



International Journal of Economics and Financial Research

ISSN(e): 2411-9407, ISSN(p): 2413-8533

Vol. 3, No. 4, pp: 44-53, 2017

URL: <http://arpgweb.com/?ic=journal&journal=5&info=aims>

Effect of Aggregated and Disaggregated Public Spending On the Nigerian Economy (1980-2015)

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Abstract: Using time series data, this study investigated the effect of aggregated and disaggregated public spending on economic growth in Nigeria during the period 1980 – 2015. Time series data such as aggregated expenditure proxy by total federal government expenditure (TFGE), disaggregated expenditure proxy by recurrent expenditure (REXP) and capital expenditure (CEXP,) and economic growth proxy by GDP were obtained from central bank of Nigeria (CBN) statistical bulletin. Error Correction Model (ECM) was used to estimate the model. The result of the finding revealed that the total federal government expenditure (TFGE) and capital expenditure (CEXP) exerts positive and significant influences on GDP while recurrent expenditure (REXP) has a positive and insignificant influence on GDP. This implies that the higher the public spending, the higher the GDP. The researchers therefore, recommend that for sustainable Economic Growth (GDP), federal government should increase capital expenditure by allocating more funds to the productive sector of the economy. More so, the positive contributions of public spending to economic growth necessitate the continued use of fiscal policy instruments to pursue macroeconomic objectives in Nigeria.

Keywords: GDP; TFGE; REXP; CEXP; ECM.

1. Introduction

In today's world the role of government has evolved to a level greater than the "night watchman" prescribed by Adam Smith and his followers. It is now clear that the best government is not necessarily the cheapest. Fiscal policy is a toll of macro-economic management, that is, a powerful instrument of stabilization. According to [Akpakpan \(1994\)](#) it is the deliberate use of government income and expenditure to influence the level of economic activity in the country. [Anyanwu \(1995\)](#) saw fiscal policy as referring to the policy of government with respect to the level of government expenditure (on purchases of goods and services and on transfers) the tax structure and debt operations. It also involves that aspect of government policy that deal with obtaining revenue for government use and deciding on how best the collected revenue should be used, ([Anyanwu, 1995](#)). According to [CBN \(1996\)](#), fiscal policy is concerned with the government's management of the nation's economy by varying the size and content of taxation and public expenditure done with much regards to their impact on the economy.

Economic growth refers to increase in a country's potential GDP, although this differs depending on how national product has been measured ([Nworji et al., 2012](#)). Economic growth must be sustained for a developing economy to break the circle of poverty. Countries usually pursue fiscal policy to achieve accelerated economic growth. [Tanzi's](#) study (as cited in [Nworji et al. \(2012\)](#)) observes that fiscal policy applies to the use of fiscal instruments (taxation and spending) to influence the working of the economic system in order to maximize economic welfare with the overriding objective of promoting long-term growth of the economy.

Public expenditure is claimed as "the most powerful economic agent in all modern societies" ([Arrow and Kurz, 1970](#)). The size and structure of public expenditure will determine the pattern and form of growth in output of the economy ([Tajudeen and Ismail, 2013](#)). In the Nigerian economy, the structure of public expenditure can be broadly categorised into capital and recurrent expenditure. Recurrent expenditure is referred to as government expenses on administration such as wages, salaries, interest on loans maintenance etc. whereas expenses on capital project like roads, airports, health, education, telecommunication and electricity generation etc., are referred to as capital expenditures, [Obinna's](#) study (as cited in [Okoro \(2013\)](#)). Furthermore, by providing new opportunities and expanding the capabilities of the masses, government spending plays an important role in ensuring sustainable economic growth ([Josaphat and Oliver, 2000](#)).

