GOVERNMENT EXPENDITURE AND ECONOMIC GROWTH IN NIGERIA: AN EMPIRICAL INVESTIGATION (1961-2009)

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ABSTRACT: This study analyses the relationship and the direction of causality between government expenditure and economic growth in Nigeria using annual data from 1961-2009. The variables of government expenditure are total government expenditure at the aggregate level and total recurrent expenditure, total capital expenditure, administration, social and community services, economic services and transfers at the disaggregate level. The econometric methodology employed was the cointegration and the Toda-Yamamoto Granger Causality test. First from the Augmented Dickey-Fuller (ADF) test, we found that the variables were non-stationary at levels, but stationary in their first differences. Secondly, according to the Toda-Yamamoto causality test this study finds that there is a unidirectional causality running from total government expenditure to economic growth, which supports the Keynesian hypothesis. Moreover, at the disaggregate level, results show that all the variables except total recurrent expenditure cause economic growth implying that government expenditure promotes growth in Nigeria. On the whole this study empirically does not support the existence of Wagner’s law both at the aggregate and the disaggregate levels in Nigeria that is economic growth causes government expenditure.

I. INTRODUCTION

Understanding the linkages between fiscal policies and economic growth has raised huge debates both at the theoretical and empirical framework. Public expenditure and national income have been at the focus of public finance, since the magnitude of public expenditure has been increasing over time in almost all the countries of the world. It is therefore necessary for governments to know the causal relationship between the two. This is crucial because it is a common belief that the government plays a significant role in the development of a country. The implication is that an increase in government expenditure will yield a positive increase in the growth of the economy by increasing the national income, especially when it is injected in development programs (Omode 2009).

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The occurrence of public expenditure growth has been a topical issue between two contending proponents i.e. the Wagnerians and Keynesians presenting two parallel views in terms of the relationship between public expenditure and growth. Wagner (1883) introduced a model showing that public expenditures are endogenous to economic growth, and that there exist long-run tendencies for public expenditure to grow relatively to some national income aggregates such as the gross domestic product (GDP). In other words, the causality between public expenditure and national income runs from national income to public expenditure. Keynes (1936) however raised the idea that during depression the use of fiscal policies will heighten economic activities. Thus the causality between public expenditure and national income runs from public expenditure to national income.

In Nigeria, government expenditure has been on the rise owing 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. Moreover, there is increasing need to provide both internal and external security for the people and the nation. Unfortunately, this rising government expenditure has not translated into 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 50 percent live on less than US$2 per day. Couple with this, are dilapidated infrastructure (especially roads and power supply) that has led to the collapse of many industries, including high level of unemployment and abandoned elephant projects. 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 couple of years. Another problem has been to channel public expenditure into those areas of the economy where its effects will be optimal in terms of growth, consumption and distribution. For example the launching of a satellite which has become a phantom project today, huge sums of money invested into sports without any benefit and a host of others. However, substantial volumes of empirical research based on identifying the significance of public expenditure on economic growth have been conducted in Nigeria though with contradictory results. More so contributors have undermined the relationship between the specific components of public expenditure and economic growth.

From the above preceding, the main objective of this paper is to pin down the specific components of government expenditure which cause economic growth and or vice versa. And also, to investigate the long run tendencies that may exist between specific components of government expenditure and economic growth. This paper is partitioned as follows: Section 1 is the introduction, Section 2 discusses literature review, Section 3 explains the methodology and sources of data, Section 4 reports the empirical results and Section 5 ends with recommendations and conclusion.

II. LITERATURE
Muhlis and Hakan (2003) investigated the long-run relationship between public expenditure and GDP for the Turkish economy. The study used the natural log of annual data from 1965-2000. They employed co-integration and Granger Causality tests on the following variables: Gross Domestic Product (GDP), Total Government Consumption (GC), Total Public expenditure (EXP), and Mid-year Annual Population. The data in nominal values were converted to real values using the Wholesale Price Index (WPI). They discovered that neither Wagner’s Law nor Keynes’ hypothesis was valid in Turkey.

Jamshaid et al. (2010) examined the nature and the direction of causality in Pakistan between public expenditure and national income along side with various selected components of public expenditure: development expenditures (DE), administration
expenditures (AE), debt services (DS), defense services (DF). Applying the Toda-Yamamoto causality test for annual data within the period of 1971-2006, the study concluded that there was a unidirectional causality running from GDP to government expenditure, which supports Wagner’s Law. Furthermore, at a disaggregated level, results showed that GDP only caused administrative expenditure while no causality was found in development expenditures, debt servicing and defense expenditures.

