

**TITLE PAGE**

**RISING PUBLIC EXPENDITURE AND  
ECONOMIC GROWTH IN NIGERIA:  
WAS WAGNER RIGHT? EVIDENCE  
FROM NIGERIA**

**ABSTRACT**

*This research work seeks to empirically test if the Wagner's law stands true for the Nigerian economy using secondary data for the period 1981 to 2015. The Ordinary Least Squares Methodology and Granger-causality test were employed using the variables; government expenditure on economic services (EC), social & community services (SCS), economic growth (RGDP) and inflation. The study showed that there is a bi-directional causality running between government expenditure on economic services to economic growth and a bi-directional causality running between social and community services and economic growth. In addition, the regression results showed a very significant impact of the various sectors of government spending on economic growth. This shows that the Wagner's law is true for the Nigerian economy.*

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## **CHAPTER ONE**

### **1.1 INTRODUCTION**

The relationship between government expenditure and economic growth has been an interesting topic of analysis and debate among economists for decades. Economic growth represents the expansion of a country GDP or outputs. Growth means an increase in economic activities (Todaro, 1995). Government expenditure, which is the total amount government pumps into the economy in a fiscal year, can be broadly categorized into two: recurrent and capital or development expenditure. According to Edeme and Nkalu; (2016), recurrent expenditure refers to operating expenses needed for the day-to-day functioning of government departments. Capital expenditure on the other hand refers to the expenditure on the creation or acquisition of fixed asset and sometimes used to improve existing facilities. Capital expenditure thus represents the expenditure undertaken by the government to build its investments. There are mainly two different approaches in the literature concerning the relationship between these economic magnitudes, these are “Wagner’s law” and “Keynesian hypothesis”. According to Wagner, economic activities and government expenditure have a positive relationship and an increase in economic activity leads to an increase in government expenditure (Henrekson, 1993). In contrast with Wagner’s proposition, Keynesian view assumes that growing government expenditure may lead to a higher level of aggregate demand, which in turn promotes economic growth. As Singh and Sahni (1984), stated, different areas of economic analysis treat the relationship between the government expenditure and national income in different ways. While at Wagner’s side, growth in national income induces government expenditure, at Keynesian side, an increase in government expenditure induces income growth.

The Wagnerian and Keynesian approaches therefore represent two alternative viewpoints in explaining the causality between the said government expenditure and national income. While Wagnerian approach posits that, the causality runs from economic development to government expenditure, the Keynesian approach posits that causality runs in the opposite direction. Wagner’s law has attracted a great deal of attention in the public finance literature since 1960s.

### **1.2 BACKGROUND OF THE STUDY**

The increasing trend of state expenditures in sectors such as social security, education, and social welfare shows the role and share of these expenditures in human communities. Endogenous growth models such as Barro (1990), predict that only the productive government expenditures will positively affect the long run growth rate. For instance, expenditure on the health and education sectors will ensure production of rich human capital/resource, which will contribute to increased productivity and thus economic growth. In addition, expenditure on infrastructure and security will increase productivity and attract investment, thus facilitating economic growth (Chude and Chude, 2013). In Nigeria however, despite the rise in government expenditure over these years, there are still public outcries over decaying infrastructural

facilities. According to data obtained from the Central Bank of Nigeria statistical bulletin, within the period under study and beyond, Nigerian government spends a considerable portion of their revenues on consumption (recurrent) expenditure, while spending less on capital expenditure. Following the position of Barro, we see from this evidence why there is still an outcry for infrastructural development. In the Nigerian 2017 appropriation Act tagged “Budget of recovery and growth” presented by President Muhammadu Buhari, to a joint session of the National Assembly on Wednesday, December 14, total expenditure was given as N7.44 trillion while total expected revenue was N5.08 trillion. Projected deficit was N2.36 trillion, to be financed largely through borrowing. N2 trillion was approved for capital expenditure (principally infrastructure), with more than N500 billion directed into investments in roads, power and housing projects; N46 billion for Special Economic Zone Projects to be set up in each geopolitical zone. We observe that government expenditure continues to rise beyond government revenue for several years (CBN statistical bulletin), and we recall that Nigeria celebrated being one of the highest growing economies earlier this decade, during the Goodluck Jonathan administration. Therefore, the growth rate of public expenditure and the economy has both been rising. However, more on the increase, the trend of government expenditure has however not been persistently on the increase or decrease. According to the analysis made by Trading Economics, Government Spending in Nigeria decreased to 720290 NGN Million in the third quarter of 2016 from 834,480 NGN Million in the second quarter of 2016. Government Spending in Nigeria averaged 1,104,189.88 NGN Million from 2010 until 2016, reaching an all-time high of 1,615,675.03 NGN Million in the fourth quarter of 2010 and a record low of 720,290 NGN Million in the third quarter of 2016.

Another recent occurrence as it concerns the Nigerian economy is its experience of a period of recession as disclosed by the CBN governor, Godwin Emefelie, alongside other countries within the period. According to reports however, Nigeria’s economy, is to be on the path of recovery. Okere (The vanguard, June 20, 2017), revealed that Nigeria recorded a positive current account balance of \$2.72 (N823 billion) million in 2016, showing a sign of recovering from a deficit of \$15.43 million in 2015. OPEC countries were shown to have recorded a collective current account deficit of \$43.740 million during this period. Current account deficit is a measurement of a country’s trade in which the value of goods and services it imports exceeds the value of goods and services it exports. The current account is a calculation of a country’s foreign transactions, and along with the capital account is a component of a country’s balance of payment.

