

Government Capital Expenditure and Economic Growth in Nigeria

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Abstract

This study examined government capital expenditure and economic growth, using annual time series data for the period from 1972-2018. In view of the need to understand public expenditure on economic growth, this study sought to establish the relationship between capital expenditure and economic growth in Nigeria. The study employed the error correction mechanism (ECM) methodology in estimating the relevant equation. However, before the final result was estimated, the study has tested for unit root using the augmented Dickey-Fuller (ADF) test and Philips-Perron (PP) test. The study also tested for the long run equilibrium relationship among the variables using Johansen-Jesulius multivariate co-integration approach. The Granger causality test was also carried out to investigate the direction of causality between gross domestic product and the various components of government capital expenditure in Nigeria. The result of the co-integration test showed that the variables are co-integrated and hence there is a long run relationship among them. The granger causality test revealed that there were bi-directional relationship between gross domestic product and capital expenditure on social and community services, expenditure on administration, expenditure on economic services and expenditure on transfers. The empirical results showed that previous one and two period values of gross domestic product have positive and significant impact on the current value of gross domestic product in Nigeria. The results also showed that public capital expenditures on administration have positive and significant impact on economic growth. Further examination of the results showed that capital expenditure on economic services has positive impact on economic growth in Nigeria. Meanwhile the results showed that capital expenditure on social and community services has positive impact on economic growth. Lastly, the results revealed that capital expenditure on transfer has negative relationship with economic growth. The study recommended that government should increase its spending in capital projects and also reduce expenditure on consumption in Nigeria.

Keywords: capital expenditure, social and community services, administration, economic services, transfers, GDP

INTRODUCTION

The expenditure of government has been on the geometric increase through the interactions with and activities of government agencies, departments and ministries. This continuous increase in the volume of government expenditure has been the experience in Nigeria if not very common in all countries world over due to the continuous state/federal expansion activities. The development of the state activities since the 20th century in areas including industrial innovations, public health, education, commercial activities, etc have accelerated government expenditure increases to a large extent. According to Abdullah (2010), public expenditure is assumed to be the most powerful economic factor of all modern societies. The form and pattern of the output growth of any economy is determined by the structure and size

of it public expenditure. (Akpan, 2005)

The Nigerian public expenditure structure can be segmented into recurrent expenditure and capital expenditure. The components of the recurrent expenditure include expenditure on administration. (Interest on loans and maintenance, salaries and wages) while capital expenditure captures government projects on the generation of the electricity, education, telecommunication, airports, roads, and so on. The provision of public infrastructural facilities has been one of the fundamental bases for public spending. Providing and maintaining these infrastructural amenities cost a huge amount financing. Hence, investment on infrastructures and productive activities spending is expected to positively contribute to the growth of the economy whereas spending on consumption by the government retard growth. It is argued that the country will benefit socially and economically from government investment (spending) on health, roads, education, agriculture, etc. Among the world of scholars, the issue of impact of public expenditure on the growth of the economy has sponsored continuous debate.(Abu & Abdullahi)

Governments have been found to be involved in two basic functions, that is, the protection functions (security) and the provision function. Government protection functions include the establishment of the rule of law and property rights enforcement. With this function, the security of lives and properties are offered, the criminality risk is minimized, and the country is secured from external aggression. The provision functions centres on the provision of public goods and services to include power, road, health and education. For instance, the expenditure of government on education and health engenders labour productivity and increases national output growth. Similarly, infrastructural expenditure on power, roads, communication, etc reduces the costs of production, facilitates the development of the private sector and industrial profitability, hence, fostering the growth of the economy (Nurudeen & Usman, 2010). The enormous effects of public expenditure on economic growth have continued to attract attention of the economists recently.

Countries such as Nigeria has over the years invested a lot of resources both human and material resources with the aim of attaining a sustainable level of economic growth in the level of output. Improvements in the quality of the socio-economic institutions, structure and composition of an economy and overall welfare of their residents have led to the incurrence of huge expenditures aimed at improving the infrastructure, social welfare and empowerment packages, employment generation, as well the creation of an enabling environment so as to ensure the growth of private investment. Such efforts are in recognition of the part played by government spending and determining economic activities level and thus the general welfare of the residents of a country. In Nigeria, such efforts led to an increase in government expenditure from 903.90 and 1,463.60 million Naira in 1970 and 1972, to 191,228.90 and 248,768.10 million Naira in 1993 and 1995, and to 1,907,580.50 and 2, 237,900.00 million Naira in 2010 and 2011 (Central Bank of Nigeria, 2013).

