Abstract: The issue of government expenditure being not effectively and efficiently maximized is an age long issue pertaining to Nigeria. The study therefore examined the relationship between public expenditure and Nigerian economic growth. Secondary data was used for the study and was from 1970 till 2020. Two models were used in the study. The dependent variable for the first model was gross domestic product while the independent variables used were capital expenditure, lag one capital expenditure, lag two capital expenditure, and recurrent expenditure. For the second model, the dependent variable was capital expenditure while the independent variables were gross domestic product and external reserve. The two stage least squares regression was used for the study. Findings showed that gross domestic product and external reserve were significant in impacting capital expenditure. Also, capital expenditure and lag two capital expenditure were both significant in explaining GDP. The study then recommended that for past capital projects especially last two years, government should try as much as possible to maintain such projects and keep it in good working conditions.

Keywords: Finances, GDP, Economic Growth, Government expenditure

1 Introduction

Government in any society performs two vital functions: maintaining law and order (defense) and provision of social amenities or public goods like education, health care, housing, road, airways, bridges, etc. In the days of Adam Smith, government involvement in economic activities was not considered a necessity since the policy of laissez-faire was in place. It was after the Great Depression of the 1930s that government began to participate in some economic activities and also established some interventionist policies. Bello-Imam and Obadan (2004) established some reasons for government expenditure in the economy to include attainment of full employment maintain price stability, promote economic growth and development, maintenance of external balance or balance of payment equilibrium, and promotion of equitable distribution of income and wealth. To achieve all these, there is need for government spending.

Public expenditure increases the flow of funds in the economy as it also affects private expenditure and government budget. According to Ofanson (2007), an increase in public expenditure raises the level of Gross National Product (GNP) while the size of the increase in the GNP as a result of additional increase in government spending is determined by the multiplier.

Amassoma, Nwosa, and Ajisafe (2011) opined that in Nigeria, government expenditure has continuously increased due to factors such as persistent rise from huge receipt in production and sales of crude oil and the increased demand for public goods such as; roads, communication, power, education and health plus also the need to ensure both internal and external security so as to avoid external invasion in the country.

Ojo and Alege (2011) on their own part stated that “a small proportion of government spending allocated to capital expenditure appears to be mainly on paper, with little to show for it in terms of their visible impact on their performance including job creation, power supply”.

From statistics of the Revenue Mobilization Allocation and Fiscal Commission (RMAFC, 2011), Nigeria only spend 52.2% of her total revenue while the remainder percentage is shared among the three tiers of government using the revenue sharing
formula. Despite all these, there is mixed feeling above depicting whether or not increasing government spending induces economic growth or not, hence, the need for this study.

According to Modebe, Regina, Onwumere, and Imo (2012), Government expenditure (like expenditure by private sector firms) can be categorized into either recurrent expenditure or capital expenditure. Recurrent expenditure is recurring spending or, in other words, spending on items that are consumed and only last a limited period of time. They are items that are used up in the process of providing a good or service. In the case of the government, current expenditure would include wages and salaries and expenditure on consumables - stationery, drugs for health service, bandages and so on. By contrast, capital expenditure is spending on 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.

Therefore, from the various budgetary expenditures on security and the recent Boko Haram menace, budgetary allocations to capital projects and the high level of poverty and low per capita income in the country coupled with the expenditures to fund oil subsidy and the high level of corruption in the oil sector, can we say that government or public expenditures has impacted positively on the Nigerian economy positively or negatively? This is the question this research work wants to answer.

2 Statement of the research problem

Public expenditure is one of the core economic activities of the government as it involves government providing goods and services to its citizens which would otherwise be expensive to provide by the private sector. One factor for classifying an economy as developing and underdeveloped one is the state of health and maintenance of the country’s public goods. This study thus seeks to examine the impact of public expenditure (both capital and recurrent) on the Nigerian economy, that is, explaining the present state of the Nigerian economy by analyzing which effect government spending has had on it.

