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Public Expenditure and Economic Growth in Nigeria: An Application of Co-Integration and Error Correction Modeling

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Abstract
This study investigates the relationship between public expenditure and economic growth in Nigeria. The long run equilibrium relationship and the direction of causality were estimated using co-integration and granger causality models respectively. The result of the co-integration analysis indicates that there is no co-integrating relationship between public expenditure and real GDP in Nigeria. Similarly, the result of the Granger causality tests reveals that neither public expenditure Granger causes real GDP, nor real GDP Granger cause public expenditure. The study concludes that there is no long run relationship between government expenditure and economic growth in Nigeria and that government expenditure and economic growth are both independent, implying that causality does not run from government expenditure to economic growth or vice versa. The study attributes this finding to some leakages in governments' administration and execution of public expenditure. Based on this finding, the study recommends that government

should demonstrate strong commitment in the implementation of public expenditure. This could be achieved through a prudent, transparent and accountable public expenditure.
Keywords: Public Expenditure; Economic Growth; Co-Integration Analysis; Granger Causality Test; Nigeria.

Introduction

After gaining political independence, governments of most developing countries including those of Africa embarked on expansionary public expenditure so as to meet the ever increasing demands of their citizens. As observed by Tanzi (1994), countries often use public expenditure as a fiscal policy instrument to influence the working of the economic system in order to maximize economic welfare with the overriding objective of long term economic growth and development of their economies. As argued by Nworji et. al. (2012), for a developing country to break the vicious circle of poverty, economic growth must be sustained. This perhaps explained the seemingly increased growth in public expenditure by most governments regardless of their level of economic development (Akpan, 2011).

For over five decades since gaining independence from Britain in 1960, successive governments in Nigeria engaged in expansionary public expenditure with the urgent goal of accelerating the pace of economic growth and development. Government expenditure in the economy gained a considerable momentum with the discovery of commercial quantities of crude oil in the 1970s which provided the country with huge foreign revenues. In particular, government expenditure in Nigeria has continued to rise due to huge oil receipts from production and sale of crude oil and increased demand for public goods such as roads, communication, power, education and health as well as the increased need for internal and external security to the citizens and the country (Nurudeen and Usman, 2010). The possible reason for the expansionary expenditure is the governments' own claim in the Forth National Development Plan that "the basic strategy will be that of using the resources generated from this wasting asset to ensure an all round expansion in the productive capacity of the economy so as

to lay a solid foundation for self sustaining growth and development in the shortest possible time" (Ayodele, 1987).

Available statistics from Central Bank of Nigeria Statistical Bulletin (2009) have shown that both, Nigeria's capital and recurrent expenditure has maintained a risen trend over the past five decades. For instance, with a government expenditure of N163.90 million in 1961, the expenditure steadily increased to N755.96 million in 1969 representing an increase of 461% (or an annual increase of 46.1%). Similarly, the country's expenditure steadily increased from N997.20 million in 1971 to N7,406.70 million in 1979 which represents an annual increase of 83% and by 1980, the expenditure has more than doubled to N14,968.50 million. With the return of the country to democratic rule in 1999, the country's expenditure witnessed a phenomenal risen trend. For instance, from N947,690.00 million in 1999, the government expenditure grew steadily to N3,456,925.40 million in 2009 representing an increase of 365.77% (CBN, 2009). This risen expenditure has rekindled debates and spawns empirical investigations as to the nature of the relationship between government expenditure and economic growth, as well as to whether growth in government expenditure causes growth in the economy.

Many empirical studies such as Nuruddeen and Usman (2010), Akpan (2011), Taiwo and Abayomi (2011), Nworji et. al. (2012) and lately Aladajare (2013) have examined the nature of the relationship between government expenditure and economic growth in Nigeria. Unfortunately, challenges still remain. To the best of our knowledge, all the studies suffer from one common fundamental shortcoming. The studies omitted the complementary role and influence of some other variables in their analysis which the literature indicates to exerts positive influence on economic growth. It is well known in the literature that economic growth in developing countries depends crucially on some important policy variables such as foreign direct investments (FDI), traded openness and savings (Iqbal and Zahid, 1998; Shabir and Mahmud, 1992). Failure to account for these omitted variables in government expenditure - economic growth nexus often produce misleading causal relationship among variables and in general leads to biased results (Loizides and Vamvoukas, 2004; Ahsan et. al. 1992).

