COMPOSITION OF SECTORIAL EXPENDITURE ALLOCATION AND THE NIGERIAN ECONOMY

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Abstract

This study examined the composition of sectorial expenditure allocation and the Nigerian economy covering a period of 36 years from 1981 – 2017. The study used time series data collected from the Central Bank of Nigeria (CBN) statistical bulletin. The study specified a model of sectorial expenditure proxied by total government expenditure on administrative services, (TGEAT), total government expenditure on social and community services (TGESC), total government expenditure on economic services (TGEEC) and total government expenditure on transfer services (TGETF) as the independent variables, while economic growth was proxied by real gross domestic product (RGDP) as the dependent variable. The statistical technique adopted were Ordinary Least Square (OLS) estimation techniques, Johansen co-integration and Granger causality test through the Econometric view (E-view) version 7.0 software. The result of the study showed that the variables are directly related to RGDP. The study concluded that all the independent variables have a strong relationship to the dependent variable. Thus, the researcher recommended that government should channel its expenditure to the sectorial spending as it reduces the cost of government spending in public welfare.

Keywords: Composition of government expenditure, Sectorial expenditure allocation, Real gross domestic Product (RGDP), Expenditure heads

Introduction

The composition of sectorial allocation can broadly be categorized into sectorial heads: Administrative Services, Social and Community Services, Economic Services and Transfer Services. Osiegbu, Onuorah and Nnamdi (2010) stated that government has a major task to provide public goods and services and these are gained through the composition of government expenditure in form of sectoral allocation such as:

(1a) Capital expenditure on administration services include expenditure as purchase of long term assets such as furniture, motor vehicles, national assembly, defense, internal security, capital projects, education, telecommunication, electricity, railways, roads constructions, hospitals, building, lands. (1b) Recurrent expenditure on administration services include government spending on administration such as salaries, interest on loans, wages, maintenance cost, recurrent government’s purchase of current goods and services.

(2a) Capital expenditure on social and community services are government expenditures on housing, health, education and others. (2b) Recurrent expenditure on social and community services are equal recurrent
government expenditure that are necessary to maintain existing levels of government social and community services on health, education and other social services.

(3a) Capital expenditure on economic services include expenditure on agricultural and natural resources, manufacture, mining and quarrying, transport and communication, housing, construction. (3b) Recurrent expenditure on economic services are those recurrent expenditure to maintain the existing levels of economic services.

(4a) Capital expenditure on transfer includes external obligation, capital recovery and replacement. (4b) Recurrent expenditure on transfer are those expenditure to maintain existing level of external financial obligations and repayments.

Findings of some research have significant negative or no relationship between an increase in government sectorial expenditure and economic growth. In this regard, one may ask, to what extent has government sectorial expenditure allocation contributed to economic growth of Nigeria. Therefore, the main thrust objective of the study seeks to investigate the composition of sectorial expenditure allocation and the Nigerian economy using secondary data for a period of thirty six (36) years spanning from 1981 – 2017.

**Review of Related Literature**

Sectorial expenditure refers to expenses on capital and recurrent expenditure which are categorized according to sectoral allocation for sectorial heads like General Administration, Social and Community Services, Economic Services and Transfer for provision of goods and services for optimizing the wealth of the masses such as roads, airports, health, education, electricity generation, etc.; and are usually aimed at increasing the assets of a state while recurrent expenditure refers to government expenses on General Administration, Social and Community Services, Economic Services and Transfer for supply of public goods and interest payment on loans among others (Njoku, Ugwu and Chigbu, 2014).
Government Expenditure (i.e. Capital or Recurrent) are classified into Administrative, Social and Community, Economic and Transfer Expenditure Services respectively and these are the components of capital heads and recurrent heads which are the independent variables for recurrent and capital expenditure while the Real Gross Domestic Product (RRGDP) is the Indicator Measure for Economic Growth and represent the dependent variable.

**Measurement of Variables**

**Administrative Services Expenditure**

Administrative services expenditure comprises of both recurrent and capital administrative expenditure. Capital expenditure on administration services include expenditure as purchase of long term assets such as furniture, motor vehicles, national assembly, defense, internal security, capital projects, education, telecommunication, electricity, roads, railways, hospital, houses, lands. While Recurrent expenditure on administration services include expenses on administration such as salaries, interest on loans, recurrent government’s purchase of current goods and services, wages, maintenance cost etc.