Omore (2009) investigated the direction of causality between Government expenditure (GE) and National Income (NI) in Nigeria using annual data. He employed the co-integration and Granger Causality tests for the period 1970-2005. His result showed that no long-run relationship existed between government expenditure and national income in Nigeria. The Granger causality test revealed that causality ran from government expenditure to national income thus concluding that government expenditure plays a significant role in promoting economic growth in Nigeria.

Olubenga and Owoye (2007) investigated the relationships between government expenditure and economic growth for a group of 30 OECD countries, using annual data during the period 1970-2005. The variables of interest were total government expenditure (TGE) and gross domestic product (GDP) with the use of co-integration and Granger causality tests. The results showed the existence of a long-run relationship between government expenditure and economic growth. More so, the authors observed a unidirectional causality from government expenditure to growth for only 16 countries, hence supporting the Keynesian hypothesis. Nevertheless, causality runs from economic growth to government expenditure in 10 among the 30 countries, confirming Wagner’s law. Lastly, a bi-causal relationship between government expenditure and economic growth, for four countries was discovered.

Singh and Sahni (1984) investigated the relationship between national income and public expenditures in India. Annual data for total (aggregate) as well as disaggregate expenditure for the period of 1950-1981 were used. The variables were deflated by using the implicit national income deflator while making use of Granger causality test. The study discovered no causal relationship among the variables indicating the failure of both Wagner’s law and Keynes hypothesis in explaining the causal relationship between national income and public expenditure in India.

John and George (2005) examined whether the relative size of government (i.e. the share of total expenditure in GNP can be determined to Granger cause the rate of economic growth, or if the rate of economic growth can be determined to Granger cause the relative size of government. He used a bivariate error correction model within a Granger causality framework, as well as adding unemployment and inflation (separately) as explanatory variables, creating a simple ‘trivariate’ analysis for each of these two variables. The combined analysis of bivariate and trivariate tests offer a rich menu of possible causal patterns. Using data on Greece, UK and Ireland, the analysis showed that: i) government size Granger causes economic growth in all countries of the sample in the short run and in the long run for Ireland and the UK; ii) economic growth Granger cause increases in the relative size of government in Greece, and, when inflation is included, in the UK.

Ergun and Tuck (2006) studied the direction of causality between national income and government expenditures for Indonesia, Malaysia, Philippines, Singapore, and Thailand. Granger causality test was used to investigate the causal links between the two variables. Annual time series data from 1960-2002 was made use of. Support for the hypothesis that causality runs from government expenditures to national income has been found only in the case of Philippines. There was no evidence for this hypothesis and its reverse for the other countries.
**[OVERVIEW OF PUBLIC EXPENDITURE IN NIGERIA]**

In Nigeria, different political regimes have played a major role in the provision of public (utilities) goods like roads, communication, power, education and health, as well as improving on the economic development of the entire Country.

Generally, government expenditure in Nigeria can be categorized into two components: recurrent expenditure and capital expenditure. Recurrent expenditure on goods and services is expenditure, which does not result in the creation or acquisition of fixed assets (new or second-hand). It consists mainly of expenditure on wages, salaries and supplements, purchases of goods and services and consumption of fixed capital (depreciation) (National Housing Assistance Data Dictionary). The pattern in Fig 1 below shows government expenditure at constant prices.

![Figure 1: Government Expenditure Trend in Nigeria](image)

**Source:** Central Bank of Nigeria

The plots on the graph show that total capital expenditure exceeds total recurrent expenditure within the period of study. The trend of government expenditure in Nigeria over the years, however, has been inconsistent and can be divided into two phases: pre-liberalization period (before 1986) which was characterized by a military regime and post-liberalization era (after 1986) made up partly of the military regime which gave way to a civilian regime from 1999 to date. It should be noted that 1986 mark the introduction of the Structural Adjustment Program (SAP) in Nigeria.