With these fluctuations, the nation needs then to understand the trend of key components of the nation’s economy, knowing whether economic growth causes government spending to rise (Wagner’s hypothesis) or vice versa. Few empirical studies have delved into finding out if the case over the years has been that public expenditure on certain sectors has boosted the economy, or whether it has been growth in the economy which has boosted or facilitated government spending.

### **1.3 STATEMENT OF PROBLEM**

Adolf Wagner (1883) realized a positive relationship between rates of economic growth and public spending. Loosely stated, one can say that Wagner found growth in the economy to cause government to spend more on the economy. The structural adjustment process, however, is an aspect that has been handled by developing countries. The expanding public sector accompanied by structural imbalances, are the result of high fiscal deficits (Samudram et al, 2009). These conflicting positions drive us towards ascertaining the linkage between public spending, usually deficit financed, and economic performance in the Nigerian case. Is it a forward linkage or a backward linkage? The answer to such a question is highly required by such a country as Nigeria to find out if the persistent rise in the yearly budget requirement is due to increasing growth economically or is required for same to occur. This will help policy makers to know how they can make appropriate use of the budgeting system and other public expenses to maneuver economic growth. More so, in line with what Chude and Chude (2013) already pointed out, for Nigeria to be ready in its quest to become one of the largest economies in the world by the year 2020, determining what economic growth causes as well as what it responds to is a necessary tool to fast-track growth in the nation's economy. These then lead us into asking the following questions:

1. What is the causal relationship between economic growth and government expenditure in Nigeria?
2. What is the impact of government expenditure on economic growth in Nigeria?

### **1.4 RESEARCH OBJECTIVES**

1. To examine the causal relationship between some components of public expenditure and economic growth in Nigeria
2. To examine the relationship between some components of public expenditure and economic growth

### **1.5 RESEARCH HYPOTHESES**

**H<sub>01</sub>**: Economic growth does not cause government expenditure in Nigeria.

**H<sub>02</sub>**: Government expenditure has no impact on economic growth in Nigeria.

### **1.6 SCOPE OF THE STUDY**

This research paper will center on the Nigerian economy with emphasis on the public sector. It will study the relationship between government expenditure and economic growth especially government expenditure on economic services and social & community services. Furthermore, it will cover the period from 1981 – 2015.

## **CHAPTER TWO - LITERATURE REVIEW**

### **2.1 THEORETICAL LITERATURE**

Testing the validity of Wagner's law entails testing whether or not increase in economic activities brings about an increase in public expenditure. Several other theories and hypotheses propounded by other economists, which have footings on public expenditure and/or economic growth, just as Wagner's law, are also discussed.

#### **The Keynesian Approach to Public Expenditure**

Keynes proposed the concept of government intervention in the economy using macroeconomic policies, fiscal and monetary policies, with a view to influencing and adjusting macro-economic variables. Following the 1929-30 Great Depression, John Maynard Keynes propounded a theory criticizing the classical economists who opposed the intervention of government in economic activities. Keynes believed that in a period of depression, when the economy suffers from an insufficiency of active demand, government intervention was required as a short-term cure. According to him, increasing public spending gives individuals more purchasing power to demand productive output and thus producers will produce more, creating more employment. This is the multiplier effect showing causality from public expenditure to national income, in contrast with the proposition of Wagner. Keynes therefore proposed a positive relationship between government spending (even in deficit) and private investment and thus economic growth. He however applied this proposal to a period of depression.

#### **The Crowding-Out Phenomenon**

Black, Calitz, and Steenekamp (1999) in explaining this neoclassical thinking says that when there is increase in government spending, aggregate demand increases, setting the multiplier process in motion. The resultant increase in income leads to an increase in the demand for money. If money supply remains constant, there will be excess demand for money, which causes interest rates to rise. Higher interest rate dampens private investment and aggregate expenditure. The dampening of private investment because of increase in interest rate is known as crowding out. Moreover, when private investment is crowded out, production and output will decrease.

According to the neoclassical school of thought, individuals are planning their consumption over their entire lifecycle. By shifting taxes to future generations, increased government (deficit), spending increases current consumption. Moreover, by assuming full employment of resources, the increased consumption implies a decrease in savings and when this happens, interest rates must rise to bring equilibrium in the capital markets. Higher interest rates, in turn, result in a decline in private investment. (Bernheim; 1989). This decline in private investment (the crowding out effect) brings about a decline in output as well. Private sectors have been widely acclaimed by many, including the monetarists, to be more efficient in production than the public sector, so when interest rate is raised, private investors may not be able to afford borrowing to invest at such a high rate and so they tend to withdraw. Their

withdrawal from investing affects production of manufactured output and all other economic outputs and this decline links a negative impact on growth, its source being increased public spending.

### **The Peacock-Wiseman Hypothesis**

Peacock and Wiseman conducted a study based on Wagner's Law on public expenditure in England. Citizens have a limit of tax that they can tolerate but their demand for more social services continues to push tax rates upwards leading to the displacement effect where public revenue and public expenditure continue to shift to new levels. Initially, when government reviews taxation upward, citizens will engender displeasure but later on, will accept the changes especially in times of crisis, such as war and natural disasters. There will be a new level of "tax tolerance". By the time the period of crisis is over, individuals have become used to the new tax level previously thought to be intolerable. Furthermore, the public expect the state to heal up the economy and adjust to the new social ideas. Peacock -Wiseman hypothesis therefore emphasize on the fact that public expenditure has tendency to increase with time.

