the idea of public debt (both domestic and external debt) becomes imperative for the development of the economy. The role of public debt in carrying out government capital

expenditure in Nigeria has been a growing concern despite the fact that the government had embarked on several policies aimed at improving the growth of capital projects in the Nigerian economy through borrowing funds tied to capital projects, a good example is the Sukuk, which was deployed largely in highway construction in Nigeria. In 2017 N100billion was deployed for the first Sukuk, while in 2018, another N100billion was deployed and in 2020 N162.56billion was also deployed (CBN statistical Bulletin, 2020).

Different scholars have carried out empirical studies into the relationship between public debt and government expenditure in Nigeria such as; Odo, Igberi and Anoke (2016) studied public debt and public expenditure in Nigeria: A causality analysis. Oluremi (2015) examined causal relationship between public debts and public expenditure in Nigeria. Uguru (2015) explored the link between public debt and government expenditure pattern in the Nigeria experience. However, they did not look at the effect of public debt (that is; domestic debt and external debt) on capital expenditure specifically in Nigeria. Furthermore, most of these studies conducted were trying to look at the causal nature of public debt and government expenditure while this study examines the longrun and shortrun effect of public debt on capital expenditure using cointegration, VECM and OLS regression.

Therefore, the broad objective of this study is to examine the effect of public debt on capital expenditure in Nigeria. The specific objectives are to:

- i. Examine the effect of domestic debt on capital expenditure in Nigeria.
- ii. Determine the effect of external debt on capital expenditure in Nigeria.

To achieve the objectives of this study, it was postulated that:

$H_{01}$ : Domestic debt has no significant effect on capital expenditure in Nigeria.

$H_{02}$ : External debt has no significant effect on capital expenditure in Nigeria.

## LITERATURE REVIEW

### Conceptual Framework

Here, the concepts of public debt and capital expenditure were identified and concretely defined; these variables were conceptualized to reflect their true meaning in the study.

#### **Public Debt**

Public debt also known as government debt or national debt is money owed by government or total debt of all governmental units, including state and local governments (Saungweme & Odhiambo, 2019). Public debt, also known as public interest, government debt, national debt and sovereign debt, (United States Department of the Treasury, 2020) contrasts to the annual government budget deficit, which is a flow variable that equals the difference

between government receipts and spending in a single year. The public debt is a debt stock variable, measured at a specific point in time, and it is the accumulation of all prior deficits. Public debt is defined as the total financial obligations acquired by governmental bodies of a nation, which includes money that is owed to individuals, mutual funds, hedge funds, pension funds, foreign governments and others. It considers government liabilities, future pension payments and payments for goods and services that the government contracted but not yet paid for (Mindaugas & Janina, 2018). Public debt (also known as public interest, government debt, national debt and sovereign debt) contrasts to the annual government budget deficit, which is a flow variable that equals the difference between government receipts and spending in a single year (Alawneh, 2017).

Nwaotka (2014) defines public debt as a planned excess expenditure over income, dictated by government policy, of creating fund to finance deficit by borrowing whether from local or foreign sources which must be repaid with interest within a specific period of time. Public debt can be seen as the practice of seeking to stimulate a nation's economy by increasing government expenditures beyond revenue sources (CBN, 2018). Public debt refers to the money that the government owes to its creditors, which include private citizens, institutions, foreign governments, and other parts of the federal government (Oyejide, Soyede & Kayode, 2014; Monogbe, 2015). Public debt represents the total outstanding debt (bonds and other securities) of a country's central government (Saifuddin, 2016). Public debt is an important source of resources for a government to finance public spending and fill holes in the budget (Hassan & Akhter, 2012).

Public debt has no particularly fixed meaning and is regarded mainly as that which government entity legally owes to another agreed to be repaid in the future. This is a particularly wide definition of public debt. It is an obligation that is enforceable by legal action to make payment of money (Adofu & Abula, 2017). Public debt is created by the act of borrowing. It is a liability an individual or firm or a country must have to repay on maturity (Kumar & Woo, 2016). It may also be a financial guarantee or commitment that ought to be honoured in due time as agreed. Asogwa (2018) explained public debt as a contractual obligation of owing or accumulated borrowing with a promise to pay back at a future date. It considers government liabilities, future pension payments and payments for goods and services that the government contracted but not yet paid for (Greiner, 2014). This definition which is narrower than that of (Adofu & Abula, 2017; Kumar & Woo, 2016; Asogwa, 2018) is the generally accepted definition of public debt.

