RE-EXAMINATION OF WAGNER'S HYPOTHESIS: IMPLICATIONS FOR THE DWINDLING OIL REVENUE IN NIGERAN ECONOMY

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ABSTRACT

This study is set out to examine the impact of aggregate government expenditure on the growth of Nigeria's economy on the basis of Wagner's hypothesis. The methodology adopted for the empirical study was multiple regression method employing ordinary least square (OLS) technique to examine the properties of the time-series data used for the analysis. These include unit root tests, tests for co-integration as well as Vector Error Correction (VEC) tests, to determine the short-run and long run relationship of the series used. Granger causality test was also carried out to confirm the presence or absence of any feedback effect and the direction of such feedback (if any) between the variables under review. The regression results show that aggregate government expenditure is positively and significantly related to economic growth in the long run. Secondly, capital and recurrent expenditure components of government expenditures in Nigeria revealed an inverse relationship with economic growth. Finally, a unidirectional causality running from economic growth to government expenditure without feedback was confirmed in line with Wagner's submission. Based on the findings above, the following prescriptions were proffered: government should increase its aggregate expenditures and closely monitor its execution to ensure that such expenditure is used for what it was budgeted for; cut-down on its wasteful recurrent expenditures so as to accelerate economic growth; etc.

Contribution/ Originality: This study contributes to the existing literature by illuminating the theoretical and empirical linkages among the aggregate government expenditures and Nigeria's economic growth which were inadequately investigated in previous studies. The linkages enhance our understanding about various interpretations which have shaped the link between economic growth and government expenditure since Wagner's theoretical postulations.

1. INTRODUCTION

In the field of economics, government expenditure and its influence on economic growth in the long run period have been issues of interest for decades. The argument has proceeded along two stages: (i) influence of state expenditure on the growth of the economy, and (ii) influence of the growth of the economy on the state expenditure.

Historically, earlier work that explored the influence of economic growth on government spending is the Wagner (1890) study. In his award winning theory, Wagner (1890) introduced the hypothesis of expanding state expenditures. The theory postulates that as government expands in its activities, the growth rate in government

spending will be proportionally in excess of the growth in gross national product (GNP). This is among the early studies which views economic growth as the principal determinant of increase in government expenditure (Loizides and Vamvoukas, 2005).

In addition, several empirical studies have been carried out to test Wagner's hypothesis that growth of the economy causes increase in state spending. Some of these studies are Ganti and Koulluri (1979) and Georgakopoulos and Loizides (1994); Kolluri *et al.* (2000) and Loizides and Vamvoukas (2005). Their findings vary from one nation state to another.

Nevertheless, with the emergence of Keynessian macroeconomics, another set of studies appeared (Loizides and Vamvoukas, 2005). These sets of studies are aimed at testing the alternative hypothesis that government spending stimulates the growth of the economy (the inverse of Wagner's hypothesis). Along this thinking, the adherents to this school believed that government expenditure stimulates economic growth (Loizides and Vamvoukas, 2005). The reasons advanced are that government provisions of infrastructures decreases the production cost of output in the private business sector, on the supply side, and that government expenditures increases aggregate demand and this increases market for private sector output on the demand side. As a result, government spending could be viewed as exogenous factor to the private sector that increases aggregate amount of goods and services produced in the economy. Just like in the case of Wagner's hypothesis, there are empirical studies testing the influence of state expenditure on the economic growth of the state. Such empirical studies include: Landau (1986); Sharma (2012); Ghali (1997); Shivaranjami (2010); Phalavani *et al.* (2011); Usman (2014) among others. The results of their findings also vary from one country to another and even from one time period to another.

In Nigeria, there is evidence that state expenditure and gross domestic output are growing as time goes on. For instance, statistics show that between 1970 and 2012, GDP of Nigeria increased by an average of 3.4% per annum for the period of 1971-1980, 0.5% for the period 1981-1990, 1.9% for the period of 1991 to 2000 and 8.1% for the period of 2001 to 2010.

 The overall average annual increase for the period of 1970 to 2014 is 3.6%.

As regards government expenditure, there has also been upsurge in the rise in state expenditure in Nigeria. For the period from 1971-1980, government expenditure increases by an annual rate of 2.2% and for the periods 1981 to 1990, 1991 to 2000, and 2001 to 2014, the average annual increase in government expenditures are 1.9%, 1.7%, and 33.2% respectively. The average annual increase for the overall period 1970 to 2014 is 8.6% per annum. The mean population growth in Nigeria within the period of this review is 2.59% per year and when this is subtracted from 3.6% GDP growth, the net increase in GDP per year is 1.01%. Following the rule of seventy (Snowdon and Vane, 2005) the wellbeing of Nigeria will double every 70 years.

From the foregoing discussions, there are two theoretical postulations regarding the link between state spending and economic growth. The neoclassical school of thought postulated that upsurge in the growth of the economy fosters increase in state spending. While Keynesian school of thought postulated the opposite view point that government expenditure engenders increase in the growth of economy. The emphasis of this particular study is to examine the effect of government spending on the growth of the economy, which is, aimed at ascertaining if state expenditure significantly stimulates growth of the economy in Nigeria.