Figure 1 shows that government expenditure did not contribute much to economic growth in the 1960s as a result of the intense civil war. In the 1970s under the military regime, some sectors started benefiting from the government. For example, rural farmers benefited from the public expenditure as well as the poor sections of the population in the form of subsidized water supply health services, electricity etc. During this period the growth rate on average stood at 2.6%. From 1980 to 1986, fiscal policy was geared mainly at generating revenue through increased tax efforts and the control of public spending. But there were unsuccessful efforts to sustain the revenue collection with a significant drop in total government expenditure.
With the introduction of the structural adjustment program which marked the post-liberalization era, strict measures were put in place to curb government spending: reduction in wage bills, reduction in government subsidies, limiting or delaying investment projects, privatization/commercialization with growth increasing to 8.3%. However the period 1990-1995 saw the regime’s efforts to combat inflation hence large budgetary deficits were avoided which made government expenditure more cost-effective consistent with the nation’s resources. The latter 1990s to 2000s witnessed a restrictive fiscal policy with the introduction of a modified value added tax and also subsidizing local industries. The levels of capital expenditure were higher within the pre-liberalization era (1973-1984) than the post-liberalization era. This could be attributed partly to the level of corruption in the country most especially as Nigeria was once rated as the most corrupt nation within the post-liberalization era.

![Figure 2: Percentage Growth Rate in Government Expenditure](image1)

![Figure 3: Economic Growth Rate](image2)
In Figures 2 and 3, the real economic growth rate is compared with the real government expenditure growth from 1961 to 2009. The two graphs show a positive relationship between the economic growth rate and the change in government expenditure in Nigeria i.e. an increase in government expenditure leads to an increase in growth rate within the considered period.

III. METHODOLOGY

At the level of the theory, bringing out the evidence of the causal relationship between economic variables furnishes us with elements to better understand economic phenomena. In a practical manner the “causal knowledge” is necessary to formulate correct economic policies. Granger (1969) proposed the concepts of causality and exogeneity using a VAR model. This study thus investigated the causality between government expenditures (aggregated and disaggregated) and economic growth based on the VAR model since it does not ascribe to a particular theoretical model.

[DATA DESCRIPTION AND SOURCES]

The study used annual data of government expenditure (TPE) and gross domestic product (GDP) from 1961 to 2009 while including specific components of government expenditure: total capital expenditure (TCE), total recurrent expenditure (TRC), administration (AD), social and community services (SC) economic services (EC), Transfers (TR). All variables were converted into real terms using the GDP deflator. The source of the data is from the Central Bank of Nigeria (CBN) Statistical Bulletin.

[TECHNIQUE]

We employed the Granger (1969) causality methodology to determine the direction of causality between government expenditure and economic growth along side with the causal link between the specific components of government expenditure with economic growth.

i) Unit Root Test

The efficacy of the VAR model in establishing the relationship among variables is conditional on the assumption that the variables must be stationary. Therefore, before conducting a Granger causality test based on the VAR, the time series must be stationary. In the case of non-stationary time series, it implies the variables may be co-integrated. This means that stationarity and co-integration test musts precede the Granger Causality test. According to Greene (2003), the Augmented Dickey Fuller (ADF) test can be employed to test for unit root based on the following equations:

\[ Y_t = \alpha + \beta Y_{t-1} + \sum_{j=1}^{p} \beta_j \Delta Y_{t-j} + \epsilon_t \]  

\[ Y_t = \alpha + \gamma t + \beta Y_{t-1} + \sum_{j=1}^{p} \beta_j \Delta Y_{t-j} + \epsilon_t \]

Where, equations (1) and (2), indicate ADF tests without trend and with trend respectively. Thus, the ADF unit root test posits a null hypothesis $\beta = 0$ versus an alternative hypothesis...
\( \beta < 0 \), where the ADF statistics were compared with the observed Mackinnon critical values. Hence, implying that if the series have unit root, one can conclude that co-integration is necessary.

**ii) Cointegration Test**

If the series are non-stationary, then there can be a meaningful long-run relationship among them which can be exploited by identifying a combination of the non-stationary series that give the same order of integration by using cointegration techniques. Two series \( Y_t \) and \( X_t \) are cointegrated if both series are integrated of say \( I(1) \) and the residuals from the cointegrating equation \( \varepsilon_t \) is \( I(0) \) where \( \varepsilon_t \) is a vector of innovations. To check if there exist any long-run tendencies between government expenditure and economic growth we employed the Johanssen (1988) and Juselius (1990) maximum likelihood test which focuses on the rank of a matrix \( \pi \). Using the Johansen approach we assume the VAR model below:

\[
\Delta Y_t = \sum_{i=1}^{p} \tau_i \Delta Y_{t-i} + \pi Y_{t-1} + \varepsilon_t \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots .3
\]

Where \( \pi = \sum_{j=1}^{r} (A_j - I) \) and \( \tau_i = -\sum_{j=1}^{r} A_{ij} \).

