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GOVERNMENT EXPENDITURE AND ECONOMIC GROWTH IN NIGERIA: AGGREGATE LEVEL ANALYSIS USING THE BOUND TEST APPROACH

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ABSTRACT: *Economists have divergent views on the relationship between public expenditure and economic growth. The pro-market viewpoint argues that large government expenditure is a source of economic instability and has negative effect on economic growth. The anti-market view, on the other hand, stresses positive effect of government spending on economic growth. Stimulated by unresolved debates on the precise relationship between government spending and economic growth, and continuous growth in government spending, this study employed modified and extended aggregate production model to examine the effects of government expenditure at its' aggregate level on economic growth in Nigeria for the period (1981-2018) using bound test (ARDL) approach. The co-integration result indicates the existence of long-run relationship between total government expenditure (LTGE) and economic growth in Nigeria. ARDL results show that total government expenditure (LTGE) impacted positively on economic growth in Nigeria in line with Keynesian theory. The granger causality test result indicates the existence of uni-directional causal relationship from LGDP to LTGE for the observed period, in line with Wagner's theory. It is recommended that there should be proper utilization of public fund in the provision of security and critical infrastructure especially electricity supply and road infrastructure which are precursors to effective economic performance. Public fund should be properly managed to ensure accountability, transparency and fiscal responsibility in carrying out public assignment. It is believed that if corruption is tackled in the country, more public fund will be freed for development and public expenditure would impact more on the economic performance, hence, the fight against corruption in the country should be frontally confronted. Public institutions charged with the responsibility of handling corruption matters in the country should be overhauled and strengthen to ensure timely and proper handling of corruption matters.*

KEYWORDS: Government Expenditure, Economic Growth, Bound Test Approach, Keynesian economic theory, Wagner's theory, Peacock and Wiseman Displacement theory, Endogenous growth theory, Keynesian economic theory and Nigeria.

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INTRODUCTION

In recent times, there had been rekindled interest among economists, policy makers and researchers on growth - government expenditure nexus. The interest emanates from the continuous growth in government expenditure in most economies over the years. Available data on public finance of developed and developing economies shows remarkable growth in the size of government expenditure in absolute term, in relation to gross domestic product (GDP) and by type of expenditure. Hall (2010) affirms growth in government expenditure and stresses that the steady rise in public spending for the past 150 years in all countries demonstrates a powerful link between public spending and economic and social development. He maintains that government spending is at historically high levels of 40% of GDP in OECD countries and is rising in developing countries. In Nigeria, for example, available data shows that there has been remarkable increase in the size of government expenditure. The growth rate of government expenditure in absolute term was 5.6 per cent in 1960, 165.7 per cent in 1970 and 75.5 per cent in 1980. It was 14.9 per cent, 40.5 per cent and 91.1 per cent in 1985, 1989 and 1993, respectively (Aigbokhan,1996). In 1995, government expenditure growth rate was 55.25 per cent, 27.76 per cent in 2005 and 21.48 per cent in 2010 CBN, 2014). The growth rate of government expenditure in 2013, 2015 and 2016 were 12.59 per cent, 8.82 per cent and 3.44 per cent respectively (CBN, 2016).

The effect of government spending on economic growth is another reason for interest casts on government spending. Economists have divergent views on the relationship between government spending and economic growth - the pro-market view and the anti-market view. The pro-market viewpoint argues that as the size of government expenditure increases, distortionary effects of high taxes and public borrowing which are required to fund larger government expenditure, diminishing returns in public capital, rent-seeking activities and bureaucratic inefficiencies become more prevalent, thereby reduce growth rate of the economy (Ram, 1986). Hence, large government spending is a source of economic instability and has negative effect on economic growth. The anti-market view, on the other hand, opines positive effect of government spending on economic growth. This group maintains that government expenditure in the provision of public goods like defence, maintenance of law and order, physical infrastructure, rule of law and protection of property right, merit goods such as education and health services, and target intervention (such as export subsidies) enhances economic growth.

A lot of studies have been conducted to empirically assess the effect of government spending on economic growth in developed and developing economies. The results of these studies are inconclusive. The findings of some empirical studies show positive and significant relationship between government spending and economic growth (Chi-Hung,et al, 2008; Muritala and Taiwo, 2011) while a good number of empirical studies report significant negative relationship (Barro,1990; Engen and Skinner,1992; Hansson and Henrekson,1994). There are also some empirical studies whose results are mixed (Jackson and Fethi, 1998; Fan and Rao, 2003; Amanja and Morrissey, 2005; Bose, Haque and Osborn, 2007) while in some there is no relationship between government spending and economic growth (Chamorro - Narvez, 2012). These results

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indicate that empirical evidence on the effect of government spending on economic growth is mixed. The result seems to vary across time (Hsieh and Lai, 1994), econometric techniques, assumption, country or set of countries and data sets used for the study (Bose, Haque and Osborn, 2007) as well as categorisation of government expenditure (Kweka and Morrissey, 2000).

The objective of this study is to examine the effects of government expenditure at its' aggregate level on economic growth in Nigeria for the period (1981-2018) using the bound test approach. In contrast to previous studies conducted in Nigeria on this area, in this study the method of analysis is difference at least in four ways. First, in order to take care of the problem of missing variables, other variables like broad money supply, international trade intensity ratio (trade openness), inflation rate and fiscal balance are incorporated into the model as importance variables that influence economic growth. In view of the objective of this study, these variables are to serve as control. Secondly, the econometric technique used in this work is bound test approach which is relatively new and advance; and to the best of my knowledge it has not been used in previous studies on government spending-growth nexus in Nigeria. Thirdly, the period covered by the study is relatively long (1981 - 2018). The purpose of this study is not to resolve the long existing controversy and debate on the effect of government spending on economic growth but to contribute to the pool of literature from Nigeria on this issue. The study is organised into five sections. Following the introduction, Section 2 reviews relevant literature on the effect of government expenditure on economic growth. The methodology adopted in the study is presented in section 3. Section 4 elaborates on the empirical results. Finally, section 5 provides the summary, conclusions and policy recommendations.

