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## Sectoral Spreads of Government Expenditures and Economic Growth in Nigeria (1980-2017): An Approach of Error Correction Model

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### Abstract

*The study intended to ascertain impact of sectoral spreads of government expenditure on economic growth in Nigeria. The specific objectives are to: examine the impact of sectoral government expenditure on economic growth in Nigeria and ascertain if there is long-term relationship between sectoral government spending and economic growth in Nigeria. The study made use of ex-post-facto research design which enables us to measure the effect or relationship between dependence variable and explanatory variables using time-series secondary data from 1980 to 2017. The data were subjected to Unit Root, Johansen Cointegration, and Error Correction test and Durbin-watson test. The study concluded that there was positive impact of sectoral spreads of government expenditure on economic performance in Nigeria. Three variables on sectoral Government expenditure among five sectoral Government expenditure variables have long-run relationship with real GDP. This study's conclusion confirmed wagner's law that increase in economic growth was achieved as a result of increase in Government expenditure. The study verified that Government expenditure on Agriculture and Defence have statistical significant effect on economic performance in Nigeria while Government expenditure in transportation and communication, health and education were not statistical significant. Based on above stated findings, the study made the following recommendations: Political officeholders and public officeholders should first have political will to turn Nigeria into developed country through*

*accountability and transparency act in the use of public fund. Nigeria government should promulgate more anti-corruption agencies to speed-up prosecution and execution of judgment on public fund looters.*

**Keywords:** Government expenditure, Economic Growth, Error Correction Model

## Introduction

Government expenditures are strong instruments introduced to remove market failure (tendency for an economy to produce too much of some goods and an insufficient amount of others) and can launch an economy into achieving economic growth. Government Expenditures are the expenses which a government incurs for (i) its own maintenance (ii) society and the economy (iii) helping other countries (Bhatia 2002). Government expenditure represents the total government spending to attain the predetermined macro-economic objectives.

In the Nigerian economy public expenditure can broadly be categorized into capital and recurrent expenditure. The recurrent expenditure are government expenses on administration such as wages, salaries, interest on loans, maintenance etc., whereas expenses on capital projects like roads, airports, health, education., telecommunication, electricity generation etc., are referred to as capital expenditure (Obinna, 2003).

The size of government expenditures and its effect on economic growth, and vice versa, has been an issue of sustained interest for over decades now. The relationship between government expenditure and economic growth has continued to generate series of debate among scholars. Government performs two major functions- protection (and security) and provisions of certain public good (Al-Yousif, 2000). Scholars argue that increase in government expenditure on socio-economic and physical infrastructures encourage economic growth. For example, government expenditure on health and education raises the productivity of labour and increase the growth of national output. Similarly, expenditure on infrastructure such as roads, communications, power, etc, reduces production costs, increases private sector investment and profitability of firms, thus fostering economic growth.

There are important sectors of the economy of which Government expenditure could channel to promote economic growth. The sectors like defence, Agriculture, transportation and communication, health and education could have essential potential to move an economy forward. Government expenditure on defence sector could help to protect an economy from external attack, Government expenditure on Agriculture sector could help to provide food security for citizenry and raw material for industrial use. Government expenditure on transportation and communication sector could enhance business activities. Government expenditure on health and education could help to keep workforce healthy, have knowledge and information, creative skills and good conduct to promote business activities.

Government spending in Nigeria has continued to rise due to the huge receipts from production and sales of crude oil, and the increased demand for public (utilities) goods like roads, communication, power, education and health. There is increasing need to provide both internal and external security for the people and the nation. Available statistics show that total government expenditure (capital and recurrent) and its sectors have continued to rise in the last three decades. For instance, government expenditure was these figures in 1980 - N780,000 million for Defence, N260,700 million for transportation and communication, N106,200 million for health, N468,000 for Agriculture and N154,900 million for education. In 1990, government

expenditure rose from N1,606,000 million for Defence, 961,000 million for transportation and communication, N498,000 million for health, N1,966,00 for Agriculture, N2,294,000 million for education. Again, government expenditure rose in 2010 from N6,8208,900 million for Defence, N18,438,900 million for transportation and communication, N12,405,200 for health, N3,574,000 for Agriculture and N18,756,300 for education. The various sectors of government expenditure have risen between 1980 and 2017.

