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EFFECT OF TAX REVENUE ON PUBLIC DEBT AND CAPITAL EXPENDITURE IN NIGERIA

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ABSTRACT
The citizens' need for accountability by the governments' continuous receipt of tax revenue without a corresponding reduction in public debt and increase in capital expenditure has raised questions on the effect of tax revenue on public debt and capital expenditure. It is against this background that the study examines the effect of tax revenue on public debt and capital expenditure in Nigeria during the period 1999 - 2018. Secondary data was sourced from the Central Bank of Nigeria (CBN) Statistical Bulletin. It adopted the ordinary least square regression method by E-views program to study the effect of the independent variables (represented by value added tax, company income tax, petroleum profit tax and customs and excise duty) on the dependent variable (external debt, internal debt and capital expenditure). The data treatments used for the times series secondary data are Descriptive Statistics, Unit Root using Augmented Dickey–Fuller, Co- integration tests using Bounds Test and Vector Error Correction Model. The findings revealed that tax revenue had a statistically significant, positive and negative effect of on public debt and capital expenditure. Tax revenue had both positive and negative effects on external debt in Nigeria (R^2 = 0.789, f = 0.00010, p<0.05); Tax revenue had both positive and negative effects on internal debt in Nigeria (R^2 = 0.959, f = 0.00000, p<0.05) and Tax revenue had both positive and negative effects on capital expenditure in Nigeria (R^2 = 0.692, f = 0.00164, p<0.05).The study concluded that tax revenue has effect on public debt and capital expenditure in Nigeria. It was recommended that the government should ensure that revenue gotten from taxes are spent on profitable investments like capital expenditure. Also, to reduce public debt, fiscal authorities should enhance the effectiveness of the tax system by sealing loopholes and enforcing compliance. The government should also look to other sources of income in order to further reduce the burden of public debt.

Key words: Capital Expenditure, Company Income Tax, Customs and Excise Duty, External Debt, Internal Debt, Petroleum Profit Tax, Public Debt, Tax Revenue, Value Added Tax,

1. INTRODUCTION
Government Expenditure has a vital role to play in infrastructural development, economic growth, employment, health and education. This expenditure can be broadly categorized into revenue expenditure and capital expenditure. The government spending is mainly financed by tax revenue although they may be sources from non-tax revenues. Tax is generally imposed on income, consumption, production, and human skill. Where

there is budget deficit, the government results to public borrowing, which can either be foreign debt or domestic debt, in order to finance its expenditure. The net borrowing of government is called fiscal deficit. According to Battaglini and Coate (2008), if public expenditure is financed by public debt, then the maintenance of sustainability of fiscal balance becomes a priority. If available funds in the budget are allocated to unproductive heads, then growth suffers, tax revenue declines and it becomes difficult to repay the debt with interest. This then makes fresh loans to be taken out in order to repay previous ones. This will adversely affect the fiscal balance.

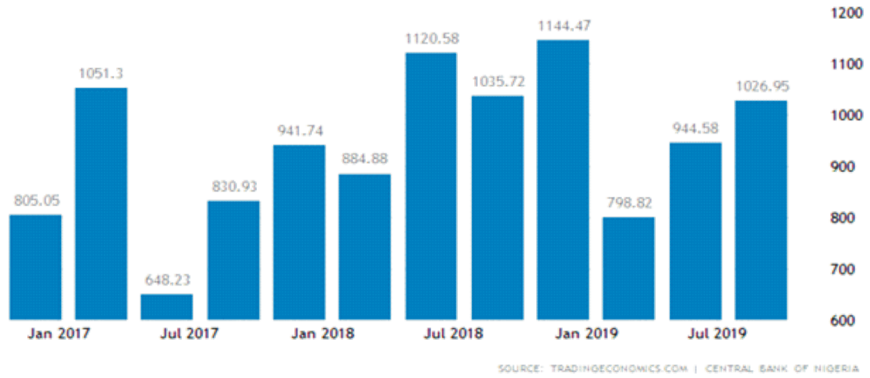

Figure 1: Nigerian Government Revenues
Source: www.tradingeconomics.com

Nigeria incurs both domestic and external debts. The external debt is typically owed to foreign creditors. These are multilateral agencies such as the Africa Development Bank, the World Bank, or the Islamic Development Bank, and bilateral agencies such as the China Exim Bank, the French Development Bank, or the Japanese Aid Agency. There are also foreign private creditors such as investors in Nigeria's Eurobonds. The domestic debt, however, is contracted within Nigerian borders, usually through bond and Treasury bills which are purchased by Nigerian banks, local pension funds, and other domestic and foreign investors. The government also has some contractor arrears, and other local liabilities which form part of total public debt. The concern is that excessive domestic borrowing could crowd out private sector investment as the government competes with the private sector for available funds.

Infrastructure is a strategic tool used in basically all human endeavors in various fields of life such as production, construction, technology and procurements. In the 1970s, due to an unprecedented increase in Nigeria's oil revenue, there was a massive increase in federal government expenditure. A significant increase in capital expenditure was noticeable between 1974 and 1980, reflecting the significant increase in government revenue following favorable developments in the international petroleum market. The period thus witnessed a boost in the provision of economic and social infrastructure such as highways, air and sea ports, hospitals, schools and housing. However, capital expenditures of the Federal Government as a percentage of GDP decreased from 1980 to 1995. These reflected adherence to the prescriptions of Structural Adjustment Program

(SAP) and also the impact of the oil glut of the 1980s on revenue of government and by extension on its expenditure. Between 1999 and 2010, it had, once again, significantly fallen. In general, the period from 1990 to 1998 was characterized by high growth in capital expenditure in nominal terms, though in real terms, growth was only marginally. The upward trend in nominal capital outlay during the period reflected high rates of inflation and the consequent low value of the naira (Oni, 2014).