The contribution of this paper is to examine the nature of the relationship and direction of causality between government expenditure

and economic growth in Nigeria by taking into account important policy variables of trade openness, savings and FDI.

Methodology and Purpose of the Study

This study examines the long run relationship between public expenditure and economic growth in Nigeria. Data for the study was mainly secondary sources obtained from the Central Bank of Nigeria's Statistical Bulletin (2009) covering 1970 to 2009. Following Ghali (1997), Loizieds and Vamvoukas (2004), Nurudeen and Usman (2010) and Aladajare (2013), the study utilized, Co-integration analysis and Granger causality tests to analyze the data using STATA software. Specifically, Johansen Co-integration model and Error Correction mechanism is the model used for this study. The choice of this model is based on its ability to be runned on more than two variables (multivariate) and it allows for testing of hypothesis on the integration relationship of variables (Brooks, 2008).

The functional relationship of the Johansen co-integration and error correction model is given by:

$$\Delta Y_t = \mu + \Sigma \acute{I} \Delta Y_{t-1} + \alpha\beta Y_{t-1} + \varepsilon \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)$$

where:

$Y_t = (n*1)$, vector of non stationary indices in the study

$\acute{I} = (n*n)$, matrix of coefficients

$\alpha = (n*r)$, matrix of error correction coefficients where r is the number of co-integrating relationships in the variables, so that $0 < r < n$, known as the adjustment parameter, which measures the speed at which variables adjust to their equilibrium.

$B = (n*r)$, matrix of r co-integrating vectors so that $0 < r < n$, representing the long run co-integrating relationship between the variables.

ε = the error term

According to Brooks (2008), Johansen defines two types of test statistics for co-integration under his method. The first is the Trace Test which is a joint test that tests the null hypothesis of no co integration between variables (H0: r = 0) against the alternative hypothesis of co-integration relationship (H1: r > 0). The second is the Maximum Eigen value Test which tests the null hypothesis that the number of co-

integrating vectors is equal to *r* against the alternative of *r+1* co-integrating vectors.

$$\gamma trace\ (r) = -T \sum_{i=r+1}^{n} \ln(1-\gamma i) \quad \text{..... (2)}$$

$$\gamma \max(r, r+1) = -T\ In\ (1-\varphi r+1) \quad \text{..... (3)}$$

r = number of co-integrating vectors under the null

$\gamma =$ estimated ith ordered eigenvalue from the αβ matrices

The decision rule is that if both the maximum eigenvalue and trace statistics are greater than the critical value statistics at 5 %, there exists a co-integrating relationship between the variables. However, in the absence of existence of any co-integrating vector between variables over the time period, it may be that the variables are causally related in the short run. In other words, when the presence of long run relationship between variables cannot be established, causality in the form of ECM cannot be used and standard VAR Granger causality should be used to detect the direction of causality between the variables. For our first pair wise model, the VAR Granger causality equation is given by:

$$\Delta LTEXP_t = \alpha_i + \Sigma\varphi_i \Delta LRGDP_{t-1} + \Sigma\vartheta j\ \Delta LTEXP_{t-j} + \mu_{1t} \text{ ....(4)}$$

$$\Delta LRGDP_t = \alpha_i + \Sigma\varphi_i \Delta LTEXP_{t-1} + \Sigma\vartheta j\ \Delta LRGDP_{t-j} + \mu_{2t} \text{ ..(5)}$$

Where:

$\alpha_{i\ and}\ \alpha_i$ = regression coefficients

$\Delta LTEXP_t$ = first differenced value of the log of total government expenditure at time, t.

$\Sigma\varphi_i\ \Delta LRGDP_{t-1}$ = vector of the first differenced lagged value of the log of real GDP.

$\Sigma\varphi_i\ \Delta LTEXP_{t-1}$ = vector of the first differenced lagged value of the log of total government expenditure.

$\Delta LRGDP_t$ = first differenced value of the log of real GDP at time t.

$\mu_{1t} + \mu_{2t}$ = uncorrelated white noice series.

To avoid spurious results in co-integration analysis which is often due to non stationarity of macroeconomic time series data (Gujirati, 1995), the time series in its level form should be non stationary and integrated of order 1, written as *I* (1) which means the series become stationary after differencing it once (Meggiora and Sperkman, 2009). Thus, before conducting the Johansen co-integration

analysis, we first conducted stationarity tests on our time series. In other words, tested for a unit root to find out if our time series data is stationary or non stationary.