However, the rising government expenditure may have not translated to meaningful growth and development, as Nigeria ranks among the poorest countries in the world. In addition, many Nigerians have continued to wallow in abject poverty, while more than fifty percent live on less than US\$1 per day. Moreover, macroeconomic indicators like balance of payments, import obligations, inflation rate, exchange rate, and national savings reveal that Nigeria has not fared well in the last three decades (Okoro, 2013).

It is disturbing to note that government expenditure seems to have not replicated same level of economic growth in Nigeria, for instance between 1980 and 1990, while the GDP growth rate was decreasing (57.15% down to 2.87%), government expenditure growth rate was increasing (23.2% to 41.24%). Thus, there is an inverse relationship between the two periods. However, it is found that the growth rate of government expenditure in 2000 and 2010 was 15.53% and 2.15% respectively, while GDP growth rate witnessed 8.79% and 1.54% in the same period respectively. Thus, government expenditure growth rate has been greater than GDP growth in the same period. Due to the mixed feeling on the above the debate has been inconclusive on whether or not increasing government spending induces economic growth or not.

Again, It is evidence from the empirical review carried out that there are diverse result by various studies, where some studies found that public spending has negative and insignificant effect to economic growth (Egbetunde & Fasanya 2013; Chude & Chude, 2013; Adewara and Oloni, 2012; Laudau, 1983; 1986). Similiar studies reveal that there exist positive significant relationship between government expenditure and economic growth (Nazifi, 2014; Okoro, 2013; Oyinlola & Olusijibomi, 2013; Ogbulu and Torbira, 2012; Ehigiamusoe, 2012 (reveals that government expenditure on agriculture contribute more to growth during the civilian than military regime).

Some studies found out that part of government spending when decomposed have positive, significant effect on economic growth while others have negative and insignificant effect on growth (Nworji et al, 2012; Abu and Abdullahi 2010, Ebiringa and Chalse-Anyagou, 2012; Usman et al, 2011, Adesoye A. B. et al, 2010 shows that public expenditure has no significant impact on growth in short run but has significant impact on growth in the long run). The reason for these diverse findings are not unconnected to the difference in methodology adopted, diversity in the choice of data used to capture the variables of study, variation in the time period which the study focused on. Based on the above this paper attempts to investigate whether sectoral increasing government spending induces economic growth performance in Nigeria.

The major objective of this study is therefore, to ascertain impact of sectoral spreads of government expenditure on economic growth in Nigeria. The specific objectives are:

1. To ascertain the impact of sectoral government expenditure on economic growth in Nigeria.
2. To ascertain if there is long-term relationship between sectoral government spending and economic growth in Nigeria.

## Theoretical Review

The following theories of public expenditure are given attention in this study:

### **Keynesian theory of Government expenditure as instrument of Fiscal policy**

John Maynard Keynes was the first proponent of government expenditure as instrument of fiscal policy in 1936 after when classicalist's postulation stated that economy is regulated with the help of market mechanism and there is no government intervention has failed and led to the great depression of 1930. Keynesian (Modern Concept) view: this opines that Government must play a positive role in order to regulate the economy by government spending and taxes in the most desirable manner. This school of thought discredits the belief of classical that supply creates its own demand and the automaticity of the economic system to generate full employment and growth by itself without interference. Keynes believes that the propensity to consume reduces as income increase and the propensity to save increase as income increase. This will bring about disequilibrium in the economy as consumptions (aggregate demands) do not grow proportionally with savings when income is rising. Thus, to maintain income, employment and growth it is necessary to off-set the effects of reducing demand for outputs by a corresponding increase in public expenditure. Hence, if undesirable economic conditions are to be avoided the gap between the income and expenditure must be filled either by increasing propensity to consume in the economy or by increasing government expenditure.