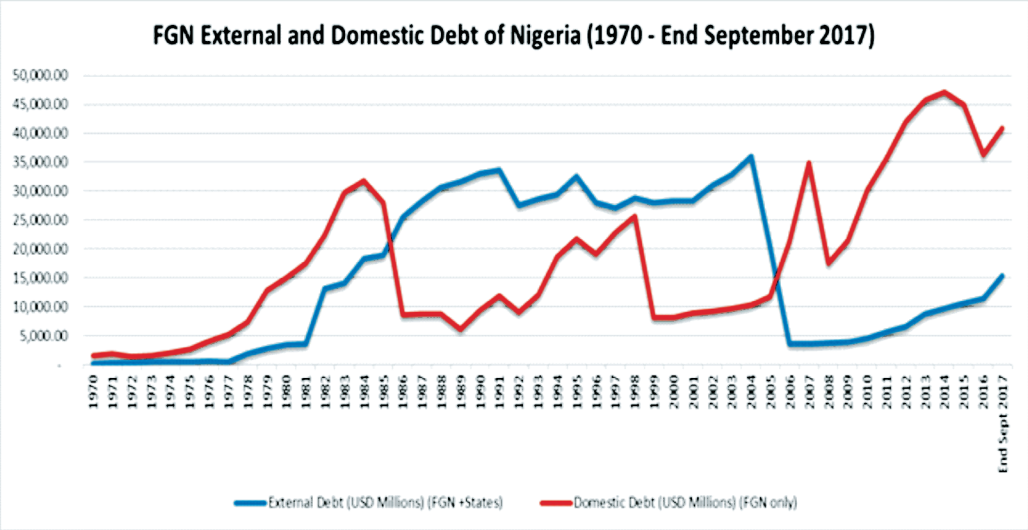

Figure 2: External and domestic Debt of Nigeria
Source: Office of the Accountant General of the Federation (OAGF) & 2017 Appropriation Act

In order for the tax revenue collected to meet the capital expenditure demands and debt repayments, the Government must pay attention to its economic and financial situation. Therefore, this study will analyze the impact of tax revenue on external and internal public debt in Nigeria and the impact of taxes on capital expenditure in Nigeria.
In the early 1970s, developing countries borrowed to finance their current account deficit. Such borrowing was geared towards boosting the level of economic growth and development. As the debt piled up, the international financial institutions from the 1980s started providing both technical and financial debt-management assistance to debtor countries. On the other hand, not much attention was being paid to the domestic debt. Thus some countries, Nigeria inclusive, have been witnessing bloated domestic debt. In recent times there seems to be a consensus among public opinion leaders that huge external debt was adversely affecting economic growth and development in developing countries (Mojekwu & Ogege, 2012).

Soludo (2003) opined that countries borrow for majorly two broad categories: macroeconomic reasons[higher investment, higher consumption (education and health)] and to finance temporary balance of payments deficits [to lower nominal interest rates abroad, lack of domestic long-term credit, or to circumvent hard budget constraints]. According to Chukwuemeka, Richardson and Chinanuife (2018),

infrastructural development has been the major concern of countries all over the world due to its significant impact in the growth of a country. They also opined that in Nigeria, it has been observed that the level of infrastructure posed serious threat to attaining sustained growth poverty in the country.

According to Canning (1999) other than giving a better understanding of the function of the country in the growth process, opportunity could be taken to carefully restructure and scrutinize the composition of public expenditure so as to enhance growth and development as well as promote the needed environment for private sector development. Therefore, this study investigates government spending on debt servicing as well as its effect on capital expenditure in Nigeria.

According to the Nigerian Ministry of Finance, Nigerian Federal and State governments have borrowed so much that debt servicing now consumes about 70% of tax revenue generated. From the words of Garba Shehu (2015), "it would appear that the country might be heading for a fiscal crisis if urgent steps are not to halt the negative trends in target setting and target realization in tax revenue". For a developing country like Nigeria, capital expenditure ought to constitute a substantial portion of her total public expenditure to lay the foundation for economic growth and sustainability (Iheanacho, 2016). There is need for a new and updated study to identify and assess the effect of tax revenue on public debt and capital expenditure in Nigeria from 2009 to 2018. The present study intends to contribute to existing body of knowledge on how the government can efficiently allocate collected tax revenues to public debt and capital expenditure.

2. LITERATURE REVIEW

According to Odum, Odum and Egbunike (2018), fiscal policy is the way and manner whereby the government manages the economy through income and expenditure to bring about certain desired macroeconomic objectives. Dada (2016) opined that it the means by which the government adjusts its spending levels and tax rates to monitor and influence a nation's economy. He said that it is the sister strategy to monetary policy through which a central bank influences a country's money supply. These two polices are combined to achieve a country's economics' objectives. However, Afolabi and Atolagbe (2018) believe that fiscal policy has no dominance in Nigeria.

According to Charles (2018), government expenditure is a determinant of fiscal policy. In a recession, governments stimulate the economy with deficit spending (expenditure exceeds revenue). During periods of expansion, they restrain a fast growing economy with higher taxes and aim for a surplus (revenue exceeds expenditure). Fiscal policy helps the government with stable resources for the provision for government to provide basic public goods and services (e.g healthcare, transport, education, infrastructure, etc). According to Ibironke (2018), the implementation of Fiscal policy in Nigeria had reduced deficit and increased fiscal discipline.