2.1 Conceptual Framework

Public finance as a field of study is the scrutiny or examination of government spending, taxation, and government borrowing. It is concerned with the management of public funds. Osagie and Stephen (1985) opined that public finance is concerned with the financial operations of public authorities. (1979) was of the view that “it is the objective study of the revenue and expenditure activities of public authorities and their mutual relation and also with financial administration and control and the effect of such actions on the economy and the welfare of the citizens”.

Early writers had different views concerning public finance. Adam Smith (1937) focused on the taxation aspect of public finance. John Stout Mill (1943) was concerned with revenue, expenditure, and public debt part of public finance. Pigou (1928) emphasized taxation based on principles of economic welfare. Musgrave and Musgrave (2004) defined public finance as “the complex of problems that centres on the revenue-expenditure process of government”. He also advocated an approach whereby the public sector was viewed as “public household” and the objective of such public household can be grouped into the following:

1. Allocation of resources.
2. Adjustments in the distribution of income and wealth.
3. Price stability
4. Employment.

In essence, the early writers’ views can be categorized into two: The principles of taxation and principles of public expenditure, (Ofanson, 2007). During the early days of capitalism, there was the general believe that the private sector was more efficient than the public sector and this created the theoretical background of laissez faire, (Bhatia, 2009). Thus the market forces of demand and supply were used to make economic decisions. During these periods, the role of government was limited to:

1. Provision of adequate security against internal wars. The police force was established and maintained to ensure law and order was enforced.
2. The maintenance of armed forces that would protect the nation against external wars.

3. Social infrastructures that the private sector could not bear the costs or the ones that were deemed commercially non-viability, the government takes over.

However, public finance has shifted focus to other areas like introduction of stabilization policy and application of macroeconomic models; hence many questions come begging for answers like how are resources allocated? What are the performance indicators of overall stability in the economy? Is the government doing enough concerning income distribution? Public project’s decisions are a function of many variables which may be economic or political. For economic decisions, a project will be beneficial and will add to the gross domestic product will be chosen and for political decisions, infrastructural needs in most of the political office holders’ constituencies will be looked into and such projects will be selected. Sometimes the national objective is taken into consideration when making decision. Some important elements to consider in public project analysis include the opportunity Cost which is the opportunities forgone as a result of the public project, shadow prices which are used when resources for projects are transferred from one area to another, and transfer payment like grants and subsidies.

Public finance can be divided into two: public revenue and public expenditure though the focus of the research work is on public expenditure.

2.2 Theoretical Framework on Growth in Public Expenditure

2.2.1. Musgrave Theory (1959): According to Musgrave (1959), the demand for public services tend to be low in developing countries due to low per capita income as all income will be devoted to satisfying primary needs (food, clothing, and shelter). As per capita income increases, the demand for public goods increases too thus spanning the government to spend. Finally, at high level of per capita income in developed countries, the rate of public sector growth tends to fall as the more basic wants are satisfied. This study follows the assumption of the Musgrave theory. As the drive towards the vision 20:2020 continues, coupled with the high demand for public goods and services, the government continues to budget for both capital and recurrent expenditure as it satisfy the high demand and also ensure economic growth. From the Musgrave theory, in the next stage, as per capita income reaches a high level government spends less as citizens satisfy their more basic needs through the private sector. This study is using this theory to see if there is actual growth and development in the Nigerian economy situation and the tendency for Nigerians to move to the latter stage of the Musgrave theory assumption.

2.3 Literature Review

Many studies have been carried out on public expenditure and its impact on the Nigerian economy and majority of the studies have come out with differing conclusions. This has generated controversies among researchers.

Onakoya and Somoye (2013) used the three stage least squares and the macro-econometric model of simultaneous equations to look at the impact of public capital expenditure on different sectors of the Nigerian economy. They concluded that public capital expenditure impacts positively on the Nigerian economy.

Muritala and Taiwo (2011) used the Ordinary Least Squares (OLS) technique to see how public expenditure causes growth in the real GDP. The result also proves a positive relationship between real GDP and recurrent and capital expenditure which is consistent with the Keynesian theory.

Nurudeen and Usman (2010) used time series data from 1977 to 2008 to analyze the impact of government expenditure on economic growth in Nigeria. They concluded that government total capital expenditure has negative effect on economic growth.