1.1. Statement of the Problem

Development economists have concluded that there are two main perspectives of viewing economic growth. These are the neoclassical economics and Keynesian school of thought. As submitted by the neo-classicals, economic growth is a function of technology-a public good that is available to all societies. The argument goes that since the acquisition of technology cannot be influenced within the state, economic growth was therefore seen as a manner from heaven which can be acquired by luck (Solow, 2000). This means that the society through government policies cannot influence economic growth.

However, the emergence of endogenous growth theory changed the situation completely. The endogenous growth model demonstrated that economic growth can be determined by the society through government fiscal and monetary policies. The theory asserts that growth is a consequence of rational economic decisions by economic agents (Governments, firms and households). Thus, firms spend resources on research and development (R & D) in order to increase their profits through technological innovations. Households invest in education to improve human capital and increase their life time earnings.

This improves their welfare. Government improves growth by providing public goods and services such as electricity, roads, railways, airports, Sea-ports etc. Through the aggregation of these individual economic agents, decisions on the growth rate of the economy become a variable of choice. It is also argued that government capital expenditure crowds out private investment through inefficient use of scarce productive resources and rise in interest rate resulting from borrowing from the capital market which according to Iyoha (2004) increases the cost of capital. This reduces private investment and growth of the economy. Amidst these conflicting evidences on the influence of state in economic growth, it is essential to verify which of the positions predominate in Nigeria. This becomes compelling especially as Nigeria's total expenditure shows upward annual trending without an appreciable increase in her economic growth indices. In addition, recent works have been undertaken by other researchers on this issue, yet, the findings have not been conclusive. Thus, while Wagner insists that economic growth causes government expenditure to increase, Keynesians adherents argued that it is the other way round. What then is the Direction of the causality between the two in Nigeria and what is the implications on the economy, especially with respect to the recent dwindling oil revenue?

1.2. Objectives of the Study

The broad objective of this study is to examine the impact of federal government aggregate expenditures on the growth of Nigeria's economy. Specifically, the study intends to:

(i) Ascertain if there is any long run significant relationship between aggregate government expenditure and economic growth in Nigeria.

(ii) Determine if there is any significant long run relationship between federal government capital expenditures and economic growth in Nigeria

(iii) Examine to what extent federal government recurrent expenditures predict the long run economic growth in Nigeria

(iv) Establish if there is any causal significant relationship between aggregate federal government spending and economic growth in Nigeria

1.3. Hypotheses of the Study

The following maintained hypotheses guided the study:

H_{o1}: There is no significant long run equilibrium between aggregate government expenditure and economic growth in Nigeria.

H_{o2}: There is no significant relationship between government capital expenditures and the growth of Nigerian economy

H_{o3}: There is no significant long run equilibrium relationship between government recurrent expenditures and the growth of Nigerian economy

H_{o4}: Causality does not run from aggregate government spending to economic growth in Nigeria

2. REVIEW OF RELATED LITERATURE

2.1. Theoretical Review

The question of the association between state expenditure and growth of the economy has three basic theoretical possibilities: the first is the Wagner's hypothesis of increasing government spending proposed by Adolf Wagner, the second is the Peacock and Wiseman Hypothesis of increasing state expenditure and the third is the Development Model of public Expenditure Growth.

2.2. Wagner's Hypothesis of Increasing Government Expenditure

Wagner's hypothesis of rising state activities as put forward by Adolf Wagner (1835-1917), a German economist built his hypothesis of rising government involvement in state on past perspectives. Wagner's Law states that there are natural propensities for the actions of diverse sectors of a state (such as federal, and regional governments) to rise both intensively and extensively. There is a practical association among economic growth and state functions with the resultant effect that the public sector grows faster than the growth of the domestic product.

As Bhatia (2008) points out, it is difficult to know if Wagner (1890) theory was referring to: (a) total amount of state spending, (b) proportion of state spending to the gross net domestic product, otherwise (c) percentages of government sector to the absolute economy. Musgrave (1894) was of the opinion that Wagner thought of percentage of government spending to total GDP above. Niti (1903) reinforced Wagner's theory and argued with practical proof that it was regularly relevant to many states which differ greatly in structures and characteristics. Governments at various levels, no matter their levels (federal, state, and local governments), whatever is their motive, non-involvement or warlike, and magnitude, etc. had demonstrated the similar propensity of rising states spending (Bhatia, 2008).

Bhatia (2008) supporting Wagner's theory listed reasons for the inherent long-term tendency recorded in history to include the following: (i) an expansion in the conventional duties of the government. Internal and external territorial protection becomes increasingly very costly over time. Internal administration of the government continues to increase in size, in terms of area covered and the scope of activities. Government activities have to be managed by experts in their fields of specializations. With the progress of society, running of government and its services had to become more extensive, cumbersome and expensive so as to retain efficiency. Secondly, there is increasing state activities. Over time, state activities have expanded in coverage more than the traditional limits of protection, fairness, rule of law and orderliness, provision of schools and administration of health services. With expanding consciousness of its duties to the community, the state started increasing its functions in traditionally unfamiliar fields of social and economic welfare. The measures included efforts to enrich cultural life of the people such as old age pensions, disaster relief etc. Subsidies for some goods also experienced an upsurge. Majority of governments as well engage in the process of ensuring that there is equity, justice and fair play through reducing income and wealth inequalities. Thirdly, the call for the provision and the expansion of the areas of state utilities received increasing attention. All these lead to rising state spending. The criticism of wagner's law was based on the argument that Wagner was contemplating long run tendency rather instead of short run variations in government spending. That since his study was relied on chronological knowledge, the exact quantitative association between the magnitude of rise in state outlay and the duration taken was not determined logically.