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The relationship between public expenditure and economic growth is especially important for developing countries, like Nigeria, most of which have experienced increasing level of public expenditure over time (Lindauer and Velenchik, 1992). Over the years, public spending in Nigeria has been expanding, as in any other country of the world. This rise in government spending is due to the huge receipts from production and sale of crude oil, and the increased demand for public goods like roads, power supply, education, health, security etc. Akpan (2005) opines that the observed growth in public spending appears to apply to most countries regardless of their level of economic development. This necessitates the need to determine whether the behaviour of Nigerian public expenditure and the economy can be hinged on the Wagner (1983) Law of Ever-increasing State Activity, or the Keynes (1936) theory or Peacock and Wiseman (1979) hypotheses.

Numerous studies have been conducted and there exist no consistent evidence for a significance relationship between public spending and economic growth, in a positive or a negative direction. Results and evidence differ by countries/region, data, analytical/statistical method employed, and categorisation of public expenditures. This study attempts to examine the effect of public expenditure on economic growth in Nigeria covering the period 1980-2015. Therefore, the debate over the effect of public expenditure on economic growth is on-going and left open to further study.

The remaining part of this section includes: review of relevant theoretical and empirical literatures as well as the trends of federal government of Nigeria expenditure.

1.1. Theoretical Literature

The nineteenth century German Economist, Adolf Wagner in his classic book, *Grundlegung der Politischen Oekonomie* (Wagner, 1963) formulated a 'law of increasing state activities'. He asserted that there is a long run propensity for the scope of government to increase with higher levels of economic development. Wagner's contribution to public expenditure theories is particularly significant when we consider that before Wagner made his observations, the prevailing views was the notion that as a country grows richer, government activities would have a tendency to decline (Henrekson, 1993). Bird (1971) concurs with Wagner's 'law' stating that 'the activities of government are an increasing function of the changing structure of the economy'. Whether the state decides to combat or to support private sector activity such as private monopolies, with the growth of this sector, it is plausible to assume that public sector activity will increase.

It is conventional however, to use per capita income as an index of development but this is not the only index of development nor is it the only compatible interpretation of the 'law' but it continues to be used by most economists (Bird, 1971; Goffman, 1968; Gupta, 1967; Michas, 1975; Musgrave, 1969; Pryor, 1968). Government expenditure is probably the most significant and practical measure of the state's activity.

Peacock and Wiseman (1979), this theory also looked at increasing public expenditure from the socio-political perspective. Government expenditure will increase as income increases but because the leaders want re-election into political offices, so more infrastructure must be provided in order to convince the electorate that their interest are being catered for by the people they voted into power. However, the citizens of the country are less willing to pay tax. The resistance to pay tax by the people will make the state to have low revenue hence the cost of providing more facilities is born by the government, making government expenditure to increase rapidly.

Keynesian public expenditure- economic growth theory has attracted a vast array of empirical investigation by economists especially from academic setting over time. Keynesians' in other hand postulates a function with the orientation that runs from government increasing undertakings to economic improvements. These expenditures are considered as normal goods in society's stance with income elasticity of demand greater than one. Keynesian's stance evolved at the hill of the Great depression of late 1930s. This advocating for government involvement in the economic managements brought about, a tremendous evolution in the field of economic. The periods witness a considerable growth on sensitive economic indicators such as investments, employment creation, and general demands whereof government spending.

1.2. Empirical Literature

Ogwuru (2008), study the case of Nigeria from 1970 to 2005 and found that there exist positive relationship between government size and economic growth. The result also confirms a positive relationship between recurrent expenditure and economic growth.

Ghosh and Gregarious (2008) analyse panel data for fifteen (15) developing countries for twenty eight (28) years and found that current spending positively impacts on growth while capital spending on the other hand impacts negatively on growth. A study by Ranjan and Sharma (2008) showed that government expenditure exerted significant positive impact on economic growth in India during the period 1950-2007, and that the two sets of variables cointegrated.

The study by Fajingbesi and Odusola (1999) showed that government capital expenditure has a significant positive effect on real output, but that real government recurrent expenditure has insignificant effect on growth.