**Social and Community Services Expenditure**

This comprises of both capital and recurrent social and community services expenditure. Capital expenditure on social and community services are government expenditures on education, health, housing and others. While Recurrent expenditure on social and community services are equal recurrent government expenditure that are necessary to maintain existing levels of government social and community services on health, education and other social services.

**Economic Services Expenditure**

Economic services expenditure comprises of both capital and recurrent economic services expenditure. Capital expenditure on economic services include expenditure on agricultural and natural resources, manufacture, mining and quarrying, transport and communication, housing, construction. While Recurrent
expenditure on economic services are those recurrent expenditure to maintain the existing levels of economic services.

**Transfer Services Expenditure**

Transfer services expenditure comprises of both capital and recurrent transfer services expenditure. Capital expenditure on transfer includes external obligation, capital recovering and replacement. While Recurrent expenditure on transfer are those expenditure to maintain existing level of external financial obligations and repayments.

**Economic Growth**

Economic growth simply refers to the total currency value of all final goods and services produced in any economy over some time period. This means the value of all goods and services produced within the geographic territory of an economy in a given interval, such as a year is known as RGDP (Hameed and Ume, 2011). Onalo (2016) writes exclusively that the RGDP value is commonly computed using three approaches; the expenditure approach which adds up households’ consumption expenditures, firms’ investments expenditures, government expenditures and net exports; the income approach which accumulates all income earned by various factors of production in the economy (e.g. workers’ pay, gross profits from firms, rental income, taxes on production and imports (less subsidies), interest, miscellaneous payments and depreciation); and finally, the production or value added method captured by the difference between value of sales of goods and the purchase of intermediate inputs used to produce the final products.

**Theoretical Review**

This section seeks to establish a theoretical foundation which creates a link between our thoughts and economic realities. However, the theoretical framework which cut across several theories such as the Keynesian theory and the Peacock and Wiseman’s hypothesis was applied.

**The Keynesian Theory of Public Expenditures**

Keynes discussed the relationship between government expenditures and economic growth, with his apparently contrasting viewpoint on this relationship. Keynes views government expenditures as an exogenous factor which can be use as a policy measure to accelerate economic growth. From Keynes perspective, government expenditure contributes absolutely to economic growth. Hence, an increase in government consumption is likely to bring about an increase in profitability, employment and investment through multiplier effects on aggregate demand. These and many more are evidences of economic growth. On the other side, government expenditure press out private investment as a result of increase in the rate of interest and this slows down economic growth and reduces the rate of capital accumulation in the long run
(Keynes, 1936). The Keynesian theory however proposes that improve in government expenditure can contribute to economic growth.

**The Peacock and Wiseman’s Hypothesis of Public Expenditure**

Peacock and Wiseman in a study of public expenditure from 1891 to 1955 in the United Kingdom disagreed with the explanations provided by the Wagner’s Law. They argued that the Wagner's Law is valid given the following;

i. That increase in government spending depends on income generated by the government as economic development brings in considerable proceeds to the government; which makes it possible to increase her spending.

ii. There is a difference between the hope of the people about public expenditure and the tolerance level of taxation in the economy. Hence, government will not disregard the demands made by people concerning varied services, particularly, when the revenue is growing at regular rate of taxation.

iii. That throughout the times of war, the government increases the tax rates, and expands the tax base to generate more money to finance the growth in defense spending however, after the war, the new tax rates and tax structures may remain the same, as people get used to them.

Hence, they put up a theory that explained the reason of increasing public expenditure from the socio-political perspective. They argued that, although government expenditure will increase as income increases, but because the leaders want re-election into political positions, additional infrastructures must be provided in order to convince the electorate that their interests are being catered for by the people voted into power. However, the citizens of the country are less willing to pay tax (Shuaib, Augustine and Frank, 2015). The resistance of the care of the government in form of increased spending to avoid social crises in the economy and the resistance to pay tax by the people will make the state to have low revenues hence the cost of providing more facilities is borne by the government, making government expenditure to increase rapidly. Hence, this increase in government expenditure may or may not contribute to economic growth. According to this hypothesis, there are three basic effects in an economy which can be seen in the growing path of a country; Displacement effect, Inspection effect and Concentration effect.