Taxation is known as an essential instrument for National development and growth in many countries all over the world. It is one of the main guides by which development and growth is measured in any civilization to the extent of wealth generated by the economic activities undertaken in the society.

The Nigeria's revised "2017 National Tax Policy" defines tax as any compulsory payment to government imposed by law without direct benefit or return of value or a service whether it is called a tax or not (Federal Ministry of Finance, 2017).

Abdulahi (2012) opined that tax can be defined as "a charge on income of individuals and corporate bodies by the government". Tax is a compulsory levy imposed on individuals and companies by government which serves as a source of income to the government to perform various legitimate function of the state (Olaoye, Ashaolu & Adewoye, 2009).

This comprises of rules and regulations relating to tax revenue and the various kind of tax in Nigeria. These laws are made by the legislative arms of the government. The following are some of the tax laws prevailing in Nigeria:

Capital expenditure (CAPEX) is spending on long term assets. It is the purchase of items that will last and will be used time and time again in the provision of a good or service. In the case of the government, examples would be the building of a new hospital, the purchase of new computer equipment or networks, building new roads and so on (Modebe *et al*, 2012).

The effect of capital expenditure usually extends to the future. It has a huge impact on the long-term strategic goals of the government. The evidence of capital expenditures can be seen years after they have been constructed or purchased. Idiake, Danjuma, Saidu and Anunobi (2019) are of the opinion that's the Nigerian budget is unconcerned with the provision of basic infrastructure for the long term growth of Nigeria but rather on spending on expenditure that do not contribute to the GDP of Nigeria.

According to Essays (2018), in a country, the needs of its citizen constantly increases, therefore, government spending has to increase as well to meet those needs. Public expenditure is usually met through taxes, fees, duties and penalties. However, government is not able to meet up its expenditure from these revenues due to budget deficit. To overcome this situation, they borrow (Campbell, 2019). Borrowing is the taking of money and similar values for repayment at a future time. Public borrowing is the legal obligation of a government to repay the principal and interest to the lender at a predetermined period in the future (Sibel, 2019).

Adam Smith and D. Ricardo opposed public borrowing. In their view, borrowing can be irresponsibly spent because it is an unearned income. In this context, they believe that the capital is wasted and the debt burden would be shifted to the next generation due to inability of the present government to pay and the inefficiency of the public expenditure.
Nigeria incurred both domestic and external debts. The external debt is typically owed to foreign creditors. The domestic debt, however, is contracted within Nigerian borders, usually through bond and Treasury bills which are purchased by Nigerian banks, local pension funds, and other domestic and foreign investors.

Table 1: Nigeria's Total Public Debt Portfolio as at June 30, 2019

	CATEGORY OF DEBT	AMOUNT OUTSTANDING (US$'M)	AMOUNT OUTSTANDING (N'M)	% OF TOTAL DEBT
A	**INTERNAL DEBT**	**27,162.63**	**8,322,629.83**	**32.38**
	FGN ONLY	22,887.96	7,012,870.94	27.29
	STATES & FCT	4,274.67	1,309,758.89	5.10
B	**EXTERNAL DEBT**	**56,720.03**	**17,379,015.91**	**67.62**
	FGN ONLY	43,775.44	13,412,796.09	52.19
	STATES & FCT	12,944.58	3,966,219.82	15.43
C	**TOTAL DEBT (A+B)**	**83,882.66**	**25,701,645.74**	**100**

Source: Debt Management Office (2019)
Note: CBN Official Exchange Rate of US$1 to NGN306.40 as at June 30, 2019 was used in converting External Debt to Naira.

The Debt Management Office (DMO) was established on October 4, 2000 to centrally co-ordinate the management of Nigeria's debt for all the tiers of government. While the state governments' external borrowing is guaranteed by the Federal Government (FG), their domestic borrowings required analysis and confirmation by the Federal Government based on clear criteria and guidelines that the states can repay based on their monthly allocations from the Federation Account Allocation Committee (FAAC) and Internally Generated Revenue (IGR).

The theory that underpins this study is The Theory of Public Finance. The Theory of Public Finance was propounded by Richard A. Musgrave in 1958. This theory talks about the raising and spending of public finance. According to Smriti (2018), Public finance is divided into four broad branches. These are Public Expenditure, Public Revenue, Public Debt and Financial Administration. Public expenditure talks about the various principles, effects and problems of expenditure made by public authorities. Public revenue discusses the various ways of raising revenue by public bodies especially through taxation. Most public finance is raised through taxes (Bailey, 2004). Public debt is the study of the different principles and methods of raising debt and their effects. It also talks about the methods of repayment and management of public debt. Financial administration deals with the methods of budget preparation, various types of budgets, war finance and development finance. This theory encompasses Tax Revenue (Independent variable) and Public Debt and Capital Expenditure (Dependent variables). It talks about how tax revenue can be raised and spent on public debt servicing and capital expenditure. Therefore this theory would be adopted for this study.

Other works have been carried out by my variables independently but not in relation to each other. Based on the article review, the gap is the effect of tax revenue and public debt in relation to capital expenditure.