Ogiogio (1995) indicated a long-term relationship between government expenditure and economic growth. The result also showed that recurrent expenditure exerts more effect than capital expenditure on economic growth.

Nworji *et al.* (2012) employed OLS multiple regression to examine the effect of public expenditure on economic growth in Nigeria for the period 1970-2009. Their results showed that capital and recurrent expenditure on economic services had insignificant negative effect on economic growth during the study period. Also, capital

expenditure on transfers had insignificant positive effect on growth. But capital and recurrent expenditures on social and community services and recurrent expenditure on transfers had significant positive effect on economic growth.

Oyinlola (1993) used defence expenditure and economic growth in Nigeria, and found a positive relationship between defence expenditure and economic growth.

Some empirical studies in Nigeria suggest no long-run relationship between government expenditure and economic growth (Aigbokhan, 1996; Aregbeyen, 2006; Babatunde, 2007; Essien, 1997). Thus, there appears to be a controversy over the long run relationship between government expenditure and economic growth in Nigeria.

Abu-Bader and Abu-Qarn (2003) employed multivariate co-integration and variance decomposition approach to examine the causal relationship between government expenditures and economic growth for Egypt, Israel, and Syria. In the bivariate framework, the authors observed a bi-directional (feedback) and long run negative relationships between government spending and economic growth.

Loizides and Vamvoukas (2005) employed the trivariate causality test to examine the relationship between government expenditure and economic growth, using data set on Greece, United Kingdom and Ireland. The authors found that government size granger causes economic growth in all the countries they studied. Komain and Brahmaire (2007) examined the association between government expenditures and economic growth in Thailand, by employing the Granger Causality Test. The results revealed that government expenditures and economic growth are not cointegrated. The results also indicated a significant positive effect of government spending on economic growth.

Chiang-Ju (2006) estimates the long –run relationship between government expenditures and output and found that there exists no long-run relationship between these variables. Schaltegger and Torgler (2007) study the case of Switzerland from 1981 to 2001 and found that there exist negative relationship between government size and economic growth. Their results also confirm a negative relationship between recurrent expenditure and economic growth.

Laudau (1983) examined the effect of government expenditure on economic growth for a sample of 96 countries and found that government expenditure exerts a negative effect on real output.

Tajudeen and Ismail (2013) used Auto-Regressive Distributed Lag (ARDL) approach to analyse the impact of public expenditure and economic growth from 1970-2010. Their findings indicated that the impact of public spending on growth was negative and recurrent expenditure was also found to have little significant positive impact on growth.

Muhlis and Hakan (2003) examined Wagner's law of relationship between public expenditure and GDP for the Turkish case over the period of 1965-2000. Using co-integration test and granger causality test, they empirically found causality in both directions.

Rehman *et al.* (2010) examines the nature and direction of causality in Pakistan between public expenditure and national income along with various selected components of public expenditure by applying Toda-Yamamoto causality test to Pakistan for the period of 1971 to 2006. The study found that there is a unidirectional causality running from GDP to government expenditure, which supports the Wagner's law.

Empirical studies have been carried out to establish a relationship between size of government and economic growth. While some studies have found a negative relationship between government expenditure and economic growth (Barro, 1990; Barth *et al.*, 1990; Grier and Tullock, 1989; Landau, 1986; Laudau, 1983), others have found a positive relationship (Aschauer, 1989; Holmes and Hutton, 1990; Ram, 1986; Sahni and Singh, 1984).

However, this study is an improvement on the previous studies on government expenditure and economic growth relationship in Nigeria. The study considers only two categories of public spending as vital variables that affect economic growth, namely recurrent and capital expenditures as disaggregated expenditure and total federal government expenditure as aggregated expenditure. The study period was also extended to 2015 and finally used Error Correction Model (ECM) for data analysis.