**Displacement Effect** - This effect is of the opinion that every economy faces many social disturbances in different periods which may affect the economic stability in an economy, e.g. war, natural calamities, political instabilities etc. When these social disturbances occur, government expenditure will rise unexpectedly; however, this rise in government expenditures cannot be transformed into economic growth because money is spent on replacements and not creation. In the case of Nigeria, the insurgency problem in the North and the insecurity problem in the South have only increased government expenditure without any meaningful corresponding economic growth.
Inspection effect - as an economy experiences displacement effect, new and higher public expenditure will come into existence and with the rise in public expenditure, government will initiate efforts aimed at raising the revenue base by adjusting the tax structure. This will lead to economic growth.

Concentration effect - after the displacement effect, the economy will follow a new equilibrium level in the economy called concentration. This condition will persist until a new social and economic displacement arises. According to Peacock and Wiseman, an economy can mature after facing social instability and such economic test will encourage the authority to increase its expenditure. Such increase would not result to economic growth because funds will be concentrated on affected areas.

Empirical Framework

Following a comprehensive review of previous studies, series of empirical evidences have been recorded in the attempts to explain the composition of sectorial expenditure allocation and the Nigeria economy. Some of these evidences focused on the effect of government expenditures on economic growth, while others achieved the same objective by demystifying the concept of government expenditure into capital expenditures and recurrent expenditures. Furthermore, some studies also focused directly on the various areas of government expenditure in Nigeria including administrative, social and community services, economic services and transfer services.

Alshahrani and Alsadiq (2014) examined government expenditure and economic growth in Saudi Arabia using Vector Error Correction Model (VECM). They discovered that economic growth is insignificantly affected by government administrative expenditures on defense and national security in the short run.

Awomuse, Olorunleke and Alimi (2013) also studied the relationship between government expenditure on health and economic growth in Nigeria using OLS multiple regression analytical method. The study finds a positive relation between health care expenditure and economic growth in Nigeria, through the period under the study period (1970 – 2008).

A study by Adofu and Abula (2010) examined the long run relationship between government social expenditures and economic growth in the case of 10 Asian countries for the period 1970 – 2005; employing the JJ-Cointegration approach and a specific rank test (panel co-integration test) for panel of these countries. The study concludes that government expenditures in the social sector can increase economic growth. The study further explains that such social expenditures enhance productivity by making available infrastructure, health, education and balancing private and social interests.

Miguel (2010) studied the relationship between the components of government economic expenditure (i.e. agriculture, transport and communication) on economic growth in Nigeria for the period spread between 1970 and 2010, using an Error Correction Model. The authors found out that government economic expenditure on agriculture was the most significant component of government expenditure which impacted
on economic growth; although, the study generally revealed that government economic expenditure affects economic growth positively.

Antra (2015) also investigated the active nature of public expenditure components and economic growth through an inter-temporal optimization framework based on Turnovsky (2007). He explained that public expenditure that are related to internal and external debt servicing is classified as ‘productive’ and ‘less-productive’, based on the rationale that a percentage of the productive public expenditure corrects disequilibrium in the public debt in the long-run. However, debt servicing helps to reduce government’s local and foreign debt which is a sign of economic growth.

Furthermore, Obademi (2012) undertook an analysis of the long-run relationship and impact of debt servicing on economic growth in Nigeria. The study adopted debt servicing as a transfer cost incurred by the Federal Government annually. The result showed that the joint impact of debt servicing as a component of government expenditure on economic growth is negative and insignificant.

However, on the contrary, Duc-Anh, Phu and Arnelie (2015) analyzed the correlation among government expenditure, tax on returns to asset, public debt, and economic growth. The authors described public debt in two forms, domestic and external debt. Their studies show that an increase in government transfer expenditure has no positive effect on economic growth. Hence, as government expenditures in this sense rises, there is bound to be poor growth.

Adofu and Abula (2009) also studied the relationship between domestic debt and economic growth in Nigeria. These domestic debts may range from unpaid pensions and gratuities to other governmental borrowings necessary for fostering economic growth. The result shows that domestic debt has affected the growth of the economy negatively.

As the authors suggests, an increase in education expenditures help to improve the economy’s growth performance is economically sound. As a caution, however, for education expenditures to have the planned results to the optimal, they suggest that there has to be competent administration at the lower level of government to formulate and execute the budget and to allocate resources proficiently within the education sector, otherwise, without this background, resources allocated to the education sector may not have significant encouraging impact on economic growth.