Granger’s representation theorem asserts that if the coefficient matrix \( \pi \) has reduced rank \( r < k \), then there exist \( k \times r \) matrices \( a \) and \( \beta \) each with rank \( r \) such that \( \pi = a \beta \) and \( \beta ' Y_{t-1} \) is \( I(0) \). \( r \) is the number of cointegration relations (the cointegrating rank) and each column \( \beta \) is the cointegrating vector. The matrix \( \pi \) is composed only of \( A_i - I \) with a rank equal to unity \( (r = 1) \) and a unique stationary combination of the endogenous variables. The first one is the Maximum Eigen value (ME) test:

\[
\lambda_{\text{max}}(r,r+1) = -T \ln (1 - \lambda_i) \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots .4
\]

Where \( T \) is the number of observations and \( \lambda_i \) is the maximum eigen value. The null hypothesis that there is \( r \) of co-integrating vectors is tested against the alternative that there are \( r + 1 \) co-integrating vectors.

**iii) Granger Causality Test**

The main objective of this study is to investigate the causality between government expenditures and economic growth. Granger (1996) proposed the concept of causality and exogeneity: a variable \( Y_t \) is said to cause \( X_t \), if the predicted value of \( X_t \) is ameliorated when information related to \( Y_t \) is incorporated in the analysis. We adopted the augmented level VAR with integrated and cointegrated processes developed by Toda and Yamamoto (1995) used by Jamshaid et al. (2010). Toda and Yamamoto (1995) method used a Modified Wald (MWALD) test for restrictions on the parameters of the VAR(k) model. This test has an asymptotic chi-squared distribution with \( k \) degrees of freedom in the limit when a VAR \( (k+q_{\text{max}}) \) is estimated (where \( k \) is the lag order of VAR and \( q_{\text{max}} \) is the maximal order of integration for the series in the system). The underline objective of the Toda-Yamamoto causality test is to overcome the problem of invalid asymptotic critical values when causality tests are performed in the presence of non-stationary series or even cointegration.
The Toda-Yamamoto based Granger causality test involves two steps. The first step involves determination of the lag length (k) and the maximum order of integration (qmax) of the variables in the system. Given VAR (k) selected, and the order of integration (qmax) is determined, a level VAR can then be estimated with a total of k+qmax lags. The second step is to apply a standard Wald test to the first k VAR coefficient matrix to make a Granger causal inference. In order to test for Toda and Yamamoto (1995) based Granger causality between aggregate government expenditures and economic growth, the bivariate VAR (k+qmax) model showing the relationship between government expenditure and economic growth is represented as:

\[
\begin{bmatrix}
GDP_t \\
GE_t
\end{bmatrix} = \begin{bmatrix}
\alpha_1 \\
\alpha_2
\end{bmatrix} + \sum_{i=1}^{k+q} \begin{bmatrix}
\beta_{1i} & \beta_{2i} \\
\gamma_{1i} & \gamma_{2i}
\end{bmatrix} \begin{bmatrix}
GDP_{t-i} \\
GE_{t-i}
\end{bmatrix} + \begin{bmatrix}
\epsilon_{1t} \\
\epsilon_{2t}
\end{bmatrix} \tag{5a}
\]

Where GDPt = Real Gross Domestic Product

GEt = Aggregate Government Expenditures

\(\beta\) and \(\gamma\) are the coefficients of GDPt and GEt respectively.

\(\epsilon\)'s are error terms that are assumed to be white noise.

The optimal lag length (k) of the VAR was determined by the Akaike (AI) and Schwarz Information Criterion (SIC). The null hypothesis can be drawn as “GEt does not Granger cause GDPt” if \(\delta_{1t} = 0\) against the alternative hypothesis “GEt does Granger-cause GDPt” if \(\delta_{1t} \neq 0\). We use the first k coefficients to compute Wald’s test. Correspondingly, the same hypothesis can be drawn between GDPt and GEt.