Omotor (2017) focused only on the education aspect of capital expenditure in Nigeria. Akpu and Ohaka (2017) worked on the tax revenue yield in Rivers State alone. Obasikene (2017) worked on government expenditure in Nigeria and its impact on the Nigerian Economy using data from 1986-2014. Therefore, it doesn't cover the expenditure of recent years. It also did not take cognizance of public debt in Nigeria. Other sources of financing education should be encouraged in order increase national development. Areghan, Babajide, Akinjare, Oladeji and Osuma (2018) worked on the effect of Public Debt on Economic Growth in Nigeria. However, it focuses on the economy and did not take cognizance of Tax Revenue on its own. This research therefore intends to overcome this gap by studying how public debt and capital expenditure and been impacted by tax revenue using recent data.

3. METHODOLOGY

The research design that was adopted for this study is the ex-post facto research design because historical data and reports would be used. The population of this study is Nigerian economy for the period of 20 years (1999-2018). The population of this study is its sample size. The Central Bank of Nigeria (CBN), Federal Inland Revenue Service (FIRS) and Debt Management Office (DMO). The tax samples to be used for this study are Petroleum Profit Tax (PPT), Company Income Tax (CIT), Customs and Excise Duty (CED) and Value-Added Tax (VAT).

Data were be collated from the Central Bank of Nigeria Statistical Bulletin. The reason for using data from the CBN Statistical Bulletin is to derive direct analyzed data from the government itself. To capture Tax revenue in Nigeria, we will use Company Income Tax, Value Added tax and Personal Income Tax. For Public debt in Nigeria, we used data on domestic debt stock and external debt stock while Capital expenditure will be taken as a whole. The research employs only quantitative method of data analysis. This study would be making use of descriptive and inferential statistics. The data gathered would be analyzed using E-View statistics.

Model Structure

The model for this study is the adapted from the above model as follows:

$$Y_1 = f(X) \text{ and } Y_2 = f(X)$$

Where:
Y_1 = Public Debt (PD)
y_{1a} = External Debt (ED)
y_{1b} = Internal Debt (ID)
Y_2 = Capital Expenditure (CE)
X will represent Tax Revenue (TR)
x_1 = Value Added Tax (VAT)
x_2 = Company Income Tax (CIT)
x_3 = Petroleum Profit Tax (PPT)
x_4 = Customs and Excise Duties (CED)

$ED = f(x_1, x_2, x_3, x_4)$ ……..…..……1
$ID = f(x_1, x_2, x_3, x_4)$ ……...…….. ……2
$CE = f(x_1, x_2, x_3, x_4)$……..…..……3

Model 1
ED= f(VAT, CIT, PPT, CED)
$ED_t = \beta_0 + \beta_1 VAT_t + \beta_2 CIT_t + \beta_3 PPT_t + \beta_4 CED_t + \mu t$
Model 2
ID= f(VAT, CIT, PPT, CED)
$ID_t = \beta_0 + \beta_1 VAT_t + \beta_2 CIT_t + \beta_3 PIT_t + \beta_4 CED_t + \mu t$
Model 3
CE=f(VAT, CIT, PPT, CED)
$CE_t = \beta_0 + \beta_1 VAT_t + \beta_2 CIT_t + \beta_3 PPT_t + \beta_4 CED_t + \mu t$

Main Model
$PD_t + CE_t = \beta 0 + \beta_1 TR_t + \mu t$
Where:
β_0 is the intercept.
$\beta_1 - \beta_4$ are the coefficients of the explanatory variables.
μt is the error terms that absorb the influence of omitted variables in proxies used.

The ordinary least square regression will be employed to obtain numerical values of the models' coefficients. The probability values of the estimated coefficients will be evaluated at a statistical significance of 5%.

The *Apriori* expectation from the data analysis is a positive and inverse relationship between tax revenues and public debt and capital expenditure and that tax revenue has a positive and direct relationship between public debt and capital expenditure.

4. RESULTS AND DISCUSSION

Descriptive Statistics

The results for the descriptive statistics for the variables are shown in the table below.

Table 2: Descriptive Statistics

	ED	LOGID	LOGCE	LOGVAT	LOGCIT	LOGPPT	LOGCED
Mean	17.22369	8.058662	6.490453	5.075690	12.60926	15.12088	12.37337
Median	6.858173	7.914541	6.647829	5.361865	13.18532	14.50412	12.57517
Maximum	51.14335	9.455198	7.427798	6.279908	15.92823	17.28156	12.99066
Minimum	4.078808	6.678099	5.478348	3.167604	9.348362	12.00945	9.225229
Std. Dev.	17.33849	0.954513	0.545471	0.976400	2.310047	1.793759	0.858795
Skewness	0.962211	0.084460	-0.406064	-0.531624	-0.035116	0.015260	-2.614836
Kurtosis	2.267736	1.524219	2.299901	1.973713	1.483848	1.530697	10.19669
Jarque-Bera	3.533012	1.838720	0.958077	1.819801	1.919709	1.799818	65.95150
Probability	0.170929	0.398774	0.619379	0.402564	0.382949	0.406607	0.000000

Source: Authors' Computation, 2019

There is no evidence of significant variation in the data set of the variables except for ED. This is shown by the differences between the maximum and the minimum figures i.e. using maximum and minimum. However, the variable 'ED' has the largest spread in its data set meanwhile 'VAT' has the smallest spread.

Additionally, skewness measures the asymmetry distribution of the series around its mean. Furthermore, from Table 2, ID, ED and PPT are positively skewed implying that the variables have a long tail to the right although, ED has the longest tail. On the other hand, CE, VAT, CIT and CED are all negatively skewed implying that they have a long tail to the left although CED has the longest tail to the left. The closer the value of skewness is to 0, the higher the tendency that the data, individually, is normally distributed. This means that all the variables except for CED are normally distributed.