LITERATURE REVIEW

Conceptual Issues

Government expenditure is expenditure made by public authorities at the central, state and local government levels. In most countries, Nigeria inclusive, government spending is categorized into economic and functional (sectoral) components. Economic component categorisation of government expenditure are capital and recurrent expenditures. While capital expenditures are payments for non-financial assets used in the production process for more than one year, recurrent expenditures are payments for transactions within one year (CBN, 2019). Capital expenditures include expenditures incurred on building of durable assets like infrastructural facilities such as roads and drainage system, airports, seaports, plants, purchase of machinery and equipment, etc. Recurrent expenditures, otherwise described as consumption expenditures, comprise wage payments, purchase of goods and services, interest payments on loans, transfers, etc. The functional (sectoral) component categorisation of public expenditure include expenditure on general services, defence, public order and safety, education, health, social security and welfare, agriculture, manufacturing and communication, environmental protection (Heller and Diamond, 1990). In Nigeria, government expenditure is grouped into two economic components categories namely capital and recurrent expenditures, and four functional categories namely administration, economic services, social and community services and transfer payments with capital and recurrent expenditure compositions (CBN, 2019). Each functional component consists of expenditure on

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some sections (or sectors) of the economy. Administration expenditure is made up of expenditure on general administration, national assembly, defence and internal security. Economic services expenditure comprises expenditure on agriculture, construction, transport and communication and others. Community services expenditure includes expenditure on education, health and others. Transfer payment consists of public debt (internal and external) charges, pension and gratuities and subventions.

Government spending is a powerful fiscal policy instrument available to a government to regulate the level of economic activity in the country. When the level of economic activity in a country is low, usually manifested in high level of unemployment, government can stimulate it by increasing its spending thereby raising aggregate demand, the level of output and create employment. On the other hand, when the level of economic activity in a country is over stimulated, usually indicated by high inflation rate, government can restrain it by reducing its expenditure. Government spending, therefore, can be used to influence national output, employment level, general price level as well as redistribute income in favour of the poor. It is importance in contributing to economic stability, growth and poverty reduction.

THEORETICAL FRAMEWORK

This study is located within the theoretical framework of Endogenous growth theory, Keynesian economic theory, Peacock and Wiseman Displacement theory and Wagner's Law of Increasing State theory. The endogenous growth theory developed by Lucas (1988), Barro (1990) and Romer (1996) postulate that economic growth in the short-run and long-run is caused by endogenous factors, hence government policy can influence growth in the short-run and long-run. Barro (1990) cited in Siraj (2012) asserted that productive public expenditure such as spending on property rights enforcements and spending on activities that enhance the productive capacity of the country can have a positive effect on economic growth. The Keynesian economic theory stresses that fiscal policy has a more direct effect on real GDP (Jhingan, 2010), hence can be used to regulate economic activity. Government expenditure is a fiscal policy instrument and can be used to stimulate or restrain economic activities in the country. It is believed that increase in public expenditure in times of economic recession will increase the purchasing power of the people, stimulate aggregate demand, compel producers to produce more and creates more employment. Thus, increase in the government expenditure in the provision of public goods like physical infrastructure, defence, maintenance of law and order, rule of law and protection of property right, merit goods such as education and health services, and target intervention (such as export subsidies) will enhance economic growth.

Peacock and Wiseman Displacement theory, postulated by Peacock and Wiseman (1961), is concerned with the growth of public expenditure. It states that there is tendency for public expenditure to increase to meet the growing need of the society and, the increase is not always in a smooth and continuous manner, but in jerk or step-like fashion. It maintains that some social and other disturbances create the need for increase in public expenditure of which the existing public revenue could not meet. To generate revenue to meet the need for increased public expenditure,

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there will be an upward revision of taxation resulting in displacement effect, a situation where low taxes and expenditure are replaced by higher tax and expenditure levels. This theory also stressed that government expands its fiscal operation partly due to disturbances and partly to expand economic activity and take up new function that were neglected. This is inspection effect. Another importance aspect which this theory stresses is that when a country is experiencing economic growth, there is the apparent tendency for the central government's economic activities to grow faster than that of the state and local government activities. This is the concentration effect of expenditure. The concentration effect appears to have a permanent influence on public expenditure once the change towards centralization is made.

Wagner's Law of Increasing State theory, developed by German political economist Adolph Wagner (1835-1917), is the "law of increasing state activity" which argues that growth in government expenditure is a function of increased industrialization and economic development. This law maintains that during the industrialization process, as the real income per capita of a nation increases, the share of public expenditures in total expenditures increases. The law also stresses that the advent of modern industrial society will result in increasing political pressure for social progress and increased allowance for social consideration by industry. Wagner (1893) identified three bases for increase in public expenditure. Firstly, during industrialization process, public sector activity will replace private sector activity and as such, state functions like administrative and protective functions will increase. Secondly, there will be increasing need for governments to provide social and welfare services like education, public health, pension or retirement allowance schemes, food subsidy, natural disaster aid, environmental protection programs and other welfare functions. Thirdly, increased industrialization will bring about technological change and emergence of large firms that tend to monopolize. To offset these effects, government will have to provide social and merit goods through budgetary means. Wagner also stressed that public expenditure is an endogenous factor, which is determined by the growth of national income. Hence, it is increase in national income that causes increase in public expenditure. The Wagner's Law tends to be a long-run phenomenon: the longer the time-series, the better the economic interpretations and statistical inferences. It was noted that these trends were to be realized after fifty to hundred years of modern industrial society.