Since this study also aimed at investigating the causality between the different specific components of government expenditure and economic growth, we can as well formulate a VAR (k+qmax) model for this purpose.

\[
\begin{bmatrix}
GDP_t \\
TCE_t \\
TRE_t \\
AD_t \\
SCSt \\
ES_t \\
TR_t
\end{bmatrix} = \begin{bmatrix}
\alpha_1 \\
\alpha_2 \\
\alpha_3 \\
\alpha_4 \\
\alpha_5 \\
\alpha_6 \\
\alpha_7
\end{bmatrix} + \sum_{i=1}^{k+q} \begin{bmatrix}
\beta_{1i} & \beta_{2i} & \beta_{3i} & \beta_{4i} & \beta_{5i} \\
\gamma_{1i} & \gamma_{2i} & \gamma_{3i} & \gamma_{4i} & \gamma_{5i}
\end{bmatrix} \begin{bmatrix}
GDP_{t-i} \\
TCE_{t-i} \\
TRE_{t-i} \\
AD_{t-i} \\
SCSt_{t-i} \\
ES_{t-i} \\
TR_{t-i}
\end{bmatrix} + \begin{bmatrix}
\epsilon_{1t} \\
\epsilon_{2t} \\
\epsilon_{3t} \\
\epsilon_{4t} \\
\epsilon_{5t} \\
\epsilon_{6t} \\
\epsilon_{7t}
\end{bmatrix} \tag{5b}
\]

GDPt = Real Gross Domestic Product

TCEt = Total Capital Expenditure

TREt = Total Recurrent Capital

ADt = Administration Expenditure (general administration, defence/internal security, national assembly)

SCSt = Social and Community Services (education, health and other services).

ESt = Economic Services (agriculture, construction, transport / communication, other services)

TRt = Transfers (public debt servicing, pensions / gratuities, contingencies / subventions, other services)

\(\alpha\)'s, \(\beta\)'s, \(\gamma\)'s are constant terms in the VAR (k+q) model. a’s, b’s, c’s, d’s, e’s, f’s are the coefficients of GDPt, TCEt, TRCt, ADt, SEt, ECt, TRt. \(\epsilon\)'s are error terms assumed to be white noise. We still apply Wald’s test to the first k coefficient matrices using the standard chi square statistic. The null hypotheses posit that
TCE, TRE, AD, SE, EC, TR, “does not Granger-cause” GDP if \( b_{1i}=0, c_{1i}=0, d_{1i}=0, e_{1i}=0, \)
and \( f_{1i}=0 \) respectively against the alternative hypotheses as TCE, TRC, AD, SE, EC, TR, “does Granger-cause” GDP if \( b_{1i}\neq 0, c_{1i}\neq 0, d_{1i}\neq 0, e_{1i}\neq 0, \) and \( f_{1i}\neq 0 \) respectively. Likewise, other hypotheses can be postulated for unidirectional and bidirectional causality among the rest of the variables.

IV. EMPIRICAL ANALYSIS

[UNIT ROOT TESTS]

The results obtained shows the order of integration of the variables based on the ADF test including both intercept and trend as highlighted in the test equations above. From Table-1 below, all the variables are stationary at first difference, meaning that government expenditure both at the aggregated and disaggregated level and real GDP are not stationary in their level but are stationary at their first difference. Hence the null hypothesis of non-stationarity for all variables is rejected at first difference at the particular level of significance described by the p-values in parenthesis. This implies that all the variables are integrated of order one I(1).

Table 1: Unit Root Tests

<table>
<thead>
<tr>
<th>Variable</th>
<th>Order of Integration</th>
<th>Augmented -Dickey Fuller Test (ADF)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>With Intercept</td>
</tr>
<tr>
<td>GDP</td>
<td>I(0)</td>
<td>-2.050227 (0.046066)</td>
</tr>
<tr>
<td>TGE</td>
<td>I(0)</td>
<td>-2.074338 (0.043671)</td>
</tr>
<tr>
<td>∆GDP</td>
<td>I(1)</td>
<td>-6.527721 (0.000000)</td>
</tr>
<tr>
<td>∆TGE</td>
<td>I(1)</td>
<td>-8.514916 (0.000000)</td>
</tr>
<tr>
<td>TRE</td>
<td>I(0)</td>
<td>-1.713946 (0.093270)</td>
</tr>
<tr>
<td>TCE</td>
<td>I(0)</td>
<td>-2.635087 (0.011399)</td>
</tr>
<tr>
<td>AD</td>
<td>I(0)</td>
<td>-2.287558 (0.026810)</td>
</tr>
<tr>
<td>SCE</td>
<td>I(0)</td>
<td>-2.201924 (0.032724)</td>
</tr>
<tr>
<td>EC</td>
<td>I(0)</td>
<td>-2.234203 (0.030371)</td>
</tr>
<tr>
<td>TR</td>
<td>I(0)</td>
<td>-2.221799 (0.031257)</td>
</tr>
<tr>
<td>∆TRE</td>
<td>I(1)</td>
<td>-8.053157 (0.000000)</td>
</tr>
<tr>
<td>∆TCE</td>
<td>I(1)</td>
<td>-9.355241 (0.000000)</td>
</tr>
<tr>
<td>∆AD</td>
<td>I(1)</td>
<td>-8.513988 (0.000000)</td>
</tr>
<tr>
<td>∆SCE</td>
<td>I(1)</td>
<td>-8.717907 (0.000000)</td>
</tr>
<tr>
<td>∆EC</td>
<td>I(1)</td>
<td>-8.768578 (0.000000)</td>
</tr>
<tr>
<td>∆TR</td>
<td>I(1)</td>
<td>-8.749153 (0.000000)</td>
</tr>
</tbody>
</table>