### **The Monetarist Theory**

To the monetarists, government spending, financed by domestic debt, constitutes merely a transfer of resources from the private sector to the public sector with little or no effect on output. However, when government finances its expenditure through bonds, it brings about increase in interest rate, which leads to the crowding out of private investment. However, since in the view of the monetarists, the private sector is more efficient than the government, such a transfer could have a negative effect on output (economic growth). In addition, government expenditure financed by external sources is counterproductive when they are spent on non-self-liquidating ventures such as consumption, because such debts have to be serviced and the principal eventually paid up through other sources.

On the external sector, government expenditure to the monetarists causes a rising demand for imported foreign goods and assets, resulting in unfavorable balance of trade. This is as a result of the excess money supply brought about by the debt instruments drawn on the central bank (Okpanachi and Abimiku; 2007) cited in Gadong (2010). As the demand for these foreign products continue to rise, domestic production and manufacturing are discouraged as people will no longer patronize the local goods but go for the imported ones, which may likely be cheaper. Hence, there will be no more incentive for local producers to continue production because to continue may mean making little or no profit and most likely-loss. The monetarist position is that expansionary fiscal policies are counter-productive to economic growth.

### **The Richardian Equivalence**

Other theories like the Richardian equivalence focuses more on the method of financing public spending. It posits that since government spending is financed through taxation or borrowing, individuals adjust their activities especially consumption and savings whenever public expenditure is raised or lowered in order to suit the current policy and the effect of the policy in



future. As a result of this, increase in public spending will have equivalent impact on economic activities and growth.

### **Wagner's law**

Having looked through various public expenditure theories and hypotheses with various views. The Keynesian view, which sees government expenditure as having a positive effect on output via its crowding-in of private investment; the neoclassical view, which posits that government expenditure reduces output via the crowding-out of private investment; and the Ricardian Equivalence, which posits that government expenditure, does not have any effect on economic growth, among others. We shall now look at the postulations of Adolf Wagner.

The Wagner's law named after Adolf Wagner, a German economist, who tried to explain the cause of growth in public expenditure in terms of his famous "Law of Increasing State Activities". He studied the trend of economic activities and public expenditure particularly in Germany. According to Moheeth (2017), "the expenditure of public authorities as Wagner propounded is a continuous increasing trend due to three reasons" which are explained below:

#### **a. Expansion of Traditional Functions:**

Traditional functions mainly include defence, administration of justice, maintenance of law and order, provision of social overheads, etc. When a nation begins to be industrialized, the scope of these traditional functions begins to expand. For example, there is greater need to defend the country with more sophisticated and expensive weaponry as external aggression may increase due to industrialization. In addition, with industrialization and growth, areas of administration increase and the required modern expertise to carry out these administrative functions are more expensive to obtain.

#### **b. Inclusion of cultural and welfare services provision:**

Traditionally, government function includes defence, administration of justice, maintenance of law and order and provision of social overheads, etc. But as the economy grows, government becomes more aware of its responsibilities to the society and begins to look into other activities such as cultural and welfare services like education, public health, low cost housing, subsidized provision of food, agricultural inputs, old age pension, sickness benefit natural disaster aid, environmental protection programs, etc. All these tend to raise the expenditure of government.

#### **c. Expanding of Public Goods:**

As the state continues to industrialize, the need to provide social and merit goods through budgetary allocation is increasingly recognized by the modern governments. Increased industrialization will bring about technological changes and large firms that tend to monopolize. Governments will have to offset these effects by providing public goods through budgetary means. There is expansion of State activities to areas like construction and maintenance of public parks, irrigation, and flood control projects creation of economic overhead capital etc. Provision of these public goods and merit goods involves heavy expenses from the government coffers.

In conclusion, Adolf Wagner argued that public spending is an endogenous factor, and determined by the growth of national income. Hence, national income causes public expenditure. It is this assertion above that this research work wishes to verify in the case of Nigeria. Meanwhile various researchers have tried to verify this same hypothesis in various countries using different approaches. We now review them and point out the gap to be filled by this research work.

## **2.2 EMPIRICAL LITERATURE**

The validity of Wagner's law has been tested in many countries. Some research works have proved the law right while others have not. In this section, several research works that have a bearing on public expenditure, especially as it relates to economic activities and growth have been reviewed.

Anoke, Odo, Chukwu and Agbi (2016) examined the validity or otherwise of Wagner's theory in Nigeria using time series data from 1980- 2015. The co integration, VECM, and pair wise granger causality econometric tools of analysis were adopted in testing the variables specified in the model. The results obtained from the estimations indicated a long run equilibrium relationship between real GDP and the independent variables. Total government expenditure was found to have a negative significant relationship with economic growth both in the short and long run. The causality test showed bidirectional causality from national income (RGDP) to government expenditure. The study recommended the adoption of discretionary fiscal policy in Nigeria that will accommodate a conscious management of public spending. Similarly, Dada and Adewale (2013) as well assessed if Wagner's law was a myth or reality with empirical evidence from Nigeria. The model made use of Time Series data on variables such as real GDP, total government expenditure, exchange rate, inflation rate, and monetary policy rate from the period 1961 to 2011 while employing the Vector Error Correction Mechanism (VECM) to model causal relation between economic growth and government spending. The result of VECM estimates provided evidence in support of long-run causality running from real GDP to government spending. However, while evidence exists for long-run causality running from real GDP to government spending such evidence does not exist for short-run causality in this same direction. This indicates that Wagner's Law is supported only in the long-run. The study concluded that government expenditure was employed as an endogenous factor determined by economic growth and that Wagner's law is not a myth but a reality in Nigeria within the period investigated. In a related study carried out in 2009 by Wijeweera and Garis in Saudi Arabia, the Engle and Granger (E-G) two-step cointegration method was used to examine the relationship between government expenditure and economic growth. The results neither confirmed nor denied Wagner's Law. Out of the four model specifications tested, two models indicate that a positive long run relationship exists between government expenditure and economic growth. However, the income elasticity was not large enough to suggest that the growth in government expenditure exceeds the growth in national income. It only suggests that the growth in national income exerts upward pressure on the government spending of Saudi Arabia. The study forecasted that Saudi