Empirical Literature Review

Public expenditure has received considerable attention in economic literature overtime. The focus of a large number of studies had been on the causes and consequences of increase in government spending. Most of these papers are theoretical or qualitative analysis. Empirical studies on the effect of government spending on economic growth started gaining momentum in the mid - 1970s following a declining growth rates of many OECD economies amidst growing government spending (Aigbokhan, 1996). In the literatures, some of the studies are case studies which focus on specific country (Jackson and Fethi, 1998; Chi-Hung, 2008; Dandan, 2011; Kweka and Morrissey, 2000). Most of the studies draw conclusion based on the experience of a set of developed countries (Heiseh and Lai, 1994) while others concentrate on developing countries (Fan and Rao, 2003). There are some studies which had large sample consisting of both developed and developing countries. In addition, the empirical studies vary in terms of data sets and econometric

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techniques as well as the results (Bose, Haque and Osborn, 2007:533). Some studies used panel data (Bose, Haque and Osborn, 2007), others employed time series data (Jackson and Fethi, 1998; Kweka and Morrissey, 2000; Amanja and Morrissey, 2005) while quarterly data were used in many studies (Taban, 2010). There is no consensus among economists on the effect of government spending on economic growth. The empirical results had been inconclusive. It varies from one study to another.

In an attempt to untangle the nature of the relationship between government expenditure and economic growth, Heiseh and Lai (1994) examined the inter temporal interactions among the growth rate in per capita real GDP, the share of government spending, and the ratio of private investment to GDP for Group-of-Seven countries. Based on the historical data for the Group-of-Seven countries, a multivariate time series analysis was carried out, with particular attention paid to the casual pattern and the shape of impulse-response function in the context of vector auto regression. The empirical results suggest that the relationship between government spending and economic growth can vary significantly across time as well as across the major industrialized countries that presumably belong to the same 'growth club'. The study shows no consistent evidence that government spending can increase per capita growth nor consistent support for the negative argument. For most of the countries under the study, public spending was found to contribute at best a small proportion to the growth of an economy. Jackson and Fetthi (1998) investigated the causal relationship between economic growth and government spending in Northern Cyprus using time series data from 1977 to 1996. The empirical results show mixed evidence; while some results support Wagners' law, others show positive relationship between government spending and economic growth in support of Keynesian theory.

Kweka and Morrissey (2000) examined the impact of public expenditure on economic growth of Tanzania using time series data for 31-year period (1965 - 1996). A simple growth accounting model patterned after Ram (1986) was formulated in which total government expenditure is disaggregated into expenditure on (physical) investments, consumption spending and human capital investment. The findings showed that increased productive expenditure (physical investment) has a negative impact on growth, consumption expenditure relates positively to growth while expenditure on human capital investment was insignificant, probably because any effect would have very long lags. The results confirm the view that public investment in Tanzania has not been productive, but counter the widely held view that government consumption spending is growth-reducing. In the same vein, Amanja and Morrissey (2005) used time series techniques to investigate the relationship between various measures of fiscal policy on growth on annual data of Kenya for the period (1964-2002). In this study, government expenditure was categorised into productive and unproductive expenditure and tax revenue into distortionary and non-distortionary. The result of the study shows that unproductive expenditure and non-distortionary tax revenue are neutral to growth in line with economic theory. Productive expenditure has strong adverse effect on growth whereas distortionary tax has no distortionary effect on growth.

Bose, Haque and Osborn (2007) examined the growth effects of government expenditure at its' aggregated and disaggregated levels for a panel of 30 developing countries over the 1970s and

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1980s. The results of the study show that the share of government capital expenditure in GDP has a positive and significant relationship with economic growth but current expenditure is insignificant. Chi- Hung et al (2008) studied the causal relationship between GDP and public expenditures for US federal government using time series data for period (1974 - 2002). The results show that total expenditure causes the growth of GDP, which is in line with Keynesian theory, but the growth in GDP does not cause the increase in total expenditures which is working against Wagners' law. In an attempt to provide further evidence on the growth and government spending, Aleixou (2009) used two different panel data methodologies to empirically examine the impact of government spending and economic growth for transition economies of the South Eastern Europe. The result indicates that out of the five variables used in the estimation, government spending on capital formation, development assistance, private investment and a proxy for trade-openness all have positive and significant effect on economic growth whereas the remaining one, population growth, was found to be statistically insignificant.

Taban (2010), using Barro (1990) endogenous growth model as the framework, re-investigated the government spending-growth nexus for the Turkish economy for the sample period (1987:Q1 - 2006:Q4). The econometric method of analysis employed were Bounds testing approach and MWALD causality test. The result shows that the share of the total government spending to GDP and the share of the government investment to GDP have negative impacts on the growth of real per capita GDP in the long run. There is no evidence of co-integration between government consumption spending to GDP ratio and per capita output growth. The causality test also indicates strong bi-directional causality between the total government spending and economic growth. There was no statistically significant relationship between the share of the government consumption spending in GDP and economic growth.