The most widely used stationarity techniques are the Dickey-Fuller (DF), Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests. In order to validate this characteristics in our time series data, the study used Phillips-Perron (PP) unit root tests and tested each time series individually to ensure non stationarity at the level of the data, and also runned the unit root test on the first difference to ensure *I* (1). We use PP test because it includes an automatic correction to the DF process for auto correlated residuals (Vanegas and Robertico, 2007) while it also takes care of structural break in a time series variable (Garba, et. al., 2009). The PP test is given by:

$$lY_t = \beta_1 + \beta_2 t + \alpha \sum lY_{t-1} + \mu_i \quad \ldots\ldots(6)$$

where;

lY_t = the log values of real GDP.
β_1 = estimated constant intercept.
β_2 = estimated coefficient of the trend variable.
t = a trend variable.
α_t = vector of the estimated parameters of log values of real GDP.
$\sum Y_{t-1}$ = vector of the log values of real GDP.
μ_i = error term

If α is less than one in absolute value ($|\alpha|<1$), then the time path is stationary, and the time path of Y_t will fluctuate around a constant mean value and therefore will not have an upward or downward trend; on the other hand, if α is greater than one in absolute value ($|\alpha|>1$), the series will be explosive and the time path is non-stationary (Gujarati and Sangeetha, 2008). However, if α is equal to one in absolute value (($|\alpha|=1$), the time path of Y_t is non-stationary, and unit root exists. The null hypothesis is that the time series has a unit root ($H0$: $\alpha = 0$) and the alternative is that the series is trend stationary ($H1$: $\alpha < 0$). The null hypothesis of non-stationarity is rejected if the t-statistic is more than the critical t-value. Equation (2) would be repeated for total government expenditure, total capital expenditure, total recurrent expenditure, total FDI, total savings and trade openness.

Theoretical Framework

Several theories have been advanced to underpin the nature of the relationship and causality among government expenditure and economic growth**.** The classical view could be traced to Smith (1776) and Ricardo (1821). These economists pioneered the notion that expansive government expenditure results in lowering economic growth. The scholars believed in the principle of *laissez faire* approach in economic activities regarding maximum government intervention as interference with the free market situation which would hinder economic progress. The maximum intervention in expenditure, Smiths believed should be limited to the fundamental functions of government: protecting the society from the violence and invasion of other independent societies, protecting every member of the society from the injustice of operation of every other member of it and erecting and maintaining those public works which are very essential to the society and which no single individual or small group of individuals could erect and maintain. This implies that apart from expenditure on the general administration, defense (both internal and external), as well as expenditure on the provision of public goods and services which no single or a group of individuals can advantageously provide to the economy, any other government expenditure entails an intervention in an economy and would not lead to economic growth.

Some scholars support Smiths claim of negative impact of excessive government expenditure on economic growth through a different dimension. Nimedi et. al. (2012) for instance argued that the negative effect of expansive government expenditure on economic growth results through increase in taxes and/or borrowing. According to him, in an attempt to finance rising expenditure, government may resort to increase in taxes or borrowing. The scholar advanced two negative effect of this scenario that would lead to lowering of economic growth. One, higher income tax may discourage individuals from working for long hours or even taking up appointment which reduces income and aggregate demand. Two, higher profit tax tends to increase production costs thereby reducing firms expenditure and investments thereby reducing firms sales volume and profit subsequently lowering production, employment and economic growth. Arguing on the borrowing effect of government expenditure on economic growth, Laudau (1986), Eugen and Skinner (1992), Folster and Henrekson (2001), Dar and AmirkhalKhali (2002) and Nimedi et. al. (2012)

stressed that if the borrowing is from banks and other financial institutions, it will crowd-out private sector, thus reducing private investment and subsequently lowering productivity and economic growth. These scholars submitted that government expenditure often turns into inefficient expenditure which causes distortion in allocation of resources and corruption.

The Wagnerian view attributed to Adolph Wagner (1883) attempts to explore the causal relationship between government expenditure and economic growth. According to him, as the real income (economic growth) increases there is the long run tendency for government expenditure to increase relative to national income. In other words, there is a functional relationship between economic growth (growth in the per capita income) and government expenditure with the causality running from per capita income to government expenditure and not vice versa. Supporting this view, Ogba and Likita (1999) argued that when economy grows, there will be increase in the number of urban centers with the associated increase in social vices such as crime, which requires government intervention in the area of internal security to maintain law and order. This intervention, according to them, has associated costs leading to increase in public expenditure in the economy.