The kurtosis which measures the flatness or peakedness indicates that CED is leptokurtic since its kurtosis value is greater than 3. Conversely, ID, ED, CE, VAT, CIT and PPT are platikurtic since their kurtosis values are less than 3. This means that the values are flat relative to the normal distribution. The closer the value of kurtosis is to 3, the higher the tendency that the data, individually, is normally distributed. This means that all the variables except for CED are normally distributed.

Finally, the Jarque-Bera test shows whether a variable or series is normally distributed or not. Table 2 indicates that all the variables except CED are normally distributed. This is because the probability values of their Jarque-Bera statistics are all greater than 0.05 while the probability value for CED is less than 0.05 therefore it is not normally distributed.

Trend Analysis

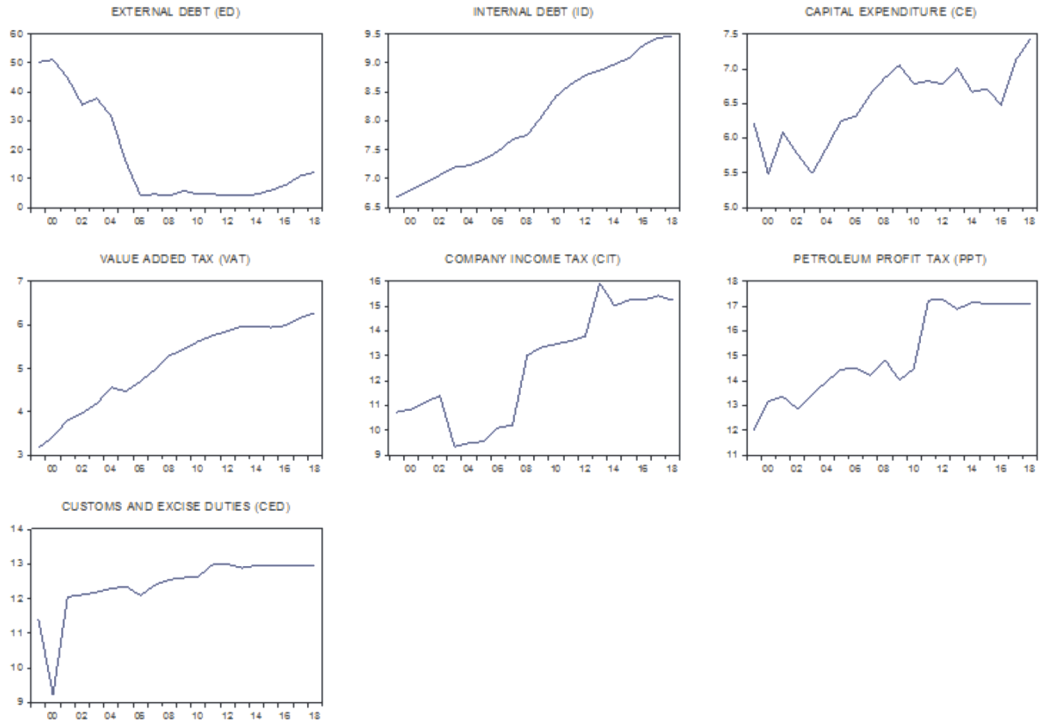

Figure 3: Trend Analysis

Figure 3 above shows that External Debt has been declining over the years. The diagram shows a 1.77% increase in 2000. However, there was a decline by 12.16% in 2001 and a further decline by 20.77% in 2002. Although there was a brief growth in 2003 by 6.06%, it quickly declined by 16.47%, 49.82% and 73.74% in 2004, 2005 and 2006 respectively. It alternatively rose and fell year after year. It rose by 10.81% in 2007, fell by 11.41% in 2008, rose by 40.94% in 2009, fell by 21.66% in 2010, rose by 1.21% in 2011, fell by 9.05% in 2012 and rose by 4.21% in 2013. It continued to grow by 4.28%, 32.43%, 29.91%, 40.87% and 1.75% in 2014, 2015, 2016, 2017 and 2018 respectively.

Figure 3 shows that there was no decline in internal debt between the period of 1999 and 2018. The internal debt began rising steadily from 1999 to 2003 with an average of 13.5%. The rise reduced to about 3% in 2004 but picked up again in 2005. It accelerated in 2007 when it rose by 23.75%. The increase reduced to about 7% in 2008 before rising by 39.12% and 41.01% in 2009 and 2010 respectively. The increase alternately varied between 8.9% and 25% between 2011 and 2017 before reducing to a growth rate of about 1.47% in 2018.

Figure 3 shows that Capital Expenditure fell drastically from 1999 to 2000 by 51.92% and quickly rose back by 83.2% in 2001. It then dropped by 51.5% between 2001 and 2003. It began to gradually rise before falling again in 2010 by 23.3%. The diagram shows consistent rise and fall in capital expenditure in 2011, 2012, 2013, 2014, 2015 and

2016 by 3.92%, -4.77%, 26.72%, -29.35%, 4.50% and -20.13% respectively. This figure then rose by 90% in 2017 and a further 35.4% in 2018.

There was a continuous growth in Value Added Tax from 2000 to 2004 which peaked at 11.17% in 2001. However, it fell by about 2% in 2005. Growth continued then after from 2006 to 2013. There was decline in growth by 0.03% in 2014 and 0.33% in 2015.Growth continued once again in 2016.