Dandan (2011) examined the impact of public spending on economic growth of Jordan using time series data for the period (1990 – 2006). The result of the study indicates that government expenditure at the aggregate level has positive impact on the growth of GDP. Al- Khulaffi (2012) employed econometrics method of unit root test, co-integration and Granger causality to study the relationship between government expenditure and economic growth for Qatars' economy using annual data for the period (1980 – 2011). Government expenditure and GDP was found to be co-integrated which prove the existence of long run relationship between GDP and government expenditure in Quarters' economy. Chamorro-Narvez (2012) employed a generalized method of moments as suggested by Arellano and Boad (1991) to examine the effects of the two economic components of government spending; namely, capital and recurrent expenditure on per capita economic growth rate in a set of Latin American countries over the period (1995-2000). The findings suggest that neither government capital nor recurrent expenditure have any impact on the per capita economic growth rate. He opined that the statistically insignificant estimated effects could be due to inefficiency of government spending.

In Nigeria, studies have been conducted to examine the effect of government spending on long run economic growth. Ekpo (1999) examined the effect of government spending in Nigeria, though indirectly, by regressing various categories of public capital expenditure on private investment for

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the period (1960-1990). The results indicate that some categories of government capital expenditure crowds in private investment while others negatively affected private investment. Ekpo concluded that the empirical results still confirm the importance of the public sector in the development process. Aigbokhan (1996) studied the role of public sector in the economic growth in Nigeria for the period (1960-1993) using the regression analysis of a simple growth equation patterned after Ram's (1986) model and Granger causality testing techniques, with the application of co-integration techniques in both cases. The results show that government spending has positive impact on private sector output. However, the overall impact of government spending on economic growth was found to be negative. Nurudeen and Usman (2010) employed disaggregated analysis to investigate the effect of government expenditure on economic growth in Nigeria for the period (1970 -2007). The study uses the co-integration and error correction method to analyze the government expenditure – growth relationship. The results show that government total capital expenditure and total recurrent expenditure have negative effect on economic growth. Connolly and Li (2016) finding shows that an increase in public social expenditure has a significant adverse effect on economic growth, and Babalola (2015) results show that government expenditure has a significant positive impact on economic development in Nigeria. Iheanacho (2016) investigated the contribution of government expenditure to economic growth in Nigeria and found a negative and significant long-term relationship between economic growth and recurrent expenditure. Mitchell (2005) argues that government spending by its nature is often economically destructive regardless of how it is financed.

METHODOLOGY

The econometric method of analysis was employed to empirically examine the relationship between government spending and economic growth in Nigeria. The data collected were subjected to different kind of tests namely Unit root test to examine the stationarity property of the time series data, Co-integration test to ascertain the existence of long run relationship of the variables, Error Correction Method (ECM) to ascertain the speed of adjustment from the short run equilibrium to the long equilibrium state and the Autoregressive Distributed Lag (ARDL) model, otherwise called the bounds testing approach proposed by Pesaran, Shin and Smith (2001).

Model Specification

The data analysis of this study is modelled in an aggregate production function framework (APF). The preference for adopting APF in this work is that, in addition to "conventional inputs'' of labour and capital used the in the neoclassical production function, it permits the inclusion of "unconventional inputs" in the model to capture their contribution to economic growth. The standard aggregate production function is written as

$$Y = AF(K, L) \quad (1)$$

Where Y denotes the aggregate production of the economy (real GDP per capita) and A, K, L are the level of technology, the stock of domestic physical capital and the stock of labour force respectively. When the level of technology, A is ignored, the standard aggregate production function becomes:

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$$Y = F(K, L) \quad (2)$$

Following Feder (1982), Ram (1986) and Grossman (1988), the standard aggregate production function is modified to include the total public expenditure, TPE and rewritten as

$$Y = F(K, L, TPE) \quad (3)$$

In order to properly capture the growth-effect of public expenditure at aggregate level, other variables like fiscal balance (FISB), inflation rate (INFL), broad money (M2) and trade openness (TOP) which are believed to affect economic growth are included in the model. The fiscal balance (FISB) is included because government decisions on spending are interdependent with those of revenue. The ratio of broad money supply to GDP controls for financial deepening while the international trade intensity ratio (trade openness) is meant to capture the degree of the country's openness. The inflation rate is used as measure of the country's macroeconomic stability. The aggregate production function used for the analysis are specified as

$$Y = F(K, L, TPE, FISB, INFL, M2, TOP) \quad (4)$$

The variables of interest in this study are Y and TPE. As earlier stated, the other variables, K, L, FISB, INFL, M2 and TOP are included to serve as controls. From the functional equation above, after taking the natural logarithms of both sides, the estimable equation is specified as follows:

$$\ln Y = a_o + a_1 \ln K + a_2 \ln L + a_3 \ln TPE + a_4 \ln FISB + a_5 \ln INFL + a_6 \ln M2 + a_7 \ln TOP + e_t \quad (6)$$

Econometric Model

The Autoregressive Distributed Lag (ARDL) model, otherwise called the bounds testing approach proposed by Pesaran, Shin and Smith (2001), is adopted in this study to examine empirically the nature of short and long term relationship between government spending and economic growth in Nigeria. As against the conventional Johansen co-integration method that uses a system of the equation to estimate long-run relationship, the choice of ARDL model is based on four major reasons. Firstly, once the model lag order is identified, the ARDL model can be estimated by Ordinary Least Squares (OLS). Secondly, it is possible to estimate the long-run and short-run parameters of ARDL model simultaneously. Thirdly, the ARDL can be applied irrespective of the order of the integration of the regressors, whether purely I(0), purely I(1) or fractionally integrated. However, the procedure will crash if l(2) series is presence. Fourth, this method is efficient especially with small (finite) sample sizes.