The Neoclassical view otherwise known as the Keynesian view holds rather an opposing view regarding the relationship and direction of causality between government expenditure and economic growth. Keynes posits that increase in government expenditure results in higher growth of the economy. Commenting on this issue, Nworji et. al. (2012) and Dermibas (1999) stated that Keynes viewed public expenditure as a fiscal policy instrument necessary for achieving short term stability and long term economic growth. In addition, it can help in overcoming the inefficiencies of the market system in the allocation of resources as well as influences the level of employment and price stability (Szorowska, 2011). Some scholars who also support the Keynesian claim regarded increase in government expenditure as instrument that provides insurance protection to private assets thus encouraging economic growth, Ram (1986), Kormendi and Merguire (1986) for instance argued that expansive government expenditure provides insurance function to private property there by encouraging private investment which cause economic growth.

Literature Review

This section reviews empirical literature on the relationship between government expenditure and economic growth around the world. To start with, Loizides and Vamvoukas (2004) examined the nature of causality between government expenditure and economic growth using annual time series data of UK, Greece and Ireland. In particular, they examined whether the relative size of government, measured as the share of total expenditure in Gross National Product (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 expenditure. The study proxied economic growth as income measured as the real per capita GNP at market prices while real government expenditure is measured as public authorities' expenditure on goods and services (including transfer payments) i.e consumption and gross fixed capital formation. The study also used unemployment calculated as unemployed persons divided by the working population and inflation measured as the sale price index and its change. Using Johansen co-integration analysis and Granger causality tests, the study found that, in both the short run and long run estimations, public expenditure Granger causes growth in national income in all the countries under the study. The study further reveals that in the case of Greece, increase in economic growth fosters increase in public expenditure, thus lending support to Wagner hypothesis that increased output causes growth in public expenditure. This pattern of causality, they further stated was found in the case of UK when inflation as a control variable was included in the model. However, the results for Ireland do not indicated any support for the Wagnerian view.

In another cross country analysis involving seven countries of South East Asia, Alexiou (2009) evaluated the impact of government expenditure on economic growth covering the 1995-2005 periods. The study employed the technique of ordinary least square regression in the estimation. The results indicate that government spending on capital formation and development assistance impacted positively on economic growth in all the countries under the study. The results also show that both private investments and trade openness also impacted positively on economic growth in the region. However, the population growth variable (labour force) was found to be statistically insignificant in all the estimated models. He attributed the negative finding to low labour mobility in the transition economies due to distortion in the housing

market. The author submitted that government spending in what ever form it is envisaged, is a mechanism for the promotion of economic growth.

Employing International Standard Classification of the Functions of Government (COFOG), Szarouska (2011) undertook a research on the relationship between government spending and economic growth in the Czech Republic involving data covering 1995 to 2008. The study examined the relationship between economic growth (proxied as GDP) and the COFOG ten components of governments spending: general public services, defense, public order and safety, economic affairs, environmental protection, housing and commerce, health, recreation and culture, education and social protection. Co-integration and Error Correction Modeling (ECM) was used in the analysis of data generated. The results show the existence of co-integration relationship between GDP and total government spending, public order and safety, and economic affairs spending functions. However, the tests indicate the non existence of co-integration relationship between GDP and the other components of government included in the model. He submitted that in the long run, increase in government total spending, spending in general public services, public order and safety, and economic affairs increases GDP and while such increases cannot be established in the case of increase in government spending on defense, environmental protection, housing and commerce, health, recreation and culture, education as well as social protection.

The nexus between governments spending and economic growth has recently received the attention of the Nigerian researchers. Babatunde (2007) tested whether government size and economic growth co-integrate using an annual time series data covering 1970-2006. He employed real government expenditure per capita as proxy for government expenditure. In the case of proxy economic growth, he used national income per capita. Using Auto Regressive Distributive Lag (ARDL) model of bound testing approach, the study shows that there is no co-integration relationship between government expenditure and economic growth in Nigeria. In addition, the results of the Granger causality tests indicate that in most cases, government expenditure and economic growth are independent of each other. However, in few cases, the Granger causality tests indicate that causality runs from government expenditure to economic growth.