Public debt is one of the methods of financing government operations; governments can also create money to settle her debts in order to avoid interest payment, though creation of

money will only reduce interest cost and will not cancel the debt itself which may cause hyperinflation (Odo, Igberi & Anoke, 2016). In some other times government might increase tax so as to finance debt repayment in the economy. Public debt arises each time the government has budget deficit. For the economy to grow as planned in a budget, shortage of revenue resulting from excess expenditure has to be financed by raising fund from other sources available to the government (Cuong, Phu, Amélie & Duc, 2018).

The act of borrowing creates debts and this debt may be domestic or external. Public debt is in different forms: internal or domestic debt (owed to lenders within the country) and foreign or external debt (owed to foreign lenders). Debt repayment arises in short term (on or less than one year), medium term (between boundaries of short and long term) and long term (more than ten years) (Uguru, 2015).

Public debt is in different forms: internal or domestic debt (owed to lenders within the country) and foreign or external debt (owed to foreign lenders) (Udeh, Ugwu & Onwuka, 2016). Debt repayment arises in short term (on or less than one year), medium term (between boundaries of short and long term) and long term (more than ten years). Public debt can be raised both externally and internally (Panizza, & Presbitero, 2014), where external debt is the debt owed to lenders outside the country (Teles & Mussolini, 2014) and internal debt represents the government's obligations to domestic lenders (Okwu, Obiwuru, Obiakor & Oluwalaiye, 2016).

According to Aybarc (2019), public debt can be classified in three forms: 1.) According to maturities which are; short-term public debts that is debts up to 1-year, medium-term public debts that is debts ranging from 1 to 5 years and long-term debts that is debts more than 5 years. 2.) According to sources which are; domestic debts that is a country's borrowing from own national resources and external debts that is resources provided from a foreign country that is repaid with principal and interest at the end of a certain period. 3.) According to voluntary basis which are; voluntary debts that is debts that are lent to the state by its own will and desire, and obligatory debts that is debts which are lent by forcing to take the bonds issued by government. This study adopts the two forms of public debts based on the source which are domestic debt and external debt.

### ***Domestic Debt***

Domestic debt or internal debt is the part of the total government debt in a country that is owed to lenders within the country (Adesola, 2019). Alison (2013) explained three theoretical reasons for government domestic debt. They are budget deficit financing, monetary policy implementation (i.e., buying and selling of treasury bills in the open market), and development of

the financial instruments to deepen the financial market. Domestic debt may have positive effect on growth in the short-run but in the long-run if the debt service repayment regime exceeds the ability to pay with some probability, it will lead to debt overhang and at a point, the interest becomes higher than the principal and the effect becomes negative (Fosu, 2017). At this point, crowding-out of investment and private sector constraints will arise due to capital shortages. Internal debt's complement is external debt, they are sourced from commercial banks, other financial institutions etc (Ogwuma, Orikara & Uruakpa, 2018).

### ***External Debt***

Arnone, Bandiera and Presbitero (2015), described external debt as that part of a country's debt that was borrowed from foreign lenders including commercial banks, governments or international financial institutions. External debt becomes necessary when domestic financial resources become inadequate to finance public goods that increase welfare and engender economic growth. External debts are funds sourced from outside the nation's border usually in foreign currency and are interest-bearing to finance specific project(s) in the borrowing country that will bring about developments and growth.

According to Ogbeifin (2017), external debt arises as a result of the gap between domestic savings and investment. As the gap widens, debt accumulates and this makes the country to continually borrow increasing amounts in order to stay afloat. He further defined Nigeria's external debt as the debt owed by the public and private sectors of the Nigerian economy to non-residents and citizens that is payable in foreign currency, goods and services. The judicious utilization of foreign loans may lead to some benefits to a nation (Mahmoud, 2015; Ijirshar, Joseph & Godoo, 2016: and, Munzara as cited in Omedero, 2019).