Based on Pesaran et al. (2001) as adopted by Choong et al. (2005) and Taban (2010), the vector autoregressive (VAR) model of order p denoted by VAR (p) is constructed to establish the relationship between economic growth and government spending in Nigeria thus:

$$Z_t = \mu_o + \delta_t + \Sigma\varphi Z_{t-1} + \varepsilon_t \qquad t = 1, 2, - - -, T \quad (7)$$

Where μ_o is (k+1) vector of intercepts and denoting a (k+1) vector of trend coefficients. The vector error correction model (VECM) for equation (7) is derived as:

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$$\Delta Z_t=\mu_o+\delta_t+\lambda Z_{t-1}+\Sigma\Upsilon_t\Delta Z_{t-1}+\varepsilon_t \quad (8)$$

where λ and ϒ are vector matrices that contain the long-run multipliers and short-run dynamics coefficients of the VECM respectively. Z_t is a vector of x_t and y_t variables respectively, where y_t is the dependent variable defined as real GDP per capita and x_i = [K, L, TGE, INFL, M2, TOP, FISB] is a vector matrix of a set of explanatory variables. All the variables are transformed to their logarithmic form as in equation (6). As a requirement, y_t must be an 1(1) variable while x_t explanatory variables can either be 1(0) and 1(1). E_t is a stochastic error term. To derive the preferred model, following the assumptions made by Persran et al (2001) in case II, that is, unrestricted intercepts and no trends, Equation (8) becomes an unrestricted error correction model (UECM) as:

$$\Delta Z_t = \mu_o + \lambda Z_{t-1} + \Sigma\Upsilon_i\Delta Z_{t-1} + \varepsilon_t \quad (9)$$

Decomposing into x_t and y_t, the reduced form of Equation (9) is stated as:

$$\Delta y_t = C_y o y_{t-1} + {}^{\beta}{}_{xx}\, X_{t-1} + \Sigma\Upsilon_i\Delta y_{t-1} + \Sigma\Upsilon_i\Delta x_{t-1} + \varepsilon_t \quad (10)$$

Bringing in the variables of interest, the UECM of Equation (10) becomes thus:

$$\Delta RGDP_t = C_o + \beta_1 RGDP_{t-1} + \beta_2 K_{t-1} + \beta_3 L_{t-1} + \beta_4 TGE_{t-1} + \beta_5 FISB_{t-1} + \beta_6 INF_{t-1} + \beta_7 M2_{t-1} + \beta_8 TOP_{t-1} + \Sigma\Upsilon_1\Delta RGDP_{t-1} + \Sigma\Upsilon_2\Delta K_{t-1} + \Sigma\Upsilon_3\Delta L_{t-1} + \Sigma\Upsilon_4\Delta TGE_{t-1} + \Sigma\Upsilon_5 FISB_{t-1} + \Sigma\Upsilon_6\Delta INF_{t-1} + \Sigma\Upsilon_7\Delta M2_{t-1} + \Sigma\Upsilon_8\Delta TOP_{t-1} \quad (11)$$

Where Δ is the first difference operator, ßi are long-run multipliers and Υ_i are short-run dynamic coefficients and C_o is the intercept (drift).

ARDL Testing Approach: Three steps were involved in the testing procedure of the ARDL bounds test. First, OLS is conducted on equation (11) to test for the existence of co-integrating long-run relationship normalized on Y_t based on the Wald test (F-statistic) for the joint significance of the lagged levels of variables. The null and the alternative hypothesis are as follows:

H_o: $\beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = \beta_6 = \beta_7 = \beta_8 = 0$ (no long-run relationship)

H_1: $\beta_1 \neq \beta_2 \neq \beta_3 \neq \beta_4 \neq \beta_5 \neq \beta_6 \neq \beta_7 \neq \beta_8 \neq 0$ (a long-run relationship exists)

The computed F - statistic value is compared with the critical bound values given in Pesaran et al. (2001). The optimal lag length for estimating equation (11) is selected using the Schwarz Bayesian Criterion (SBC). The upper and lower bound critical values assume that the explanatory variables are purely 1(0) and purely 1(1) respectively. The null hypothesis of no co-integration is accepted if the F-statistic lies below the lower critical values. On the other hand, if the F-statistic lies above the upper critical values, the null hypothesis of no co-integration is rejected which means, the dependent and the explanatory variables share a long-run level relationship. The results are inconclusive if the computed F-statistic lies in between the lower and upper bound critical values. When co-integration is established, the next step involves estimating the long-run ARDL model for $RGDP_t$ as follows:

$$RGDP_t = C_o + \Sigma\beta_1 y_{t-1} + \Sigma\beta_2 K_{t-1} + \Sigma\beta_3 L_{t-1} + \Sigma\beta_4 TPE_{t-1} + \Sigma\beta_5 FISB_{t-1} + \Sigma\beta_6 INF_{t-1} + \Sigma\beta_7 M2_{t-1} + \Sigma\beta_8 TOP_{t-1} + \varepsilon_t \quad (12)$$

As the last step, an error correction model (ECM) below, derived from equation (12), is estimated to obtain the short-run dynamic parameters as specified below:

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$$\Delta RGDP_t = C_o + \Sigma\Upsilon_1\Delta RGDP_{t-1} + \Sigma\Upsilon_2\Delta K_{t-1} + \Sigma\Upsilon_3\Delta L_{t-1} + \Sigma\Upsilon_4 TPE_{t-1} + \Sigma\Upsilon_5\Delta FISB_{t-1} + \Sigma\Upsilon_6\Delta INF_{t-1} + \Sigma\Upsilon_7\Delta M2_{t+1} + \Sigma\Upsilon_8\Delta TOP_{t-1} + \mu ECM_{t-1} + \varepsilon_t \quad (13)$$

Where μ is the speed of adjustment parameter and ECM_{t-1} is the residuals that are obtained from the estimated co-integration model of equation (6).