### **Theory of Increasing Public Expenditure: Wagnerian Law of Increasing State Activities.**

A German economist, Adolph Wagner propounds the law of increasing state activities. He postulates inherent tendencies of the activities of government to increase both intensively and extensively. The theory emphasized the functional relation between the economic growth and government activities with the effect that government sector grows rapidly relative to the economy. According to Wagner the reasons for the increasing tendency for public expenditure are categorized below: *Administrative and protective Obligations*: under this function defence became increasingly more expensive. Administrative roles kept increasing in coverage and intensity. Justice, law and order, maintenance of state machinery and social overheads continue to be expansive and expensive. *Welfare and equitable income distribution roles*: this covers the activities involve in enrichment of cultural life of the masses and provision of social security to people. Old age pension, subsidies payments direct provision of merit goods items and services feature prominently here with the tendency of expanding and expensive as the economy grows. These above roles bring about distributive justice by mitigating the harsh effects of wealth and income inequalities in the society. *Provision of public goods and services roles*: The governments also direct its activities to areas where there are market failures which necessitate the expansion of investment activities of the governments (Bhatia, 2002).

### **Wiseman-Peacock (Displacement) Hypothesis**

This hypothesis was put forward by Peakcock and Wiseman in their empirical investigation of public expenditure of UK. The quest for increase public expenditure resulting from the unanticipated social disturbance and inadequacy of the available revenue brings about new level of government expenditure which necessitates higher taxation. The phenomenon is known as *displacement effect*. Comparison of inadequate available revenue and public expenditure required to carry out government activities brings about *Inspection effect*. The adaptation of the



citizens to this higher level of revenue obtained through taxation to carry out the required public spending is view as *Tax tolerance*. The combination of macro factors like population upsurge, urbanization, administration, welfare roles, defence expenditure and ever increasing awareness of government responsibilities and the micro factors resulting from increasing in price level which tends to increase the cost of public activities in one hand is the cause of ever increase public expenditure.

### **Musgrave Hypothesis: Private Goods, public Goods and Per capita Income Nexus.**

Musgrave made attempt to explain the growing public expenditure on the basis of private goods that required public goods in order to be able to put into use. Meanwhile, the private acquired goods depend on the level of per capital income. In view of the foregoing, Musgrave maintained that increasing demand of private goods necessitates a corresponding demand for public goods (Bhatia, 2002). He opined that increase in per capital income leads to increase in privately owned goods which tend to require more provision of public goods i.e. there is *complementarities link* between the two set of goods as there is increase in per capital income.

The Nigeria economy is not an exception as there is increasing growth in the economy resulting from the new emerging sectors like communication, entertainment and the political zeal on the part of political office holders to prove their mettle that they are capable of improving the living standard of the citizenry in accord with the yelling of the international polity.

### **Empirical Review**

The link between public expenditures and economy growth has attracted the attention of the researchers and scholars. The approaches of the examination of this topic have been taking several dimensions by different scholars. Many scholars examined the discussion on the basis of the structure of public expenditure i.e. capital and recurrent expenditure by the government. Others focus on the sectors of government expenditure.

However, this study focuses on the impact of public expenditure on economic growth on the sectoral basis. The issue under review is a vital subject that should be subjected to painstaking empirical review in order to keep abreast with the positions of the concerned researchers and scholars on this subject and to determine the gap inherent in the earlier related studies.

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. Moreover, the causality test within the trivariate framework (that include share of government civilian expenditures in GDP, military burden, and economic growth) illustrated that military burden has a negative impact on economic growth in all the countries. Furthermore, civilian government expenditures have positive effect on economic growth for both Israel and Egypt.

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. The finding was true for Ireland and the United Kingdom both

in the long run and short run. The results also indicated that economic growth granger causes public expenditure for Greece and United Kingdom, when inflation is included.

