Examining the Relationship between Government Spending and Economic Growth in Nigeria: An Application of Wagner's Law Hypothesis

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DOI: https://dx.doi.org/10.47772/IJRISS.2023.7011009

Received: 30 September 2023; Revised: 15 October 2023; Accepted: 21 October 2023; Published: 28 November 2023

ABSTRACT

This paper examined the relationship between Government Spending and Economic Growth in Nigeria with special reference to Wagner's Law Hypothesisusing annual data that spanned from 1981 to 2022. By examining the relationship between governments expenditure and the annual growth rate of GDP. The study sourced its data from the Central Bank of Nigeria's statistical bulletin 2022, and first, examines the stochastic properties of the variables through the Augmented Dickey-Fuller (ADF) test. The result reveals that, the data series are stationary at level. The hetero skedasticity test through Breusch-Pagan-Godfrey and Serial Correlation through the Breusch-Godfrey LM Test were performed and the long-run relationship between the variables has been examined through regression model (OLS). The result of the model reveals that government expenditure are significant in explaining GDP, this implies that government expenditure and GDP have a statistically significant long-run relationship, and thus, concluded in support of the validity of Wagner's law for the Nigerian economy. It's therefore, recommended that the Nigerian government should step up its effort in ensuring proper management of its resources and invest more inlabor-intensive sectors like agriculture.

Keywords: Economic Growth, GDP, Government Spending, Nigerian Economy, Wagner's Law

INTRODUCTION

Public finance is one of the most extensively debated facets of economics. Government expenditure, in particular, has been so well studied theoretically and empirically that further attempts to revisit it often seem to be a rehearsal of the same old arguments. Nevertheless, many of the issues have remained inconclusive both at the level of theory and empiricism. What drives public expenditures, or the relationship between income and public spending, is one such contentious issue. Despite the substantial increase in government expenditure in Nigeria, it remains unclear whether this substantial investment is yielding the expected returns in terms of sustained economic growth and development. The inconsistent correlation between public spending and economic performance has raised critical questions about the effectiveness of fiscal policies and the specific factors influencing this relationship. This inconsistency poses a significant challenge in Nigeria's quest for economic stability and sustainable growth.

The Wagner Law (WL) is iconic among the early attempts to explain this relationship. The magnitude of public expenditure has been increasing over time in almost all the countries of the world. Therefore, governments must know the causal relationship between the two. Wagner (1883), postulated that public expenditure is an endogenous variable and that there exist long-run tendencies for public expenditure to grow relatively to some national income aggregates such as the gross domestic product (GDP). Moreover, public expenditure is a consequence rather than the cause of national income. In other words, the causality between public expenditure and national income runs from national income to public expenditure.

Therefore, Wagner's law viewed that public expenditure plays no role in generating national income.

In Nigeria, government expenditure has been on the rise owing to the huge receipts from the production and sales of crude oil, and the increased demand for public goods like roads, power, education, communication, and health. Moreover, there is an increasing need to provide both internal and external security for the people and the nation. Unfortunately, this rising government expenditure has not translated into meaningful growth and development, as Nigeria ranks among the poorest countries in the world. The result of the government's role in economic activities and the achievements in economic performance have been mixed. For instance, the economy will experience growth in real output in some years and declines in others. Meanwhile, the economy is mostly dominated by the public sector except recently that the government is trying to adopt a privatization policy. But the overall picture is low scoring for the country's developmental efforts. The objectives of monetary and fiscal policies in Nigeria are wide-ranging, involving the Gross Domestic Product growth rate, reduction in the rates of inflation and unemployment, improvement in the balance of payments, accumulation of financial savings and external reserves as well as stability in the Naira exchange rate. The guiding principle as well as instruments applied to attain these objectives, however, have until recently been far from adequate. Perhaps, this could be attributed to inconsistency in the formulation and implementation of vibrant policies.

In many oil-exporting developing economies, including Nigeria, Morgan (1979) observed that Government expenditure has remained the major lubricant driving economic activities such that whenever there is a decline in oil revenues, economic growth suffers. The implication for these economies is that, even when alternatives to oil revenues are found, the discourse about the relationship between government expenditure and economic activity still continues to subsist.

Wagner's law offers a good theoretical premise for analyzing the relationship between Federal Government expenditures and national income growth not just in Nigeria but in other economies. The empirical evidence of Wagner's law on developing countries is growing albeit with conflicting results. Whereas some studies including Dada and Oguntegbe (2013); and Ogbonna (2012) reported evidence of Wagner's Law in Nigeria, others reported no existence of the law based on equally robust analysis (Babatunde, 2011 and Olayemi, 2009). Consequently, further investigations are required in this direction.

LITERATURE REVIEW

The literature extensively explored the link between government expenditure and economic growth, on the basis of which we made our contribution to knowledge through gaps identified, by separating capital and recurrent expenditure to identify their effect individually.