Values in parenthesis are p-values for the ADF test statics and: \( \Delta \) implies the first difference operator, and the Level of Significance considered (1%, 5%, and 10%).
[COINTEGRATION TEST]

Having confirmed that all the series were integrated of the same order I(1), the next step was to check if there were any long run tendencies between government expenditure and economic growth. The Johansen (1988), and Johansen and Juselius (1990) maximum likelihood testing procedure on the number of cointegrating vectors, which also includes testing procedures for linear restrictions on the cointegrating parameters, for any set of variables that were used. Two tests statistics to identify the number of cointegrating vectors, namely the trace test statistic and the maximum Eigen value test statistic were adopted. Table-2 below shows that the null hypothesis of no co-integration is therefore not rejected since both trace statistic and the maximum Eigen value statistic indicate no cointegration at the 5 percent level of significance, suggesting that there is no cointegrating (or long run) relationship between Government expenditure and economic growth both the aggregated and disaggregated levels. This result may not be surprising since the Nigerian’s fiscal policies had undergone a series of regulations in the eighties most especially the Structural Adjustment Program (SAP) and others in the nineties. Besides, cointegration as a long run relationship between variables may be expected to exist only when the system is in a steady state (Ford 1997).

**Table 2: Johansen Cointegration Test**

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Variables</th>
<th>Max-Eigen Statistic</th>
<th>Critical Value (5%)</th>
<th>Trace Statistics</th>
<th>Critical Value (5%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Gross Domestic Product and Total Government Expenditure</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ho</td>
<td>r = 0</td>
<td>7.608215</td>
<td>14.07</td>
<td>9.279981</td>
<td>15.41</td>
</tr>
<tr>
<td>Ha</td>
<td>r &lt;= 1</td>
<td>1.671766</td>
<td>3.76</td>
<td>1.671766</td>
<td>3.76</td>
</tr>
<tr>
<td></td>
<td><strong>Cointegration at Disaggregated Levels</strong></td>
<td></td>
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<tr>
<td></td>
<td><strong>Gross Domestic Product and Total Recurrent Capital</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ho</td>
<td>r = 0</td>
<td>6.803747</td>
<td>14.07</td>
<td>7.788008</td>
<td>15.41</td>
</tr>
<tr>
<td>Ha</td>
<td>r &lt;= 1</td>
<td>0.984261</td>
<td>3.76</td>
<td>0.984261</td>
<td>3.76</td>
</tr>
<tr>
<td></td>
<td><strong>Gross Domestic Product and Total Capital Expenditure</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ho</td>
<td>r = 0</td>
<td>7.097802</td>
<td>14.07</td>
<td>11.07993</td>
<td>15.41</td>
</tr>
<tr>
<td>Ha</td>
<td>r &lt;= 1</td>
<td>3.982124</td>
<td>3.76</td>
<td>3.982124</td>
<td>3.76</td>
</tr>
<tr>
<td></td>
<td><strong>Gross Domestic Product and Administration</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ho</td>
<td>r = 0</td>
<td>7.606155</td>
<td>14.07</td>
<td>9.911829</td>
<td>15.41</td>
</tr>
<tr>
<td>Ha</td>
<td>r &lt;= 1</td>
<td>2.305674</td>
<td>3.76</td>
<td>2.305674</td>
<td>3.76</td>
</tr>
<tr>
<td></td>
<td><strong>Gross Domestic and Social/community Services</strong></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
The results in Table 2 according to Model 1 reveal that causality runs from TGE<sub>t</sub> to GDP<sub>t</sub> and there is no evidence of bi-directional causality between these two variables. The probability values of F and $X^2$ statistics are given; the low p-values suggested that the null hypothesis can be rejected. Consequently, a unidirectional causality runs from total government expenditure to economic growth in Nigeria.