2.3. Peacock and Wiseman Hypothesis of Increasing State Expenditure

Another hypothesis explaining the increase of government spending is propounded by Wiseman and Peacock through their work on government spending in the United Kingdom (UK) during the period 1890-1955. The hypothesis states that government spending does not rise in an even and incessant manner, but in jerks or pace like manner. That sometimes, some societal or communal upheavals occur, causing a necessity for rising state spending

that the available revenue of the state cannot support. Before this time, there is no enough pressure to force government to increase its own spending. The need for increased state expenditure makes public spending to increase and after the upheaval, the increase in state expenditure is never brought to its original levels.

The criticism of this hypothesis is based on the argument that, Wiseman and Peacock are concerned about the reoccurrence of abnormal situations which cause substantial jumps in public spending and incomes. They forgot to realize that from historical facts, other factors such as advancement of the economy structural changes therein, systematic expansion of the public activities, increasing population, urbanization, increasing awareness of the civil rights on the part of the people, coupled with an increasing awareness of its duties on the part of the state, lead to an upward movement of public expenditure.

2.4. Development Model of Public Expenditure Growth

This theory is otherwise known as Musgrave theory. Musgrave argued that at low level of capital income, the demand for public services tends to be generally high. The reason is that at the starting point of economic growth, the income level is very low and government strives to provide the basic infrastructure facilities for economic take-off.

However, when the per capita income starts to rise above the low level of income, demand for services supplied by the public sector tends to rise. At high level of income typical of developed economies, the rate of public sector growth tends to fall as more basic wants are satisfied.

2.5. Empirical Literature Review

Scholars have investigated the influence of state spending on the growth of the economy in different regions of the world as well as in the different countries too. Some examined the influence of state outlay on growth, others the effect of the size of outlay of government on growth, while others assessed the effect of public spending on certain segments of the economy and how this impact on growth. However, there is no consensus among scholars and researchers on how government expenditure impacts on economic growth yet. Empirical literature reviewed in this section is classified into empirical evidences on impacts of government expenditure on economic growth in OECD countries, Middle-East countries, Asian countries, developing countries, other African countries, and Nigeria.

In OECD countries, Alfonso and Furceri (2007) analyzed the impact of government size, its composition and volatility on the growth of the economy on member countries. On theoretical motivation of the research, the study suggested based on: (i) Lucas (1988) that government spending on education increases the level of human capital; (ii) Barro (1990) that government spending improve public infrastructure provision; (iii) Romer (1990) that government spending on research and development (R&D) improves technology and increases productivity of production inputs, and (iv) Aghion *et al.* (2005) and Fatas (2002) all argued that government spending smoothens business cycles through automatic stabilizers and help to stimulate private output. All these can increase long run economic growth.

Myles (2009) studied the role of taxation on the growth of the economy in OCED nations. The study states that endogenous growth model portrays growth as the consequence of rational economic decisions. These decisions are the firm's decisions to spend on research and development (R&D), consumers invest in education to increase life time earnings and this increases human capital, and government provides public input, encourages foreign private investments and provide health facilities. All these can stimulate growth potentials of a country. The aggregation of all these can determine the rate of growth. The government decision to tax can affect each of these variables and in effect determine the level of output. When we view these variables from the perspective of endogenous growth, the impact of taxation on economic growth becomes more apparent. Corporate taxation affects the level of investment and must also affect economic growth. Personal income tax affects individual decision to invest in education and

this also affect economic growth. Finally, the tax rate affects the ability of government to provide public inputs, education and health facilities and thus influencing economic growth.

In his model, Myles stated that the growth proportion of an output is measured by dividing the output of the preceding year with the current year and multiplying the result by 100 to obtain the percentage increase in output. The study demonstrated, through modeling output growth with taxation that the growth rate varies with tax rate. At low level of taxation on input (when tax rate is equal to zero) output are very low and growth rate is zero. When tax rate is low, the growth rate is low. As tax rate increases, growth rate also increases and reaches maximum. Further rise in tax percentages reduces the growth ratio. Thus the relationship between tax percentage and the growth percentage has an overturned *U* shape.

Irmen and Kuchnel (2008) provided a comprehensive survey of productive state spending on the growth of the economy. In analyzing productive state spending and its effect on the growth of the economy, two approaches were involved: the flow approach as specified in Barro (1990). In the former, productive government expenditure is regarded as the stock of goods. It is considered that government provision of public goods is regarded as a flow; the provision of government services instantly impact the production function of firms. When government spending is regarded as a stock, it increases to the accumulation of government capital and influences the technical of private businesses in the future. In either case, the public ownership of production input from individual consumers and business firms are transformed into production inputs and individual firms have access to these productive inputs. If government productive activity is regarded as flows, the steady state economic growth rate will be such that the growth rate in government productive activities will grow in proportion to all other variables. When productive government spending is regarded as a stock, productive government spending is not provided in the current spending but in the past productive government expenditure.