1.3. Trends of Federal Government of Nigeria Expenditures

1980-1985

The total expenditure of the Federal Government as a ratio of the Gross Domestic Product (GDP) which had earlier increased between 1970 and 1980 considerably, actually declined by 15.6 percent in 1980 to 9 percent in 1985. That is a decline in total government expenditure from ₦14.9billion to ₦13.2billion in 1980 and 1985. The relative decline in government expenditure took place as a result of the fall in revenue due to the collapse of the world oil market, beginning about 1980.

1986-1992

In this period, total expenditure increased from ₦16.2billion in 1986 to ₦66.5billion in 1991, and increased further to ₦82.7billion in 1992. However, much of the growth in total expenditure was accounted for by the increase in transfer payments, especially debt service payments, while expenditure on productive activities declined. This rise was as a result of the introduction of Structural Adjustment Programme (SAP) around the middle of 1986 by General Ibrahim Babangida (President).

1993-1998

This period initially experienced a policy of strict regulation of the economy (in contrast to the period 1986-1992) and later, that of guided deregulation from 1995 as was made popular by the late Head of State, General Sani Abacha. Interestingly, after several years of deficits recorded in the economy, surpluses of ₦1billion and

₦37.04billion were recorded in 1995 and 1996, respectively. 1997 recorded another deficit of about ₦5billion. The economy experienced another deficit by the end of 1998 given the global falling oil prices (much below the 1998 Budget projects) which led to falling revenue (20-25 percent) for the economy.

1999-2006

The two-tier exchange rate system was abolished by the government in 1999 and the price of petrol was reduced by 20%; a bill was passed to pave the way for the reduction programme – the Poverty Eradication Scheme – to which US\$231 million was allocated. 2002 sees the government facing an ongoing struggle to reduce the fiscal deficit and restore macroeconomic stability. Total expenditure, decreased from ₦947.69billion in 1999 to ₦701.05billion 2000. And increased further to ₦1, 018.02 billion in 2001 and ₦1879.65billion in 2006. The increment was as a result of the birth of pure civil rule (democracy) and the introduction of economic and institutional reforms by President Obasanjo. Bank recapitalization policy of year 2004 also helps to stabilize the economy at that period.

2007-2015

In this period, total government expenditure increased from ₦2, 348.6billion in 2007 to ₦5, 211.42billion in 2014. The increase was because of the introduction of Seven Point Agenda (7PA) by Late President Musa Yar’dua and Transformation agenda by President Goodluck Jonathan’s administration. These reforms gave room for more expenditure on education, health, infrastructure, power supply etc. There was also increase in expenditure on defence and security due to the rise of insurgency (Boko Haram) in the country. Though there was a drastic fall in total expenditure of N692.2billion in year 2015 due to change in government that led to the delay in release of annual budget and fall in oil prices.

Table-1. Federal Government Expenditures 1980 – 2015.

Year	REXP	CEXP	TFGE
1980	4805.2	10163.4	14968.5
1981	4846.7	6417.2	11413.7
1982	4885.7	6417	11923.2
1983	5278.8	4885.7	9636.5
1984	5827.5	4100.1	9927.6
1985	7576.2	5464.7	13041.1
1986	7696.9	8526.8	16223.7
1987	15646.4	6372.5	22018.7
1988	19409.4	8340.1	27749.5
1989	25994.2	15034.1	41028.3
1990	36219.6	24048.6	60268.2
1991	38243.5	28340.9	66584.4
1992	54072.2	39763.3	92797.4
1993	82143.6	54501.8	191228.9
1994	85918.9	70918.3	160893.2
1995	132899.7	121138.3	248768.1
1996	124291.3	158678.3	337217.6
1997	158563.5	269651.7	428215.2
1998	178097.8	309015.6	487113.4
1999	449662.4	498027.6	947690.0
2000	461608.5	239450.9	701059.4
2001	579329.1	438696.5	1018025.6
2002	867336.5	321378.1	1188714.6
2003	984268.1	241688.6	1225956.7
2004	1032741.3	351259.9	1384001.2
2005	1223730.0	519510.0	1743240.0
2006	1343045.2	536609.7	1879654.9
2007	1589300.0	759300.0	2348600.0
2008	2117400.0	960900.0	3078300.0
2009	2128000.0	1152800.0	3280800.0
2010	3109400.0	883900.0	3993300.0
2011	3314400.0	918500.0	4232900.0
2012	3325200.0	874800.0	4200000.0
2013	3689100.0	1108400.0	4797500.0
2014	2530340.0	2681080.0	5211420.0
2015	478418.0	213790.0	692208.0