Data and Sources

The government spending-growth effect in Nigeria was examined using time series data covering the period of 38years (1981-2018). The variables of interest were real gross domestic product per capita (proxy for economic growth) (Y) and total government expenditure share in real GDP (TGE). The control variables were labour force (L) and the capital stock of the economy (K) proxied by the real value of gross fixed capital formation (GFCF). This proxy for capital stock has been used in studies like Mansouri (2005), Frimpong and Oteng-Abayie (2006), among others. Other control variables included overall fiscal balance (FISB) share in real GDP, the inflation rate (INFL), the share of real broad money in real GDP (M1) and the share of the sum of export and import values in real GDP (TOP). The quantitative data on these variables were obtained from the Central Bank of Nigeria Statistical Bulletin (Various issues) and World Bank Development indicator (WDI online version, 2018)

Estimation Technique

Time series statistics for the period spanning 38years (1981 - 2018) of the included variables were used in the estimation. The data collected were subjected to some verification tests such as unit root test using Augmented Dickey-Fuller (ADF) test and causality test using granger causality test. The study employed the Autoregressive Distributed Lag (ARDL) model, otherwise called the bounds testing approach to evaluate the nature of relationship between the variables. To ascertain that the model satisfies some basic econometric assumptions, some diagnostic tests such as auto-correlation (serial correlation) test using Durbin-Watson statistics, normality test using Jarque Bera test, ARCH test to check for heteroscedasticity, RESET and LM test to check for misspecification on the model were conducted.

Unit Root Test: Non-stationary data are unpredictable and the result obtained by using non-stationary time series may be spurious. Hence, the need for unit root test to ascertain the stationarity of the data before estimation. Stationarity of the variables was tested using Auqmented Dickey-Fuller (ADF). The ADF test was estimated using the regression equation:

$$\Delta Y_1 = \alpha_1 + \alpha_2 + \beta Y_{t-1} + \theta i \Sigma^m_{i=1} \Delta YX_{t-1} + \mu_t \quad (14)$$

Where Y is variables of interest, Δ is the difference operator, t is the time trend, and μ is the white noise residual of zero mean and constant mean and constant variance ($\alpha_1, \alpha_2, \beta_1$, - - - β_m) is the set of parameters to be estimated. The null hypothesis is that the variable under investigation has a unit root, against the alternative that it does not. The null hypothesis is rejected if the series is stationary.

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Granger Causality Test: The granger causality was adopted to examine the causal relationship between two variables. It follows that if the p values of the variable Y significantly contribute to forecast the value of another variable X, then Y has a Granger causality relationship with X and vice versa. The test is based on the equation below:

$$Y_i = \omega_0 + \Sigma^p_{z=1}\, \omega_z Y_{t-z} + \Sigma^q_{t=1} \tau_i X_{t-1} + \mu_t \quad (15)$$

$$Xi = \psi_0 + \Sigma^p_{z=1}\, \varphi_z X_{t-z} + \Sigma^q_{t=1}\, \alpha_i Y_{t-1} + \varepsilon_t \quad (16)$$

Where Yi and Xi are the tested variables, μ_t and ε_t are error terms, and t implies that the time period, z and i are the number of lags. The null hypothesis is $\tau_i = \alpha_i = 0$ for all i. In the alternative hypothesis that $\tau_i \neq 0$ and $\alpha_i \neq 0$ for at least some i if the coefficient τ_i are significant but α_i are not significant, then X is Granger causal to Y. However, if both coefficients are significant, the causality runs both ways.

Co integration Test: The vector autoregressive (VAR) based co-integration tests was employed to determine whether the variables in the model are co-integrated or not. Co-integration will also be tested to determine the need for using a Error Correction Model (ECM). The Johansen co-integration methodology is given as:

$$Y_t = Z + \Sigma_{t=1}{}^{p}\, U_i\, Y_{t-1} + \varepsilon_t \quad (17)$$

Where z is a (nx1) vector of deterministic variables, ε is a (nx1) vector of white noise error terms and Ui is a (nxn) matrix of coefficients. The ECM has co-integration relations built into the specification so that it restricts the long-run behaviour of the endogenous variables to converge to their co-integrating relationships while allowing for short-run adjustment dynamics.

Error Correction Mechanism (ECM): The model may not be in equilibrium in the short-run, though it is in equilibrium in the long-run. To correct short-run disequilibrium, error correction term is included in the model. Error correction mechanism was first used by Sargam (1983) and latter popularized by Engle and Ganger to correct disequilibrium. The granger representation theorem states that if two variables are co-integrated, then the relationship between the two can be expressed as ECM.

PRESENTATION AND ANALYSIS OF RESULTS

Stationarity (Unit Root) Test Results: There is tendency for non-stationary data used in regression to generate spurious regression results (Granger and Newbold, 1974). To avoid this, stationary status of all the variables were examined by conducting test for the order of integration of the individual variables, before carrying out the ARDL bounds test. The bound test is based on the assumption that the variables were 1(0) or 1(1) series. The presence of 1(2) series renders the calculated F-statistic invalid thereby crashing the ARDL procedure. Hence, pre-testing for unit roots becomes crucial for the analysis as it helps to authenticate that the variables were not 1(2) stationary. The Augmented Dickey-Fuller (ADF) test was conducted for both levels and first difference on each variable. The results, as presented in Table 4.1, reveal that the dependent variable, LRGDP, was stationary at levels, 1(0). As for the explanatory variables, total government

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expenditure (TGE), labour force (LF) and money supply (M2) were stationary at levels, 1(0) while foreign development assistant (ODA), gross capital formation (GCF), inflation rate (INFL), trade openness (TOP) and fiscal balance (FISB) were integrated at the order one, 1(1). Based on this result, the order of integration level of the variables is the mixture of both I(0) and I(1); hence indicting the suitability of the variables for ARDL bounds test.