Using modeling system, Irmen and Kuchnel (2008) made the following conclusions. State capital expenditure is essential for a reasonable economic output per head. In the absence of productive state activities, the economy will return to the neoclassical growth without technological growth and so the aggregate production frontier will show reducing returns to productive inputs and without long run sustained growth. At the individual firm's level, there is constant return with respect to private capital. At the society or social level the growth percentage in output is proportional to the growth ratio in government productive activity and these are proportional to private capital growth rate. Secondly, the immediate flow of state outlay is appropriate to the magnitude of the total output. These assumptions hold only when the economy is in the steady state growth rate.

Third, state capital spending affects steady state growth rate in two ways: (i) it impacts directly on technology; and (ii) indirectly by encouraging investors via giving funding incentives. The immediate result is salutary one with exception of tiny economies where growth rate of consumption is influenced by factors external to the economic system. Fourth, in maximizing the welfare of the society, government spending has to be reduced and government investment must be increased. Using the stockpile concept, the advantage from present state investment is lesser but they supplement about tomorrow's benefit. Further, to achieve "Parento-efficient" allocation, appropriate fiscal policy is required. A strictly positive tax has to be imposed to reduce the congestion of private capital because of negative externalities such as congestion, increased inequality in the society, and the tendency to embark on corrupt activities. Government imposes tax to provide funds for this. On the other hand, government itself has the tendency to be corrupt, if balance has to be struck between private corruption and public corruption. This means that there must be a tax rate that minimizes both (Barro, 1990).

Backgrounder (2008) investigated factors that make government expenditure not to stimulate the growth of the economy. The work analyzed the myth about government spending stimulating economic growth. This work further insisted that the more government spending is, the higher the level of taxation from the public and therefore the more transfer payment are made. Backgrounder further insisted that increasing productivity required increasing material capital and human capital. This work further posited that the functioning of the market mechanism is

another important ingredient that stimulates growth and productivity. Cooray (2009) analyzed impact of public spending on economic growth.

This work uses neo-classical production frontier in the estimation of the paradigm. The study incorporated not only the size of government but the quality of governance. This work adopted generalized moment method (GMM). The size of the state is measured based on the magnitude of total government spending. The quality of governance is base on the quality of government decision-making. The study was based on 71 countries, both developing and developed. The study showed that both the size and the quality of governance have stimulating effect on the level of economic growth.

Gregoriou and Ghosh (2007) examined the effect of government expenditure on the growth of the economy in a non-homogenous group of 15 underdeveloped countries (Sudan, Zimbabwe, Argentina, Pakistan, Malaysia e.t.c). The study made use of generalized method of movement (GMM) in its studies deriving the data fro the period of 1972 to 1999. The data were obtained from the Global development Network Growth database. The study made use of the computed average capital spending and average recurrent spending as the ratio of total output. The study made use of GMM to take care of the problem of endogeneity of the variables. Another assumption of the model was that the error terms were not correlated with the repressor. The study used the fixed effect model of regression analysis. This assumes that the panel units are not identical and the intercept exhibits the difference across the countries. The result of the study demonstrated that for countries with heavy government spending, government expenditure exerted significant impact on economic growth. Those countries with small government spending, public spending did not affect the growth of the economy.

Odhioma (2013) investigated the causality linking public spending and the growth of the economy in South Africa in a bi-directional way from public expenditure to the growth of the economy and from the growth of the economy to public spending. The study relied on data taken from South Africa. Three variables were involved in the study. They are government expenditure, the real total output and the degree of unemployment in South Africa. This work adopted the standard ARDL model-bounds testing model to determine the linkages between the variables. The objective of the work was to test the Keynesian hypothesis that public spending causes economic growth to take place, that is, government spending leads to growth to growth in the real GDP. This hypothesis was tested against that of Wagner that increasing state activities measured on the basis of government spending is due to increasing economic activities. This means that economic activities can cause increased expenditure. This is known as Wagner's law of rising state activities. The findings of this study showed causality running from both sides from public expenditure to the growth of the economy and public spending. The result was based on standard granger causality analysis. The result of ARDL analysis showed a one way causality running from the growth of the economy to public spending. Thus the Wagner's thesis is not rejected in South Africa. For unemployment vis-à-vis the growth of the economy and public expenditure, the Grangers causation came from public expenditure to unemployment and from development of the economy to unemployment. We thus say, there is one way causality from the growth of the economy to unemployment and from government spending to unemployment.

In Nigeria, public expenditure and its effect on the growth of Nigeria economy has been investigated over the years. One of such studies is that of the Loto (2011) who examined the influence of public sect oral outlay on the growth of the economy during the period of 1980 to 2008. The study selected five (5) key sectors of the economy: security, health, education, transport and communication, and Agriculture. The theoretical background of the study was based on Barro (1990) who postulated that government productive investment are expected to stimulate economic growth. On the other hand, non-productive government spending, if it is excessive beyond the level that is necessary to implement productive investment will only retard economic growth. This means that below the threshold, unproductive government spending (consumption spending) is ineffective productive investment.