External debt can be obtained from foreign commercial banks, international financial institutions like IMF, World Bank, ADB etc and from the government of foreign nations. Normally these types of debts are in the form of tied loans, meaning that these have to be used for a predefined purpose as determined by a consensus of the borrower and the lender. Government and corporations are eligible to raise loans from abroad. These are in the form of external commercial borrowings. The interest rate on foreign loans is linked to LIBOR (London Interbank Offer rate) and the actual rate will be LIBOR plus applicable spread, depending upon the credit rating of the borrower (Fosu, 2017).

### ***Concept of Capital Expenditure***

Capital expenditures are investments with possible multiplier effects on the economy in terms of public benefits. In most cases government intervention has brought stability in income

and employment in the economy. A capital expenditure is an amount spent to acquire or significantly improve the capacity or capabilities of a long-term asset such as equipment or buildings (Cuong, Phu, Amélie & Duc, 2018). Usually, the cost is recorded in a balance sheet account that is reported under the heading of Property, Plant and Equipment. The asset's cost (except for the cost of land) will then be allocated to depreciation expense over the useful life of the asset. The amount of each period's depreciation expense is also credited to the contra-asset account Accumulated Depreciation.

Capital expenditure is the money spent by the government on the development of machinery, equipment, building, health facilities, education, etc. It also includes the expenditure incurred on acquiring fixed assets like land and investment by the government that gives profits or dividend in future (IMF,2019).

Capital expenditure, which leads to the creation of assets are long-term in nature and allow the economy to generate revenue for many years by adding or improving production facilities and boosting operational efficiency. It also increases labour participation, takes stock of the economy and raises its capacity to produce more in future (Ayinde & Ayinde, 2012).

Capital expenditure are payments for acquisition of fixed capital assets, stock, land or intangible assets. A good example would be building of schools, hospitals or roads. However, it is important to note that much donor-funded “capital” expenditure, though referring to projects, includes spending on non-capital payments. Government capital expenditure is an expenditure on assets and it is also the purchase of items that will last and will be used time to time in the provision of a good services.

## **Empirical Review**

### ***Domestic Debt and Capital Expenditure***

Ogwuma, Orikara and Uruakpa (2018) investigated the relationship between domestic public debts, capital expenditure and recurrent expenditure on economic growth in Nigeria using data spanning (1980 – 2016). Secondary data were collected from the CBN statistical bulletin and National Bureau of Statistics. Recurrent Expenditure and Capital Expenditure were used as proxies for Public Expenditure and Gross Domestic Product represents Economic Growth. The study made use of ordinary least squares of multiple regressions. The adopted Augmented Dickey – Fuller (ADF) unit root test shows that, at level, none of the variables was stationary at first difference. The Johansen co-integration test results shows evidence of long run relationship of the variables. The study reveals that domestic public debt and recurrent expenditure have negative and insignificant effect on economic growth in Nigeria, while capital expenditure has a positive and significant effect on economic growth in Nigeria. The study recommends that



government should only obtain public loans where interest rates are very low in order to reverse the negative effect of domestic public borrowing in its economy especially in the long run. Government should commit more of its funds to capital projects especially infrastructural development in order to boost its economic growth among others.

Alawneh (2017) estimated the impact of capital expenditure, current expenditure and external and internal public debt on taxes in Jordan during the period 2001–2014. It adopted the multiple linear regression method to analysed the impact of the independent variables (represented by capital expenditure, current expenditure, external and internal public debit) on the dependent variable (taxes). The statistical analysis showed a statistically significant, positive impact of both the capital expenditure and the current expenditure on taxes. The study also found a statistically significant, positive relationship between external and internal public debt on taxes in Jordan. The study presented a number of recommendations, most importantly for the public sector, taking into account the capital expenditure, the current expenditure and the external and internal public debt, which directly affect the tax increases in Jordan. There is a need to use non-traditional alternatives to finance capital expenditures instead of external public debt and internal sources, such as Sukuk Murabaha Islamic participation, to finance capital expenditure for the Government to build schools, hospitals and other government services. The study advised Government to take into account the current expenditure of tax revenues, while capital expenditure should be covered by non-traditional means.