Furthermore, Ighodaro and Okiakhi (2010) examine government expenditure using on general administration, community and social services in Nigeria. They applied the Granger causality test and used time series data for 46 years ending 2007. The results showed that government expenditure has negative impact of on economic growth.
Moreover, Akpan (2005) also used the components of government expenditure and opined that no significant relationship exists among some government components and economic growth in Nigeria.

Aregbeyen (2007) while carrying out his study concluded that a positive and significant relationship exists between capital expenditure and economic growth but a negative relationship between recurrent expenditure and economic growth.

Modebe et al (2012) examined the impact of government capital and recurrent expenditure on the Nigerian economy from 1987 to 2010 using three variables multiple regression model. While capital expenditure had a negative and non-significant impact on the economy, recurrent expenditure had a positive and non-significant impact on the same economy.

Amassoma, Nwosa, and Ajisafe (2011) used the error correction model to study the impact of government expenditure disaggregated into agriculture, education, health, transport, and communication on the Nigerian economy with data from 1970 to 2010. They concluded that only agriculture expenditure had a significant impact on the economy. Others had insignificant influence on economic growth.

Oluwatobi and Ogunrinola (2011) also studied the impact of capital and recurrent expenditure on education and health (human capital) and their effect on economic growth using Augmented Solow model. They discovered that there is a positive relationship between recurrent expenditure on human capital and level of real output but a negative relationship between capital expenditure and the level of real output.

Ogujiuba and Adeniyi (2004) examined the impact of government education expenditure on economic growth. Their result showed a statistically significant positive relationship between economic growth and recurrent expenditure on education, while capital expenditure was wrongly signed and not significant in its contributions.

Loto (2011) studied the effects of government expenditures on security, health, education, transport, communication, and agriculture on the economy using error correction test. He opined that expenditures on agriculture negatively impact the economy. Education was both negative and non-significant to the economy. Expenditures on health positively impacted the economy while security, transport and communication though positively were non-significant to the economy.

Finally, Fajingbensi and Odusola (1999) found the contribution of recurrent expenditure to growth as insignificant.

While few of the literatures reviewed above saw the fact that a simultaneous relationship exists between GDP and capital expenditure (Onakoya and Somoye 2013, Nurudeen and Usman 2010), what they fail to realize is that past capital expenditures can also influence present Gross Domestic Product. As earlier reviewed in the literatures, failure to maintain past capital projects can lead to unemployment, waste, and insecurity in the country. One gap this research study wants to fill is the fact that while drawing the linkage between past capital expenditures and present revenue generating power of the Federal Government to improve the economy, Ofanson (2002), opined that workers working for “companies” created by the government pay tax annually and such tax is recorded in the current year as revenue for the government with such tax used to impact on the current year.

3. Methodology

3.1 Model Specification

The model used in this research will be partly based on the modified standard growth regression equation of Levine (2000) which is in line with the objectives of this study of examining the impact of government recurrent expenditure and capital expenditure on economic growth in Nigeria, the equation is shown below:

\[ GDP = a_0 + a_1 \text{CAPX} + a_2 \text{RECX} + a_3 \text{CAPX}_{-1} + a_4 \text{CAPX}_{-2} + U_{t-1} \ldots \ldots \ (4) \]

Where GDP = Gross Domestic Product

\[ a_0 = \text{intercept} \]

\[ a_1 = \text{parameter estimating capital expenditure} \]
\[ a_2 = \text{parameter estimating recurrent expenditure} \]
\[ a_3 = \text{parameter estimating lagged capital expenditure for one period} \]
\[ a_4 = \text{parameter estimating lagged capital expenditure for two periods.} \]

\[ \text{CAPX} = \text{Capital Expenditure} \]
\[ \text{RECX} = \text{recurrent expenditure} \]
\[ \text{CAPX}_{-1} = \text{lagged capital expenditure for one period} \]
\[ \text{CAPX}_{-2} = \text{lagged capital expenditure for two periods.} \]

\[ U_1 = \text{Stochastic error term for the first equation} \]

Due to the argument that Gross Domestic Product also can impact current capital expenditure as shown in the literature review section, a simultaneous equation system exists and there will be a second equation which will be used to evaluate the CAPX.