However, even with the loftiness of the Nigerian government efforts since the country obtained its political independence from Britain, economic growth remains elusive. The continuous increases in the expenditure of the Nigerian government have not resulted in the expected or assumed substantial growth and development, hence, the country is categorized among the world's poorest countries. Added to this is the state of the country's infrastructure which is generally in a dilapidated state (especially roads and power supply). Many industries have collapsed as a result, including the overwhelming unemployment level and most giant projects abandoned. Moreover, most macroeconomic measures such as exchange rate, import obligation, national savings, inflation and balance of payments have shown Nigeria in the last couple years as not being doing well. Questions also arose with respect to the composition of government expenditure, which in Nigeria has generally been skewed in favour activities which contribute very little to the welfare of its citizens to say the least. This can be seen in the recent

launching of a satellite which has become a phantom project today, huge sums of money invested into sports without any benefit and a host of others.

LITERATURE REVIEW

Thus, government at all kinds, irrespective of their size and level of intensions, showcased similar increasing tendency of public expenditure. The Wagner's law in order words state that, as the economy's per capita income grows, the public expenditure grows also its relative size while the relative size of government will also grow along. As growth is being witnessed in the economy, the number of urban centers also increases with the correspondent social vices to the barest minimum. Huge internal security is required in large urban settlements in order to maintain law and order. Hence, these government interventions have resulted to the public expenditure increases in the economy. Wagner theory states further that the growth of the economy is the fundamental factor that determines the growth of the public sector. According to Bano (1991), his seminar work brought about fresh investigation regarding the impact of government expenditure on the growth of the economy. Similarly, Barro and Sala-i-Martin (1992) suggested that, the directions of the growth of the economy is being influenced or determined by the activities of government. Amirkhalkhair (2002) also revealed that in predicting the future growth of the economy via the endogenous growth hypothesis, fiscal policy is very crucial. This has caused many scholars to embark on aggressive investigation regarding government expenditure effect on the growth of the economy. However, Ekpo (1995) carried out an understanding study when the regressed government capital disaggregated expenditure components on private investment by employing the ordinary least square (OLS) technique of analysis from 1960-1990. His study found out that, private investment in Nigeria is influenced by capital expenditure on education, health, communication and transportation, and agriculture, which in turn facilitated the entire growth of the economy. On the other hand, private sector investment was crowded out via government capital expenditure on manufacturing and construction. The examination of the effect of capital, recurrent and sectional spending from 1970-1993 was undertaken by Ogiogio (1995). His study revealed that the growth of the economy and government expenditure had the presence of long run relationship. Meanwhile, public contemporaneous recurrent spending significantly affected capital expenditure more whereas, a five year capital expenditure lag values are more growth inductive. It was further indicated by the study that, the investment programmes of the government regarding the provision of social-economic basic amenities engender an environment that is suitable for the private sector-led growth.

Empirically, Fujingbesi (1999) investigated government expenditure and the growth of the Nigerian economy in order to establish their relationship. His investigations revealed that, government real capital expenditure significantly and positively impacted the real output. Again, he noted that, there is a minute effect on growth by government real recurrent expenditure. In another study, Aregbeyen (2006) examined both national income and government spending and established that, there is a unidirectional causality between them via the application of the standard causality and Johansen cointegration tests. Ranjan and Sharma (2008) studied government expenditure effect during the periods of 1950 to 2007 on economic growth. They revealed that government expenditure has a significant and positive impact on economic growth. It was also revealed by them that, cointegration existed among the variables under study. Increase in infrastructural expenditure of the government resulted in higher growth of the economy. But the Neo-classical growth model has a contrary opinion and maintained that the fiscal policies of government do not influence national output growth. They argued that government intervention (fiscal policy) is responsible for most set-back as a result of market inefficiencies.