**Methodology**

The study employed quasi experimental design because it is not applied in the laboratory rather as a management study. The justification for the use of survey research design is owe to the fact that it involves events that have already occurred and cannot be manipulated or carried out in the laboratory. This study adopted the work of Aschenke (2014) who studied government sectorial expenditure on economic growth in Ethiopia. The study covers government sectorial expenditure allocation based on the sectorial functionality
sub-heads such as administrative services, social and community services, economic services and transfer services for both capital and recurrent sectorial expenditure allocation. The study employed purposive sampling technique. According to Crossman (2017), a purposive sampling is a non probability sampling that is selected based on the characteristics of a population and the objectives of the study.

The study applied unit root to confirm the assumptions of Ordinary Least Square (OLS). The Ordinary Least Square (OLS) regression estimation technique via the Econometric Views (E-Views) version 7.0 statistical model tested for the relationship between composition of sectorial expenditure allocation and the economic growth of Nigeria for the period under study.

**Model Specification**

The functionality of sectorial allocation such as administrative expenditures, social and community expenditures, economic expenditures and transfer expenditures respectively presented as:

\[ Y_t = f(x_{1t}, x_{2t}) \]  \hspace{1cm} (1)

Where:

- **Y**<sub>t</sub> = dependent variable in time t (gross domestic product)
- **X**<sub>1t</sub> – **X**<sub>2t</sub> = independent variables in time t (composition of sectorial expenditure allocation)

In explicit form, the model is presented as:

\[ RGDP_t = \alpha_0 + \alpha_1 TGEAT_t + \alpha_2 TGESC_t + \alpha_3 TGEEC_t + \alpha_4 TGETF_t + U_t \] \hspace{1cm} (2)

Where:

- **RGDP**<sub>t</sub> = Value of dependent variable that is being predicted in year t
- “The dependent variable here is the Real Gross Domestic Product (RGDP)”
- \( \alpha_0 \) = a constant, equals the value of **Y** when the value of **x** = 0
- **TGEAT**<sub>t</sub> = The value of Total Government Expenditure on Administrative Services (Capital and Recurrent Expenditures) in year t.
- **TGESC** = The value of Total Government Expenditure on Social and Community (Capital and Recurrent Expenditures) in year t.
- **TGEEC**<sub>t</sub> = The value of Total Government Expenditure on Economic Services (Capital and Recurrent Expenditures) in year t.
- **TGETF**<sub>t</sub> = The value of Total Government Expenditure on Transfer Services Capital and Recurrent Expenditures in year t.

Logarithm introduced in the data series:
LnRGDP_t = a_0 + a_1LnGEAT_t + a_2LnTGESC_t + a_3LnTGEEC_t + a_4LnTGEFT_t + U_t \ldots \ (3)

**Appriori Expectation**

The expectation of this proposed study is that all the independent variables will be greater than zero; TGEAT >0, TGESC >0, TGEEC >0 and TGETF <0. This presumption indicates that fund allocated to the sectorial heads will yield positively to the economy. Expenditure on administrative services (TGEAT), social and community services (TGESC), economic services (TGEEC) and transfer services (TGETF) affects gross domestic product directly within the same period under study (1981 – 2017)

**Results and Discussion**

**Unit Root Test (FIRST DIFF. 1(1))**

**Unit Root Test for RGDP (FIRST DIFF)**

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(RGDP)
Method: Least Squares
Date: 08/30/18 Time: 06:27
Sample (adjusted): 1981 2017
Included observations: 34 after adjustments

Null Hypothesis: RGDP has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic - based on SIC, maxlag=9)

<table>
<thead>
<tr>
<th>t-Statistic</th>
<th>Prob.*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Augmented Dickey-Fuller test statistic</td>
<td>3.905325</td>
</tr>
</tbody>
</table>

Test critical values:
- 1% level: -3.639407
- 5% level: -2.51125
- 10% level: -2.264300


**Unit Root Test for TGEAT (FIRST DIFF)**

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(TGEAT)
Method: Least Squares
Date: 08/30/18 Time: 06:29
Sample (adjusted): 1981 2017
Included observations: 35 after adjustments

Null Hypothesis: TGEAT has a unit root
Exogenous: Constant
Lag Length: 6 (Automatic - based on SIC, maxlag=9)

<table>
<thead>
<tr>
<th>t-Statistic</th>
<th>Prob.*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Augmented Dickey-Fuller test statistic</td>
<td>-3.832883</td>
</tr>
</tbody>
</table>

Test critical values:
- 1% level: -3.679322
- 5% level: -2.967767
- 10% level: -2.622989