Theoretical Literature

Of the numerous attempts to explain the growth in government expenditure, Wagner (1890), was perhaps the first systematic theoretical construct to put forward an explanation for the increasing scale of a state or government activity in countries. Though, Wagner's theory had been interpreted in diverse ways, Recktenwald (1978), however, stated that "…from the political economy standpoint, this law means absolute and even relative growth" and that "…an ever-increasing and increasingly important proportion of aggregate demand of an advancing civilized people are met by the state instead of by others…".

According to Wagner, for government to discharge its various duties to society, it had to incur expenditures for different purposes. He went on to argue that as the scale of government increased, the amount of expenditure it incurred for various developmental projects also increased. Thus, the expansion of the public sector or economic growth and public expenditure moved in the same direction. In other words, as the economy developed, the government tended to spend more in the quest for industrialization and social

development as asserted by Bhatia (1985), Recktenwald (1978), and Gandhi (1971). This was true, the nexus of Wagner's law. Thus, expenditure was posited to be positively correlated to the level of economic growth and development.

As observed earlier, Wagner's law remained unchallenged until 1961, when Peacock and Wiseman (1961) came up with an alternative hypothesis that government expenditure grew because of the presence of social disturbances. They found from the results that in the UK, government expenditure moved in ara ther spasmodic and step-like manner, as the growth in government expenditure was discovered to have been concentrated within the disturbance period and occurred with a displacement effect. The displacement effect was produced because people appeared to accept the higher level of taxes associated with very disturbance and even after the disturbance, government expenditures did not return to their original levels.

Since the works by Wagner in 1890 and those of Peacock and Wiseman (1961), several other studies had been carried out to determine the nature of changes in government expenditure across countries. These results varied from the school of thought that government expenditure actually grew with the level of economic activity (Beck, 1976 and 1979; Pluta, 1981 and 1979). The decline in government expenditure was found to have occurred in both developed and developing countries, but it was more apparent in developing countries.

Empirical Literature

The empirical literature on Wagner's Law explores deep into the multifaceted relationship between government expenditure and economic growth. This comprehensive review encompasses a wide range of findings, methodologies, and geographic locations, offering valuable insights into the complexities of this economic theory. The literature can be grouped into several key themes, shedding light on the applicability and distinctions of Wagner's Law.

Global Perspectives on Wagner's Law

In a global context, a plethora of empirical studies has explored the validity of Wagner's Law, attempting to uncover whether government expenditure indeed grows with the level of economic activity. For instance, Szarowska's (2012) investigation extended to eight European countries, including the Czech Republic, Bulgaria, Latvia, Slovenia, Hungary, Romania, Slovakia, and Estonia from 1995 to 2009. Her research found that Wagner's Law held true in each of these countries, providing a robust endorsement of the theory.

Similarly, Mohsen and Nafise (2016) explored the causal relationship between government expenditure and GDP for countries in the Middle East and North Africa (MENA) region. Panel unit root tests and panel co-integration analysis were employed for the period from 1970 to 2010, revealing a strong causality from economic growth to government expenditure. However, government spending did not significantly affect GDP.

Additionally, Odhiambo (2015) studied the dynamic causal relationship between government expenditure and economic growth, focusing on South Africa, the most advanced economy in Africa. Employing the Auto-Regressive Distributed Lag model (ARDL) and bounds testing approach, the study uncovered that, while both government expenditure and economic growth Granger-caused each other in the short run, in the long run, it was economic growth that Granger-caused government expenditure.

Similarly, Kumar et al. (2012) conducted research in New Zealand, examining data from 1960 to 2007 and employing both GNP and GDP as proxies for economic activity. Their findings aligned with Wagner's Law, further strengthening the argument for its validity. However, not all studies have concurred with this perspective. Ekimova and Balatsky (2012) explored the theory's applicability in countries such as the

United States, Great Britain, Sweden, and Russia. In these cases, the Law was not found to hold, highlighting the diverse nature of the relationship between government expenditure and economic growth.

Wagner's Law in Developing Economies

Studies on developing countries also reported mixed results on the validity of Wagner's law. Bojanic (2013) applied disaggregated data on Bolivia using error correction models and co-integration analysis to test the assumption of a long-run relationship between various kinds of government expenditure and national income. The results showed that there was bi-directional causality between income and government expenditure, thus, establishing validity for Wagner's law in Bolivia.