Source: CBN Statistical Bulletin, Dec., 2014, vol., 25 and Dec., 2015.

The above table agrees with the writing in the 1880’s of the German economist Adolph Wagner in his “law of rising public expenditures”. He felt ... that the development of modern industrial society would give rise to increasing political “pressures for social progress” and call for increased allowance for “social consideration” in the conduct of industry. In consequence, continual expansion of the public sector and its share in the economy should be expected’ (Musgrave and Musgrave, 1999).

The operation of Wagner's law' is evident in Nigeria. Over much of the period for which we have the relevant data, the public sector was growing and its share in the economy was rising. The first thing that will be noticed is that Federal Government spending grew almost systematically over the period. It grew in absolute terms from N14.96 billion in 1980 to N5211.4 billion in 2014 and drastically falls to N692.2 billion in 2015.

The table 2 below will help us to know the contributions of aggregated total federal government expenditure (TFGE) and its disaggregated expenditure (REXP and CEXP) to GDP.

Table-2. Selected Years of Federal Government Expenditure

EXP	1980	1985	1990	1995	2000	2005	2010	2015
TEXP	14968.5	13041.1	60268.2	248768.1	701059.44	1743240.0	3993300	692208
(%)	100%	100%	100%	100%	100%	100%	100%	100%
REXP	4805.2	7576.2	36219.6	132899.7	461608.5	1223730	3109400	478418
(%)	32.1%	58.1%	58%	53.4%	65.8%	70.2%	77.9%	69.1%
CEXP	10163.4	5464.7	24048.6	121138.3	23450.9	519510	883900	213790
(%)	67.9%	41.9%	39.9%	46.6%	34.2%	29.8%	22.1%	30.9%
GDP at current factor cost	96186.6	144724.1	497351.3	2991941.7	6850228.8	12548792.3	33984800	94144690
TEXP as a % of GDP	15.6%	9%	12.1%	83%	10.2%	13.9%	11.8%	0.7%
REXP as a % of GDP	5%	5.2%	7.2%	4.4%	6.8%	9.8%	9.1%	0.5%
CEXP as a % of GDP	10.6%	3.8%	4.9%	3.9%	3.4%	4.1%	2.7%	0.2%

Sources: CBN Statistical Bulletin, Dec., 2014, vol.,25 and Dec., 2015.

Table 2, focuses on the percentage shares of recurrent and capital expenditures in total federal government spending. The information is important because it gives us an idea on how much of the spending was being made on current consumption and that of development of the country's productive capacity. As we can see, the share of capital expenditure, the expenditure on the development of the country's productive capacity, decline from 67.9% in 1980 to 30.9% in 2015 while the recurrent expenditure rises from 32.1% to 69.1% in 1980 and 2015. These changes reflect, among other things, the changes in government as well as government policies.

In addition, also, in terms of the contributions of total government spending to GDP, there is a decline from 15.6% in 1980 to 0.7% in 2015. Moreso, haven disaggregated public expenditure, there is a decline in the ratio of CEXP to GDP from 10.6% in 1980 to 0.2% in 2015 while the contribution of REXP to GDP decreased from 5% to 0.5% in 1980 and 2015. This implies that the REXP contributes more to economic growth than the CEXP.