### Unit Root Test for TGESC (FIRST DIFF)

Augmented Dickey-Fuller Test Equation  
Dependent Variable: D(TGESC)  
Method: Least Squares  
Date: 08/30/18  Time: 06:30  
Sample (adjusted): 1981 2017  
Included observations: 35 after adjustments

Null Hypothesis: TGESC has a unit root  
Exogenous: Constant  
Lag Length: 7 (Automatic - based on SIC, maxlag=9)

<table>
<thead>
<tr>
<th>t-Statistic</th>
<th>Prob.*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Augmented Dickey-Fuller test statistic</td>
<td>3.397208</td>
</tr>
</tbody>
</table>

Test critical values:  
- 1% level: -3.689194  
- 5% level: -2.971853  
- 10% level: -2.625121  


### Unit Root Test for TGEEC (FIRST DIFF)

Augmented Dickey-Fuller Test Equation  
Dependent Variable: D(TGEEC)  
Method: Least Squares  
Date: 08/30/18  Time: 06:31  
Sample (adjusted): 1981 2017  
Included observations: 35 after adjustments

Null Hypothesis: TGEEC has a unit root  
Exogenous: Constant  
Lag Length: 8 (Automatic - based on SIC, maxlag=9)

<table>
<thead>
<tr>
<th>t-Statistic</th>
<th>Prob.*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Augmented Dickey-Fuller test statistic</td>
<td>3.601506</td>
</tr>
</tbody>
</table>

Test critical values:  
- 1% level: -3.699871  
- 5% level: -2.976263  
- 10% level: -2.627420  


### Unit Root Test for TGETF (FIRST DIFF)

Augmented Dickey-Fuller Test Equation  
Dependent Variable: D(TGETF,2)  
Method: Least Squares  
Date: 08/30/18  Time: 06:33  
Sample (adjusted): 1981 2017  
Included observations: 35 after adjustments

Null Hypothesis: D(TGETF) has a unit root  
Exogenous: Constant  
Lag Length: 1 (Automatic - based on SIC, maxlag=9)

<table>
<thead>
<tr>
<th>t-Statistic</th>
<th>Prob.*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Augmented Dickey-Fuller test statistic</td>
<td>-6.092155</td>
</tr>
</tbody>
</table>

Test critical values:  
- 1% level: -3.646342  
- 5% level: -2.954021
Discussion of Findings

The unit root test is a test to check for presence or absence of stationarity in the series. Thus, the stationarity tests were performed first in levels and again in first difference to establish the presence of units roots and the order of integration in all the variables. The results of the ADF stationarity tests for each variable shows that ADF test fails to accept the presence of unit root for RGDP, TGEAT, TGESC and TGEEC. The result of each of the variables show that these variables are stationary at 5\% significance level integrated of order 1(1). As stated by Ihelanacho (2016) that if a linear combination of 1(1) or 1(0) exist in stationarity tests, we thus proceed to test for co-integration of time series.

Ordinary Least Square (OLS) result

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>345771.5</td>
<td>1327270.</td>
<td>0.260513</td>
<td>0.7962</td>
</tr>
<tr>
<td>TGEAT</td>
<td>56526.79</td>
<td>8211.919</td>
<td>6.883506</td>
<td>0.0000</td>
</tr>
<tr>
<td>TGESC</td>
<td>63528.54</td>
<td>9585.962</td>
<td>6.627247</td>
<td>0.0000</td>
</tr>
<tr>
<td>TGEEC</td>
<td>31483.35</td>
<td>7015.105</td>
<td>4.487937</td>
<td>0.0001</td>
</tr>
<tr>
<td>TGETF</td>
<td>3042.904</td>
<td>7731.189</td>
<td>0.393588</td>
<td>0.6966</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.801897</td>
<td>Mean dep. var</td>
<td>1918320.</td>
<td></td>
</tr>
<tr>
<td>Adjusted R-squared</td>
<td>0.776335</td>
<td>S.D. dep. var</td>
<td>11325592</td>
<td></td>
</tr>
<tr>
<td>S.E. of regression</td>
<td>5356237.</td>
<td>Akaike info</td>
<td>33.95367</td>
<td></td>
</tr>
<tr>
<td>Sum squared resid</td>
<td>8.89E+14</td>
<td>Schwarz criterion</td>
<td>34.17360</td>
<td></td>
</tr>
<tr>
<td>Log likelihood</td>
<td>-606.1660</td>
<td>Hannan-Quinn crit.</td>
<td>34.03043</td>
<td></td>
</tr>
<tr>
<td>F-statistic</td>
<td>31.37104</td>
<td>Durbin-Watson stat</td>
<td>2.053182</td>
<td></td>
</tr>
<tr>
<td>Prob(F-statistic)</td>
<td>0.000000</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Estimation Command:
LS RGDP C TGEAT TGESC TGEEC TGETF