Nurudeen and Usman (2010) investigated the effect of government spending on economic growth in a disaggregated analysis that examined total government expenditure, total recurrent expenditure, total government expenditure on health, on education, on transport and communication. They also included in their analysis inflation and overall fiscal balance to isolate their effect on economic growth. The study analyzed the time series data generated on these variables over the 1970 – 2008 period using co-integration and ECM. It found that governments total capital expenditure, total recurrent expenditure and government expenditure on education have negative effect on economic growth. The study also found that government expenditure on health, on transport and communication results in increase on economic growth.

In a study, still on Nigeria, Akpan (2011) investigated the validity of Wagner's law of long rung causal relationship between national income and public expenditure over the 1970-2008. The author employed the technique of Auto Regressive Distributive Lag (ARDL) model of co-integration and VEC model to tests the long run linear relationship between the variables and Granger causality test to determine the nature of causality among the variables. His analysis reveals that a long run relationship exists between national income as a measure of economic growth and public expenditure. The analysis further reveals that in the long run, there is unidirectional causal relationship from national income (economic growth) to public expenditure in Nigeria. However, in the short run the results indicate that public expenditure Granger causes economic growth which validates the Keynesian view.

In a study covering 1970-2009, Nworji et. al. (2012) using OLS examined the impact of government expenditure on economic growth in Nigeria. In particular, the study examined the effect of government capital and recurrent expenditure on economic services, social and community services and transfers on economic growth measured as growth in GDP. The study found that while both governments' capital and recurrent expenditures on economic services were inversely related to economic growth implying a negative effect, the capital and recurrent expenditures on social community services as well as expenditures on transfers has direct relationship with economic growth implying a positive effect. The study concluded that there is a positive relationship between government expenditure and economic growth and that government expenditure exerts significant effect on economic growth.

The causal relationship and dynamic interactions between economic growth and government expenditure in Nigeria was also examined by Aladajare (2013) over the 1962 -2010 period. The study used real GDP as an indicator of economic growth while government capital and recurrent expenditure proxied for government spending. The results of the VEC model and Granger causality tests indicate that economic growth spur government expenditure which validates Wagnerian hypothesis. In other words, government capital expenditure Granger causes economic growth. The results further show that the causal effect of economic growth on government capital expenditure is more significant when compared with the government recurrent expenditure. However, growth in government recurrent expenditure does not bring about significant growth in the economy.

Results

To begin with, we present results of the stationarity test conducted on the time series variables. Table no.1 shows the result of the PP test conducted on the series in logrithmic form with and without a tend.

Table no. 1. Stationarity Test at Level Values

	Without Trend	**With Trend**
Variables	PP Test Sta.	PP Test Sta.
Real GDP	(2.087)*	(−1.894)
Total Expenditure	(4.637)***	(−2.399)
Capital Expenditure	(2.765)***	(−2.541)
Recurrent Expenditure	(5.558)***	(−2.652)
Foreign Direct Investment	(3.531)***	(−2.207)
Total Savings	(0.528)	(−1.530)
Trade Openness	(0.174)	(−1.819)

Source: Author's calculation using STATA software, version 9.1

Note: S*ignificant at 1% (***) and 10% (*) level of significance.*

As seen in Table no.1, non of the variables is stationary at level values when time trend is included in the model. Thus, we accepted our null hypotheiss of non stationarity of the variables. We then proceeded and took the first difference of the series and re-run the PP tests. The regression's results are presented in Table no. 2.

Table no. 2. Stationarity Test at First Difference

	Without Trend	**With Trend**
Variables	PP Test Sta.	PP Test Sta.
Real GDP	(–7.316)***	(–9.796)***
Total Expenditure	(–3.969)***	(–6.676)***
Capital Expenditure	(–5.092)***	(–6.348)***
Recurrent Expenditure	(–3.752)***	(–6.243)***
Foreign Direct Investment	(–7.410)***	(–8.650)***
Total savings	(–4.147)**	(–4.261)**
Trade openness	(–7.117)***	(–7.297)***

Source: Author's calculation using STATA software, version 9.1
Note: *Significant at 1% (***) and 5% (**) of significance.*

