

## **Rising public expenditure and economic growth, was Wagner right? Evidence from Nigeria**

**Richardson Kojo Eedme; Chukwuemeka Valentine Okolo;  
Chinazor Jane-Francis Idenyi; Chiamaka Faith Okolomike**

Department of Economics, University of Nigeria, Nsukka-Nigeria

*e-mail correspondence: richard.edeme@unn.edu.ng*

### **Abstract**

This study empirically tests if the Wagner's law stands for the Nigerian economy using data for the period 1981-2015. From the results, economic, social and community services expenditure show highly significant values suggesting that these sectors are very much needed and still adds value to the economy. The results of the Granger causality analysis indicates that there is a bi-directional causality between economic growth and government spending, which posit to a high level of accuracy that Wagner's law holds for Nigeria. The result suggests that economic growth has an important role to play in determining government spending because as the economy grows, it expands and for this, government need to expand its spending to meet up with the demands of the expansion. There is therefore the need for curtail the rapid growth of its size above the optimum level that stimulates rise in expenditure. Any further expansion in expenditure should focus on economic, social and community services since they are growth enhancing.

---

**Keywords:** *Public expenditure, Economic growth, Wagner's Law, Granger causality*

**JEL classification:** E10, E62, O11, O47

### **INTRODUCTION**

The relationship between government expenditure and economic growth has been an interesting topic among economists and policy makers for decades (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 & Nkalu (2016), recurrent expenditure refers to operating expenses for the day-to-day functioning of government departments while capital expenditure are expenditure on 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. In literature, there are basically two different views on the relationship between economic growth and public expenditure which has culminated into 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 a corresponding increase in government expenditure (Henrekson, 1993). In contrast, Keynesian posits that growing government expenditure may lead to a higher level of aggregate demand, which in turn promotes economic growth. As contended by Singh & Sahni (1984), Bojanic (2013), different analyses treat the relationship between government

expenditure and national income in different ways. At Wagner's side, growth in national income induces government expenditure while for the Keynesians; an increase in government expenditure induces income growth. The Wagnerian and Keynesian approaches therefore represent two alternative viewpoints in explaining the causality between government expenditure and national income.

Although government over the years have been involved in economic and social sector expenditure, endogenous growth models such as Barro (1990) predict that only the productive expenditures will positively affect the long run growth. 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 Nigeria, 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, government spends a considerable portion of their revenues on recurrent expenditure, while spending less on capital component. Over the years, the growth rate of public expenditure and the economy has both been on the rise, the trend of government expenditure has been persistently gyrating. For instance, government expenditure declined to N720290 million in the third quarter of 2016 from N834,480 million in the second quarter and averaged N1,104,189.88 million between 2010 and 2016, reaching an all-time high of N1,615,675.03 million in the fourth quarter of 2010 and a record low of N720,290 million in the third quarter of 2016. With these fluctuations, there is need to understand the trend of key components of the nation's economy and ascertain whether economic growth causes government spending to rise 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. Wagner (1883) realized a positive relationship between rates of economic growth and public spending. Loosely stated, Wagner found growth in the economy to cause government to spend more on the economy.

These conflicting positions drive us towards ascertaining the linkage between public spending and economic performance in Nigeria. Testing the validity of Wagner's law entails determining whether or not increase in economic activities leads to an increase in 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.

## **EMPIRICAL LITERATURE REVIEW**

The validity of Wagner's law has been tested in many countries by various studies with some proving the law right while others have not. For instance, Anoke, Odo, Chukwu & 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 to government expenditure. 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 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 by Wijeweera & Garis (2009), 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 confirm 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. 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 (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. Also invalidating the Wagner's hypothesis in Nigeria was the work of Ibrahim (2009) who analyzed 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 studies that bordered on public expenditure on economic growth generally, Isibor, Babajide & 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. Abu & 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. 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.

From the empirical literature review, Ukwueze (2014), Okoro (2013) and Ibrahim (2009) invalidated Wagner's law while Anoke, Odo, Chukwu & Agbi (2016) as well as Dada & Adewale (2013) found bidirectional causality and affirming Wagner's law. But this study adopts a different approach by disaggregating the components of government expenditure and looking at the causal relationship as well as the relationship among these variables and economic growth.