Estimation Equation:
RGDP = C(1) + C(2)*TGEAT + C(3)*TGESC + C(4)*TGEEC + C(5)*TGETF

Substituted Coefficients:
RGDP = -345771.509613 - 56526.7941072*TGEAT + 63528.5388275*TGESC + 31483.3455921*TGEEC + 3042.90412862*TGETF

Discussion of Findings

The coefficient of individual or specific variables TGEAT, 56526.79, TGESC 63528.54, TGEEC 31483.35 and TGETF 3042.904 presented in the table are positively related to RGDP which the constant value C is
345771.5. This shows that an increase in each of the independent variables leads to an increase in the RGDP. This indicates a direct relationship between TGEAT, TGESC, TGEEC, TGETF and RGDP.

The p-value of the three specific variables confirm that the series are significant to the study as the P-value of TGEAT 0.000 < 0.05, TGESC 0.000 < 0.05, TGEEC 0.0001 < 0.05. This results shows that there is significant relationship between TGESC, TGEEC and RGDP. TGETF is 0.6966 > 0.05 which shows that Total Government Capital and Recurrent Expenditure on Transfer is not significant to Real Gross Domestic Product in Nigeria.

The coefficient of the overall variables $R^2$ is used to determine the magnitude of the relationship among the independent variables. If the value of $R^2$ is positive, it is directly related, implying that all the independent variables put together have direct relationship with the Real Gross Domestic Product in Nigeria. Therefore, all the series; TGEAT, TGESC, TGEEC and TGETF put together is 0.801897.

This result shows that all the independent variables have a strong relationship to Real Gross Domestic Product (RGDP). This indicates that the magnitude of the relationship between the independent variables and the dependent variable is direct relationship. This proves that as Administration, Social and Community, Economic and Transfer increase by one, there must be a corresponding increase in the level of Real Gross Domestic Product in Nigeria. The level of relationship of the independent variables is 80%.

The Adjusted $R^2$ which is the coefficient of determination determines the level of spread and degree of variation among the independent variables and the dependent variable. Therefore, all the variables show evidence of high degree of spread. It shows that about 78% of variation could be explained by the independent variables to the dependent variable RGDP while 22% of the variation could not be explained by the independent variables due to financial problems.

The Prob-value of F-stat is a test for overall significance where the null hypothesis is that the series are not significant. If the probability of the F-stat is greater than that of the critical value, the null hypothesis is accepted, otherwise reject the null hypothesis. Therefore, the P-value of F-stat is 0.000 < 0.05 and value of F-stat 31.37 > 2.95. This shows existence and presence of significant relationship among the series and economic growth in Nigeria.

The Durbin-Watson (Dw) statistics measures the absence or existence of autocorrelation in the series where the null hypothesis states that there is no autocorrelation in the series. That is, the variables are not clustered together. If the value of Dw stat is less than 2.0, we reject the null hypothesis and conclude that there is existence of autocorrelation which confirms spurious regression result. Therefore, the Dw stat is 2.053182 > 2.00 rule of Thum. We accept the null hypothesis that there is no autocorrelation in the series and concluded that the model is fit for prediction.
This study is consistent with the studies of Athukorala (2003), Akinio (2004) and Ibrahim (2013) whose findings suggest that 1% increase in the rate of capital and recurrent sectorial allocation spending increases the rate of economic growth in Nigeria by 1%.