Table 4.1: Unit Root (ADF)Test for Stationarity

Augmented Dickey-Fuller (ADF) Test			
Variables	Level	1st / 2nd Diff	Status
LGDP	-3.696455**	-	I(0)
LGCF	-0.062945	- 5.024888*	I(1)
LLF	2.766533**	-	I(0)
LTGE	-3.891767*	-	I(0)
INFL	-2.268031	- 4.042320*	I(1)
LM2	-3.251681*	-	I(0)
TOP	-1.293316	- 6.183904*	I(1)
FISB	-0.048435	- 4.810289*	I(1)

Source: Author's Computation

Note: *and ** indicate the rejection of the null hypothesis of non-stationary at significance level 1%, 5% and 10% respectively. The null hypothesis is that the series is non-stationary, or contains a unit root. The rejection of the null hypothesis is based on MacKinnon (1996) critical values.

Lag Length Selection Results: The computation of ARDL F-statistic is very sensitive to lag order selection; hence, before conducting ARDL co-integration test to establish a long-run relationships among the variables, it was imperative to select an appropriate lag length. In chosing the lag length, the various lag length selection criteria such as Akaike information criterion (AIC), Schwarz information criterion (SIC) and the Hannan-Quinn information criterion (HQC) were utilized. This study adopts the HQ criterion on the ground that its optimal lag length is in-between the AIC which has long lag length and SC which is known for short lag length and it performs better. As shown in Table 4.2, two (2) lag was selected based on HQ criterion as the appropriate lag length for the series and to compute the F-statistic for co-integration. The lag length selection test results are presented in Tables 4.2.

Table 4.2: Lag Length Selection Test Result

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-281.6484	NA	4607650.	18.16553	18.57777	18.30217
1	-260.2138	29.47264	1292530.	16.88836	17.34640	17.04019
2	-257.2836	3.845893 *	1154324. *	16.76772 *	17.27157 *	16.93474 *
3	-256.3188	1.206014	1167650.	16.76992	17.31957	16.95212
4	-256.3164	0.002791	1256855.	16.83228	17.42773	17.02965
5	-254.9537	1.533109	1245437.	16.80960	17.45086	17.02216

Source: Author s Computation

Note: * indicates lag order selected by the criterion.

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LR: sequential modified LR test statistic (each test at 5% level); FPE: Final prediction error, AIC: Akaike information criterion, SC: Schwarz information criterion, HQ: Hannan-Quinn information criterion.

Bound Test Co-integration Results:

Table 4.3: ARDL Bounds Testing Result

ARDL Bounds Test
Null Hypothesis: No long-run relationships exist

Test Statistic	Value	K
F-statistic	6.064848	2

Critical Value Bounds

Significance	I0 Bound	I1 Bound
10%	3.17	4.14
5%	3.79	4.85
2.5%	4.41	5.52
1%	5.15	6.36

Source: Authors Computation

The bound test co-integration result is shown in Table 4.3. The result in Table 4.3 reveals that the F-statistic value of 6.065 is greater than the lower and upper bound critical value at 2.5 per cent, 5 per cent and 10 per cent level of significant which confirm the existence of a long run relationship between the macroeconomic variables estimated. However, at 1 per cent level of significance, there is no long-run relationship between the variables.

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Long Run Impact Results

Table 4.4a: Long Run Impact Result

ARDL Cointegrating And Long Run Form
Dependent Variable: LY
Selected Model: ARDL(2, 1, 0)

Cointegrating Form				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
DLY(-1)	0.342709	0.204375	1.676861	0.1065
D(TPE)	0.003270	0.013369	0.244630	0.8088
D(FISB)	0.000022	0.000032	0.684407	0.5003
DLL	0.557197	0.661606	0.842188	0.4080
D(GFCF)	-0.000002	0.000005	-0.438630	0.6649
D(INFL)	0.000099	0.000609	0.163048	0.8718
D(OPEN)	-0.000566	0.000965	-0.586269	0.5632
DLM2	-0.057438	0.070664	-0.812840	0.4243
CointEq(-1)	-0.242139	0.096619	-2.506111	0.0194

Cointeq = LY - (0.1037*TPE + 0.0001*FISB + 2.3011*LL 0.0000 *GFCF + 0.0004*INFL - 0.0023*OPEN - 0.2372*LM2 +26.3383)

Table 4.4b: Long Run Coefficients

Variable	Coefficient	Std. Error	t-Statistic	Prob.
TPE	0.103698	0.060962	1.701031	0.1019
FISB	0.000090	0.000137	0.655221	0.5186
LL	2.301148	2.746346	0.837895	0.4104
GFCF	-0.000008	0.000019	-0.436015	0.6667
INFL	0.000410	0.002458	0.166846	0.8689
OPEN	-0.002338	0.003639	-0.642306	0.5268
LM2	-0.237212	0.292004	-0.812359	0.4246
C	-26.338262	46.078343	-0.571597	0.5729

Source: Author's computation

The long-run impact results of the estimated model is presented in Tables 4.4a and Table 4.4b. The result in the Table 4.4a shows the first difference of each of the explanatory variables while the result in Table 4.4b indicates the long run impact in the natural form. In both tables. total government expenditure (LTGE) has a positive impact on economic growth in Nigeria in the long-run. As for control variables, fiscal balance (FISB), labour force (LF) and inflation rate (INFL)

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have positive effect on economic growth in Nigeria in the long-run while money supply (M2), trade openess (OPN) and domestic capital (measured by gross fixed capital formation (GFCF)) exerted negative impacts on economic growth in the long-run. The result shows that the ECM variable, ECT(-), is negative and significant. It shows that the speed of adjustment from the short-run equilibrium to the long-run equilibrium is 24.2 per cent. This implies that if there is any distortion in the system, the system will be adjusted by 24.2 per cent in each time period.