Idenyi, Ogonna and Ifeyinwa (2016) investigated the causal relationship between total public debt and public expenditure in Nigeria from 1980 to 2015. The focus of the study is to determine if government borrowing in Nigeria is based on the need to provide social services and infrastructure as provided in the budget or by mere reason of privileged access to financial institutions both domestically and internationally. Applying co integration, vector error correction model and Wald test econometric tools of analysis to public debt, government capital expenditure, government recurrent expenditure and interest rate variables within the study period, the study obtained the following results. The trace statistics indicates two (2) cointegration equations, suggesting that there is a long run relationship among the variables tested and that the results can be relied upon in taking long run policy decisions in the economy. The findings of the VEC test indicate that government capital and recurrent expenditure have significant positive relationship with public debt in the Nigerian economy. The Wald test result shows that unidirectional causality runs from both capital and recurrent expenditure to public debt in Nigeria. An obvious implication of this result is that government borrowing in Nigeria is triggered by government deficit budgeting, a situation which is well known in Nigeria at both federal and state levels. It therefore becomes necessary that the government budgeting process



need to be reexamined to ensure that allocative efficiency is achieved in our budgeting system and that borrowing to finance budget deficit must be done objectively and realistically.

Greiner (2007) used endogenous growth model of public capital and public debt. It was assumed that the ratio of the primary surplus to gross domestic income is a positive linear function of the debt income ratio which assures that public debt is sustainable. The study then derives necessary conditions for the existence of a sustainable balanced growth path for the analytical model. Further, simulations are undertaken in order to gain insight into stability properties of the model and in order to analyse growth effects of deficit financed increases in public investment. The latter is done for the model on the sustainable balanced growth path as well as for the model along the transition path.

### ***External Debt and Capital Expenditure***

Uguru (2016) examined the relationship between public debt and government expenditure in Nigeria from 1980 to 2013. The data which is purely secondary data was sourced through the Central Bank of Nigeria Statistical Bulletin for various years. The study estimated a model with public debt as the dependent variable while the capital expenditure and recurrent expenditure are the independent variables. Using the ordinary least square regression technique, the t-test statistic results at 5% level of significance, revealed that there is a significant relationship between public debt and government expenditure in Nigeria. It then recommends that the government of Nigeria should make haste to reduce its recurrent expenditure and embark more on capital expenditure so as to meet the Vision 20:2020. Again, the economy of Nigeria should be diversified to reduce the over dependence on crude oil revenue. The study suggested that the diversification programme is embarked upon, it will definitely reduce the tendency of the government to accumulate public debt.

Antr, Alessandro and Pasquale (2014) investigated the relationship between public capital expenditure and public debt in the European Union (EU) on a panel of fifteen countries over the sample period 1980-2013. They found robust evidence of a negative cointegrating relation, according to which increases in the capital expenditure-GDP ratio cause reductions in the debt-GDP ratio in the long run. The study empirical results suggest that current EU fiscal austerity can trigger upward debt spirals if cuts in total expenditure disregard its composition. Consistently with the golden rule of public finance, EU fiscal rules should allow for higher levels of capital expenditure in order to foster debt consolidation through growth dividends.

Eboigbe and Idolor (2013) examine the impact of external debt on public sector investment in Nigerian economy, using the co-integration economic technique on annual time series data for 31 years (1980 – 2011) to test the hypothesized relationship. The result of the

study shows that there is a positive relationship between external debt and public investment, meaning that an increase in debt stock will lead to increase in capital expenditure and public investment in turns. The paper recommends that Nigeria should be concerned about the absorptive capacity of the economy before embarking on more external debt acquisition; and that the portfolio of debt should be diversified in terms of sources and types to avoid concentrations of debt service imperatives.

## **Theoretical Framework**

### ***Theory of Public Expenditure***

Public expenditure is spending made by the government of a country on collective needs and wants such as pension, provision, infrastructure, etc. Until the 19th century, public expenditure was limited as laissez faire philosophy believed that money left in private hands could bring better returns as a result of an invisible hand that allocated resources to their optimal usage. In the 20th century, John Maynard Keynes argued the role of public expenditure in determining levels of income and distribution in the economy. Governments at all levels (national, regional and local) need to raise revenue from a variety of sources to finance public-sector expenditures. The details of taxation are guided by two principles: who will benefit, and who can pay. This theory believed that maximum satisfaction should be yield by striking a balance between public revenue and expenditure by the government.