RESEARCH METHODOLOGY

Basically, there are two methods of data collection. These are the primary and secondary sources. In line with the main focus of this study, only the secondary source is used. Data involve an examination of already existing data such as textbooks, journal, articles, libraries, internet search and CBN statistical bulletin. This study employed including total capital expenditure and gross domestic product. The time series data for the period 1972-2018 on the amount of federal government expenditure on capital expenditure This study employed the following techniques in order to analyze the relationship that existed between government expenditure and the growth of the Nigerian economy. They include Granger causality, error correction mechanism, cointegration and unit root. The unit root test is engaged in order to ascertain the stationarity or non-stationarity of the variables under study. In order to achieve this, the study shall engage the augmented Dickey-Fuller (ADF) unit root test and the Philip-Perron (PP) unit root test. The cointegration analyses test shall be carried out in order to identify the existence of a long run relationship among the variables. In order to ascertain if the contributions of public expenditure do impact the growth of the Nigeria economy, it is proper to develop a justifiable model on the expected relationship that exist between the variables. In line with the Wagner's law, this study specified its models. Hence, the models specified in this study were:

$$\text{RGDP} = f(\text{CAPEX})$$

Where:

RGDP = Real gross domestic product

CAPEX = Capital expenditure

The capital expenditure variables are disaggregated into administration, economic services, social/community services and transfer

Therefore, $\text{GDP} = f(\text{CEAD}, \text{CEES}, \text{CESCS}, \text{CETRANS})$

Where:

CEAD = Capital expenditure on administration

CEES = Capital expenditure on economic service

CESCS = Capital expenditure on social and community service

CETRANS = Capital expenditure transfer

$$\text{GDP} = \alpha_0 + \alpha_1 \text{CEAD} + \alpha_2 \text{CEES} + \alpha_3 \text{CESCS} + \alpha_4 \text{CETRANS} + U_t$$

DATA ANALYSIS

Unit root

In order to ascertain the order of integration among the variables in the model, the unit root tests were carried out. The tests employed were the augmented Dickey-Fuller and the Philip-Peron tests presented below.

From the results of both the ADF and PP unit root tests, it was revealed that no variable was found to be stationary at levels; hence, it becomes impossible at this stage to reject the null hypotheses. This is so because the test statistics values at level for each variable using both ADF and PP tests were below the critical values at one per cent, five per cent and ten per cent levels of significance. However, when the variables were differenced once, they were stationary. This is because the tests statistics values for both tests were found to be greater than the critical values at one per cent, five per cent and ten per cent levels of significance, that is, all variables having the same order of integrated I(1).

Unit root test using the augmented Dickey-Fuller (ADF) statistics

Variables	ADF Test Statistics		Order of integration
	Level	1 st Difference	
LGDP	-0.577651	-5.547899	I(1)
LCEA	-1.115747	-9.541237	I(1)
LCEES	-2.292986	-6.283218	I(1)
LCESCS	-2.358944	-8.265122	I(1)
LCETRANS	-0.224066	-2.437163	I(1)

Test critical values at level: 1% = -3.592462, 5% = -2.9331404, 10% = -2.603944

Test critical values at 1st Diff: 1% = -3.596616, 5% = -2.933158, 10% = -2.604867

Source: Researcher's computation from E-views

Unit root test using the Philips-Perron (PP) statistics

Variables	PP test statistics		Order of integration
	Level	1 st Difference	
LGDP	0.567613	-5.539729	I(1)
LCEAD	0.940173	-9.232405	I(1)
LCEES	-2.1663445	-6.290474	I(1)
LCESCS	-3.137121	-8.228557	I(1)
LCETRANS	-2.349658	-22.11883	I(1)

Co-integration test

Seeing that the series was integrated of order I(1) suggesting the presence of a unit root, hence, the need to determine if there is the existence of a long run relationship by conducting a co-integration test among the variables. In order to establish the long non-equilibrium relationship, the study employed the Johansen and

Unrestricted cointegration rank test (trace)

Jesulius (1990) multivariate cointegration approach based on trace and maximum eigenvalue tests. The co-integration test results indicated several co-integration equations at five per cent significance level. The values of the test statistics in each of the co-integration equations were found to be greater than their critical values at 5 per cent significance level. These results concluded that, since there is co-integration among the variables, there is the existence of the long run relationship among the variables.

Unrestricted cointegration rank test (maximum eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.999739	338.3418	58.43354	0.0000
At most 1 *	0.998669	271.4888	52.36261	0.0001
At most 2 *	0.976200	153.2608	46.23142	0.0000
At most 3 *	0.947476	120.8056	40.07757	0.0000
At most 4 *	0.910585	98.99324	33.87687	0.0000

Max-eigenvalue test indicates 5 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.999739	1128.803	197.3709	0.0001
At most 1 *	0.998669	790.4613	159.5297	0.0000
At most 2 *	0.976200	518.9725	125.6154	0.0001
At most 3 *	0.947476	365.7117	95.75366	0.0000
At most 4 *	0.910585	244.9061	69.81889	0.0000

Trace test indicates 5 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

Source: Researcher's computation from E-views

Granger causality test

Since the variables are co-integrated, this suggests that there is some sort of causal relationship among the variables. The Pairwise Granger causality test was employed in order to establish the causality relationship among the variables; this is presented below.. From the test result, it showed a bi-directional relationship between gross domestic product and expenditure on transfers, economic services, administration and social community services. This means that an increase in gross domestic product and hence aggregate national income will result in a positive increase in each of these expenditure components which will in turn increase the gross domestic product in Nigeria.