Komain and Brahmasrene (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. Moreover, the results indicated a unidirectional relationship, as causality runs from government expenditures to growth. Lastly, the results illustrated a significant positive effect of government spending on economic growth.

Olugbenga and Owoye (2007) investigated the relationships between government expenditure and economic growth for a group of 30 OECD countries during the period 1970-2005. The regression results showed the existence of a long-run relationship between government expenditure and economic growth. In addition, the authors observed a unidirectional causality from government expenditure to growth for 16 out of the countries, thus supporting the Keynesian hypothesis. However, causality runs from economic growth to government expenditure in 10 out of the countries, confirming the Wagner's law. Finally, the authors found the existence of feedback relationship between government expenditure and economic growth for a group of four countries.

Liu, Hsu and Younis (2008) examined the causal relationship between GDP and public expenditure for the US data during the period 1947-2002. The causality results revealed that total government expenditure causes growth of GDP. On the other hand, growth of GDP does not cause expansion of government expenditure. Moreover, the estimation results indicated that public expenditure raises the US economic growth. The authors concluded that, judging from the causality test Keynesian hypothesis exerts more influence than the Wagner's law in US.

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. The finding was true for Ireland and the United Kingdom both in the long run and short run. The results also indicated that economic growth granger causes public expenditure for Greece and United Kingdom, when inflation is included.

A Disaggregated Analysis was carried out by Abu and Abdullahi (2010), using the co-integration and error correction methods, the study has its basis on the Keynesian and endogenous growth models. The result reveals that government total capital expenditure, total recurrent expenditure and government expenditure on education have negative effect on economic growth while, government expenditure on transport and communication and government expenditure on health result to an increase in economic growth.

Adesoye A. B. et al (2010) investigated dynamic analysis of government Spending and economic growth in Nigeria used time series data covering 1977-2006 to analyse the RAM model. The study employed three variants of Ram model were developed to regress Real GDP on private investment. The empirical result showed that private and public investments have no significant effect on economic growth. However, the study shows that long run relationship between public expenditure and economic growth.

Usman et al (2011) empirically examined the public expenditure and economic growth in Nigeria. The study adopted augmented Solow model is specified in Cobb-Douglas. The study focuses on sectoral government expenditure which are decomposed to three streams; expenditure on

building human capital- public expenditure on education and health, expenditure on building infrastructure-public expenditure on transport and communication, and other social services, and expenditure on administration to study the impact government expenditure on economic growth. The result shows that public spending doesn't has impact on growth in the short run, however there is long run relationship between public expenditure and economic growth.

Ehigiamusoe (2012) in his study titled 'A comparative Analysis of Agricultural Performance between the Military and Civilian Regime in Nigeria' the papers adopt descriptive approach in its study. The research work compares the proportion of public expenditure on agricultural with the allocation to other sectors of the economy such as education, health and transport. The study reveals the agricultural sector received more percentage of public expenditure during civilian regime but the contribution of agriculture to GDP during military regime is greater than the civilian regime.

Adewara and Oloni (2012) in Composition of Public Expenditure and Economic Growth in Nigeria analyzed the relationship between public expenditure compositions from 1960 to 2008 on economic growth using the Vector Autoregressive Model (VAR). The study finds out that expenditure on education has failed to enhance economic growth due to the high rate of rent seeking in the country and high rate of unemployment. The study also recommends that expenditure on health and agriculture should be encouraged due to their positive contributions to growth.

Ben-Caleb and Godwins (2012) researched on Budget discipline in Nigeria: A critical evaluation of military and civilian regimes. The paper juxtaposes military and civilian regimes with respect to adherence to budgetary estimates. The study employs descriptive statistics, simple variances and percentages with the help of independent T-test of difference of variances. The paper reveals that budget indiscipline under democratic regime is higher than the budget indiscipline under democratic regime by analyzing budget expenditure variances between the two regimes.