### ***The Keynesian Theory***

Of all economists who discussed the relation between public expenditures and economic growth through industrial sector output, Keynes was among the most noted with his apparently contrasting viewpoint on this relation. Keynes regards public expenditures as an exogenous factor which can be utilized as a policy instrument to promote economic growth.

From the Keynesian thought, public expenditure can contribute positively to economic growth. Hence, an increase in the government consumption is likely to lead to an increase in employment, profitability and investment through multiplier effects on aggregate demand. As a result, government expenditure augments the aggregate demand, which provokes an increased output depending on expenditure multipliers. Keynesian economics was very influential for several decades and dominated public policy from the 1930s to the 1970s. The theory has since fallen out of favour. But it still influences policy discussion particularly on whether or not changes in government spending have transitory economic effects. For instance, some policymakers still use Keynesian analysis to argue that higher or lower level of government spending will stimulate or dampen economic growth.

## METHODOLOGY

The research design adopted for this study is ex post facto design. This study uses yearly time series data covering the period 1986 to 2019. This period includes all the after effect of Structural Adjustment Programme (SAP) which was a major condition giving to Nigeria by IMF before loan was granted in 1985. The variables of the study are domestic debt, external debt and capital expenditure. Data for the study was obtained from the Central Bank of Nigeria Statistical Bulletin 2019. Descriptive statistics was used to explain the data. A stationarity test was conducted to test for the presence of unit root in the time series data. In addition, co-integration test was conducted to investigate possible correlation among the variables of this study. A vector error correction model was also used: Vector error correction model is a restricted type of VAR designed for use of non-stationary series that are known to be co-integrated. The data obtained was also analyzed using ordinary least squares through Eviews 10 Statistical Package. The analysis process of this study follows the following steps:

The Phillips-Perron (PP) unit root test was employed to determine the order of integration of the variables in an attempt to establish stationarity level of the variables. The PP unit root test is conventionally said to have greater unit root detection ability when compared with the ADF unit root test. The PP test is thus preferred to the Augmented Dickey Fuller (ADF) because it deals with potential correlated error by employing a correction factor that estimates the long run variance of the error process.

$$\Delta y_{t-1} = \alpha_0 + \lambda y_{t-1} + \dots + \lambda y_{t-p} + \varepsilon_t$$

## Cointegration

Johansen (1990) developed two likelihood ratio tests: The Trace Test and the Maximum Eigen value Test. The two procedures test for the presence of cointegrating vectors between banking sector debt, non-bank public debt, external debt and gross domestic product.

$$\Delta Y_t = \mu + \sum_{i=1}^{n-1} \Gamma_i \Delta Y_{t-i} + \sum_{i=0}^{m-1} \gamma_i \Delta X_{t-i} - ECM_{t-1} + \varepsilon_t$$

where,  $\Delta$  is the first difference operator,  $Y_t$  is a  $p \times 1$  vector of stochastic variables,  $X_t$  is the independent variable, ECM is the error-correction coefficient and is also called the adjustment coefficient,  $I$  is a vector of constants, and  $\varepsilon_t$  is a vector of normally, independently, and identically distributed errors with zero means and constant variances and  $p$  is number of variables.

### Error Correction Model

Granger (1987) showed that if two variables are cointegrated, then they have an error correction representation. The Error Correction Model (ECM) provides information about the long run, short run relationship as well as the speed of adjustment between the variables in incorporating to the estimated equation, the error correction term (ECT).

$$\Delta Y_t = a_0 + b_1 \Delta X_t - \lambda \hat{u}_{t-1} + Y_t$$

The model is specified as follows:

$$CAPEX = f(DD, EXD) \dots\dots\dots (1)$$

The econometric form of equation (1) is represented as:

$$CAPEX_t = \alpha + \beta_1 DD_t + \beta_2 EXD_t + \mu_t \dots\dots\dots (2)$$

Where: DD = Domestic Debt; EXD = External Debt; CAPEX = Capital Expenditure;  $\alpha$  = Intercept or Constant;  $\beta$  = Slope of the regression line with respect to the independent variables;  $\mu$  = Error Term. The Cointegration model of the study is represented by:

$$\Delta CAPEX_t = \mu + \sum_{i=1}^{n-1} \Gamma_i \Delta CAPEX_{t-i} + \sum_{i=0}^{m-1} \gamma_1 \Delta DD_{t-i} + \gamma_2 \Delta EXD_{t-i} + ECM_{t-1} + \varepsilon_t \dots\dots\dots (3)$$

where, DD = Domestic Debt; EXD = External Debt; CAPEX = Capital Expenditure; and ECM = Error-correction coefficient;  $\varepsilon$  = Error term;  $\Delta$  = First difference operator;  $\mu$  = Intercept or Constant;  $t-i$  = Time lagged;  $\gamma_1$ –  $\gamma_3$  = Coefficient of independent variables.

### RESULTS AND DISCUSSION

The data were analyzed using descriptive statistics, unit root test, Johansen cointegration, error correction model, ordinary least square regression, while post estimation analysis such as serial correlation test and normality test were also carried out.

Table 1. Descriptive Statistics (*Eview version 10 output*)

	CAPEX	DD	EXD
Mean	473.9900	2874.909	1698.217
Median	309.0200	898.2500	633.1444
Maximum	2289.000	14272.64	9022.422
Minimum	4.100000	11.19000	2.331200
Std. Dev.	528.3003	4124.126	2195.768
Skewness	1.406542	1.523872	1.763094
Kurtosis	5.032604	4.050829	5.585451
Observations	39	39	39

Table 1 above shows that capital expenditure has a mean value of 473.99 which means that capital expenditure on an average is N473 billion per annual. The deviation from the mean (standard deviation) was 528.3003; this means that capital expenditure was not normally distributed because the standard deviation value was greater than the mean value. In like manner, it has a median of 309.0200 with skewness and kurtosis of 1.406542 and 5.032604 respectively. The maximum capital expenditure in Nigeria as at the period of study was 2289.000 which means that the highest capital expenditure was not more than N2289 billion, while the minimum capital expenditure for the period under study was N4 billion.

The domestic debts have mean value of 2874.909 while deviation from the mean (standard deviation) was 4124.126. This means that domestic debts were not normally distributed because the standard deviation value was greater than the mean value. In like manner it had median of 898.2500 with skewness and kurtosis of 1.523872 and 4.050829 respectively. The maximum domestic debts in Nigeria as at the period of study was 14272.64 which means that the highest debt drawn from sources within Nigeria was not more than N14273 billion, while the minimum debt drawn from sources within Nigeria for the period under study was approximately N11 billion.

Furthermore, external debts have mean value of 1698.217 while deviation from the mean (standard deviation) was 2195.768. This means that external debts were not normally distributed because the standard deviation value was greater than that of the mean value. In like manner it had a median of 633.1444 with skewness and kurtosis of 1.763094 and 5.585451 respectively. The maximum external debts in Nigeria as at the period of study was 9022.422 which means that the highest external debt was not more than N9022 billion, while the minimum external debts for the period under study was approximately N2 billion.

Table 2. Unit Root Test

Variables	Adj. T-Statistic	Prob. Values	Order of Stationarity
CAPEX	-4.562077	0.0008	I(1)
DD	-4.131543	0.0027	I(1)
EXD	-2.995404	0.0446	I(1)

The variables tested are CAPEX, DD and EXD, results are presented in table 2 above. To examine the existence of stochastic non-stationarity in the series, the research establishes the order of stationarity of individual time series through the unit root tests. The test of the stationarity of the variables adopted was Phillips-Perron.

From the table 2, it was discovered that CAPEX, DD and EXD were found to be stationary at first difference, that is, at order I(1). The PP test statistics were greater than their

respective tabulated values and their p-values are all below the 0.05 significant level for this study.