**Johansen Co integration**

Date: 08/30/18  Time: 06:34  
Sample (adjusted): 1981-2017  
Included observations: 35 after adjustments  
Trend assumption: Linear deterministic trend  
Series: RGDP TGEAT TGESC TGEEC TGETF  
Lags interval (in first differences):

Unrestricted Cointegration Rank Test (Trace)

<table>
<thead>
<tr>
<th>Hypothesized No. of CE(s)</th>
<th>Eigenvalue</th>
<th>Trace Statistic</th>
<th>0.05 Critical Value</th>
<th>Prob.**</th>
</tr>
</thead>
<tbody>
<tr>
<td>None *</td>
<td>0.817201</td>
<td>140.4882</td>
<td>69.81889</td>
<td>0.0000</td>
</tr>
<tr>
<td>At most 1 *</td>
<td>0.624247</td>
<td>81.01029</td>
<td>47.85613</td>
<td>0.0000</td>
</tr>
<tr>
<td>At most 2 *</td>
<td>0.540329</td>
<td>46.75145</td>
<td>29.79707</td>
<td>0.0002</td>
</tr>
<tr>
<td>At most 3 *</td>
<td>0.323542</td>
<td>19.54792</td>
<td>15.49471</td>
<td>0.0116</td>
</tr>
<tr>
<td>At most 4 *</td>
<td>0.154331</td>
<td>5.866951</td>
<td>3.841466</td>
<td>0.0154</td>
</tr>
</tbody>
</table>

Trace test indicates 5 cointegratingeqn(s) at the 0.05 level  
* denotes rejection of the hypothesis at the 0.05 level  
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

<table>
<thead>
<tr>
<th>Hypothesized No. of CE(s)</th>
<th>Eigenvalue</th>
<th>Max-Eigen Statistic</th>
<th>0.05 Critical Value</th>
<th>Prob.**</th>
</tr>
</thead>
<tbody>
<tr>
<td>None *</td>
<td>0.817201</td>
<td>59.47787</td>
<td>33.87687</td>
<td>0.0000</td>
</tr>
<tr>
<td>At most 1 *</td>
<td>0.624247</td>
<td>34.25884</td>
<td>27.58434</td>
<td>0.0060</td>
</tr>
<tr>
<td>At most 2 *</td>
<td>0.540329</td>
<td>27.20353</td>
<td>21.13162</td>
<td>0.0062</td>
</tr>
<tr>
<td>At most 3 *</td>
<td>0.323542</td>
<td>13.68097</td>
<td>14.26460</td>
<td>0.0617</td>
</tr>
<tr>
<td>At most 4 *</td>
<td>0.154331</td>
<td>5.866951</td>
<td>3.841466</td>
<td>0.0154</td>
</tr>
</tbody>
</table>

Max-eigenvalue test indicates 5 cointegratingeqn(s) at the 0.05 level  
* denotes rejection of the hypothesis at the 0.05 level  
**MacKinnon-Haug-Michelis (1999) p-values

The result of the co-integration test based on Johansen co-integration approach is used to test for long run relationship between the variables. Thus, the Johansen co-integration test tested on the long run relationship between the dependent variable RGDP and the independent variables TGEAT, TGESC, TGEEC and TGETF. The results of Johansen co-integration presented in the table above shows that the test fail to accept null hypothesis of No co-integration at 5% level of significance. Both the trace and maximum Eigen value suggest the presence of 5 co-integrating vector. The Johansen co-integration test shows this by comparing the statistic values with the critical value, a result is chosen at the value where the trace or max-Eigen statistic is greater than the corresponding critical value. This is base on the rule of log likelihood ratio of trace and Eigen and the trace statistics of Mckinnon, Haug-Muchelis (1999) critical P-value comparison test.
In this study, it is very clear that there is existence of 5 co-integrating equation in the model with both trace statistics and maximum Eigen values at 5% significance level. This implies that a long run equilibrium relationship exists among the co-integrating variables TGEAT, TGESC, TGEEC, TGETF and RGDP in Nigeria. This study is inconsistency with the findings stated in Nom Fundo (2016) and Alajekwu and Acheegbu (2012) which says that the result of trace statistics shows only one (1) co-integration equation, there is existence of long run relationship in the series.