2. Materials and Methods

This study used a systematic time series econometrics approach to investigate the effect of aggregated and disaggregated government expenditures on economic growth (GDP) in Nigeria during the period 1980-2015. For the purpose of arriving at a dependable and unbiased analysis, the researchers employed a secondary data obtained from Central Bank of Nigeria (CBN) statistical bulletin. Such data include total federal government expenditure (TFGE), recurrent expenditure (REXP) and capital expenditure (CEXP) and economic growth proxy by gross domestic product (GDP). Augmented Dickey Fuller (ADF) unit root test is used to test the stationarity of the variables. Johansen Cointegration test is also applied to check the long-run relationship among the variables while Error Correction Model (ECM) is adopted to capture the short-run deviations that might have occurred in the estimation of the long-run cointegration equation.

2.1. Model Specification

The dependent variable is economic growth (GDP) while the independent variables are total federal government expenditure (TFGE), recurrent expenditure (REXP) and capital expenditure (CEXP). The models are stated as thus:

$$GDP = f(TFGE) \dots\dots\dots(1)$$

$$GDP = f(REXP,CEXP)\dots\dots\dots(2)$$

Thus, the functional relationships between dependent and the independent variables in the study are stated as follows:

$$GDP = f(TFGE) + U_{1E} \dots\dots\dots(3)$$

$$GDP = F(REXP, CEXP) + U_{2E} \dots\dots\dots(4)$$

Hence, the mathematical forms of the models are as follows:

$$GDP = a_0 + a_1TFGE + U_{1t} \dots\dots\dots(5)$$

$$GDP = b_0 + b_1REXP + b_2CEXP + U_{2t}\dots\dots\dots(6)$$

Where:

GDP = Gross Domestic Product

TFGE = Total Federal Government Expenditure

REXP = Recurrent Expenditure

CEXP = Capital Expenditure

U_t = error term

The parsimonious error correction model is stated as thus:

$$D(\text{GDP}) = a_0 + a_1D(\text{TFGE}_{t-1}) + a_2\text{ECT}_{t-1} + U_{1t} \dots\dots\dots(6)$$

$$D(\text{GDP}) = b_0 + b_1D(\text{REXP}_{t-1}) + b_2D(\text{CEXP}_{t-1}) + b_3\text{ECT}_{t-1} + U_{2t} \dots\dots\dots(7)$$

Where:

ECT = Error Correction Term

2.2. A Priori Expectation

From the equations above, GDP is a function of government expenditure. That is, GDP is expected to be positively related to TFGE, REXP and CEXP. This implies that increase in government expenditure will, all things being equal, lead to increase in GDP. Hence, $a_1, b_1, b_2 > 0$.

3. Results and Discussion

The results of the ADF test as presented in [table 3](#) show that the dependent variable (GDP) is integrated of order zero, lag two, 0(2) while the independent variable TFGE is integrated of order two, lag two, 2(2), all at 5% level of significance. In other words, GDP is found to be stationary at level and TFGE is also found to be stationary after second difference. Thus, the model follows integrating process. This conclusion is informed by the absolute values of ADF test statistics against their absolute critical values at 5%.

In addition, the [table 4](#) in the appendix depicts the results of ADF test. It shows that GDP and REXP are integrated of order zero, lag two, 0(2) while CEXP is integrated of order one, lag two, 1(2), all at 5% level of significance. Therefore, GDP and REXP are found to be stationary at levels while CEXP is stationary at first difference. Hence, the model follows integrating process. This conclusion is informed by the absolute values of ADF test statistics against their absolute critical values at 5%.