Productive government investments are expected to stimulate economic growth, and for a number of reasons. One, it contributes to capital accumulation. The productive government spending provides services that are not

attractive to the market forces such as health and mass education, as well as excludable public goods such as electricity, road net work, railways, airport, e.t.c. The model used in this study was built on Barro (1990) and Moosa (2002) whose works were built on the endogenous model. The models employed by these studies emphasized that the growth maximizing ratio of public expenditure to the GDP, need to be equal to the public services elasticity in the aggregate production function.

Obioma and Ozughalu (2010) investigated the interaction between government revenue, expenditure and their effect on economic growth in Nigeria. This study was anchored on the belief that understanding the relationship between revenue earning and government spending will ensure the formulation of policy to ensure fiscal discipline and avoidance of unsustainable fiscal deficit. This can help in using government policy to further the course of economic growth (see (Wolde-Rufael, 2008; Chang, 2009)). The study was designed to test the hypothesis of spend-and-tax advanced by Peacock and Wiseman (1961;1979) which postulated that changes in revenue earned by the government causes changes in government expenditure. The reason for this is that economic or political crisis can cause government expenditure to increase and this can make taxes as well to increase. And once this takes place, the situation becomes permanent even after the crisis. This is known as displacement effect (Bhatia, 2008; Chang, 2009). An alternative hypothesis is that of fiscal synchronization hypothesis attributed to Musgrave (1966) and Melzer and Richard (1981) who stated that both government revenue and expenditure are jointly determined. So there is a bi-directional causality between the two. This means that government spending causes government revenue and vice-versa. There is also independent or institutional hypothesis which states that both are independent of each other and neither government revenue causes government spending nor government spending causes government revenue. This hypothesis was attributed (Baghesttani and McNown, 1994).

Nurudeen and Usman (2011) examined the impact of public expenditure on growth based on disaggregated approach. The data employed were from the central bank of Nigeria covering the period of 1970 to 2008. The study was based on the theoretical reasoning of the Keynesian and the neoclassical economist. Keynesians and the neoclassical economist view the effect of government spending on output differently. The Keynesian economists emphasized that government expenditure on provision of public goods and infrastructures contribute to the growth of the economy both in the short run and in the long run terms. This is because Keynes assumed that the economy is always operating at less than full employment equilibrium. This is because government spending is capable of raising aggregate demand and thus stimulates investment, output and employment. The neoclassical economists assumed that the economy is always operating at full employment equilibrium and so if government spends more money than the revenue, it generates, the deficit spending will lead to inflation and this will cause distortion in the level of economic activities.

Ademola (2012) examined contributions of public spending and manufacturing on the growth of Nigerian economy. The study emphasized that the choice of manufacturing as one of the key determinants of economic growth was based on the perception of manufacturing as the engine of growth. It is the engine of growth because it is capable of generating a lot of employment to the masses; it provides market for raw materials and intermediate inputs; among others. The study identified the role of fiscal policy in an economy as: allocation, distribution of resources based on Musgrave and Musgrave (1984). This means that government can ensure effective utilization of limited resources, equitable distribution of income and stabilization of economic resources. By this we mean that government functions help to stimulate economic activities and manufacturing activities.

3. RESEARCH MEHODOLOGY

Since the study requires testing the effect of some exogenous variables on endogenous variable, Expo-facto research design becomes appropriate for this study. However, the methodology adopted is multiple regression based on Musgrave (1894) model specification of Wagner's law of state activities. However, the model was modified to suit Nigerian case. The unique departure of this work from the previous work on Wagner's thesis is the breaking up

of Aggregate government expenditures into its composition such as capital and recurrent expenditures. The essence is to measure the effect of each component on the growth of Nigeria's economy. This approach is aimed at assisting the author proffer policy advice to the government on which component to increase or cut down in its desire to achieve vision 2020-20.

3.1. Model Specification

To achieve the above goal, the author modified Wagner's hypothesis to suit Nigeria case and each objective tested with separate model as shown below:

3.2. Model Specification for Objectives One and Two

To capture the effects of both capital and recurrent government expenditures on Nigeria's economic growth, model (3.1) below was used:

$$RGDP_t = \alpha_0 + \beta 1 RGCEt + \beta 2 RGREt + \beta 3 RAGEt + \mu_1 \qquad (3.1)$$

Where,

$RGDP_t$ = Real Gross Domestic product at time t (proxy for economic growth)

$RGCE_t$ = Real Government capital expenditure at time t

$RGRE_t$ =   Real Government recurrent expenditure at time t

$RAGE_t$ = Real Aggregate government expenditure at time t

μ_t =   Stochastic error term (Omitted variables)

α_0 =   Intercept

$\beta_1 = \beta_3$ =   Parameters to be estimated

A priori expectation: $(\beta_1 - \beta_3 > 0)$

3.3. Model Specification for Objective Three

Objective three of this study is meant to establish the direction of causality between aggregate government expenditure and economic growth in Nigeria. To address this problem, the famous Granger causality test was extensively applied.