## **DATA AND METHODOLOGY**

Time series sourced from the Central Bank of Nigeria (CBN) Statistical Bulletin for the period spanning 1981-2015 was used in this study. According to endogenous growth theory, fiscal policy can affect both the level and growth rate of the economy. Detailed illustration of the mechanism through which fiscal policy influences growth can be found in, amongst others, Barro (1990); Barro & Sala-i-Martin (1995). In the analysis, government expenditure is measured through two components (economic service and social and community services. Specifying economic growth according to

be a function of government expenditure, the relationship between Gross domestic product and public expenditure can be specified as:

$$Y = f(X_i) \dots \dots \dots (1)$$

where Y= gross domestic product, Xi= expenditure on the various component of government expenditure. In line with the variables under consideration, the linear relationship between the dependent and explanatory variables is stated thus:

$$EG = \beta_0 + \beta_1 EC + \beta_2 SCS + \beta_3 INFL + \mu t \dots \dots \dots (2)$$

where EG = economic growth (proxied by real gross domestic product), EC = Economic services expenditure, SCS = social and community service expenditure, INFL = Inflation.

**RESULTS AND DISCUSSIONS**

In conducting our analysis, we first ascertain if the variables have unit root making use of the Augmented-Dickey Fuller (ADF) Test and the results is presented in Table 1.

**Table 1.** Unit roots results

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

From the result in Table no. 1, real gross domestic product and inflation are stationary at level form while Economic services expenditure and Social and community service expenditure are stationary at first difference.

**Table 2.** Regression result

Variable	Coefficient	Newey-West Std. Error	t-Statistic	Probability
EC	10.5948	3.5239	3.01	0.005
SCS	42.9495	4.4705	9.61	0.000
INFL	2.379761	22.6867	0.10	0.917
Constant	17796.37	1094.749	16.26	0.000
R <sup>2</sup> = 0.9585		F-stat = 213.90	DW = .6369747	
Adjusted R <sup>2</sup> = 0.9545		Prob. (F-stat) = 0.0000		

In Table no. 2 which shows the result of the impact of the government expenditure on economic services, government expenditure on social and community services and inflation on public sector, the coefficient of economic services expenditure is 10.6828 suggests that a percentage increase in government expenditure on economic services increase economic growth by 10.6 percent and expenditure on social and economic services engender economic growth by 42.94, averagely. Meanwhile, an increase in inflation dampens growth by 2.4 percent point

**Table 3.** Granger causality results

	<b>F-Statistics</b>	<b>Lags</b>	<b>P-Value</b>
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	0.2367	1	0.627
SCS does not cause RGDP	3.8710	1	0.049
SCS does not cause EC	6.1549	1	0.013
SCS does not cause INFL	0.0561	1	0.813
INFL does not cause RGDP	0.2798	1	0.597
INFL does not cause EC	0.1094	1	0.741
INFL does not cause SCS	0.0053	1	0.942

From the result of the Granger-causality in Table no. 3, the null hypothesis that economic growth *does not Granger cause* economic services expenditure and that economic services expenditure *does not Granger cause* economic growth were rejected. Hence, that there is a bi-directional causality between economic services expenditure and economic growth. Also, the null hypothesis of economic growth *does not Granger cause* social and community service expenditure was rejected given that the probability is less than 0.05 at 0.042. Similarly, the null hypothesis that social and community service expenditure *does not Granger cause* economic growth was rejected. Hence, concluding that there is a bi-directional causality running from Social and community service expenditure and economic growth. However, the null hypothesis of economic growth *does not Granger cause* inflation given that the probability is 0.787 and that inflation *does not Granger cause* economic growth was accepted given that the probability is greater than 0.05 at 0.597. Hence, we conclude that there is no causality between economic growth and inflation. Given that the probability is less than 0.05 at 0.008 the null hypothesis of social and community service expenditure *does not Granger cause* economic services expenditure was rejected, which implies that there is bi-causality between economic services expenditure and social and community service expenditure. This finding corroborates Dada & Adewale (2013) and Anoke, Odo, Chukwu & Agbi (2016) who found bidirectional causality which affirms the existence of Wagner’s law for Nigeria.

## CONCLUSIONS AND RECOMMENDATIONS

### Conclusions

Government expenditure on economic, social and community services expenditure add value to the growth process of an economy. The Granger causality analysis has shown that there is a bi-directional causality between economic growth and government spending, which posit to a high level of accuracy that Wagner’s law holds for Nigeria.