Arabia should expect growing government expenditure in the coming years. Serena and Andrea () also looked into the increasing public expenditures: Wagner's law in 23 OECD countries. The paper proposed a set of panel ARDL model, which was estimated via the pooled mean group (PMG) methodology. The empirical evidence provided indication of a structural positive correlation between public spending and per-capita GDP that is consistent with the Wagner's law. In addition, it was found that the correlation is usually higher in countries with lower per-capita GDP, suggesting that the catching-up period is characterized by a stronger development of government activities with respect to economies in a more advanced state of development.

In the study conducted by Ukwueze in Nigeria in 2014 on public expenditures and economic growth, four models were applied both for the short run dynamics and the long run relationships using data from 1961-2012. From the results, it was found that the size of revenue, national output growth (national income), external debts and domestic debts are the determinants of the size of public sector in Nigeria. The result also showed that public expenditure has positive and significant impact on output growth in the short run but insignificant in the longer period. It was also found that both the recurrent and capital expenditures granger cause output changes, and that the shocks from them cause fluctuation in output of Nigeria, thus invalidating Wagner's law. The recommendations in the research were that public debts should be curtailed, revenue base should be expanded, price moderation is important, more social infrastructures should be provided to create avenues for private investment to increase, restraining from the use of recurrent expenditure because it is inflationary and can worsen the economic situation. Also invalidating the Wagner's hypothesis in Nigeria was the work of Ibrahim (2009) who analysed the pattern of public expenditure and economic growth in Nigeria between 1970 and 2007. Engel Granger causality test was carried out to test the relationship between public expenditure pattern and economic growth. Gross Domestic Product was found not to Granger cause public expenditure. In the least square regression with GDP as the dependent variable, defence and agriculture were found to have positive and negative relationships with economic growth respectively, however both effects were insignificant. Expenditure on education and health were positively related to GDP, however expenditure on education had a significant impact while that on health did not. The work suggested proper monitoring of expenditure on the Agricultural sector and health sector as well as encouragement of expenditure on education and defence. Okoro (2013), also looked into government spending and economic growth in Nigeria using time series data between 1980 and 2011. Making use of the granger causality test, the error correction model as well as the ordinary least square multiple regression analysis to estimate the model, the result showed that there exists a uni-directional causality running from both capital and recurrent expenditure to real GDP. This as well invalidates Wagner's law in Nigeria. The research also discovered a long-run equilibrium relationship existing between government spending and economic growth in Nigeria. Both the short-run and long-run expenditure had significant effect on the economic growth of

Nigeria. The study recommended increase in both capital expenditure and recurrent expenditure mostly on issues that should attract economic growth. Funds meant for development of the Nigerian economy should be properly managed to boost employment as well as improve the wellbeing of citizens.

In examining studies that bordered on public expenditure on economic growth generally, Isibor, Babajide and Okafor (2013), assessed the impact of government expenditures on the Nigerian economy using data from 1970 to 2012. Variables such as capital expenditure, recurrent expenditure internal debt etc, were subjected to the instrumental variables two-stage least squares regression. The result showed that both capital expenditure and lagged-two capital expenditure positively and significantly impacts GDP. Internal debt was found to positively affect GDP as well. The study recommended among others, that government should ensure that adequate budget provisions be made and more budgetary allocations should go to public expenditures while the Public Private Partnership model was encouraged for capital projects in order to minimize corruption. Public Private Partnership for capital projects should be encouraged where there are limited funds in the hands of the government. It also recommended that some funds from internal debt should be used to finance capital expenditure projects while such projects should be able to generate adequate funds to pay back and service the debt.

Abu and Abdullahi (2010) employed a disaggregated analysis to study government expenditure and economic growth in Nigeria between 1970 and 2008. The results revealed that government total capital expenditure, total recurrent expenditure, and government expenditure on education have negative effect on economic growth. Rising government expenditure on transport, communication and health, result to an increase in economic growth. The authors recommended that government should increase both capital expenditure and recurrent expenditure, including expenditures on education, as well as ensuring that funds meant for the development of these sectors are properly managed. Among the recommendations was that government should increase its investment in the development of transport and communication, in order to create an enabling environment for business to thrive. In addition, government should raise its expenditure in the development of the health sector since it would enhance labour productivity and economic growth. Lastly, government should encourage and increase the funding of anti-corruption agencies in order to tackle the high level of corruption in public offices.

Summarily, from the research work reviewed, most of the researches carried out in Nigeria including Ukwueze (2014), Okoro (2013) and Ibrahim (2009) invalidated Wagner's law. However some others such as Anoke, Odo, Chukwu and Agbi (2016) as well as Dada and Adewale (2013) found some sort of bidirectional causality or short run causality affirming Wagner's law, all in the Nigerian case. This work would therefore take a different approach by disaggregating the components of government expenditure and looking at the causal relationship as well as impact relationship between some selected ones and economic growth.

## **CHAPTER THREE: RESEARCH METHODOLOGY**

### **3.1 MODEL SPECIFICATION**

According to endogenous growth theory, fiscal policy can affect both the level and growth rate of the economy. A detailed illustration of the mechanism through which fiscal policy influences growth can be found in, amongst others, Barro (1990) and Barro and Sala-i-Martin (1995). Therefore In the analysis of the methodology for this academic work to explain the objective of this study, the Gross domestic product (GDP) will be the proxy for economic growth while government expenditure will be measured through two components; economic service as well as social and community services. The study specified economic growth according to Wagner's law to be a function of government spending/expenditure.