Short Run Impact Results: The short run result presented in Table 4.5 reveals that government expenditure (TGE) has a positive impact on economic growth in both the first and second difference. As for explanatory variables, domestic investment (GFCF) and money supply (M2) had negative impact on real GDP at both first and second difference while inflation rate (INFL) and trade openness (OPEN) had positive impact on real GDP at first difference and negative impact at second difference.

Table 4.5: Short-run Impact Result

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FISB(-1)	5.12E-05	9.01E-05	0.568185	0.5813
FISB(-2)	8.86E-05	7.84E-05	1.130222	0.2824
TPE(-1)	0.024397	0.023087	1.056737	0.3133
TPE(-2)	0.002616	0.016617	0.157407	0.8778
LGFCF(-1)	-0.014531	0.012549	-1.157906	0.2714
LGFCF(-2)	-0.016204	0.013290	-1.219212	0.2483
INFL(-1)	0.000980	0.000775	1.264428	0.2322
INFL(-2)	-9.02E-05	0.000856	-0.105411	0.9179
LM2(-1)	-0.047569	0.232170	-0.204891	0.8414
LM2(-2)	-0.035037	0.137884	-0.254102	0.8041
OPEN(-1)	0.002135	0.001651	1.293589	0.2223
OPEN(-2)	-0.002180	0.001218	-1.790328	0.1009

Source: Authors' Computation

Granger Causality Test Results: The essence of granger causality test is to actually ascertain whether a causal relationship exists between two variables of interest as well as indicate the direction of influence. The rule states that if the probability value lies between 0 and 0.05, there is a causal relationship. The granger causality test using the pairwise approach result as presented in Table 4.6 shows that TGE does not granger cause RGDP since the probability value of 0.5824 is greater than 0.05 against Keynesian theory. However, RGDP granger cause TGE because the probability value of 0.0044 is less than 0.05. Hence, there is unidirectional causality from LRGDP to LTGE for the observed period in agreement with Wagner's Law.

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Table 4.6: The Results of Pairwise Granger Causality Tests.
Lags:1

Null Hypothesis:	Obs	F-Statistic	Prob.
LTGE does not Granger Cause LGDP	25	0.31149	0.5824
LGDP does not Granger Cause LTGE		10.0987	0.0044

Source: Author's computation

Diagnostic Test Results

Autocorrelation Test Results: The model was checked for autocorrelation using the Breusch-Godfrey Serial Correlation LM Test. The results presented in Table 4.7 show that there is no evidence of serial correlation as the p-values of the model (0.1285) was greater than 0.05 level of significance.

Table 4. 7: Breusch-Godfrey Serial Correlation LM Test:

F-statistic	3.104845	Prob. F(1,6)	0.1285
Obs*R-squared	8.184244	Prob. Chi-Square(1)	0.0042

Source; Author's Computation

SUMMARY, CONCLUSION AND RECOMMENDATIONS

Economists have divergent views on the relationship between public expenditure and economic growth. The pro-market viewpoint argues that large government expenditure is a source of economic instability and has negative effect on economic growth. The anti-market view, on the other hand, stresses positive effect of government spending on economic growth. This study employed modified and extended aggregate production model to examine the effects of public expenditure at its aggregate level on economic growth in Nigeria for the period (1981-2018) using bound test approach. The data used for the study were obtained from the Central Bank of Nigeria Statistical Bulletin (various issues) and World Development Indicator (2018). The cointergration result indicates the existence of long-run relationship between total government expenditure (LTGE) and economic growth in Nigeria. ARDL results show that total government expenditure (TGE) impacted positively on economic growth in Nigeria both in the short-run and long-run, in line with keynesian theory view of the need for government active intervention in the economy using fiscal policy instruments. For the control variables, fiscal balance (FISB), labour force (LF) and inflation rate (INFL) had positive long-run impact on economic growth in Nigeria while money supply (M2), trade openess (OPEN) and domestic capital (GFCF)(proxied by gross fixed capital formation) had negative impact on economic growth in the long-run. The granger causality test result indicates the existence of uni-directional causal relationship from LGDP to LTGE for the observed period where LRGDP granger cause LTGE, in line with Wagner's theory. The model

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was checked for autocorrelation using the Breusch-Godfrey Serial Correlation LM Test and the result shows that there was no evidence of serial correlation.

Based on the findings of this study, it is recommended that there should be proper utilization of public fund in the provision of critical social and economic overhead capital especially security, electricity supply and road infrastructure which are precusors to effective economic performance. There should be proper management of public fund; hence, there should be accountability, transparency and fiscal responsility in carrying out public assignment. There should be committed leadership, entrenchment of good governance in every sphere of government activity and weak institutions in the country should be replaced with strong ones. Finally, public expenditure would impact more on the economic performance if more public fund is freed for development by tackling corruption in the country. Hence, the fight against corruption in the country should be frontally confronted. It should go beyond political office holders and government functionaries preaching that there is zero tolerance for corruption or selective treatment on issues of corruption. Public institutions charged with the responsibility of handling corruption matters in the country should be overhauled and strengthen to ensure timely and proper handling of corruption matters, and those found guilty should face stringent penalty, to serve as deterient to others.

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