3.4. Estimation Procedure

The author shall first of all perform a unit root test in order to produce a meaningful estimate. This is because most of the macroeconomic time-series have unit root and the regression of a non-stationary time series on another non-stationary time series is bound to produce a spurious regression (Greene, 2012). Thus, this study first tested the nature of the time series to determine whether they are stationary or not and if stationary, we determine their order of integration. The order of integration assisted us in determining the long-run relationship among the variables. To do this, the Augmented Dickey fuller test was used. The tests were conducted with a deterministic trend (t) for each of the series. The general form of ADF test is estimated by the following regression.

$$\Delta y_t = \alpha_o + \alpha_1 y_{t-1} + \sum \alpha_1 \Delta y_i + \delta_t + \varepsilon_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots. (3.3)$$

Where Y is a time series, t is a linear time trend, Δ is the first difference operator, such that $\Delta y_t - 1 = y_t - y_{t-1}$, b_0 is a constant, n is the optimum number of lags in the dependent variable and ε_t is the random error term. The null hypothesis is that $\alpha_1 = 0$. If the null hypothesis $\alpha_1 \neq 0$, then we conclude that the series under consideration $\Delta(y_t)$ has a unit root and therefore non-stationary.

If the ADF test fails to reject the test in levels but rejects the test in first differences, then the series contains one unit root and is thus integrated of order one 1(1). If the test fails to reject the test in levels and first differences but rejects the test in second differences, then the series contains two unit roots and is integrated of order two 1(2).

3.5. Co integration Tests

After the unit root tests, the author tested for co-integration among variables used. Co-integration indicates the presence of a linear combination of non-stationary variables that are stationary. In a case where co-integration does not exist, it means that the linear combination is not stationary and the variable does not have a mean to which it returns (Maddala, 2001). The presence of co-integration however implies that a stationary long-run relationship among the series is present. The Mackinnon ADF or Residual procedure was adopted in this study.

3.6. Vector Error Correction Model (VECM)

If variables are co integrated, vector error correction model shall be specified and estimated using standard diagnostic tests. According to Gujarati and Porter (2009) "the coefficient of Error Correction term measures the speed of adjustment of the short run relation to unexpected shocks". When the dependent variables are above the level indicated by the explanatory variables, the dependent variable will be expected to fall, and vice versa, in order to maintain long run equilibrium.

As noted by Koutsoyiannis (2007) "the Vector error Correction model (VECM incorporates both the long run and short run effects simultaneously". The advantage of vector error correction model is that once variables are confirmed to be non-stationary but co-integrated, the estimates from such vector error correction model are more efficient than the OLS. The vector error correction model also saves one from the agony of endogeniety crisis.

3.7. Granger Causality Tests

The causality test was conducted to establish the existence or not of any feedback relationship, and the direction of causality (if any) among the variables under investigation.. This was done using the Granger causality tests.

3.8. Data Discussion

The above equations are estimated using annual time-series data from 1970-2014. The estimation period was determined largely by the availability of adequate data on all variables. Below are the variables and how they are calculated where applicable:

Real Gross Domestic Product (RGDP): This was obtained by dividing nominal GDP at current market Prices by the Consumer Price Index; ie GDP/CPI

Real Government Aggregate Expenditure (RAGE): RAGE was measured as the sum of both recurrent and capital expenditure and divided by CPI to derive the real government expenditure; (RAGE/CPI)

Real Government **Capital expenditure (RGCE):** This was measured by the summation of federal Government capital expenditure and divided by CPI

Federal Government Recurrent Expenditure (RGRE): This is the ratio of Federal Government recurrent expenditure to the consumer price index; GRE/CPi

3.9. Sources of Data Employed

The above time-series data were generated from the following sources:

1. CBN- statistical Bulletin and Annual Reports and Statement of accounts (various years) 2012, 2014

2. International Financial Statistics (IFS) published by the International Monetary Fund (IMF). 2012, 2013 and 2014

3. Nigerian Annual Abstract of Statistics published by the Federal Bureau of Statistics (FBS), Abuja. 2013 and 2014.

4. PRESENTATION AND ANALYSIS OF EMPIRICAL RESULTS

4.1. Unit Root Tests Result

Table 1 presents the estimates of the unit root tests for the stationarity of the variables, using the Augmented Dickey fuller statistic. The Augmented Dickey-Fuller statistic for unit root has an added advantage of taking care of the possible autocorrelation in a function. The tests were conducted at both 1% and 5% levels of significance.

Table-1. Unit root test on the variables

Variables	LEVEL			1ST DIFF.			REMARKS
	ADF STAT	1%CRITIC VALUE	5%CRITICAL VALUE	ADF STAT	1%CRITI VALUE	5%CRITIC VALUE	
RGDP	0.008106	-4.180911	-3.515523	-10.01505	-4.192337	-3.520787	1(1)
GCE	-1.945053	—4.180911	-3.515523	-11.10938	-4.192337	-3.520787	1(1)
GRE	-2.645311	-4.180911	-3.515523	-5.936134	-4.192337	-3.520787	1(1)
AGE	-4.500237	-4.180911	-3.515523	-	-	-	1(0)

Source: Data Analysis using E-view 7.0 software

As shown on the table, the unit root results indicate that real gross domestic product (RGDP), government capital expenditure (GCE), and government recurrent expenditure (GRE) are stationary only after first differencing at both 1% and 5% critical or significant levels, whereas, aggregate government expenditure (AGE) is stationary at levels. This became a motivation to run cointegration tests in order to find out the existence or not of any long run relationship among the variables. As stated by Wooldridge (2007) and Greene (2012) " if more than one variable is not stationary at levels, there is every need to run a co-integration test in order to determine if the variables have any long run stable or equilibrium relationship. In view of the fact that some of the variables were stationary after first differencing, the Johansen and Juselius (1990) co-integration tests for co-integration on the variables were conducted and the results shown on tables 2 and 3 as shown below:

Table-2. Unrestricted Cointegration Rank Test (Trace)

Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.744279	105.9119	63.87610	0.0000
At most 1 *	0.482938	45.91057	42.91525	0.0243
At most 2	0.242137	16.88847	25.87211	0.4233
At most 3	0.101094	4.689360	12.51798	0.6414
Trace test indicates 2 co-integrating eqn(s) at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
** p-values				

Source: Data Analysis using E-view 7.0 software

Table-3. Unrestricted Co-integration Rank Test (Maximum Eigen-value)

Hypothesized		Max-Eigen	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.744279	60.00136	32.11832	0.0000
At most 1 *	0.482938	29.02210	25.82321	0.0183
At most 2	0.242137	12.19911	19.38704	0.3969
At most 3	0.101094	4.689360	12.51798	0.6414
Max-eigenvalue test indicates 2 cointegrating eqn(s) at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
** p-values				

Source: Data Analysis using E-view 7.0 software

Series: RGDP, GCE, GRE, AGE

Lag interval: In first differences

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The results of the co-integration test shown in Tables 2 and 3 are based on trace and maximum eigen values respectively. However, while the trace test indicates two co-integrating equations, the maximum eigrn-value test as well indicates two co-integrating equation. In theory, at least one co-integrating equation is enough to show that there is a long run stable or equilibrium relationship among the variables. The null hypothesis of no co-integrating relationship is therefore rejected in at least one equation at 5% level.

To determine the long run impact of the explanatory variables on economic growth in Nigeria, the vector error correction model (VECM) is estimated. The beauty of the vector error correction model is that it shows side by side both the long run and short-run impacts of the variables on the dependent variable, in this case, the real gross domestic product. Table 4 below presents the vector error correction model estimates:

Table-4. Vector Error correction Model (VECM)

Vector Error Correction Estimates				
Date: 02/27/16 Time: 01:51				
Sample (adjusted): 1971 2014				
Included observations: 44 after adjustments				
Standard errors in ( ) & t-statistics in [ ]				
Co-integrating Eq:	CointEq1			
RGDP(-1)	1.000000			
GCE(-1)	-3.018453			
	(0.72336)			
	[-4.17281]			
GRE(-1)	-0.701664			
	(0.22877)			
	[-3.06706]			
AGE(-1)	0.993886			
	(0.09693)			
	[10.2532]			
C	-137147.8			
Error Correction:	D(RGDP)	D(GCE)	D(GRE)	D(AGE)
CointEq1	-0.000225	0.060638	0.029933	-0.949641
	(0.00520)	(0.01305)	(0.09209)	(0.19111)
	[-0.04323]	[4.64495]	[0.32503]	[-4.96907]
C	22443.77	21837.17	9443.793	31280.96
	(5126.76)	(12859.8)	(90718.3)	(188259.)
	[4.37777]	[1.69810]	[0.10410]	[0.16616]
R-squared	0.000045	0.339369	0.002509	0.370236
Adj. R-squared	-0.023764	0.323640	-0.021241	0.355241
Sum sq. resids	4.86E+10	3.06E+11	1.52E+13	6.55E+13
S.E. equation	34007.10	85302.05	601757.2	1248768.
F-statistic	0.001869	21.57560	0.105643	24.69162
Log likelihood	-520.5201	-560.9838	-646.9447	-679.0672
Akaike AIC	23.75092	25.59017	29.49748	30.95760
Schwarz SC	23.83202	25.67127	29.57858	31.03870
Mean dependent	22443.77	21837.17	9443.793	31280.96
S.D. dependent	33610.09	103721.9	595466.3	1555188.
Determinant resid covariance (dof adj.)	2.69E+42			
Determinant resid covariance	2.23E+42			
Log likelihood	-2394.966			
Akaike information criterion	109.4076			
Schwarz criterion	109.8941			

Source: Data Analysis using E-view 7.0 software

As shown in the upper region of the VECM (Long run relationship), only Aggregate government expenditure (AGE) appear with the correct a priori signs. While government capital and recurrent expenditures are inversely

related to real gross domestic product, aggregate government expenditure is positively related to real gross domestic product in Nigeria. The model shows that a fall in either capital or recurrent expenditure or both, all other factors remaining constant will result in a an increase in real gross domestic product in Nigeria and vice versa. On the other hand, an increase in aggregate federal government expenditure will all other factors remaining constant, give rise to an increase in real gross domestic product in Nigeria and vice versa.

As the VECM estimates indicates, all the variables are significant determinants of Nigeria's economic growth performance. In the long run, however, the adjusted R-squared value of -0.023764 implies that only about 23 percent of the long run variability in Nigeria's economic growth is determined by changes in the explanatory variables, while the remaining 77 percent are determined by the variables outside the model. Irrespective of the fact that aggregate government expenditure is shown to be highly significant in the determination of Nigeria's economic growth performance, the goodness of fit of the regression model is disappointingly low considering the value of R-squared.