Table no. 2 reveals that after first diferencing, all the variables were stationary at 1 per cent level except total savings which is significant at 5 per cent level. This study adopts 5 per cent level as its level of significance which is a strong stationarity. i.e our variables are integrated at order1, $I(1)$. On the basis of this, we reject the null hypothesis of non stationarity and accepted the alternative one. With this result, we conducted the co-integration regression to examine whether the variables share a common stochastic long term trend. However, as a prerequisite to the conduct of the cointegration, optimal lag length to be included in the co-integration regression must be selected. Generally, there are four information criteria that are being used in the choice of optimal lag length in co-integration studies. These are the Final Prediction Error (FPE), Hannan-Quinn Information (HQIC), Schwartx, Bayes Information Criterion (SBIC) and Akaike Information Criterion (AIC). This study adopted the FPE as it was found to produce the least probability of under estimation among all the criteria (Liew, 2004). While Final Prediction Error (FPE), Hannan-Quinn Information (HOIC) and Schwartx and Bayes Information Criterion (SBIC) indicated one lag length, Akaike Information Criterion (AIC) and Likelyhood Ratio indicated four lags to be included in the model. We selected one lag to be included in the model as it is the out come of the FPE. Table no. 3 depicts the results of the Johansen cointegration regression.

Table no. 3. Co-integration Regression Results among Real GDP, Total Expenditure, Capital Expenditure, Recurrent Expenditure, FDI, Total Savings and Trade Openness

Hypothesized	Eigenvalue	Trace statistic	Critical value 5%
None		97.1928*	124.24
At most 1	0.57536	63.7888	94.15
At most 2	0.52559	34.7072	68.52
At most 3	0.28462	21.6446	47.21
At most 4	0.21640	12.1339	29.68
At most 5	0.17811	4.4842	15.41
At most 6	0.09476	0.6016	3.76
At most 7	0.01531		

Source: Author`s calculation using STATA software, version 9.1
Note: *Significant at 10% (*)*

Table no. 3 indicates that the maximum eigenvalue which tests the null hypothesis, r, of no co-integrating relationship among the variables is accepted as the trace statistic (97.1928) is lower that the critical value (124.24) at 5% level of significance. Thus, since no co-integrating relationship among the variables is revealed, VEC model can not be applied. Thus, Granger causality test using the VAR is conducted to examine the direction of causality among the variables in the short run. Once again, as a prerequisite to the conduct of the VAR, optimal lag length to be included in the VAR model has to be selected. Accordingly, we included one lags in the VAR model as it was indicated by FPE.

Table no. 4. Granger Causality Test Results

Model No.	Dependent Variable	Independent Variable	Chi-Square Test Stat.	Remark
1a.	Real GDP	Total Expenditure	1.346 (0.500)	Total expenditure does not Granger cause real GDP.
1b.	Total Expenditure	Real GDP	1.254 (0.614)	Real GDP does not Granger cause total expenditure. Thus, there is no causal relationship between total

				expenditure and real GDP.
2a.	Real GDP	Capital expenditure	0.278 (0.598)	Capital expenditure does not Granger cause real GDP.
2b.	Capital expenditure	Real GDP	0.300 (0.584)	Real GDP does not Granger cause capital expenditure. Thus, there is no causal relationship between capital expenditure and real GDP.
3a.	Real GDP	Recurrent expenditure	2.002 (0.157)	Recurrent expenditure does not Granger cause real GDP.
3b.	Recurrent expenditure	Real GDP	0.174 (0.677)	Real GDP does not Granger cause recurrent expenditure. Thus, there is no causal relationship between recurrent expenditure real GDP.
4a.	Real GDP	FDI	0.678 (0.410)	FDI does not Granger cause real GDP
4b.	FDI	Real GDP	1.505 (0.477)	Real GDP does not Granger cause FDI. Thus, there is no causal relationship between real GDP and FDI.
5a.	Real GDP	Total savings	0.078 (0.780)	Total savings does not Granger cause real GDP.
5b.	Total savings	Real GDP	0.363 (0.547)	Real GDP does not Granger cause total savings. Thus, there is no causal relationship between total savings and real GDP.
6a.	Real GDP	Trade openness	0.158 (1.989)	Trade openness does not Granger cause real GDP
6b.	Trade openness	Real GDP	3.713 (0.054)**	Real GDP Granger cause trade openness. Thus, there is causal