Pairwise Granger causality tests

Null hypothesis:	Obs	F-Statistic	Prob.
ESCS does not Granger cause GDP	47	8.83491	0.0007
GDP does not Granger cause ESCS		51.1471	2.E-11
EAD does not Granger cause GDP	47	21.0031	8.E-07
GDP does not Granger cause EAD		24.3533	2.E-07
EES does not Granger cause GDP	47	4.54878	0.0171
GDP does not Granger cause EES		6.32871	0.0043
ETRANS does not Granger cause GDP	47	5.13497	0.0108
GDP does not Granger cause ETRANS		3.95470	0.0278

Source: Researcher's computation from E-views

Over-parameterized result

The results of the over-parameterized equation of the economic growth – capital expenditure nexus are presented below. The result showed that the factor of the error corrections was correctly signed and found to be significant statistically in line with theoretical expectation. The coefficient of the error correction variables of 0.507 showed that above 51 per cent of the disequilibrium in economic growth has been corrected each year. The R-squared of 0.934 and adjusted R-squared of 0.894 showed the model estimated ha a good fit. The independent variables were responsible for the total variation of about 89.4 per cent (Adjusted R-squared) in the dependent variable. The model therefore has a high explanatory power. The F-statistics value of 23.506 showed that, at the conventional significance levels (one, five, and ten per cent), the overall model was found to be statistically significant. Meanwhile, there was the absent of autocorrelation in the model as shown by the DW value of 1.98. Hence, the residual terms are not interdependent.

Over-parameterized result

Dependent variable: D(GDP)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	77985.76	112381.1	0.693940	0.4941
D(GDP(-1))	1.113283	0.151080	7.368851	0.0000
D(GDP(-2))	-0.130619	0.207214	-0.630358	0.5342
D(CEAD)	16.10348	11.31054	1.423759	0.1669
D(CEAD(-1))	-14.19093	11.33151	-1.252343	0.2220
D(CEAD(-2))	27.56071	9.506654	2.899097	0.0077
D(CEES)	-9.965917	3.611387	-2.759582	0.0107
D(CEES(-1))	5.495458	4.120733	1.333612	0.1944
D(CEES(-2))	-5.985505	2.904960	-2.060443	0.0499
D(CESCS)	22.62378	18.03040	1.254758	0.2212
D(CESCS(-1))	-12.58357	15.91829	-0.790510	0.4367
D(CESCS(-2))	-48.36284	16.53547	-2.924795	0.0072
D(CETRANS)	-0.080637	8.009761	-0.010067	0.9920
D(CETRANS(-1))	-19.35480	9.593581	-2.017474	0.0545

D(CETRANS(-2))	-4.166838	6.502625	-0.640793	0.5275
ECM(-1)	-0.507244	0.165467	-3.065528	0.0052
R-squared	0.933790	Mean dependent var	1033892.	
Adjusted R-squared	0.894065	S.D. dependent var	1740685.	
S.E. of regression	566553.4	Akaike info criterion	29.61832	
Sum squared resid	8.02E+12	Schwarz criterion	30.28703	
Log likelihood	-591.1756	Hannan-Quinn criter.	29.86183	
F-statistic	23.50590	Durbin-Watson stat	1.998228	
Prob(F-statistic)	0.000000			

Source: Researcher's computation from E-views.