Specific Case of Nigeria

In Nigeria, the outcome of studies on the validity of Wagner's law was also mixed, with some supporting the Law and others disputing it, but with most of the differences coming mainly from the direction of causality. Magaji (2019) who examine the influence of government expenditure in promoting economic growth in Nigeria over the period of three decade, using annual time series data from 1981 to 2018. his study used RGDP as proxy for economic growth, while capital expenditure and recurrent expenditure was used as explanatory variables, Autoregressive Distributed Lag (ARDL) model was used to check there lationship between the variables. his findings showed that there is a negative and statistically significant long-run relationship between capital expenditure and economic growth in Nigeria. His result also reveals that, there is a statistically significant and positive long-run relationship between recurrent expenditure and economic growth in Nigeria. Who then recommended based on his findings, that government should increase its budgetary allocation to capital projects. Udoka and Any ingang (2015) empirically analyzed the effect of public expenditure on the growth and development of Nigerian economy (1980-2012) using Ordinary least square multiple regression technique. They argued that total government spending had a positive and significant impact on economic growth and development of the Nigerian economy. The analysis which further disaggregated public expenditure into capital and recurrent expenditure showed that both components positively and significantly induced growth and development in Nigeria.

Other studies on Nigeria included. Ebong, Ogwumike, Udongwo and Ayodele (2016) assessed the impact of government capital expenditures on economic growth in Nigeria. A multiple regression model based on a modified endogenous growth framework was utilized to capture the interrelationships. Drawing on error correction and co-integration specifications, an OLS technique was used to analyze the annual time series. They found that the disaggregated expenditures do not crowd out private investment. Danmola, Olateju, and Abba (2013) investigated the linkages between different components of government expenditure and real gross domestic product for Nigeria. Utilizing Granger causality, error correction models, and co-integration techniques, their results were diverse. While total capital expenditure and real gross domestic product supported Wagner's Law through the Granger causality test, indicating a unidirectional causality, total recurrent expenditure and real gross domestic product exhibited bi-directional causality.

In the same vein, Matthew and Adewale (2013) employed a Vector Error Correction Model (VECM) to confirm the unidirectional causality running from expenditure to revenue. These findings further add to the complexity of the Wagner's Law debate in the Nigerian context.

More so, Shuaib and Ahmed (2015) examined impact of public finance on the growth of the Nigeria economy, with a time series data from 1960 to 2013. Their study using Markov Switching Linear Regression Analysis showed a direct relationship between public finance and economic growth in Nigeria and therefore, stressed the need for the government to increase its capital expenditure, wedge war against corruption and intensify effort on internally generated revenue.

However, Babatunde (2011) used data for the period 1970 to 2009 and found no evidence of Wagner's Law in Nigeria. Similarly, Clement and Dickson (2010) used disaggregated data of federal government functional expenditures for the period 1961 to 2007 to test Wagner's law. They could not establish any evidence of Wagner's law even when other fiscal policy variables were included in the model.

In summary, it could be concluded that Wagner's law had a strong validity at the early stages of development, implying a weakening of the Law as the country developed. This meant that Wagner's law had more policy relevance to developing than advanced economies, and the quality of the results was influenced by the econometric technique.

METHODOLOGY

In this study, annual data series was employed for the time frame covering 1981 to 2022 with a total of 41 observations for each individual variable with respect to the Nigerian economy. The data were sourced from the Central Bank of Nigeria (CBN) Statistical Bulletin of 2022.The study adopts a quantitative method to evaluate the empirical evidence of the relationship between government expenditure and economic growth in Nigeria. To comprehensively analyze this relationship and ensure the reliability of the findings, a battery of econometric techniques was utilized. These techniques encompass The ADF test which was applied to assess the stationarity of the data series. This test determines whether differencing is required to achieve stationarity. The Breusch-Pagan-Godfrey test was also employed to identify the presence of heteroskedasticity in the dataset. Detecting non-constant variance is crucial for accurate regression analysis, The Breusch-Godfrey LM Test was used to examine potential serial correlation within the data. It assesses the autocorrelation in the residuals, a critical factor for regression model validity. And finally the ordinary least square (OLS) regression technique was used to determine the relationship between Government expenditure and economic growth in Nigeria. In statistics, ordinary least squares (OLS) or linear least squares is a method for estimating the unknown parameters in a linear regression model.

Thus, the model reads as;

$$Y = \beta_1 + \beta_2 X_t + et \quad \text{……..….. (1)}$$

Where:

Y = the dependent variable and

β_1 and β_2 are the intercept and slope respectively.