The relationship between Gross domestic product (GDP) and public expenditure can be specified as:  $Y = f(X_i)$

Where  $Y$  = gross domestic product

$X_i$  = is expenditure on the various component of government expenditure.

Therefore, the model specification is:

$$\text{RGDP} = \beta_0 + \beta_1 \text{EC} + \beta_2 \text{SCS} + \beta_3 \text{INFL} + \mu_t$$

Where  $\text{GDP}$  = gross domestic product

$\text{EC}$  = Economic services expenditure

$\text{SCS}$  = social and community service expenditure

$\text{INFL}$  = Inflation

$\mu_t$  = random error term

### **3.2 SOURCE OF DATA**

Our interest is to examine the link or functional relationship between public expenditure and the economic growth in Nigeria. To achieve this, a time series data was sourced mainly from secondary sources, data obtained for this research work are from the Central Bank of Nigeria (CBN) Statistical Bulletin for the period spanning from 1981 – 2015. The range of selected data was due to the availability of data.

### **3.3 METHOD OF ANALYSIS**

We begin the analysis by investigating the effect of total government expenditure on Nigeria's economy. The ordinary least squares estimation technique will be explored for this, The choice of ordinary least square technique is informed by the fact that it is Best Linear Unbiased Estimation (BLUE) and it will be used to test for the empirical validity of Wagner's law, the elasticity of the public expenditure with respect to GDP will be estimated.

## CHAPTER FOUR

### ANALYSIS, PRESENTATION AND INTERPRETATION OF RESULTS

In this chapter, the findings of the regression results are presented, interpreted, and evaluated in line with the two objectives and their respective hypothesis are also evaluated.

#### 4.1 GRANGER CAUSALITY TEST

The test for Granger-Causality test is based on the following hypotheses:-

$H_0: \gamma_i = \psi = 0$  for all i's

$H_1: \gamma_i \neq 0$  and  $\psi \neq 0$  for at least some i's.

Reject  $H_0$  if  $p < 0.05$

In the evaluation of our objective one, we are to check the causality of our variables.

GRANGER CAUSALITY TESTS			
	F-STATISTICS	LAGS	P-VALUE
RGDP does not cause EC	9.5269	1	0.002
RGDP does not cause SCS	4.1403	1	0.042
RGDP does not cause INFL	0.0731	1	0.787
EC does not cause RGDP	6.6146	1	0.010
EC does not cause SCS	7.0462	1	0.008
EC does not cause INFL	0.23674	1	0.627
SCS does not cause RGDP	3.871	1	0.049
SCS does not cause EC	6.1549	1	0.013
SCS does not cause INFL	0.05612	1	0.813
INFL does not cause RGDP	0.2798	1	0.597
INFL does not cause EC	0.10939	1	0.741
INFL does not cause SCS	0.00534	1	0.942

We reject the null hypothesis of **RGDP does not Granger cause EC** at 5 percent level of significance given that the probability is 0.006, and we reject the null hypothesis of **EC does not Granger cause RGDP** at 5 percent level of significance given that the probability is 0.010. Hence, we conclude that there is a **bi-directional causality** between **EC** and **RGDP**. We reject the null hypothesis of **RGDP does not Granger cause SCS** at 5 percent level of significance given that the probability is less than 0.05 at 0.042, also, we reject the null hypothesis that **SCS does not Granger cause RGDP** at 5 percent level of significance given that the probability is 0.049. Hence, we conclude that there is a **bi-directional causality** running from **SCS** and **RGDP**. We do not reject the null hypothesis of **RGDP does not Granger cause INFL** at 5 percent level of significance given that the probability is 0.787 and we do not reject the null hypothesis of **INFL does not Granger cause RGDP** at 5 percent level of significance given that the probability is greater than 0.05 at 0.597. Hence, we conclude that there is **no causality** between **RGDP** and **INFL**. We reject the null hypothesis of

**EC does not Granger cause SCS** at 5 percent level of significance given that the probability is less than 0.05 at 0.008 and we reject the null hypothesis of **SCS does not Granger cause EC** at 5 percent level of significance given that the probability is 0.013. Hence, we conclude that there is **bi-causality** between **EC** and **SCS**. We do not reject the null hypothesis of **EC does not Granger cause INFL** at 5 percent level of significance given that the probability is 0.627. We do not reject the null hypothesis of **INFL does not Granger cause EC** at 5 percent level of significance given that the probability is 0.741. Hence, we conclude that there is **no causality** between **EC** and **INFL**. We do not reject the null hypothesis of **SCS does not Granger cause INFL** at 5 percent level of significance given that the probability is less than 0.05 at 0.813. We do not reject the null hypothesis of **INFL does not Granger cause SCS** at 5 percent level of significance given that the probability is less than 0.05 at 0.942. Hence, we conclude that there is **no causality** between **SCS** and **INFL**.

## 4.2 PRE-DIAGNOSTIC TESTS

### 4.2.1 UNIT ROOT TEST RESULT

This study made use of the Augmented-Dickey Fuller (ADF) Test to find out if the variables have unit root i.e. to find out whether the moments of distribution are constant over time.