The second equation will follow the argument that past years’ external reserve can be used to fund current capital expenditure projects (Idahosa 2004). The model will be: \[ \text{CAPX} = a_0 + a_1 \text{GDP} + a_2 \text{RSVE} + U_2 \]

Where:

\[ a_0 = \text{intercept} \]
\[ a_1 = \text{parameter estimating Gross Domestic Product} \]
\[ a_2 = \text{parameter estimating Lagged-one external reserve} \]

\[ \text{CAPX} = \text{Capital Expenditure} \]
\[ \text{GDP} = \text{Gross Domestic Product} \]
\[ \text{RSVE} = \text{External reserve} \]
\[ U_2 = \text{Stochastic error term for the second equation} \]

### 3.2 Instrumental Variables

These variables are used to solve the problem of correlation between the exogenous variable and the error term. For OLS to give consistent estimators the error term must not correlate with any of the exogenous variables, that is \[ E (u|x) = 0. \] If there is any correlation, the instrumental variable is the use to correct this, (Koutsoyiannis, 2003). The instrumental variables must be correlated with the particular endogenous variable but uncorrelated with the error term. For the model to be used here, GDP is a function of CAPX and others, but CAPX too is a function of GDP as when government wants to maintain a high GDP they spend more on CAPX, (Ofanson, 2007). Thus there is a correlation between the CAPX and the error term. The instrumental variables which are related with CAPX but not correlated with the error term are now introduced into the model to get the actual estimate of CAPX which will not correlate with the error term.

The instrumental variables to be used for the model are the EDBT (External debt), IDBT (Internal debt), ERTE (Exchange rate), and RSVE-2 (Lagged two external reserve). The reason for these choices of variables is their connection to capital expenditure. Funds from both external and internal debt are sometimes used to fund capital project which carry enormous cost. External debt are normally borrowed in foreign currencies, thus at most times there is the need to convert some part of the currencies to Naira in order to carry out some minor operations on capital expenditures, (Asemota and Eweca, 2002), for example purchase some materials from local suppliers for capital projects, therefore exchange rate has a relationship with capital expenditure. Due to the massive problem the Nigerian economy is facing as a result of public debt, the most important area the government looks into for fund is the nation’s external reserve. The reserve (both present and past) serves as a source of funding some capital project, (Chockley, 1999).

### 3.3 Sample Size

All the data to be analyzed are from 1970 to 2020, thus the data span for 50 years. The reason for this large span is to see the impact of both the capital and recurrent expenditure on the economy for a long period of time. The Phillips-Perron unit root test will be used to test for the stationarity of the data while
the two stage least squares econometric technique will be used to analyze the data.

### 4. Data analysis and interpretation

#### 4.2 Phillip-Perron (Unit Root) Test

Table 1: Result of Phillips-Perron unit root test at first difference, trend and intercept.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Phillips-Perron test statistics</th>
<th>5% Test Critical Values</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>LGDP</td>
<td>-5.830169</td>
<td>-3.529758</td>
<td>Stationary</td>
</tr>
<tr>
<td>LCAPX</td>
<td>-5.861352</td>
<td>-3.529758</td>
<td>Stationary</td>
</tr>
<tr>
<td>LCAPX_1</td>
<td>-7.391322</td>
<td>-3.529758</td>
<td>Stationary</td>
</tr>
<tr>
<td>LCAPX_2</td>
<td>-6.566496</td>
<td>-3.529758</td>
<td>Stationary</td>
</tr>
<tr>
<td>LRECX</td>
<td>-4.478232</td>
<td>-3.529758</td>
<td>Stationary</td>
</tr>
<tr>
<td>LEDBT</td>
<td>-3.708858</td>
<td>-3.529758</td>
<td>Stationary</td>
</tr>
<tr>
<td>LIDBT</td>
<td>-4.812721</td>
<td>-3.529758</td>
<td>Stationary</td>
</tr>
<tr>
<td>ERTE</td>
<td>-6.172800</td>
<td>-3.529758</td>
<td>Stationary</td>
</tr>
<tr>
<td>LRSVE</td>
<td>-3.937257</td>
<td>-3.529758</td>
<td>Stationary</td>
</tr>
<tr>
<td>LRSVE_1</td>
<td>-3.790529</td>
<td>-3.529758</td>
<td>Stationary</td>
</tr>
<tr>
<td>LRSVE_2</td>
<td>-4.692244</td>
<td>-3.529758</td>
<td>Stationary</td>
</tr>
</tbody>
</table>

Source: Author’s computation using Eviews 7 (2017)

From the table above, it can be seen that the log of all the variables were stationary at first difference (5%) trend and intercept.