Anyanwu et al (2012) in their Comparative Regime Analysis of the Trend and Structure of Military Expenditure in Nigeria, the study covers from 1980 to 2010 where the descriptive statistical tool employed in the analysis ironically shows civilian administrations spend more for defence purposes than military and that recurrent defence expenditure takes a higher proportion of total allocation for defence in Nigeria.

Ebiringa and Chalse-Anyaogu (2012) investigated the Impact of Government Sectoral Expenditure on the Economic Growth of Nigeria. He opined that government expenditures remain the bedrock of Nigeria's economic growth. The work adopted the ECM method to analyse the long run effect of selected macro economic variables on growth. The findings of their work shows that expenditure on telecommunication, defence and security, education and health sectors have positive effect on Nigeria economic growth. But, transportation and agricultural expenditures have impacted negatively on the economic growth.

Ogbulu and Torbira (2012) carried out empirical study on Budgetary Operations and Economic Growth: The Nigerian Perspective. The study adopted the linear OLS mechanism in the analysis of budgetary economic growth model patterned after multivariate regression model of linear formation. The ECM was used to indicate how the departure from the long-run equilibrium is corrected. The study reveals that five budgetary items: non-oil revenue, economic, administrative, social and transfer expenditures exerted a significant effects on the GDP.



Nworji et al (2012) worked on the Effects of Public Expenditure on Economic Growth in Nigeria: An Disaggregated Time Series Analysis from 1970-2009. The study use the OLS multiple regression model. The result of the analysis shows that capital and recurrent expenditure on economic services have insignificant negative effect on economic growth; capital expenditure has insignificant positive effect on growth. While capital and recurrent expenditure on social and community services and recurrent expenditure on transfers has significant positive effect on economic growth.

Chude and Chude (2013) examine the Impact of Government Expenditure on Economic Growth in Nigeria between the period of 1977 to 2012. The study focuses on the sectoral expenditures analysis. The study employed Ex post facto design and Error Correction Model in its analysis. The study reveals that total expenditure education is highly and statistically significant and has positive relationship on economic growth in Nigeria in the long run.

Oyinlola and Olusijibomi (2013) investigated public expenditure and economic growth nexus: Further evidence from Nigeria during the period of 1970 to 2009. The study employed disaggregated public expenditure using the structural breaks co-integration technique. The result of the research confirms Wagners law in two models in the long run, the result also shows that economic growth and development are the main objectives of government expenditure, especially investment in infrastructure and human resources all of which falls under social and community services.

Egbetunde and Fasanya (2013) delve into the Public Expenditure and economic Growth in Nigeria: Evidence from Auto-Regressive Distributed Lag Specification during the period 1970-2010. The Bounds approach to cointegration was used in the analysis to examine the long run and short run relationships between public expenditures and economic growth. The ARDL approach signifies that the variables are bound together in the long-run. The study reveals that recurrent expenditure has significant impact on growth; total public spending has negative effect on growth.

Okoro (2013) explores Government Spending and Economic Growth in Nigeria covering 1980 to 2011. The study used Error correction mechanism and Granger causality test in its analysis. The findings reveal that there exist a long run equilibrium relationship between government spending and economic growth in Nigeria.

Nazifi (2014) researched on the capital expenditure and its impact on economic growth in Nigeria: 1980-2010. The multiple regression model of Ordinary Least Square was used to analyse the data. The findings of the study shows that total capital expenditure, capital expenditure on administration, capital expenditure on social community services and capital expenditure on transfers have positive impact on economic growth in Nigeria.

Akpan (2005) used a disaggregated approach to determine the components (that include capital, recurrent, administrative, economic service, social and community service, and transfers) of government expenditure that enhances growth, and those that do not. The author concluded that there was no significant association between most components of government expenditure and economic growth in Nigeria.

Ighodaro and Okiakhi (2010) used time series data for the period 1961 to 2007 and applied Cointegration Test and Granger Causality test to examine government expenditure disaggregated into general administration and community and social services in Nigeria. The results revealed negative impact of government on economic growth.