				relationship running from real GDP to trade openness.
7a.	Total expenditure	Capital expenditure	0.456 (0.500)	Capital expenditure does not Granger cause total expenditure.
7b.	Capital expenditure	Total expenditure	0.079 (0.778)	Total expenditure does not Granger cause capital expenditure. Thus, there is no causal relationship between total expenditure and capital expenditure.
8a.	Total expenditure	Recurrent expenditure	0.003 (0.953)	Recurrent expenditure does not Granger cause total expenditure.
8b.	Recurrent expenditure	Total expenditure	0.007 (0.933)	Total expenditure does not Granger cause recurrent expenditure. Thus, there is no causal relationship between recurent expenditure and total expenditure.
9a.	Total expenditure	FDI	0.009 (0.923)	FDI does not Granger cause total expenditure.
9b.	FDI	Total expenditure	0.243 (0.622)	Total expenditure does not Granger cause FDI. Thus, there is no causal relationship between total expenditure and FDI.
10a.	Total expenditure	Total savings	4.937 (0.026)**	Total savings Granger cause total expenditure.
10b.	Total savings	Total expenditure	0.347 (0.556)	Total expenditure does not Granger cause total savings. Thus, there is causal relationship running from total savings to total expenditure.
11a.	Total expenditure	Trade openness	0.927 (0.336)	Trade openness does not Granger cause total expenditure.

11b.	Trade openness	Total expenditure	0.133 (0.715)	Total expenditure does not Granger cause trade openness. Thus, there is no causal relationship between total expenditure and trade openness
12a.	Capital expenditure	Recurrent expenditure	0.265 (0.606)	Recurrent expenditure does not Granger cause capital expenditure.
12b.	Recurrent expenditure	Capital expenditure	0.014 (0.907)	Capital expenditure does not Granger cause recurrent expenditure. Thus, there is no causal relationship between recurrent expenditure and capital expenditure.
13a.	Capital expenditure	FDI	0.035 (0.851)	FDI does not Granger cause capital expenditure.
13b.	FDI	Capital expenditure	0.760 (0.782)	Capital expenditure does not Granger cause FDI. Thus, there is no causal relationship between capital expenditure and FDI.
14a.	Capital expenditure	Total savings	4.319 (0.038)**	Total savings Granger cause capital expenditure.
14b.	Total savings	Capital expenditure	0.800 (0.371)	Capital expenditure does not Granger cause total savings. Thus, there is causal relationship running from total savings to capital expenditure.
15a.	Capital expenditure.	Trade openness	2.903 (0.088)*	Trade openness Granger cause capital expenditure.
15b.	Trade openness	Capital expenditure.	1.041 (0.715)	Capital expenditure does not Granger cause trade openness. Thus, there is causal relationship running

				from trade openness to capital expenditure.
16a.	Recurrent expenditure	FDI	0.080 (0.777)	FDI does not Granger cause recurrent expenditure
16b.	FDI	Recurrent expenditure	0.549 (0.815)	Recurrent expenditure does not Granger cause FDI. Thus, there is no causal relationship between recurrent exepnditure and FDI.
17a.	Recurrent expenditture	Total savings	0.315 (0.575)	Total savings does not Granger cause recurrent expenditure.
17b.	Total savings	Recurrent expenditture	0.450 (0.503)	Recurrent expenditure does not Granger cause total savings. Thus, there is no causal relationship between recurrent expenditure and total savings.
18a.	Recurrent expenditture	Trade openness	0.070 (0.792)	Trade openness does not Granger cause recurrent expenditure.
18b.	Trade openness	Recurrent expenditture	0.0002 (0.989)	Recurrent expenditure does not Granger cause trade openness. Thus, there is no causal relationship between recurrent expenditure and trade openness.
19a.	FDI	Total savings	0.253 (0.615)	Total savings does not Granger cause FDI.
19b.	Total savings	FDI	0.206 (0650)	FDI does not Granger cause total savings. Thus, there is no causal relationship between total savings and FDI.
20a.	FDI	Trade openness.	2.961 (0.085)*	Trade openness Granger cause FDI.
20b.	Trade openness.	FDI	0.231 (0.631)	FDI does not Granger cause trade openness. Thus, there is causal relationship runnig

				from trade openness to FDI.
21a.	Total savings	Trade openness.	0.276 (0.600)	Trade openness does not Granger cause total savings.
21b.	Trade openness.	Total savings	0.981 (0.322)	Total savings does not Granger cause trade openness. Thus, there is no causal relastionship between trade openness and total savings.