From the diagram above, company income tax started growing gradually from 1999 with an average of 2% but fell by 17% in 2003. But it picked up again in 2004. There was a rapid growth by 27.3% in 2008. The growth reduced and was on an average of 1.47%. Growth increased greatly by 15.61% in 2013 and declined by 5% in 2014. There was no growth in 2016. It started again in 2017 by 1.15% and declined in 2018 by 1.16%.

Growth in Petroleum Tax started from 9.67% in 2000. It declined by 3.655 in 2002. There was steady growth from then till 2006. It declined in 2007 by 2.11% and again in 2009 by 5.43%. Growth reached an all-time high of about 19% in 2011. From then, growth rose and fell before flat lining in 2016. It rose again in 2018 by 0.25%.

From Table 2 above, we can see that Customs and Excise Duties fell drastically in 2000 by 18.96%. It then grew rapidly by 30.59% in 2001. It grew steadily from 2002 to 2005 within 0.51% to 0.86%. CED declined by 2.19% in 2006 but continued growing steadily from 2007 to 2012 before declining again by 0.80% in 2013. It alternatively rose and fell year after year. It rose by 0.54% in 2014 and fell by 0.09% in 2015. However, there was no change in 2016. It fell again by 0.09% 2017 and rose by 0.09% in 2018.

Correlation Test

Table 3: Correlation Test

	ED	LOGID	LOGCE	LOGVAT	LOGCIT	LOGPPT	LOGCED
ED	1.000000						
LOGID	-0.741570	1.000000					
LOGCE	-0.777868	0.791835	1.000000				
LOGVAT	-0.870374	0.960135	0.833074	1.000000			
LOGCIT	-0.579623	0.903148	0.763425	0.831541	1.000000		
LOGPPT	-0.732514	0.937762	0.695218	0.915030	0.818978	1.000000	
LOGCED	-0.747816	0.709798	0.687668	0.789957	0.553104	0.674950	1.000000

From Table 3 above, External Debt (ED) has a strong negative relationship with all the variables except Company Income Tax (CIT) which has only a good negative relationship. This implies that Tax Revenues (TR) and External Debt (ED) move in opposite direction and has an inverse relationship. Value Added Tax (VAT) has the strongest negative relationship.

From Table 3 above, Internal Debt (ID) has a very strong positive relationship with all the variables. This implies that Tax Revenues (TR) and Internal Debt (ID) move in the same direction and has a direct relationship. However, Value Added Tax (VAT) has the strongest positive relationship.

From the table 3 above, Capital Expenditure (CE) has a very strong positive relationship with Value Added Tax (VAT) and Company Income Tax (CIT) while Petroleum Profit Tax (PPT) and Customs and Excise Duties (CED) which have a good positive relationship. This implies that Tax Revenues (TR) and Capital Expenditure (CE) move in the same direction and has a direct relationship. However, Value Added Tax (VAT) has the strongest positive relationship.

Table 4: Results

Variable	**Model One**				
	Coefficient	**Std. Error**	**T Stats**	**F Stats**	**Prob.**
ECT(-1)	-0.010920	0.026336	0.414654		0.0268
Chi-Square					0.0300
LOGVAT	-0.2530143	6.310307	-4.00954	0.0011	
LOGCIT	0.03130751	1.528628	2.048080	0.0585	
LOGPPT	0.02315107	2.631660	0.879713	0.3929	
LOGCED	-0.0029537	3.666895	-0.08055	0.9369	
C	0.7481771	40.52722	1.846110	0.0847	
Adjusted R^2	0.789552			18.82089	0.000010
Breusch-Godfrey Serial Correlation Test	0.5281				
Heteroskedasticity Test	0.5631				
Ramsey Reset				15.09457	

Sources: Authors' Computation, 2019

From table 4, for model one, the co-efficient for ECTt-1 is the speed of adjustment towards long run equilibrium which is 1.09%. This means about 1.09% of departures from long run equilibrium is corrected each period. The p-value of 0.0268 which is statsitically significant at 5% is significant for explaining External Debt. The Chi-square's p-value of 0.0300 is also statistically significant at 5%, therefore, we do not accept the null hypothesis. This shows evidence that there is a causual effect from tax revenue to external debt.

Table 5: Long run result

Variable	Model Two				
	Coefficient	**Std. Error**	**T Stats**	**F Stats**	**Prob.**
ECT(-1)	-0.001173	0.011776	0.099648		0.0224
Chi-Square					0.0181
LOGVAT	0.491089	0.152918	3.211460	0.0058	
LOGCIT	0.117807	0.040689	3.361483	0.0062	
LOGPPT	0.136639	0.061956	3.406180	0.0490	
LOGCED	-0.020054	0.047488	3.372858	0.8245	
C	2.262625	0.114531	1.989962	0.0360	
Adjusted R^2	0.959223			112.7364	0.000000
Breusch-Godfrey Serial Correlation Test	0.7073				
Breusch-Godfrey Heteroskedasticity Test	0.6212				
Ramsey Reset				19.66825	

Sources: Authors' Computation, 2019

From table 5, for model two, the co-efficient for ECTt-1 is the speed of adjustment towards long run equilibrium which is 0.11%. This means about 0.11% of departures from long run equilibrium is corrected each period. The p-value of 0.0224 which is statsitically significant at 5% is significant for explaining Internal Debt. The Chi-square's p-value of 0.0181 is also statistically significant at 5%, therefore, we do not accept the null hypothesis. This shows evidence that there is a causual effect from tax revenue to external debt.