Table 3. Johansen Cointegration Analysis (*Output EvIEWS 10*)

Date: 04/16/21 Time: 09:39				
Sample (adjusted): 1983 2019				
Included observations: 37 after adjustments				
Trend assumption: Linear deterministic trend				
Series: CAPEX DD EXD				
Lags interval (in first differences): 1 to 1				
Unrestricted Cointegration Rank Test (Trace)				
Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.554644	45.86623	29.79707	0.0003
At most 1 *	0.248013	15.93760	15.49471	0.0429
At most 2 *	0.135591	5.391253	3.841466	0.0202
Trace test indicates 3 cointegrating eqn(s) at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon-Haug-Michelis (1999) p-values				
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
Hypothesized		Max-Eigen	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.554644	29.92863	21.13162	0.0022
At most 1	0.248013	10.54635	14.26460	0.1785
At most 2 *	0.135591	5.391253	3.841466	0.0202
Max-eigenvalue test indicates 2 cointegrating eqn(s) at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon-Haug-Michelis (1999) p-values				

The Trace test of Johansen cointegration shows that there are indications of cointegration at 0.05 significance level as shown in its Trace statistics of none (45.86623), At most 1 (15.93760) and At most 2 (5.391253) which are greater than their respective 0.05 critical values (29.79707, 15.49471 and 3.841466), while the p-value (0.0003, 0.0429 and 0.0202) is below the 0.05 level of significance for this study. Also, the maximum Eigen value test of Johansen cointegration shows that there are indications of cointegration at 0.05 significance level as shown in its Max-Eigen statistics of none (29.92863) and At most 2 (5.391253) which is greater than its respective 0.05 critical values (21.13162 and 14.26460), while its p-value (0.0022 and 0.0202) are below the 0.05 level of significance for this study. Since there is cointegration in the two criteria of Johansen cointegration test, it implies that there is long run relationship between domestic debts, external debts and capital expenditure. This suggests the use of Vector Error Correction model.

Table 4. Vector Error Correction Model (*Output Eviews 10*)

Standard errors in ( ) & t-statistics in [ ]			
Cointegrating Eq:	CointEq1		
CAPEX(-1)	1.000000		
DD(-1)	0.087337		
	(0.02308)		
	[ 3.78448]		
EXD(-1)	-0.091952		
	(0.02384)		
	[-3.85624]		
C	-540.7711		
Error Correction:	D(CAPEX)	D(DD)	D(EXD)
CointEq1	-0.364371	1.277451	0.220459
	(0.10502)	(0.18305)	(0.48420)
	[-3.46966]	[ 6.97877]	[ 0.45530]
D(CAPEX(-1))	0.256154	-0.816896	-0.659210
	(0.20255)	(0.35306)	(0.93392)
	[ 1.26462]	[-2.31376]	[-0.70585]
D(CAPEX(-2))	0.829957	-0.708394	-0.154649
	(0.19991)	(0.34844)	(0.92171)
	[ 4.15174]	[-2.03302]	[-0.16778]
D(DD(-1))	0.179638	0.083465	0.239220
	(0.10188)	(0.17758)	(0.46974)
	[ 1.76324]	[ 0.47001]	[ 0.50926]
D(DD(-2))	0.438415	-0.856161	0.065794
	(0.12783)	(0.22281)	(0.58938)
	[ 3.42977]	[-3.84261]	[ 0.11163]
D(EXD(-1))	-0.031410	0.014141	0.632179
	(0.04190)	(0.07304)	(0.19320)
	[-0.74959]	[ 0.19361]	[ 3.27208]
D(EXD(-2))	-0.022834	0.197218	-0.226363
	(0.04459)	(0.07771)	(0.20557)
	[-0.51215]	[ 2.53774]	[-1.10114]
C	-183.3827	693.0060	78.82310
	(59.1231)	(103.054)	(272.601)
	[-3.10171]	[ 6.72468]	[ 0.28915]
R-squared	0.538153	0.821512	0.482748
Adj. R-squared	0.422692	0.776890	0.353435
Sum sq. resids	631866.7	1919737.	13432815
S.E. equation	150.2221	261.8435	692.6351
F-statistic	4.660883	18.41049	3.733172
Log likelihood	-226.9943	-246.9970	-282.0162
Akaike AIC	13.05524	14.16650	16.11201
Schwarz SC	13.40713	14.51839	16.46391
Mean dependent	63.44750	395.8450	250.3290
S.D. dependent	197.7105	554.3481	861.3870
Determinant resid covariance (dof adj.)	6.35E+14		



Determinant resid covariance	2.99E+14
Log likelihood	-753.1851
Akaike information criterion	43.34362
Schwarz criterion	44.53125
Number of coefficients	27

Table 4...