4.2. Tests of Hypotheses

1. *There is no significant long run equilibrium between aggregate government expenditure and economic growth in Nigeria.*

With n = 45 observations and the number of estimated parameters K = 5, giving (n − K) = (40 − 5) = 35 degrees of freedom and at 5 percent level of significance, the tabular or theoretical value is 2.021. Since the computed t-value for AGE in absolute terms is 10.32, which is greater than the tabular value of 2.021, we reject the null hypothesis and conclude that there is long run significant equilibrium relationship between aggregate government expenditure and economic growth in Nigeria.

2. *There is no significant relationship between government capital expenditures and the growth of Nigerian economy.*

In other hand, with n = 45 observations and the number of estimated parameters K = 5, giving (n − K) = (40 − 5) = 35 degrees of freedom and at 5 percent level of significance; the tabular or theoretical value is 2.021. Since the computed t-value for GCE in absolute terms is -4.17281, greater than the tabular value of 2.021, we reject the null hypothesis and conclude that government capital expenditure was highly significant in the determination of Nigeria's economic growth performance within the period under review

3. *There is no significant long run equilibrium relationship between government recurrent expenditures and the growth of Nigerian economy within the sampled period.*

With a computed t-value of -3.06706 greater than the theoretical or tabular value of 2.021 at the relevant degrees of freedom and at 5 percent level of significance, the null hypothesis is rejected and the conclusion is that there is a long run equilibrium relationship between government recurrent expenditure and the growth of Nigerian economy within the period under study.

4. *Causality does not run from government spending to economic growth in Nigeria.*

Using the result of the pair-wise Granger causality tests result as shown in table 5.

It can be deduced that a unidirectional causality exists between economic growth and aggregate government expenditure in Nigeria since the coefficient (0.0428) of one of the null hypothesis is below the alfa level of (0.0ia5). As a result the null hypothesis is thus rejected and the conclusion becomes that economic growth (RGDP) granger cause aggregate government expenditure in Nigeria in conformity with Wagner's submission.

Pair-wise Granger Causality Tests
Date: 02/27/16   Time: 01:53
Sample: 1970 2014
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
GCE does not Granger Cause RGDP	43	1.51825	0.2321
RGDP does not Granger Cause GCE		2.97603	0.0630
GRE does not Granger Cause RGDP	43	0.83106	0.4433
RGDP does not Granger Cause GRE		1.34961	0.2715
AGE does not Granger Cause RGDP	43	0.45266	0.6393
RGDP does not Granger Cause AGE		3.42807	0.0428
GRE does not Granger Cause GCE	43	0.28871	0.7509
GCE does not Granger Cause GRE		14.7215	2.E-05
AGE does not Granger Cause GCE	43	11.4789	0.0001
GCE does not Granger Cause AGE		5.07239	0.0112
AGE does not Granger Cause GRE	43	3.29380	0.0480
GRE does not Granger Cause AGE		2.53369	0.0927

Source: Data Analysis using E-view 7.0 software

5. SUMMARY OF FINDINGS

This research investigated the impact of federal government aggregate expenditures on the growth of Nigeria's economy for the period 1970 to 2014. The major findings of this research are as follows:

i. Aggregate government expenditure has a positive and highly significant long run relationship with economic growth in Nigeria.

ii. Government capital expenditure is highly significant in the determination of Nigeria's economic growth performance within the period under review.

iii. There is a long run equilibrium relationship between government recurrent expenditure and the growth of Nigerian economy within the period under study.

iv. Unidirectional causality runs from economic growth (RGDP) to aggregate government expenditure in Nigeria without feedback in conformity with Wagner's submission and contrary to Keynesian hypothesis.

6. CONCLUSION

This study examined the impact of federal government expenditures on the growth performance of Nigerian economy and its implications to the current dwindling oil price. The study employed the methods of unit root tests, co-integration and vector error correction model to establish the long run relationship of the variables used. In other hand, granger causality test was also carried out to ascertain if there is any feedback effect between aggregate government expenditure and economic growth in Nigeria.

The result of the study demonstrated that there exists long run relationship between aggregate government expenditure and economic growth in Nigeria.

This implies that government expenditure and economic growth always move together and that if there is any deviation of one from another, it is temporary, since in the long run, the two will converge. The study also established a unidirectional causality running from economic growth to government expenditure in line with Wagner's submission.

The most interesting revelation is the fact that though aggregate government expenditure showed a significant influence on growth in Nigeria, its component (Capital and recurrent) indicated an inverse relationship with economic growth within the period under study. The implication of this is that money budgeted for productive expenditure may be diverted to other things other than what it is budgeted for.

7. RECOMMENDATIONS

From the results of the findings of this research, the following recommendations are made:

i.   Nigerian government should increase its aggregate expenditure and closely monitor its execution so as to ensure that such expenditure is done towards the right direction. This will ensure that money budgeted for development purposes are used for what it is meant for.

ii.   Government should as well cut down on its recurrent expenditure so as to accelerate growth since recurrent expenditure was discovered to negatively affect growth of Nigeria's economy. This becomes imperative in view of dwindling oil prices which threatens Nigeria's development aspirations.

iii.   A proper fiscal and monetary policy mix is advocated to usher in a balanced growth in Nigerian economy and to save the economy from over reliance on Keynesian fiscal postulations which is suspected to have adversely affected the growth aspiration of Nigerian government over the years.

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