Parsimonious error correction results

The variables that were statistically significant in the over-parameterized analysis were extracted and engaged in the parsimonious model estimation. The parsimonious short run error correction model for equation one as presented. From the parsimonious test result, the factor of the error correction model was correctly signed and formed to be significant statistically as expected theoretically. This is rather a show adjustment speed level from the disequilibrium in the short run to equilibrium in the long run. Both the R-squared (0.898) and adjusted R-squared (0.888) confirmed the model to have a good fit and has a high explanatory power regarding the dependent variable. The F statistic value of 41.59 showed that the independent variables have joint effect on the dependent variable. This revealed the degree of high linear relationship between the variables in the model. The result remained inconclusive as a result of the DW statistic value of 2.67. This is so because the Durbin-Watson value of 2.67 fell in the inconclusive region of the Durbin-Watson. This means that the model does not have any precise conclusion if there is or no autocorrelation among the residual terms. Analysis of the short run coefficient showed the gross impact of the one period lagged value on GDP current value. This was found to be in line with theoretical expectation. As such, a million naira increase in last period value of gross domestic product increases the GDP current value by N0.91 million, *ceteris paribus*. The results also showed that administrative capital expenditure has a significant and positive impact on GDP in Nigeria and conformed to a priori expectation. This result implies that a million naira increase in administrative capital expenditure would result in a N35.10 million increase in the value of gross domestic product in Nigeria, other factors remaining the same. Contrary to expectation, there is a negative impact on the GDP in Nigeria by the current capital spending on economic services. This is due largely on the fact that most capital investment in economic services do take long generation period before the benefit are felt thus situation is a typical example of public investment in infrastructures, such as electricity, transport, communication and agriculture.

However, there was a significant and positive impact on the gross domestic product in Nigeria after two years of engaging on capital spending on economic services. This was in line with theoretical expectation; hence, a million naira increase in capital expenditure on economic services resulted in N7.19 million increases in GDP after two years. In the same vein, the results showed that, there is a significant and positive relationship between social and community services' capital expenditure and GDP in Nigeria after two years. This is in line with theoretical expectation, hence, a million naira increase in capital spending on social and community services would increase the GDP in Nigeria by N33.91 million, *ceteris paribus*. Lastly, capital expenditure on transfers has negative impact on GDP in Nigeria. . Similarly, a million naira increase in capital spending on transfers will result to a decrease in gross domestic product by

₦10.14 million, other factors remaining the same. This also was not in tune with theoretical expectation that capital spending contributes positively to growth. The negative effect of capital expenditure on transfers on gross domestic product may have been due to the fact that aggregate output in Nigeria would be positively impacted.

Parsimonious error correction result

Dependent variable: D(GDP)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	161190.5	116005.8	1.389504	0.1740
D(GDP(-1))	0.911824	0.067293	13.55008	0.0000
D(CEAD(-2))	35.09926	7.285329	4.817801	0.0000
D(CEES)	-8.451388	1.533401	-5.511532	0.0000
D(CEES(-2))	7.186164	1.738707	4.133050	0.0002
D(CESCS(-2))	33.90788	5.581069	6.075517	0.0000
D(CETRANS(-1))	-10.14056	2.493754	-4.066383	0.0003
ECM(-1)	-0.288342	0.061085	-4.720307	0.0000
R-squared	0.898179	Mean dependent var		1033892.
Adjusted R-squared	0.876580	S.D. dependent var		1740685.
S.E. of regression	611523.1	Akaike info criterion		29.65847
Sum squared resid	1.23E+13	Schwarz criterion		29.99283
Log likelihood	-599.9987	Hannan-Quinn criter.		29.78023
F-statistic	41.58525	Durbin-Watson stat		2.669288
Prob(F-statistic)	0.000000			

Source: Researcher's computation from E-views

Conclusion and Recommendations

The study empirically examined government capital expenditure and economic growth in Nigeria. Based on the analysis of the results, it was revealed that there is a significant and positive impact between administration and GDP in Nigeria. Also, discovered that there is a significant and negative impact between economic services and the growth of the Nigeria economy, social and community services has a positive impact on the growth of Nigeria economy and capital expenditure has a negative impact on the growth of Nigeria economy. In Nigeria, government spending has been on a steady rise as a result of the crude oil sales and production huge receipts together with the increase demand for public goods. However, the poor socio-economic indices in the country have last doubt as to whether government spending has brought about economic growth in Nigeria. Government expenditure is assumed to be the most powerful economic factor of all modern societies. The form and pattern of the output growth of any economy is determined by the structure and size of the government expenditure. It is concluded that government expenditure is the incurred costs of the government for its maintenance, economy and society and assisting other nations. The study recommended that appropriate measures that will focus primarily increasing the aggregate output level that would be implemented. This can be achieved by the provision of the needed amenities such as a transport system that is functional, constant and steady supply of power, efficient communication system, and maintenance of stable political and macroeconomic environments in Nigeria;

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