**Test of Hypothesis:**  $H_0: \delta = 0$  (i.e. the variables are non-stationary)

$H_1: \delta < 0$  (i.e. the variables are stationary)

**Decision Rule:** Reject  $H_0$ , if  $|ADF_{cal}| > |ADF_{tab}|$  at  $\alpha = 5\%$ , otherwise do not reject.

### MODEL 2

VARIABLE	ADF-STATISTIC	5% CRITICAL VALUE	LEVEL OF INTEGRATION	DECISION
RGDP	6.288	-2.975	I (0)	Stationary
EC	-6.091	-2.978	I (1)	Stationary
SCS	-4.332	-2.978	I (1)	Stationary
INFL	-3.011	-2.975	I (0)	Stationary

## 4.3 PRESENTATION OF REGRESSION RESULTS

### MODEL 2 – NEWY-WEST HAC STANDARD ERRORS AND COVARIANCE METHOD

Dependent Variable: RGDP

VARIABLE	COEFFICIENT	NEWY-WEST STD. ERROR	t-STATISTIC	PROBABILITY
EC	10.59481	3.523959	3.01	0.005
SCS	42.94949	4.470535	9.61	0.000
INFL	2.379761	22.68699	0.10	0.917
CONSTANT	17796.37	1094.749	16.26	0.000
$R^2 = 0.9585$		$F\text{-stat} = 213.90$		$DW = .6369747$
$\text{Adjusted } R^2 = 0.9545$		$\text{Prob. (F-stat)} = 0.0000$		

Thus:  $RGDP_t = 17796.37 + 10.59481EC_t + 42.94949SCS_t + 2.379761INFL_t$

#### 4.4 EVALUATION BASED ON ECONOMIC CRITERIA

##### MODEL TWO

$$RGDP_t = 17796.37 + 10.59481EC_t + 42.94949SCS_t + 2.379761INFL_t$$

From the above results, we can see the direct impact of the various variables (government expenditure on economic services, government expenditure on social and community services, and inflation) on public sector proxied by Real Gross Domestic Product in Nigeria.

The intercept or constant is 17796.37 implying that given all other variables remaining constant, RGDP will increase by ₦17, 796.37. The coefficient of EC is 10.68282 implying that a ₦1 increase in government expenditure on economic services will lead to an ₦10.59481 increase in RGDP in the long run. Thus conforming with the a priori expectation that an increase in the EC will lead to an increase in RGDP. The coefficient of government expenditure on social and economic services (SCS) is 42.94949, showing that SCS has a positive impact on RGDP and an increase in SCS will increase savings by ₦42.94949. It conforms to a priori expectation that if government spends more on the welfare and education of the people, it will lead to an increase in RGDP. A unit increase in inflation leads to ₦2.379761 increase in RGDP in the long run, though it is not significant. The reason for this, I believe is the data irregularities and inconsistency.

#### 4.5 EVALUATION BASED ON STATISTICAL CRITERIA

These tests are conducted in order to ascertain the statistical reliability of the estimate gotten. The tests conducted are the student t-test,  $R^2$  and F-test.

##### 1. Adjusted $R^2$ (Co-efficient of Determination)

This checks for the proportion of the total variations in the dependent variable captured by the explanatory variables as well as adjusting it for inflation. The adj.  $R^2$  for model 1 is 0.9545 implying that the explanatory variables account for 98.16% of the variation occurring in the dependent variable. Hence, the model possess a very good fit.

##### 2. The t-TEST

Measuring the individual significance of the variables in the model. For a two tail test,

**The hypothesis testing:**  $H_0: \beta_0 = \beta_1 = \beta_2 = \beta_3 = 0$  (statistically Insignificant) – Model 2

**The decision rule:** Reject  $H_0$  if  $|t_{cal}| > |t_{tab}|$  otherwise, do not reject;

Where t-critical =  $t_{\alpha/2}$  with n-k degrees of freedom at 5% level of significance.

##### For Model 2

$$N=35, k=4; n-k = 31, t_{cal} = t_{0.025}^{31} = 2.042$$

##### STUDENT'S T-TEST FOR MODEL 2

VARIABLES	t-STATISTICS	t-CRITICAL	DECISION	CONCLUSION
EC	3.01	2.042	Reject $H_0$	Statistically Significant
SCS	9.61	2.042	Reject $H_0$	Statistically Significant
INFL	0.10	2.042	Do not Reject $H_0$	Statistically Insignificant



<b>CONSTANT</b>	16.26	2.042	Reject H <sub>0</sub>	Statistically Significant
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### 3. F-TEST

To measure the overall significance of the variables on the dependent variable in the model.

**The hypothesis testing:** H<sub>0</sub>: β<sub>0</sub>= β<sub>1</sub>= β<sub>2</sub>= β<sub>3</sub>=0 (statistically Insignificant) – Model 2

**The decision rule:** Reject H<sub>0</sub> if F<sub>cal</sub> > F<sub>tab</sub> otherwise, do not reject;

Where F-critical = F<sub>α</sub> (k-1, n-k) degrees of freedom at 5% level of significance.

**For Model two:** F<sub>tab</sub>=F<sub>0.05</sub> 3/31=2.92; F<sub>cal</sub> = **213.90**

Since F<sub>cal</sub> (213.90) > F<sub>tab</sub> (2.92), we reject H<sub>0</sub> and conclude that there is a statistically significant joint impact of the independent variables on the dependent variable in the model.