As for Model 2 causality results between disaggregated government expenditures and economic growth and reveals that a unidirectional causality runs from TCE<sub>t</sub> to GDP<sub>t</sub>. Also, a unidirectional causality was found running from administration, social and community service, economic service and transfers to economic growth. But interestingly there is no causality between TRE<sub>t</sub> and GDP<sub>t</sub>. However, causality runs from the sum of TRE<sub>t</sub> and TCE<sub>t</sub> made up of AD<sub>t</sub>, SCE<sub>t</sub>, EC<sub>t</sub>, and TR<sub>t</sub> to GDP<sub>t</sub> meaning that total recurrent expenditure alone without total capital expenditure cannot cause economic growth. These results in Nigeria for both models on aggregate and disaggregate level of expenditures support Keynes’s hypothesis, which explains that increase in government’s expenditure magnifies economic growth. The fact that recurrent expenditure does not cause economic growth is not surprising. This can be attributed to the prevalence of mismanagement, gross embezzlement and diversion of public funds by government officials and political appointees. Secondly, the government allots more funds in capital expenditures than recurrent expenditures as a consequence total capital expenditure will certainly lead to growth than total recurrent expenditure.

### Table 3: Results of Granger Causality Test

<table>
<thead>
<tr>
<th>Ho</th>
<th>r = 0</th>
<th>7.633877</th>
<th>14.07</th>
<th>9.657563</th>
<th>15.41</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ha</td>
<td>r &lt; 1</td>
<td>2.023686</td>
<td>3.76</td>
<td>2.023686</td>
<td>3.76</td>
</tr>
<tr>
<td>Ho</td>
<td>r = 0</td>
<td>7.627596</td>
<td>14.07</td>
<td>9.752874</td>
<td>15.41</td>
</tr>
<tr>
<td>Ha</td>
<td>r &lt; 1</td>
<td>2.125277</td>
<td>3.76</td>
<td>2.125277</td>
<td>3.76</td>
</tr>
<tr>
<td>Ho</td>
<td>r = 0</td>
<td>7.630607</td>
<td>14.07</td>
<td>9.716197</td>
<td>15.41</td>
</tr>
<tr>
<td>Ha</td>
<td>r &lt; 1</td>
<td>2.08559</td>
<td>3.76</td>
<td>2.08559</td>
<td>3.76</td>
</tr>
</tbody>
</table>

All tests are performed with two lag lengths according to the Schwartz criterion.

### Granger Causality Test (Toda-Yamamoto Methodology)

Table 3 below shows the results of Granger causality test for both Model 1 and Model 2, according to Toda and Yamamoto (1995) methodology. The optimum lag length of the VAR in both models is k=2 based on AI and SIC criteria. qmax=1 since all the variables were integrated of order one. A system of VAR was estimated at levels with a total of k+qmax=2+1 = 3 lags in both models. Nevertheless, causality test was carried as follows:

Firstly, for the existence of both Wagner’s law if there existed a unidirectional causality running from GDP and public expenditure at an aggregated level or among its components at a disaggregated levels. Secondly, if there existed a unidirectional relationship for the existence of Keynesian hypothesis running from public expenditure to GDP. Thirdly, a bidirectional causality that is the feedback of both variables and lastly absence of causal relationship among variables was also conducted.

The results in Table 2 according to Model 1 reveal that causality runs from TGE<sub>t</sub> to GDP<sub>t</sub> and there is no evidence of bi-directional causality between these two variables. The probability values of F and $X^2$ statistics are given; the low p-values suggested that the null hypothesis can be rejected. Consequently, a unidirectional causality runs from total government expenditure to economic growth in Nigeria.