Loto (2011) investigated the impact of sectoral government expenditure on economic growth in Nigeria for the period 1980-2008 and applied Johansen cointegration technique and error correction model. The results inferred that in the short run expenditures on agricultures and education were negatively related to economic growth. However, expenditures on health, national security, transportation, and communication were positively related to economic growth, though the impacts were not statistically significant.

Studies in Nigeria, like Nurudeen and Usman (2010) showed mixed results. Therefore, this study is an improvement on the previous studies on economic growth and government expenditure relationship in Nigeria. It considers government spending only in two categories – capital and recurrent expenditure as important variables that affects economic growth. Secondly, it extends the study period to 2011 and finally employed the Error Correction Mechanism (ECM) in the study.

### **Methodology**

This study made use of ex-post-facto research design which enables us to measure the effect or relationship between dependence variable and explanatory variables using time-series secondary data. To empirically examine the impact of sectors in government expenditure on the economic growth in Nigeria, the researcher subjected the data collected to Unit Root, Cointegration, and Error Correction test and Durbin-watson test. The ADF test is used to test whether the variables are non stationary (unit root). If the results indicate that all series are stationary in the first difference or all series are generated by 1(1) process, condition of stationarity is established or confirmed (Gujarati, 2004). The unit root was carried out to avoid non-sense regression and violation of ordinary least square assumption. An Error Correction Mechanism is employed to ascertain the speed of adjustment from the short run equilibrium to the long run equilibrium state. The Durbin-watson test was used to identify whether the model suffer from autocorrelation problem. The autocorrelation problem violates of ordinary least square assumption that stated error term of different observation is different from any explanatory variable.

### **Data Sources**

To investigate how government expenditure could affect economic growth in Nigeria, a number of variables have been taken into consideration in this study. These variables consist of Real Gross Domestic Product (RGDP), Defence Government expenditure (Defence), Transportation and communication Government expenditure (Transcom), Health Government expenditure (Heath), Agriculture Government expenditure (Agriculture) and Education Government expenditure (Education) for the period of 1980-2017 and are defined in our model specification. All the variables were sourced from Central Bank of Nigeria's (CBN) statistical bulletin for various years. And are all expressed in million Naira.

### **VI. Model Specification**

This study is anchored on the Keynesian model in 1936 states that expansion of government expenditure accelerates economic growth. This study is aimed at establishing the dynamics properties of the relationship between government spending and RGDP in Nigeria over the years (1980-2017). The functional form, on which our model was based, employed a multiple

regression equation in the analysis of this work. In an attempt to specified the model which is based on previous studies. Real Gross Domestic Product (RGDP), Defence Government expenditure (Defence), Transportation and communication Government expenditure (Transcom), Health Government expenditure (Heath), Agriculture Government expenditure (Agriculture) and Education Government expenditure (Education) were used to formulate our model. Thus, the model is represented in a functional form of the model was shown below:

$$RGDP = F(\text{Defence, Transcom, Health, Agriculture, Education}) \dots\dots\dots (\text{eqn1})$$

Where

RGDP = Real Gross Domestic Product (Dependent variable)

Defence = Defence Government Expenditure (Independent variable)

Trans= Transportation and Communication Government Expenditure (Independent variable)

Health = Health Government Expenditure (Independent variable)

Agriculture = Agriculture Government Expenditure (Independent variable)

Education = Education Government Expenditure (Independent variable)

In a linear function, it is represented as follows:

$$RGDP = \beta_0 + \beta_1 \text{ Defence} + \beta_2 \text{ Transcom} + \beta_3 \text{ Health} + \beta_4 \text{ Agriculture} + \beta_5 \text{ Education} + U_t \dots (2)$$

Where:  $\beta_0$  = Constant term,  $\beta_1$  to  $\beta_5$  = Regression coefficient and  $U_t$  = Error Term.

## Results and Discussion

Table 1: Results of Stationarity (unit root) test.