### 4.6 EVALUATION BASED ON ECONOMETRIC CRITERIA

#### 1. NORMALITY TEST

This test aimed to check if the residuals or error term follow a normal distribution using the Jacque-Bera normality test

$$JB = n \left[ \frac{s^2}{6} + \frac{(k-3)^2}{24} \right]$$

**Hypothesis testing:** H<sub>0</sub>: residuals follow normal distribution

**Decision Rule:** Reject H<sub>0</sub> if JB<sub>cal</sub> > χ<sub>0.05</sub><sup>2</sup> (2 df), otherwise, do not reject

Where n = 35 and df = 2 at α = 5%

	JB <sub>cal</sub>	JB <sub>tab</sub>	Skewness	Kurtosis	Decision	Conclusion
<b>MODEL 2</b>	1.968539372	5.99	0.5562016	2.664717	Reject H <sub>0</sub>	Not Normally Distributed

However, we reject with caution, because the Jacque-Bera test is used mostly for large samples and may reject the null hypothesis for smaller samples even though the sample might become normally distributed if increased.

#### 2. AUTOCORRELATION TEST

This tests whether there is serial correlation in the error term. The Durbin Watson test is used.

**Hypothesis testing:** H<sub>0</sub>: ρ = 0 (no autocorrelation)

H<sub>1</sub>: ρ > 0 (serial correlation)

NULL HYPOTHESIS	DECISION RULE	CONDITION (IF)
No positive autocorrelation	Reject	0<d<dl
No positive autocorrelation	No decision	dl<d<du
No negative autocorrelation	Reject	4-dl<d<4
No negative autocorrelation	No decision	4-du<d<4-dl
No autocorrelation, positive, or negative	Do not reject	du<d<4-du

### THE RESULTS

	D <sub>CAL</sub>	D <sub>L</sub>	D <sub>U</sub>	4 – D <sub>U</sub>	4 - D <sub>L</sub>	DECISION	CONCLUSION
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<b>MODEL 2</b>	0.637	1.222	1.726	2.268	2.823	Reject $H_0$	Since it is closer to $D_L$ than $D_U$ , we conclude that there is positive autocorrelation
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However, the autocorrelation is corrected by the use of the Newey-West HAC technique.

### 3. HETEROSCEDASTICITY TEST

This test aims at verifying whether the error term has equal variance.

**Hypothesis testing:**  $H_0: \rho \geq 0.05$  (homoscedasticity)

$H_1: \rho < 0.05$  (heteroscedasticity)

**Decision Rule:** Reject  $H_0$  if  $p < 0.05$  at  $\alpha = 5\%$ , otherwise do not reject

	Test-statistic	Probability	Decision	Conclusion
<b>MODEL 2</b>	7.31	0.0445	Reject $H_0$	Heteroscedastic

The heteroscedasticity is corrected by the use of the Newey-West HAC technique.

### 4.7 EVALUATION OF RESEARCH HYPOTHESIS

We try to evaluate the hypothesis set up earlier in this work and as a reminder, they are:

**H<sub>01</sub>:** Increase in Public Sector does not Cause Increase in Government Spending in Nigeria.

**H<sub>02</sub>:** Public Sector Expenditure has not impact on Government Spending in Nigeria.

$$RGDP_t = 17796.37 + 10.59481EC_t + 42.94949SCS_t + 2.379761INFL_t$$

In the first hypothesis modeled using the granger causality test, we discovered that there is a bi-directional causality running between **EC** and **RGDP** and between **SCS** and **RGDP** and between **EC** and **SCS**. This means that government expenditure on economic services causes public sector growth and vice versa, government expenditure on social and community services causes public sector growth and vice versa and finally that government expenditure on economic services and that on social and community services causes each other. Since Wagners' law states that as the public sector increases, government spending also increases with regards to some key sectors such as on economic services, education, health etc. Therefore, we reject the null hypothesis and conclude that increase in public sector causes increase in government spending. Hence, Wagners' law is fulfilled in Nigeria.

In the second hypothesis, looking at the results obtained for model two, government expenditure on economic services and government expenditure on social and community services were statistically significant and far greater than 1 while inflation rate was statistically insignificant following the 2-t rule of thumb. Also, based on the F-test, the variables jointly impacted on the private savings in Nigeria and the  $R^2$  was greater than 0.5, hence a good fit. From the results, we can see that a unit increase in government expenditure on economic services (EC) will lead to an increase of ₦10.59481 in RGDP. A unit increase in government expenditure on social and community services will lead to an increase of ₦42.94949 in RGDP while a 1% increase in inflation rate will cause an increase of ₦2.379761 in RGDP. From the above, we do reject the null hypothesis and conclude that government activities/spending has a significant impact on the Public Sector (RGDP).

## **CHAPTER FIVE**

### **SUMMARY, POLICY RECOMMENDATIONS AND CONCLUSION**

#### **5.1 SUMMARY**

This study was carried out based on the need to find out if the Wagner's law of public expenditure holds true in the Nigerian scenario i.e. if economic growth causes a rise in government spending. Using annual data series from 1981-2012 and the Ordinary Least Squares technique and the Granger Causality test, the models were estimated and results obtained. From the ADF test, all the variables were found to be stationary either at level form or at first difference.

The F-test showed that the variables were jointly significant, while the  $R^2$  adjusted were good showing that the variables could explain most of the variation in the dependent variables.

Given that the results of the estimation of the models showed that there is a bi-directional causality between economic growth and government spending, we can posit to a high level of accuracy that Wagner's law is true for Nigeria. However, given that the Keynesian law of public expenditure states that there the causality flows from government spending to economic growth, we can also conclude that that also holds true for Nigeria. Hence, we can say that as the economy grows, government expenditure also grows alongside with it; however, government spending can also lead to economic growth. This can be through the use of budget deficits. The Nigerian government has in the over two decades ago, made use of deficit budgets and financing its deficit from external sources, as a way to aid/boost the economy, in this is the Keynesian law also true for Nigeria. Given that the regression results show a very significant impact of the key sectors of government spending on the gross domestic product further buttresses the above.