As a follow up to the unit root test, cointegration test was used to determine whether there exist any cointegrating vectors supporting the existence of long run relationship between the dependent variable and independent variables. The result in [table 5](#) indicates the presence of 1 cointegrating equation at 5% level of significance for the GDP model and therefore confirms the existence of long-run equilibrium relationship between GDP and TFGE. More so, the result in [table 6](#) also indicates the presence of two (2) cointegrating equation at 5% level of significance for the GDP model and therefore confirms the existence of long-run equilibrium relationship between GDP and its explanatory variables (REXP and CEXP). All the conclusions are based on the values of trace statistics against their critical values at 5% significance level.

The satisfactory results obtained from unit root and cointegration tests motivated the estimation of an error correction model. From the parsimonious error correction model result, the explanatory variable (TFGE) explained 94% change in GDP, hence, the coefficient of determination is significantly high. The overall regression is highly significant and the error correction model (ECM) coefficient is very low (29%), rightly signed and insignificant. This implies that about 29% deviation from the long-run equilibrium relationship between GDP and its determinant is corrected. (see [table 7](#)). Moreover, the parsimonious result in [table 8](#) show that the independent variables (REXP and CEXP) explained 97% variability in GDP. Hence, the coefficient of determination is significantly high and the overall regression is also significant. The error correction model (ECM) coefficient is low, rightly signed and insignificant. This implies that about 33% deviation from the long-run equilibrium relationship between GDP and its determinants are corrected.

The result in [table 7](#) revealed that TFGE has a positive and significant effect on GDP. This meets the ‘a priori expectation’ that increase in total public spending lead to increase in GDP and vice versa. This result corroborates with the findings of [Ranjan and Sharma \(2008\)](#), [Ghosh and Gregarious \(2008\)](#), and [Komain and Brahmasrene \(2007\)](#) on the effect that TFGE and GDP are positively and significantly related.

Moreover, the result presented in [table 8](#) also revealed that REXP at lag 2 and CEXP at lag 1 were positively related to GDP, though, REXP is insignificant. This meets the ‘a priori expectation’ that the higher the REXP and CEXP, the higher the GDP and vice versa. The result from the analysis however, corroborates with the findings of [Ogwuru \(2008\)](#), [Ram \(1986\)](#), [Aschauer \(1989\)](#), [Holmes and Hutton \(1990\)](#), [Sahni and Singh \(1984\)](#), [Fajingbesi and Odusola \(1999\)](#) on the effect that GDP and its explanatory variables are positively and significantly related except the REXP that is insignificant.

4. Conclusion

The study used error correction model (ECM) to investigate the effect of public spending on economic growth proxy by GDP in Nigeria during the period 1980 – 2015. Analysis from the estimation suggests that the total federal government expenditure (TFGE) and capital expenditure (CEXP) exerts positive and significant influences on GDP while recurrent expenditure (REXP) has a positive and insignificant influence on GDP. This implies that the higher the public spending, the higher the GDP. The researchers therefore, recommend that for sustainable Economic Growth (GDP), federal government should increase capital expenditure by allocating more funds to the productive sector of the economy. More so, the positive contributions of public spending to economic growth necessitate the continued use of fiscal policy instruments to pursue macroeconomic objectives in Nigeria.

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Appendix

Table-3. Unit Root test results (GDP & TFGE)

Variables	ADF test statistics	5% critical value	Order of integration
GDP	-4.946405	-2.954021	0(2)
D(TFGE)	-4.130148	-2.954021	2(2)

Source: Researchers' computation, 2017.

Table-4. Unit Root test results (GDP, REXP & CEXP)

Variable	ADF test statistics	5% critical value	Order of integration
GDP	-4.946405	-2.954021	0(2)
REXP	-3.884611	-2.954021	0(2)
D(CEXP)	-10.41898	-2.954021	1(2)

Source: Researchers' computation, 2017.