The error correction term equation which shows the cointegrating relationship between variables, signifies long run effect. This is indicated by the domestic debts t-statistics of 3.7845 and external debt t-statistics of 3.8562 which are all above 2, establishing the long run relationship between public debt and capital expenditure. The average change in DD is associated with a 0.18% at lag 1 and 0.44% at lag 2 increase in CAPEX on average ceteri paribus in the short run. While the average change in EXD is associated with a 0.03% at lag 1 and 0.02% at lag 2 decrease in CAPEX on average ceteris-paribus in the short run.

Table 5. Regression Result (*Output Eviews 10*)

Dependent Variable: CAPEX				
Included observations: 39				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	132.3984	53.73877	2.463742	0.0187
DD	0.099537	0.014361	6.930857	0.0000
EXD	0.032641	0.026974	1.210118	0.2341
R-squared	0.770015	Mean dependent var		473.9900
Adjusted R-squared	0.757238	S.D. dependent var		528.3003
S.E. of regression	260.2980	Akaike info criterion		14.03533
Sum squared resid	2439182.	Schwarz criterion		14.16330
Log likelihood	-270.6890	Hannan-Quinn criter.		14.08125
F-statistic	60.26611	Durbin-Watson stat		0.542382
Prob(F-statistic)	0.000000			

Domestic debt has significant effect on capital expenditure because the p-value is 0.0000 which is lower than the 5% significant level, indicating that increase in domestic debt will automatically increase capital expenditure to the extent of 0.099537. Therefore, the study rejects  $H_{01}$ , which states that domestic debt has no significant effect on capital expenditure in Nigeria. On the other hand external debt has no significant effect on capital expenditure because its p-value is 0.2341 which is greater than the 5% significant level, indicating that increase in external debt will not automatically increase capital expenditure to the extent of 0.032641. Therefore, the study accepts  $H_{02}$ , which states that external debt has no significant effect on capital expenditure in Nigeria.

The coefficient of determination ( $R^2$ ) is 0.770015 implying that public debt explain variation on capital expenditure to the extent of 77%, while the remaining variation was explained by other variables not captured in the model. The model is fit with F-statistics of 0.00.

Table 6: Post Estimation Test

Description	Probability values
<b>Normality Test:</b>	
Jarque-Bera	4.319205
P-value:	0.115371
<b>Serial Correlation</b>	
F-statistics	2.679170
P-value	0.0840

Table 6 indicates that the data is skewed, denoting that the data are normal. This is corroborated by the Jarque-Berra Statistic of 4.319205 and its corresponding P-value of 0.115371 which are all greater than the t-value of 0.05.

The Breusch-Godfrey Serial Correlation LM Test indicates that there is no autocorrelation. This is given by the F-statistic of 2.679170 and its corresponding P-value of 0.0840.

## CONCLUSION AND RECOMMENDATIONS

The main objective of the study is to empirically examine the effect of public debts on capital expenditure in Nigeria for the period 1981 to 2019. Based on the findings of the study, it can be concluded that there is an existence of long run equilibrium relationship between domestic debts, external debts and capital expenditure in Nigeria. The study concludes that domestic debts have significant effect on capital expenditure in Nigeria. This means that the use of domestic debts to fund budget deficit in Nigeria does have a proportionate increase on the capital expenditure. This finding is in line with the works of Alawneh (2017). However, external debt does not significantly increase the capital expenditure. This result is against the findings of Eboigbe and Idolor (2013) who found out that external debt has significant effect on capital expenditure, meaning that an increase in debt stock will lead to increase in capital expenditure and public investment in turns.

Based on the findings of this study, it is recommended that domestic debts source of financing deficit should be encouraged since it contributes to increased capital expenditure which should causes the economy to grow and per capita income to increase. However, it should be properly channeled to productive sector of the economy that will enhance increase of gross domestic product and stability of other macroeconomic variables. Especially, domestic

debt tied to capital projects like Sukuk should be encouraged the more. Government should reduce external debt used in deficit financing in order to increase debt from domestic source of deficit financing that will contribute positively to capital expenditure.

Further studies can be carried out on issues around public debt and recurrent expenditure as it will show how accumulation of public debt further affect government expenditure.

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