#### 4.2.1 Order Identification Test

The model must satisfy the order condition which is very vital if one wants to use the two-stage least squares and it must either be exactly identified or over-identified. The formula for the identification order satisfaction is:

(K-M) >= (G-1)

Where K = number of total variables in the model.

M = number of variables in a particular equation.

G = number of equations.

From the model: GDP = b0 + b1 CAPX + b2 RECX + b3 CAPX_1 + b4 CAPX_2 + U2

K = 6, M = 5, G = 2,

(K-M) >= (G-1)

(6− 5) (2 − 1)

1= 1 [Order condition satisfied]

For the second equation, CAPX = a0 + a1 GDP + a2 RSVE_1 + U1

K = 6, M= 3, G = 2

(K-M) >= (G-1), (6− 3) >= (2 − 1) = 3 > 1 [Order condition also satisfied]
4.3: Two-Stage Least Squares Regression

4.3.1: First Equation

Table 5 shows the tabulated result gotten after the first equation.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>-105381.5</td>
<td>0.93121</td>
<td>-3.067862</td>
<td>0.0040</td>
</tr>
<tr>
<td>GDP</td>
<td>0.793701</td>
<td>0.18242</td>
<td>6.4350823</td>
<td>0.0001</td>
</tr>
<tr>
<td>RSVE</td>
<td>0.931210</td>
<td>0.22671</td>
<td>4.107386</td>
<td>0.0002</td>
</tr>
</tbody>
</table>

SOURCE: Eviews 7 Result (2017)

R-squared = 0.8922

F-statistics = 162.7061

4.3.2 Second Equation

Table 5 shows the tabulated result gotten after the first equation.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>118234.3</td>
<td>43505.4</td>
<td>2.717686</td>
<td>0.0100</td>
</tr>
<tr>
<td>LCAP X</td>
<td>1.044524</td>
<td>0.506865</td>
<td>2.060754</td>
<td>0.0466</td>
</tr>
<tr>
<td>LREC X</td>
<td>-0.187550</td>
<td>0.458169</td>
<td>-0.409347</td>
<td>0.6847</td>
</tr>
<tr>
<td>LCAP X-1</td>
<td>-1.259572</td>
<td>1.153942</td>
<td>-1.091538</td>
<td>0.2823</td>
</tr>
<tr>
<td>LCAP X-2</td>
<td>1.598690</td>
<td>0.879532</td>
<td>1.817660</td>
<td>0.0774</td>
</tr>
</tbody>
</table>

SOURCE: EVIEWS 7 ESTIMATION (2017)

R-squared = 0.48

Adjusted R-squared = 0.42

F-statistics = 15.00

Durbin-Watson Test = 2.07

For the equation above, the estimated results achieved show a R^2 of 0.89 meaning that the variables GDP and RSVE causes 89% changes in the endogenous variable CAPX. After adjusting for degree of freedom, the adjusted R^2 becomes 0.88 meaning that all the coefficients now explain 88% changes in the endogenous variable CAPX holding other factors that can impact it constant. The Durbin-Watson Test is 1.76 to show that there is no autocorrelation in the data.

Using the prob. variable, both GDP and RSVE are significant in explaining the dependent variable while under coefficient variable, both carried the positive sign to show a positive relationship too with the dependent variable.

4.3.2 Second Equation

Table 5 shows the tabulated result gotten after the first equation.

F-statistics = 15.00

Durbin-Watson Test = 2.07

From the two stage least squares result of the first equation above, the goodness of fit (R^2) is 0.48 and this means that all the coefficients CAPX, RECX, CAPX-1, and CAPX-2 explains 48% of the total variation in GDP. There are many other factors that cause changes in the GDP but 48% of those changes can be explained by the four coefficients above. After adjusting for degree of freedom, the new (adjusted) R^2 is 0.42 which now means that all the four coefficients now explain 42% of changes in GDP holding other factors constant.