As for Model 2 causality results between disaggregated government expenditures and economic growth and reveals that a unidirectional causality runs from TCE<sub>t</sub> to GDP<sub>t</sub>. Also, a unidirectional causality was found running from administration, social and community service, economic service and transfers to economic growth. But interestingly there is no causality between TRE<sub>t</sub> and GDP<sub>t</sub>. However, causality runs from the sum of TRE<sub>t</sub> and TCE<sub>t</sub> made up of AD<sub>t</sub>, SCE<sub>t</sub>, EC<sub>t</sub>, and TR<sub>t</sub> to GDP<sub>t</sub> meaning that total recurrent expenditure alone without total capital expenditure cannot cause economic growth. These results in Nigeria for both models on aggregate and disaggregate level of expenditures support Keynes’s hypothesis, which explains that increase in government’s expenditure magnifies economic growth. The fact that recurrent expenditure does not cause economic growth is not surprising. This can be attributed to the prevalence of mismanagement, gross embezzlement and diversion of public funds by government officials and political appointees. Secondly, the government allots more funds in capital expenditures than recurrent expenditures as a consequence total capital expenditure will certainly lead to growth than total recurrent expenditure.
Table 3: Toda-Yamamoto Granger Causality Test at Aggregate and Disaggregate Levels

<table>
<thead>
<tr>
<th>Null Hypothesis</th>
<th>Test Statistics</th>
<th>Test Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>χ²-statistic</td>
<td>F-statistic</td>
</tr>
<tr>
<td></td>
<td>Value</td>
<td>Prob.</td>
</tr>
<tr>
<td>Causality at Aggregate Level (Model-1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GEt does not Granger cause GDPt</td>
<td>15.51717</td>
<td>0.0004</td>
</tr>
<tr>
<td>GDPt does not Granger Cause GEt</td>
<td>2.237418</td>
<td>0.3267</td>
</tr>
<tr>
<td>Causality at Disaggregate Level (Model-2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TREt does not Granger cause GDPt</td>
<td>1.201062</td>
<td>0.5485</td>
</tr>
<tr>
<td>GDPt does not Granger cause TREt</td>
<td>1.035385</td>
<td>0.5959</td>
</tr>
<tr>
<td>TCEt does not Granger cause GDPt</td>
<td>31.18116</td>
<td>0.0000</td>
</tr>
<tr>
<td>GDPt does not Granger cause TCEt</td>
<td>2.019777</td>
<td>0.3643</td>
</tr>
<tr>
<td>ADt does not Granger cause GDPt</td>
<td>22.92768</td>
<td>0.0000</td>
</tr>
<tr>
<td>GDPt does not Granger cause ADt</td>
<td>2.178434</td>
<td>0.3365</td>
</tr>
<tr>
<td>SCSt does not Granger cause GDPt</td>
<td>20.06603</td>
<td>0.0000</td>
</tr>
<tr>
<td>GDPt does not Granger cause SCSt</td>
<td>2.218913</td>
<td>0.3297</td>
</tr>
<tr>
<td>ECt does not Granger cause GDPt</td>
<td>21.16736</td>
<td>0.0000</td>
</tr>
<tr>
<td>GDPt does not Granger cause ECt</td>
<td>2.205159</td>
<td>0.3320</td>
</tr>
<tr>
<td>TSt does not Granger cause GDPt</td>
<td>20.74711</td>
<td>0.0000</td>
</tr>
<tr>
<td>GDPt does not Granger cause TSt</td>
<td>2.210716</td>
<td>0.3311</td>
</tr>
</tbody>
</table>
VI. CONCLUSION

This paper, empirically investigated the relationship between government expenditure and economic growth both at the bivariate (aggregated) and the multivariate (disaggregated) systems. The econometric investigation was based on a cointegration approach and the Toda-Yamamoto Augmented Granger Causality test. The results of Johansen bivariate/multivariate cointegration revealed that there was no long-run relationship among the stationary variables. Further results from a causality test showed that, government’s expenditure causes economic growth at a bivariate level supporting Keynes’s hypothesis that increased government expenditure amplifies economic growth. At the multivariate level, total capital expenditure, administration, social and community service, economic service and transfers cause economic growth.

Finally, the findings of the study do not support the existence of Wagner’s law in Nigeria that economic growth causes government expenditure. As concerns recommendations, for recurrent expenditure to enhance growth as well as capital expenditure becoming more contributive to economic growth, government should increase anti-corruption agencies like the Economic and Financial Crime Commission (EFCC), and the Independent Corrupt Practice Commission (ICPC) in order to checkmate, arrest and penalize those who divert and embezzle public funds. Also, it should channel its funds to rightful projects at the right time to meet the people’s demand rather than spending on gigantic projects that will not translate into any meaningful growth of the economy. And, lastly, the government should plan well before implementing projects so as not to abandon these projects in the long run and make resources wasteful.

BIBLIOGRAPHY