X_t is the independent variable

While'et' is the error term that is independently and identically distributed with stochastic mean and a constant variance. Equation (1) can be re-written as:

$$GDP = \beta_1 + \beta_2 GEXP + et. \quad \text{…….. (2)}$$

Where:

GDP = Gross Domestic Product (in US Dollars)

GEXP = Government Expenditure (in billion Naira)

β_1 = Constant Parameter

$\beta_2 - \beta_3$ = Coefficient of the independent variable

et = Error term

RESULTS AND DISCUSSION

This section contains a detailed presentation and discussion of data analysis and the result of this study. The findings are presented under the following tables; Augmented Dickey-Fuller unit-root Test, Heteroskedasticity test Breusch-Pagan-Godfrey, Breusch-Godfrey Serial Correlation LM Test and Regression Analysis

Table 1: Augmented Dickey-Fuller unit-root Test

Varriables	t-statistics	Level
GDP	2.9659*	I(0)
GEXP	3.9691*	I(0)

Source; EViews8.*,**&****indicates stationarity at 1%,5%&10% level of significance

Table 1 shows the different results obtained for the ADF unit root test for the two variables employed in the study within the timeframe of 1981 to 2022 in the Nigerian economy. As shown in the table, both of the variables GDP and GEXP passed the unit root test atleveland are statistically significant at 1%.

The main idea behind the unit-root testing is to find out the stochastic properties of each series. That is, mean, variance, and co-variance need to be constant for us to have a stationary process. The result shows that our variables are not random and have long-run information.

The heteroskedasticity Breusch-Pagan-God freytest was performed and the result shows that the data set ishomoscedastic, free from Heteroskedasticity.

Table 2: Heteroskedasticity test Breusch-Pagan-Godfrey

F-statistic	1.528212	Prob. F(2,38)	0.2300
Obs*R-squared	3.052223	Prob. Chi-Square (2)	0.2174

Source; E Views 8.

A further test was conducted to test for autocorrelation, at first, the result showed evidence of correlation and was corrected by adding 3 period lag of the dependent variable into the explanatory variables, and the result is as follows:

Table 3: Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	2.010433	Prob. F(3,33)	0.1316
Obs*R-squared	6.180988	Prob. Chi-Square (3)	0.1031

Source; E Views 8.

The result clearly shows that there is no auto/serial correlation. Because the probability of observed R^2 is greater than 5%.

Table 4: A Regression Analysis: GDP (Dependent Variable)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	87.19362	17.82186	4.892510	0.0000
GEXP	0.046147	0.004117	10.40543	0.0000

Source; E Views 8.

Table 4 presents a regression analysis conducted between GDP as the dependent variable and governments pending as the independent variable. The main reason for regressing the two series is to test the validity of Wagner's law of public finance to the Nigerian economy. The law is linked to the German economist Adolph Wagner (1835-1917), who asserts the presence of a long-run positive relationship between the government's total expenditure and a national income proxy by the Growth Domestic Product, in other words, the total expenditure of the nation rises constantly as the economy expands.

The result shows thata 1 billion Naira increase in government spending will lead to .046 Billion Dollar increase in GDP. This impliesa positive relationship between government expenditure and GDP and it is statistically significant at a 1% level of significance, and therefore we reject the null hypothesis and accept the alternative (there is a positive and statistically significant relationship between GDP and GEXP. This implies that Wagner's lawholds for the Nigerian economy within the period under focus.

CONCLUSION AND RECOMMENDATIONS

The paper examined the relationship between Government Spending and Economic Growth in Nigeria using Wagner's Law. The timeframe was from 1981 to 2022 based on annual time series of government expenditures and Gross Domestic Product, to realize the set objectives, statistical and empirical tests were conducted, such as unit root test, Ordinary Least Squares, heteroscedasticity, and Breusch-Godfrey Serial Correlation LM Test: The empirical evidence from this study points out that, positive relationship exist between GDP and government expenditure in Nigeria. The study has therefore, confirmed the assumptions of Wagner's hypothesis in Nigeria.

Given that economic activity position was positively influenced by government expenditure a mutualism relationship might be exploited by policy-makers to accelerate growth. For planning, the results are very crucial. This is because, as the economy expands, government recurrent expenditure commitment increases, which may be sustainable if the revenue base is simultaneously strengthened. It is, therefore, possible to plan and implement improvements in taxation as the economy grows to avoid fiscal indiscipline.

Based on the statistical and empirical findings of this paper, it is therefore recommended that the Nigerian government should improve its sources of revenue in order to satisfy the increasing demand of its people now and in the future. This can be archived by diversifying the economy away from dependence on earnings; such as crude oil because the potential fall in oil earnings may lead to a corresponding fall in government expenditure. The economy can be diversified to more labor-intensive sectors like agriculture and industries so as to increase output and income per capita and so that government expenditure can be based more on tax receipts than on oil export earnings. More financially responsible households will demand an increase in government expenditure as their incomes increase especially for the provision ofpublic goods and services such as roads, power, education, and communication for which they are

currently financially committed.

The government should also establish an agencythat will be in charge of the capital contract awarding process which will closely monitor and also guard against overestimation of capital project cost, in order to prevent the rechanneling of public funds into the private account of top government officials, and giving autonomy to existing anti-graft or anti-corruption agencies like the Economic and Financial Crime Commission (EFCC), The Independent Corrupt Practice Commission (ICPC)

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