Using the prob. variable, both CAPX and CAPX-2 are significant in explaining the dependent variable while under coefficient variable, both carried the positive sign to show a positive relationship too with the dependent variable. RECX and CAPX-1 are not significant in explaining the dependent variable and the both also carry the negative sign.

To test for the overall or joint significance of all the exogenous variables in the equation, the F-stat
The calculated F-stat will be applied. The calculated F-stat will compared with its table value and at 95% significance level and n – k degree of freedom = 36 \( (v_2) \) and \( K – 1 = 3 \ (v_1) \) and for decision-making, if the calculated F-test is greater than its table value at 95% significance level and degree of freedom, the model is said to have variables that are jointly significant.

The value of the calculated F-stat is 15.00 and is far greater than the table value of the F-stat which is 2.84; hence all the exogenous variables are jointly significant in explaining GDP.

Taking a critical look at the Durbin-Watson test figure of 2.07, it is approximately 2 to show no presence of autocorrelation.

5 Recommendations and Conclusions

First, the government should ensure that there should be adequate budget provision capital expenditures. According to a report by Business Day newspaper of June 25, 2013 edition, “The rate of change of legislator pay is growing faster, relative to the growth rate of the capital expenditure”. The news further gives a breakdown of the growth of the capital expenditure budget which grew by 53.9 percent in 2010 (from the 2009 levels), fell by 18.2 percent in 2011 (from the 2010 levels), and rose by 17.8 percent in 2012 (from the 2011 levels). On the other hand, there is a steep rise in National Assembly pay in 2011 which rose by 82.2 percent, compared to a 53.9 percent rise in capital expenditure which occurred in 2010. This is not good for the growth of the economy as even the National Assembly budget in 2011 which rose by 82.2 percent, compared to a 53.9 percent rise in capital expenditure which occurred in 2010. This is not good for the growth of the economy as even the National Assembly budget for 2013 is equivalent to 9.2 percent of the 2013 capital expenditure. There should be adequate budget that will make enough provisions for capital projects in all the 36 states of the Federation.

Second, aside the budget provision, there should be a full implementation of the budget for the current year. There is the fact that the capital budget is rarely implemented at 100 percent (Ojo and Alege, 2011), meaning that if the actual money spent on Capital expenditure which is often close to the 50 percent mark was used to compute the comparison between National Assembly budget and Capital expenditure, it would paint a much worse picture. Also according to Ojo and Alege (2011), “the budget should be a performance budget based on functions, activities, and projects” and not a mere figure on paper”.

Third, for past capital projects especially last two years, government should try as much as possible to maintain such projects and keep it in good working conditions.

Fourth, since external reserve is a significant determinant of capital expenditure, some part of the funds from the reserve should be used to fund the capital expenditure projects. According to a statement on the website of the Central Bank of Nigeria, “the Nigeria’s external reserves stood at 48.76 billion dollars (N75.57 trillion) as at April 16 2013 and this figure represents an increase of 2.54 per cent over the last figure of 48.75 billion dollars (N75.56 trillion). Also, the News Agency of Nigeria maintained that Nigeria’s external reserves was 44.18 billion (N68.47 trillion) in December of 2012. It grew to 44.34 billion (N68.72 trillion) in January of 2013, representing an increase of 2.82 per cent. Some percentages of this growth in reserve can be used to fund huge capital projects that would generate employment for the populace and also help the country in periods of recession, etc.

Finally, there is the issue of corruption to tackle. The government can tackle this menace by ensuring that there is transparency in the whole budgetary process. Also, the introduction of Public Private Partnership for capital projects should be encouraged where there are limited funds in the hands of the government or in order to reduce corruption when allocating funds to capital projects. The Infrastructure Concession Regulatory Commission (ICRC) which was established to regulate the PPP infrastructure arrangement in the country should ensure a framework, regulations, and model etc that would ensure willingness to invest, contract design and prevention of regulatory failure.
References