Variables	ADF- Statistics	Critical Value	Order of integration
RGDP	-6.042212	1% level = -3.632900 5% level = -2.948404 10% level = -2.612874	Stationary first difference
Defence	-4.895445	1% level = -3.632900 5% level = -2.948404 10% level = -2.612874	Stationary first difference
Transcom	-7.763051	1% level = -3.632900 5% level = -2.948404 10% level = -2.612874	Stationary first difference
Health	-5.874127	1% level = -3.632900 5% level = -2.948404 10% level = -2.612874	Stationary first difference
Agriculture	-8.702422	1% level = -3.632900 5% level = -2.948404 10% level = -2.612874	Stationary first difference
Education	-6.660525	1% level = -3.632900 5% level = -2.948404 10% level = -2.612874	Stationary first difference

The results of the stationarity (unit root) test indicate that Real Gross Domestic Product (RGDP), Defence Government expenditure (Defence), Transportation and communication Government expenditure (Transcom), Health Government expenditure (Heath), Agriculture Government expenditure (Agriculture) and Education Government expenditure (Education) were stationary at first difference.

### Johansen Cointegration Results

The main theoretical argument of co-integration analysis is that even if individual variable is non-stationary, the group of variables may drift together. In support of this Engle and Granger (1987) pointed out that a linear combination of two or more non-stationary series may be stationary. If such a stationary linear combination exists, the non-stationary time series are said to be *cointegrated*. The stationary linear combination is called the *cointegrating equation* and may be interpreted as a long-run equilibrium relationship among the variables.

Since the variables under study are integrated at the same order, there is the need to test for co-integration relationships using Johansen approach. This approach is preferred to the Engle and Granger two step procedure because the later conceals information on the coefficients of the explanatory variables in the co-integrating vector, hence makes it in appropriate for this study. Using this approach, the result was found to be sensitive to the lag length used. The Akaike information criterion is used in selecting lag length to be included in the estimation.

Series: RGDP DEFENCE TRANSCOM HEALTH AGRICULTURE EDUCATION

Lags interval (in first differences): 1 to 1

#### Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.916072	209.1524	95.75366	0.0000
At most 1 *	0.797362	119.9518	69.81889	0.0000
At most 2 *	0.606383	62.48379	47.85613	0.0012
At most 3	0.432166	28.91820	29.79707	0.0629
At most 4	0.161030	8.544824	15.49471	0.4091
At most 5	0.059906	2.223916	3.841466	0.1359

Trace test indicates 3 cointegrating eqn(s) at the 0.05 level

\* denotes rejection of the hypothesis at the 0.05 level

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

The Johansen cointegration test identified that there were three cointegration equations in the model. The trace test statistic indicated three cointegrating equations at 0.05 significant level. It means that three variables among five explanatory variables have long-run relationship with real GDP.

### Data Analysis

Empirical Results of the Multi-regression Error correction model

Dependent Variable: D(RGDP,1)

Method: Least Squares

Date: 12/09/18 Time: 06:58

Sample (adjusted): 1981 2017

Included observations: 37 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	14785.61	16206.68	0.912316	0.3689
D(AGRICULTURE,1)	1.590911	0.171810	9.259711	0.0000
D(DEFENCE,1)	0.510432	0.041809	6.938422	0.0000
D(EDUCATION,1)	2.159743	1.416151	1.525079	0.1377
D(HEALTH,1)	0.842189	2.567624	0.328003	0.7452
D(TRANSCOM,1)	0.253729	0.433436	-0.585390	0.5627
ECM(-1)	-0.762600	0.165420	-4.610083	0.0001
R-squared	0.758696	Mean dependent var	1034.120	
Adjusted R-squared	0.710435	S.D. dependent var	89028.32	
S.E. of regression	83968.62	Akaike info criterion	25.68293	
Sum squared resid	2.12E+11	Schwarz criterion	25.98770	
Log likelihood	-468.1342	Hannan-Quinn criter.	25.79038	
F-statistic	18.44870	Durbin-Watson stat	1.940431	
Prob(F-statistic)	0.000211			