#### **5.2 POLICY RECOMMENDATIONS**

Following our research findings, it can be argued that a country's economic growth has an important role to play in determining government spending because as the economy grows, it expands and as it expands, government also needs to expand its spending to meet up with the demands of the expansion. However, on the other hand, the government can also stimulate economic growth by running a budget deficit, in order to finance the economy by injecting cash into it. However, according to public expenditure theories, it is detrimental for the health of any economy for the government size to grow beyond the rate at which the economy is growing. Therefore, policies and checks needs to be put in place in order to curtail the rapid growth of government size above the optimum level. Such policies may include:

- i) Policy checks should be put in place to check mate the size of the yearly budget. Redundant items should be removed. The government should implement its new budget type- Zero budgeting. Yes, it has been said that the government now operates a zero budgeting system, however, it has still not been actually implemented in the preparation and running of the annual budget.
- ii) Policies and processes should be put in place to checkmate the percentage of deficit being run by the government and its impact on the overall debt ratio of the country.

iii) External debt financing has been shown, though to carry more risk, to be a better way of financing government deficit budget. However, checks should be put in place to curtail excessive borrowing and especially if we are borrowing to consume as has been the case in Nigeria.

iv) Government should revisit its recurrent budget funding and look for ways to reduce its size example by fishing out ghost workers in the civil service and channel the funds recovered into more profitable and rewarding sectors or sectors where it is needed most.

### **5.3 CONCLUSION**

It is an inevitable fact that as the economy grows, government size also grows and as government size grows, the economy can also experience growth as of a result of the push made from the government increasing its budget. However, we should be cautious in the rate at which the government spending grows in relation to the economy as there is an optimum level of government size for each economy beyond which it becomes detrimental to the economy. From our research findings we saw that the two sectors on which the analysis were carried out – Economic Services and Social and Community Services – showed highly significant values which implies that the funds spent by the government on these two areas are still very much needed and it still adds value to these areas of the economy. Examples including providing for or highly subsidized education for the citizens, its poverty alleviation programmes such as N-Power initiative, highly subsidized price for fertilizers sold to the farmers which brings about a cheaper cost of farming and hence cheaper prices of farm produce. Hence, from the above, we can conclude that the Wagner's Law is true for Nigeria and the Nigerian government size is still below optimum level.

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PUBLIC EXPENDITURE AND ECONOMIC GROWTH IN NIGERIA:  
WAS WAGNER RIGHT? EVIDENCE FROM NIGERIA

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Residuals				
Percentiles	Smallest			
1%	-5937.438	-5937.438		
5%	-5415.514	-5415.514		
10%	-4105.482	-4121.696	Obs	35
25%	-2688.438	-4105.482	Sum of Wgt.	35
50%	332.8502		Mean	-8.72e-06
		Largest	Std. Dev.	3526.241
75%	1210.801	6341.646		
90%	6341.646	6583.543	Variance	1.24e+07
95%	6837.755	6837.755	Skewness	.5562016
99%	7738.932	7738.932	Kurtosis	2.664717

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Granger causality Wald tests

Equation	Excluded	chi2	df	Prob > chi2
rgdp	ec	6.6146	1	0.010
rgdp	scs	3.871	1	0.049
rgdp	infl	.2798	1	0.597
rgdp	ALL	10.933	3	0.012
ec	rgdp	9.5269	1	0.002
ec	scs	6.1549	1	0.013
ec	infl	.10939	1	0.741
ec	ALL	9.7726	3	0.021
scs	rgdp	4.1403	1	0.042
scs	ec	7.0462	1	0.008
scs	infl	.00534	1	0.942
scs	ALL	21.75	3	0.000
infl	rgdp	.0731	1	0.787
infl	ec	.23674	1	0.627
infl	scs	.05612	1	0.813
infl	ALL	1.9138	3	0.590

year	ec	scs	rgdp	infl
1981	3.81	1.59	15258	17.4009
1982	2.74	1.3	14985.1	6.94184
1983	2.46	1.32	13849.7	38.7719
1984	0.87	0.59	13779.3	22.6296
1985	1.17	1.61	14953.9	1.03093
1986	1.38	1.12	15238	13.6735
1987	2.85	0.92	15263.9	9.69479
1988	3.35	3.84	16215.4	61.2111
1989	5.35	6.07	17294.7	44.6701
1990	5.1	5.49	19305.6	3.61404
1991	4.45	4.17	19199.1	22.9597
1992	5.42	3.47	19620.2	48.802
1993	26.09	18.24	19928	61.2623
1994	31.01	15.08	19979.1	76.7589
1995	49.07	23.04	20353.2	51.5913
1996	122.58	24.65	21177.9	14.3143
1997	175.81	28.96	21789.1	10.2133
1998	212.44	44.81	22332.9	11.9129
1999	410.66	88.62	22449.4	0.223606
2000	140.1	112.75	23688.3	14.527
2001	312.77	132.97	25267.5	16.4949
2002	268.28	184.65	28957.7	12.1685
2003	194.05	158.34	31709.4	23.8114
2004	226.5	164.42	35020.6	10.0085
2005	329.34	223.01	37474.9	11.5652
2006	341.89	272.85	39995.5	8.54872
2007	537.45	407.57	42922.4	6.56395
2008	818.04	485.1	46012.5	15.0556
2009	929.62	499.11	49856.1	13.9296
2010	974.95	702.67	54612.3	11.8
2011	696.9	878.29	57511	10.3
2012	551	887.46	59929.9	12
2013	797	998.77	63218.7	8
2014	659.85	886.06	67152.8	8
2015	624.1	890.6	69023.9	9.6