Source: Author`s calculation using STATA software, version 9.1
Note: *Significant at 5 % (**) and 10 % (*) level of significance*

From Table no. 4, equation 1a, the null hypothesis that total government expenditure does not Granger cause real GDP is accepted, implying that causality does not run from total government expenditure to economic growth. Similarly, the null hypothesis that real GDP does not Granger cause government expenditure is also accepted as revealed by the results of equation 1b. This implies that there is no causal relationship between total government expenditure and economic growth in Nigeria. This nature of causal relationship is also found to exist amongst real GDP, capital expenditure and recurrent expenditure as revealed by equations 2a, 2b and 3a, 3b respectively.

Similarly, equations 4a and 4b revealed the absence of any causality between FDI and economic growth. This implies that the level of FDI in the country is not significant as to influence the rate of growth in Nigeria. As reveled by equations 5a and 5b, the level of our domestic national savings has also not cause an increase in the rate of economic growth. This could be the result of the tendency of successive governments to unwisely spend most of the earnings particularly oil revenue windfall that accrue to the country within their administration with out recourse to national savings. However, as revealed by equations 6a and 6b, the variable trade openness and growth rate of real GDP turns out to be related in the short run with causality running from real GDP to trade openness. This denotes that the rate of our economic growth spur the country's propensity to liberalize our trade policies.

There is a negative causal relationship between domestic savings and total expenditure with savings negatively Granger causing total expenditure as revealed by equation 10a. More specifically, total

savings Granger cause the country's capital expenditure but in a significantly negative manner. However, domestic savings does not exhibit any causal relationship with government recurrent expenditure as indicated by equations 17a and 17b. This implies that growth in the Nigeria's total savings result to slower growth in the country's total expenditure. Put differently, an increase in the level of the country's savings lead to a decrease in the level of her total expenditure more particularly, her capital expenditure. This finding suggests that though the country's savings are mainly channeled in capital projects, it does not spur growth in the economy as revealed by this study. However, on the basis of the result of equation 15a, this study found the existence of a significantly positive causal relationship between trade openness and capital expenditure. That is, an increase in the country's level of trade openness in the short run lead to an increase in the level of her capital expenditure.

Similarly, according to equation 20a, there exists a significant positive causal relationship between trade openness and FDI with causality running from trade openness to FDI. In other words, an increase in the level of the country's trade openness leads to an increase in the level of FDI in the country in the short run.

Discussion

In recent times, studies on the relationship between public expenditure and economic growth are taking the attention of most researchers. Huge expenditure is under-taken by most governments in attempt to improve economic growth and developments of their economies. This study reveals that there is no long run relationship between public expenditure, economic growth, FDI, total savings and trade openness in Nigeria. This finding confirms the finding of Aregbeyen (2006) and Babatunde (2007). The Granger causality shows that there is no causal relationship between public expenditure and economic growth in Nigeria. This implies that, increase in government aggregate capital or recurrent expenditures does not translate into growth in Nigeria. In other words, public expenditure and economic growth in Nigeria are both independent of each another. This finding is also consistent with the finding of Babatunde (2007), but inconsistent with the finding of Aregbeyen (2006), where causality was found to run from public expenditure to national income.

These findings could be attributed to leakages and mismanagement of public resources in the country over the years which took away significant proportion of the funds made available to spur growth and development in critical real sectors of the economy particularly agriculture, power, transport and road infrastructure. These real sectors contribute immensely to economic growth and development of many developed nations. Several reports from the global watch dog on corruption, the Transparency International, has indicated that Nigeria continue to feature prominently in the world corruption index. For instance, according to the agency's 1998 Corruption Index Report, as being reported by Sam (2008), Nigeria is the 5th most corrupt country in the World. In 2001, the country fell from the 5th position to being the most corrupt country in the World (with first position). Over the years, he further reported, from 2002 through to 2012 the country ranked as the 35th (out of 174) most corrupt nations in the World.

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Conclusion

This study contributes to the existing literature by throwing more light on the nexus between government expenditure and economic growth in Nigeria. Johansen co-integration analysis and Granger causality test were used to analyze the data generated. Findings showed that there is no long run relationship between government expenditure and real GDP, FDI, total savings and trade openness in Nigeria. Similarly, there is no causal relationship between government expenditure and real GDP. However, there is causal relationship between real GDP and trade openness with causality running from real GDP to trade openness. Also, while total savings Granger cause total expenditure, trade openness Granger causes capital expenditure and FDI. The study concludes that there is no long run relationship between government expenditure and economic growth in Nigeria and that neither government expenditure Granger cause economic growth nor economic growth Granger cause government expenditure.

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