Table 6: Long run equilibrium

Variable	Model Three				
	Coefficient	**Std. Error**	**T Stats**	**F Stats**	**Prob.**
ECT(-1)	-0.000510	0.017535	-0.029106		0.0397
Chi-Square					0.0253
LOGVAT	0.506090	0.240014	2.108588	0.0522	
LOGCIT	0.085766	0.100096	-1.544082	0.1609	
LOGPPT	-0.154556	0.058142	1.475115	0.1434	
LOGCED	0.072528	0.139471	0.520024	0.6106	
C	4.279862	1.541460	2.776499	0.0141	
Adjusted R^2	0.692394			11.69184	0.000164
Breusch-Godfrey Serial Correlation Test	0.6185				
Breusch-Godfrey Heteroskedasticity Test	0.7296				
Ramsey Reset				0.330108	

Sources: Authors' Computation, 2019

From table 6, for model three, the co-efficient for ECT_{t-1} is the speed of adjustment towards long run equilibrium which is 0.05%. This means about 0.05% of departures from long run equilibrium is corrected each period. The p-value of 0.0397 which is statistically significant at 5% is significant for explaining Capital Expenditure. The Chi-square's p-value of 0.0253 is also statistically significant at 5%, therefore, we do not accept the null hypothesis. This shows evidence that there is a casual effect from tax revenue to external debt.

For the purpose of this study, the Ordinary Least Square (OLS) regression estimation technique would be employed in estimating the research model and for obtaining the numerical estimates of the co-efficient in different equations.

From the model results in Table 4 above, Value Added Tax has a negative impact on External Debt. Specifically, a 1% change in Value Added Tax would lead to a 25.3% decrease in External Debt of the country. The effect of VAT on ED is statistically significant with a p-value of 0.0011 at 5% significance level. It conforms to *a priori* because an increase in VAT is expected to reduce External Debt.

Company Income Tax has a positive impact on External Debt. Specifically, a 1% change in Company Income Tax would lead to a 13.13% increase in External Debt. The effect of CIT on ED is not statistically significant with a p-value of 0.0585 at 5% significance level. It does not conform to *a priori* because an increase in CIT is not expected to increase External Debt.

Petroleum Profit Tax has a positive impact on External Debt. Specifically, a 1% change in Petroleum Profit Tax would lead to a 23.2% increase in External Debt. The effect of PPT on ED is not statistically significant with a p-value of 0.3929 at 5% significance level and it does not conform to *a priori* because an increase in PPT is expected to reduce External Debt.

Customs and Excise Duty has a negative impact on External Debt. Specifically, a 1% change in Customs and Excise Duty would lead to a 0.3% decrease in External Debt. The effect of CED on Ed is not statistically significant with a p-value of 0.9369 at 5% significance and it conforms to *a priori* because an increase in CED is expected to reduce External Debt.

Table 5 shows the following:

Value Added Tax has a positive impact on Internal Debt. Specifically, a 1% change in Value Added Tax would lead to a 49.1% increase in the Internal Debt of the country. The effect of VAT on ID is statistically significant with a p-value of 0.058 at 5% significance level. It does not conform to *a priori* because an increase in VAT is expected to reduce Internal Debt.

Company Income Tax has a positive impact on Internal Debt. Specifically, a 1% change in Company Income Tax would lead to an 11.8% increase in Internal Debt. The effect of CIT on ID is statistically significant with a p-value of 0.0062 at 5% significance level. However, it does not conform to *a priori* because an increase in CIT is not expected to increase Internal Debt.

Petroleum Profit Tax has a positive impact on Internal Debt. Specifically, a 1% change in Petroleum Profit Tax would lead to a 13.7% increase in Internal Debt. The effect of PPT on ID is statistically significant with a p-value of 0.0490 at 5% significance level but it does not conform to *a priori* because an increase in PPT is expected to reduce Internal Debt.

Customs and Excise Duty has a negative impact on Internal Debt. Specifically, a 1% change in Customs and Excise Duty would lead to a 2% decrease in Internal Debt (ID). However, the effect of CED on ID is not statistically significant with a p-value of 0.8245 at 5% significance level but it conforms to *a priori* because an increase in CED is expected to reduce Internal Debt.

Table 6 above shows the following:

Value Added Tax has a positive impact on Capital Expenditure. Specifically, a 1% change in Value Added Tax would lead to a 50.6% increase in Capital Expenditure of the country. The effect of VAT on CE is not statistically significant with a p-value of 0.0522 at 5% significance level. It conforms to *a priori* because an increase in VAT is expected to increase Capital Expenditure.

Company Income Tax has a positive impact on Capital Expenditure. Specifically, a 1% change in Company Income Tax would lead to an 8.6% increase in Capital Expenditure. The effect of CIT on CE is not statistically significant with a p-value of 0.1609 at 5% significance level. However, it conforms to *a priori* because an increase in CIT is expected to increase Capital Expenditure.

Petroleum Profit Tax has a negative impact on Capital Expenditure. Specifically, a 1% change in Petroleum Profit Tax would lead to a 15.5% decrease in Capital Expenditure. The effect of PPT on CE is not statistically significant with a p-value of 0.14342 at 5% significance level and it does not conform to *a priori* because an increase in PPT is not expected to reduce Capital Expenditure.

Customs and Excise Duty has a positive impact on Capital Expenditure. Specifically, a 1% change in Customs and Excise Duty (CED) would lead to a 7.3% increase in Capital Expenditure (CE). However, the effect of CED on CE is not statistically significant with a p-value of 0.6106 at 5% significance level but it conforms to *a priori* because an increase in CED is expected to increase Capital Expenditure.