### Recommendations

There is need for government to curtail rapid growth of government size above the optimum level that escalates expenditure. Also further expansion on expenditure should focus on economic, social and community services since they are growth enhancing.

## REFERENCES

- Anoke, C.I, Odo S. I, Chukwu B.C & Agbi P. E. (2016). Testing the applicability of Wagner's Law in Nigeria. *Quest Journal of Research in Business & Management*. 4(6), 33-45, Retrieved from [www.questjournals.org](http://www.questjournals.org)
- Bojanic, A. N. (2013). Testing the validity of Wagner's Law in Bolivia: A Cointegration and causality analysis with disaggregated data, *Revista de Análisis Económico*, Vol. 28 (1), 25-45
- Chang, T., Liu, W & Caudill, S. (2004), A re-examination of Wagner's Law for ten countries based on cointegration and error correction modelling techniques, *Applied Financial Economics*, 14(8), 577-589
- Dritsakis, N. & Adamopoulos, A. (2004). A causal relationship between government spending and economic development: An empirical examination of the Greek economy, *Applied Economics*, 36(5), 457-464
- Edeme, R.K & Nkalu, N.C (2016). Crowding-in and crowding-out effects of recurrent and capital expenditure on human capital development in Nigeria, *Asian Development Policy Review*, 4(3): 65-73, doi: 10.18488/journal.107/2016.4.3/107.3.65.73
- Henrekson, M. (1993). Wagner's Law: A spurious relationship? *Public Finance/Finances Publiques*, 48 (2), 406-415
- Ibrahim Y.A. (2009). Public expenditure pattern and economic growth in Nigeria (1970-2007), Unpublished MSc thesis, University of Nigeria, Nsukka. Retrieved from [www.unn.edu.ng/publications](http://www.unn.edu.ng/publications)
- Isibor A.A, Babajide A.A & Okafor T.C. (2013), Public expenditure and Nigerian economic growth. Unpublished PhD thesis, Covenant University, Ogun State. Retrieved from [www.covenantuniversity.edu.ng](http://www.covenantuniversity.edu.ng)
- Kumar, S., Webber, D. J & Fargher, S. (2009). Wagner's Law revisited: Cointegration and causality tests for New Zealand, University of the West of England Discussion Papers, 917
- Mathew A.D. & Oguntegbe, A. A (2013). Is Wagner's law a myth or a reality? Empirical evidence from Nigeria, *International Journal of Development & Economic Sustainability*, 1(1), 123-137, retrieved from [www.ea-journals.org](http://www.ea-journals.org)
- Moheeth M. (2017). Analysis of public expenditure growth: 3 theories. Retrieved from [www.accountingnotes.net](http://www.accountingnotes.net)
- Nurudeen A. & Usman A. (2010). Government expenditure and economic growth in Nigeria, 1970-2008: A disaggregated analysis, *Business & Economics Journal*, available from <http://astonjournals.com/bej>
- Okoro, A.S (2013). Government spending and economic growth in Nigeria (1980-2011), *Global Journal of Management & Business Research Economics and Commerce*, 13(1), 21-30
- Serena L. & Andrea, Z. (2015). Increasing public expenditures: Wagner's law in OECD countries, Unpublished thesis. Retrieved from <https://dialnet.unirioja.es/descarga/articulo/3136564.pdf>
- Singh, B & Sahni, B. S. (1984). Causality between public expenditure and National income, *Review of Economics and Statistics*, 66 (4), 630-644
- Tobin, D. (2005). Economic Liberalization, the changing role of the State and Wagner's Law: China's, development experience since 1978, *World Development*, 33(5), 729-743

- Udo, B (2017). 12 things to know about Nigeria's 2017 budget, Accessed from <http://www.premiumtimesng.com/news/top-news/233990-12-things-to-know-about-nigerias-2017-budget.html>
- Ukwueze, E.R. (2014). Public expenditures and economic growth in Nigeria: 1961-2012, Unpublished PhD thesis, University of Nigeria, Nsukka. Retrieved from [www.unn.edu.ng/publications/.../PUBLIC%20EXPENDITURES%20AND%20ECO%20N](http://www.unn.edu.ng/publications/.../PUBLIC%20EXPENDITURES%20AND%20ECO%20N)
- Wijeweera, A & Garis, T. (2009). Wagner's law and social welfare: The case of the kingdom of Saudi Arabia, *Applied Econometrics & International Development*, 9(2), 199-209