Table-5. Johansen Cointegration test results (GDP & TFGE)

Date: 03/01/17 Time: 18:48
 Sample (adjusted): 1982 2015
 Included observations: 34 after adjustments
 Trend assumption: Linear deterministic trend
 Series: GDP TFGE
 Lags interval (in first differences): 1 to 1
 Unrestricted Cointegration Rank Test (Trace)

Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.579203	29.46500	15.49471	0.0002
At most 1	0.001013	0.034470	3.841466	0.8527

Trace test indicates 1 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

Source: Researchers' computation, 2017.

Table-6. Johansen Cointegration test results (GDP, REXP & CEXP)

Date: 03/01/17 Time: 19:03
 Sample (adjusted): 1982 2015
 Included observations: 34 after adjustments
 Trend assumption: Linear deterministic trend
 Series: CEXP GDP REXP
 Lags interval (in first differences): 1 to 1
 Unrestricted Cointegration Rank Test (Trace)

Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.630430	55.51800	29.79707	0.0000
At most 1 *	0.457659	21.67387	15.49471	0.0052
At most 2	0.025282	0.870626	3.841466	0.3508

Trace test indicates 2 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

Source: Researchers' computation, 2017.

Table-7. Parsimonious Error Correction Model result of GDP & TFGE

Dependent Variable: D(GDP)

Method: Least Squares

Date: 03/01/17 Time: 18:30

Sample (adjusted): 1984 2015

Included observations: 32 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GDP(-1))	-0.460685	0.434811	-1.059508	0.3004
D(GDP(-2))	0.172676	0.470061	0.367347	0.7167
D(GDP(-3))	0.575180	0.477700	1.204061	0.2408
C	-208.4792	1551.930	-0.134335	0.8943
D(TFGE)	-0.009515	0.000697	-13.64504	0.0000
D(TFGE(-1))	0.000701	0.003562	0.196867	0.8457
D(TFGE(-2))	0.007189	0.003683	1.951813	0.0632
D(TFGE(-3))	0.008426	0.003540	2.379829	0.0260
ECM(-1)	-0.290042	0.463217	-0.626146	0.5374
R-squared	0.940152	Mean dependent var		2940.371
Adjusted R-squared	0.919335	S.D. dependent var		9112.883
S.E. of regression	2588.197	Akaike info criterion		18.78757
Sum squared resid	1.54E+08	Schwarz criterion		19.19981
Log likelihood	-291.6011	Hannan-Quinn criter.		18.92421
F-statistic	45.16341	Durbin-Watson stat		1.980065
Prob(F-statistic)	0.000000			

Source: Researchers' computation, 2017.

Table-8. Parsimonious Error Correction Model result of GDP, REXP & CEXP

Dependent Variable: D(GDP)

Method: Least Squares

Date: 03/01/17 Time: 19:19

Sample (adjusted): 1983 2015

Included observations: 33 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GDP(-1))	1.855054	0.456287	4.065540	0.0005
D(GDP(-2))	-0.599173	0.812891	-0.737088	0.4685
C	-900.9979	1296.081	-0.695171	0.4939
D(REXP)	-0.001271	0.001444	-0.880662	0.3876
D(REXP(-1))	-0.011911	0.004057	-2.935944	0.0074
D(REXP(-2))	0.006721	0.005818	1.155161	0.2599
D(CEXP)	-0.002699	0.001730	-1.560101	0.1324
D(CEXP(-1))	0.017299	0.003817	4.532341	0.0001
D(CEXP(-2))	0.003754	0.004458	0.841984	0.4085
ECM(-1)	-0.330131	0.408375	-0.808402	0.4271
R-squared	0.970943	Mean dependent var		2851.391
Adjusted R-squared	0.959573	S.D. dependent var		8983.917
S.E. of regression	1806.350	Akaike info criterion		18.08105
Sum squared resid	75046709	Schwarz criterion		18.53454
Log likelihood	-288.3373	Hannan-Quinn criter.		18.23364
F-statistic	85.39430	Durbin-Watson stat		2.475820
Prob(F-statistic)	0.000000			

Source: Researchers' computation, 2017.