From the result in Table 4, the Adjusted R^2 is 0.789552 showing that about 78.9% of the dependent variable is traceable to the independent variables while the remaining 21.1% is explained by factors not included in the model. This shows that the model has a very good fit. This implies that the independent variables are strong explanatory variables of the dependent variable. That is, Tax Revenue is significant in explaining External Debt.

Since the probability value of f-stat is 0.000010 which is less than 0.05, that is, significant, we reject the null hypothesis and conclude that the model is significant in explaining the effect of tax revenue on public debt and capital expenditure.

From the result in Table 5 above, the Adjusted R^2 is 0.959223 showing that about 95.9% of the dependent variable is traceable to the independent variables while the remaining

4.1% is explained by factors not included in the model. This shows that the model has a very good fit. This implies that the independent variables are strong explanatory variables of the dependent variable. That is, Tax Revenue is significant in explaining Internal Debt.

Since the probability value of f-stat is 0.000000 which is less than 0.05, that is, significant, we reject the null hypothesis and conclude that the model is significant in explaining the effect of tax revenue on public debt and capital expenditure.

From the result in Table 6 above, the Adjusted R^2 is 0.692394 showing that about 69.2% of the dependent variable is traceable to the independent variables while the remaining 30.8% is explained by factors not included in the model. This shows that the model has a good fit. This implies that the independent variables are good explanatory variables of the dependent variable. That is, Tax Revenue is significant in explaining Capital Expenditure.

Since the probability value of f-stat is 0.000164 which is less than 0.05, that is, significant, we reject the null hypothesis and conclude that the model is significant in explaining the effect of tax revenue on public debt and capital expenditure.

The study sought to understand the effect of tax revenue on public debt and capital expenditure in Nigeria over the span of 20 years, that is, 1999-2018. Given the empirical findings, the study concludes that, public debt and capital expenditure respond to tax revenue.

The first objective was to assess the impact of tax revenue on external public debt in Nigeria. The study concludes that CIT and PPT have positive impacts on external debt based on their co-efficient of 0.03130751 and 0.02315107 respectively while the other variables (VAT and CED) are expected to have negative impacts on external debt in Nigeria with co-efficient of -0.2530143 and -0.0029537 respectively. In addition, a bi-directional causality relationship exists between tax revenue and external debt. Furthermore, the correlation results indicate that tax revenue has a strong negative relationship with tax revenue and external debt. The co-efficient of determination (R^2) is 0.789. This implies that 78.9% of variations in External debt can be traceable to all our explanatory variables while the remaining 21.1% variations in the respective dependent variable were caused by other factors not included in this model. Based on the probability value of the result's F-statistic of 0.0010% we therefore reject the null hypothesis and conclude that tax revenue has both positive and negative impacts on external debt.

The second objective was to determine the impact of tax revenue on internal public debt in Nigeria. This study concludes that internal debt responds positively to VAT, CIT and PPT based on their co-efficient of 0.491089, 0.117807 and 0.136639 respectively while CED is expected to have a negative impact on internal debt with a co-efficient of -0.020054. In addition, there is a significant relationship between tax revenue and internal debt. Furthermore, results for correlation indicated a very strong positive relationship between tax revenue and internal debt. The R^2 is 0.959. This implies that 95.9% of variations in internal debt can be traceable to all our explanatory variables while the

remaining 4.1% variations in the respective dependent variable were caused by other factors not included in this model. Based on the probability value of the result's F-statistic of 0.0000%we therefore reject the null hypothesis and conclude that tax revenue has both positive and negative impacts on internal debt.

The third objective was to identify the extent to which tax revenue has contributed to capital expenditure in Nigeria. This study concludes that capital expenditure responds positively to VAT, CIT and CED with co-efficient of 0.506090, 0.085766 and 0.072528 respectively while PPT has a negative effect on capital expenditure with a co-efficient value of -0.154556. Furthermore, results for correlation indicated the existence of a strong positive relationship between tax revenue and capital expenditure. The co-efficient of determination (R^2) is 0.692. This implies that 69.2% of variations in internal debt can be traceable to all our explanatory variables while the remaining 30.8% variations in the respective dependent variable were caused by other factors not included in this model. Based on the probability value of the result's F-statistic of 0.0164%we therefore reject the null hypothesis and conclude that tax revenue has both positive and negative effects on capital expenditure.

5. CONCLUSION AND RECOMMENDATIONS

This study concludes that the government follows the spend-revenue hypothesis in its budget deficit decisions. This implies that the government spends first before raising revenue. This means that unless they are able to spend according to available resources, the government will continue to borrow. The strong correlation between the variables in the main model also helps us to conclude that there is a significant effect of tax revenue on public debt and capital expenditure.

It was recommended that to reduce public debt, fiscal authorities should enhance the effectiveness of the tax system by sealing loopholes and enforcing compliance. A cut in government expenditure is also necessary to restore fiscal balance as well as solve the problem of deficit budget and public debt in Nigeria. This can also be solved by prioritizing expenditure on key sectors that have the potential of boosting the overall productivity of the economy which will, in turn, be used to service these debts. Government should also ensure that revenue gotten from taxes are spent on profitable investments like capital expenditure and not spent carelessly. The government can use tax revenues to pay of the public debt directly rather than invest in unnecessary and poorly planned projects with or no profits. Ideally, the government should look to other sources of income in order to further reduce the burden of public debt.

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