**Granger Causality Test**

**Pairwise Granger Causality Tests**

Date: 08/30/18  Time: 06:34  Sample: 1981-2017
Lags: 2

<table>
<thead>
<tr>
<th>Null Hypothesis</th>
<th>Obs</th>
<th>F-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>TGEAT does not Granger Cause RGDP</td>
<td>34</td>
<td>10.8067</td>
<td>0.0003</td>
</tr>
<tr>
<td>RGDP does not Granger Cause TGEAT</td>
<td></td>
<td>7.42160</td>
<td>0.0025</td>
</tr>
<tr>
<td>TGESC does not Granger Cause RGDP</td>
<td>34</td>
<td>2.15670</td>
<td>0.1339</td>
</tr>
<tr>
<td>RGDP does not Granger Cause TGESC</td>
<td></td>
<td>8.82548</td>
<td>0.0010</td>
</tr>
<tr>
<td>TGEEC does not Granger Cause RGDP</td>
<td>34</td>
<td>1.10875</td>
<td>0.3436</td>
</tr>
<tr>
<td>RGDP does not Granger Cause TGEEC</td>
<td></td>
<td>6.46585</td>
<td>0.0048</td>
</tr>
<tr>
<td>TGETF does not Granger Cause RGDP</td>
<td>34</td>
<td>1.97904</td>
<td>0.1564</td>
</tr>
<tr>
<td>RGDP does not Granger Cause TGETF</td>
<td></td>
<td>21.1546</td>
<td>0.0100</td>
</tr>
<tr>
<td>TGESC does not Granger Cause TGEAT</td>
<td>34</td>
<td>13.9758</td>
<td>0.0021</td>
</tr>
<tr>
<td>TGEAT does not Granger Cause TGESC</td>
<td></td>
<td>12.9161</td>
<td>0.0001</td>
</tr>
<tr>
<td>TGEEC does not Granger Cause TGEAT</td>
<td>34</td>
<td>6.16852</td>
<td>0.0059</td>
</tr>
<tr>
<td>TGETF does not Granger Cause TGEAT</td>
<td></td>
<td>3.30789</td>
<td>0.0408</td>
</tr>
<tr>
<td>TGETF does not Granger Cause TGETF</td>
<td></td>
<td>7.55979</td>
<td>0.0023</td>
</tr>
<tr>
<td>TGEEC does not Granger Cause TGESC</td>
<td>34</td>
<td>1.39172</td>
<td>0.2648</td>
</tr>
<tr>
<td>TGESC does not Granger Cause TGEEC</td>
<td></td>
<td>2.24732</td>
<td>0.1238</td>
</tr>
<tr>
<td>TGETF does not Granger Cause TGESC</td>
<td>34</td>
<td>11.1564</td>
<td>0.0003</td>
</tr>
<tr>
<td>TGESC does not Granger Cause TGETF</td>
<td></td>
<td>6.11267</td>
<td>0.0061</td>
</tr>
<tr>
<td>TGETF does not Granger Cause TGESC</td>
<td>34</td>
<td>6.84880</td>
<td>0.0037</td>
</tr>
<tr>
<td>TGESC does not Granger Cause TGETF</td>
<td></td>
<td>9.22904</td>
<td>0.0008</td>
</tr>
</tbody>
</table>

The Granger Causality result exhibited uni directional and dual causal relationship between the variables. The uni directional relationship flow between one variable, i.e. RGDP granger cause TGESC, RGDP granger cause TGEEC, TGEAT granger cause TGESC, TGEAT granger cause TGETF and TGESC granger cause TGEEC. While dual causality exist between two variables, i.e. TGEAT granger cause RGDP and RGDP granger cause TGEAT, TGEEC granger cause TGEAT and TGEAT granger cause TGEEC, TGETF
granger cause TGESC and TGESC granger cause TGETF, TGETF granger cause TGESC and TGESC granger cause TGETF.

This relationship is an assertion of Wagner’s law of increasing state activities where he opined that government expenditure increase with increase in economic activities GDP.

A run through the results of the pairwise granger causality test indicates that there are both unidirectional and dual directional pairs. In other words, we accept all the alternate hypotheses that variable A granger cause variable B, or variable A granger cause variable B and variable B granger cause variable A in this study.

Conclusion and Recommendation

In line with the sectorial allocation which is specified as: \( RGDP = a_1 \text{TGEAT}_t + a_2 \text{TGESCT}_t + a_3 \text{TGECC}_t + a_4 \text{TGETF}_t + U_t \), the study concluded that all the independent variables have a strong relationship to the dependent variable. The study shows that the Durbin Watson statistics is greater than 0.00 of the rule of thumb which shows that the series are good model fit for predictions. This study is consistent with the studies of Okoro (2013), Akinlo (2004) and Ibrahim (2013) whose findings suggest that 1% increase in the rate of capital and recurrent sectorial allocation spending increase the rate of economic growth in Nigeria by 1%. Therefore, it was recommended that government should channel its expenditure to the sectorial spending as it reduces the cost of government spending in public welfare.

References


Keynes, J.M. (1936). The general theory of employment, interest and money.