In testing this hypothesis, Defence Government expenditure (Defence), Transportation and communication Government expenditure (Transcom), Health Government expenditure (Heath), Agriculture Government expenditure (Agriculture) and Education Government expenditure (Education) were regressed against Real Gross Domestic Product (RGDP). The result of the regression analysis was summarized and it shows that the model for the effect of government expenditure sectors on real GDP. The empirical result shows that the coefficient of Defence Government expenditure (Defence), Transportation and communication Government expenditure (Transcom), Health Government expenditure (Heath), Agriculture Government expenditure (Agriculture) and Education Government expenditure (Education) have positive effect on Real Gross Domestic Product (RGDP). The ecm statistic showed that the model has 72% of the error is corrected every year from short-run to long-run. The results of the t – statistics denotes that Agriculture (9.259711) and Defence (6.938422) were statistically significance. This is because observed values of t – statistics are greater than its P-values. The results of the F – statistical test show that the overall regression of the variables was statistically significance. This is because observed values of the F – statistics (18.44870) was greater than its P-value. Again, our empirical result shows that the adjusted R-squared ( $R^2$ ) is 0.710435. Explanatory powers of the variables were very high.

#### Econometric Test

**Table 4.3 Result of Durbin-watson Autocorrelation Test**

Model	Observed value of Durbin – Watson (Dw)	Critical value of Durbin – Watson Du(4 – du)	Test Result
Model 1	1.940431	1.58	AA



AA = Autocorrelation Absent

Durbin- Watson statistics ( $d^*$ ) was carried to test randomness of the residuals and the assumption of ordinary least square was not violated. The assumption that explanatory variable has no correlation with error term. The result of Durbin–Watson test (1.94031) carried out at five percent level of significance shows that the model is free from Autocorrelation problem was greater than upper critical value of Durbin-watson (1.58). This denotes that prediction base of the Ordinary Least Square estimates were efficient and unbiased.

## Conclusion

The concluded that there is positive impact of sectoral spreads of government expenditure on economic performance in Nigeria. Three variables on sectoral Government expenditure among five sectoral Government expenditure variables have long-run relationship with real GDP. This study's conclusion confirmed wagner's law that increase in economic growth was achieved as a result of increase in Government expenditure. The study verified that Government expenditure on Agriculture and Defence have statistical significant effect on economic performance in Nigeria while Government expenditure in transportation and communication, health and education were not statistical significant. Government expenditure on defence and Agriculture has increased drastically due to government commitment to stop Boko-Harram and Fulani herdsmen insurgency and government commitment to shift the economy from mono-economy of crude oil export to heterogeneous economy. This means government has not put sufficient fund on education and health sector of Nigeria economy up to the standard requirement of international organization. The various unrest – ASUU and ASUP industrial actions in education sector; clamor for improvement in government investment in education and 26% budgetary allocation recommendation by UNDP that fell into the deaf hear of the Federal Government of Nigeria (Yusuf, 2014) are facts corroborating the failure of these sectors as revealed by the study. Government expenditure in transportation was poor because of neglect in road, airway, railway and seaports construction and maintenance. In addition, government expenditure on communication was so poor and now it is in the hand of private sector. The lack of political will on the part of the government officials to be committed to the course of national interest and welfare through the fiscal indiscipline, embezzlement and diversion of public resources for their personal use have really caused health, Education and transportation and communication sectors to serve as drag to economic growth in Nigeria.

## Recommendations

Based on above stated findings, the study made the following recommendations:

- i. Political officeholders and public officeholders should first have political will to turn Nigeria into developed country through accountability and transparency act in the use of public fund.
- ii. Nigeria government should promulgate more anti-corruption agencies to speed-up prosecution and execution of judgment on public fund looters.
- iii. Nigeria government should put more public spending on defence, education, health, transportation and communication and agriculture because they are sectors of economy that required urgent need for more funding to derive Nigeria economy.

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