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Nigeria Economic Recess versus Wagner's Law and Keynesian Proposition

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Abstract

This study is a follow-up on effectiveness of government strategies to redress the current Nigeria economic recess. Specifically, the study examined the adequacy of public expenditure led approaches to retract the negative growth of national income. In order to achieve this, the paper examines the validity of Wagner's law and Keynesian proposition in Nigeria using Toda and Yamamoto and Dolado and Lutkepohl (TYDL) approaches to causality within the frameworks of augmented VAR and Block Exogeneity Wald test. The study employed aggregate and disaggregated government expenditure under six different sub divisions. The results show that five of the six pairs of the expenditure components, which includes, total government expenditure, capital expenditure, expenditure on economic activities, expenditure on general administration and expenditure on agriculture support Wagner's law, only expenditure on agriculture supports Keynesian proposition on bidirectional causality while no causality is found for recurrent expenditure. It is therefore evidenced that Wagner's law is strongly supported in Nigeria, thus suggests that private sector led approach would be more appropriate for Nigeria economic recovery than the current expansionary fiscal policy approach of the government.

Keywords: Administration; Economic recovery; Management strategy

Introduction

The current economic recession in Nigeria poses researcher's curiosity on how to device new strategies and what the government should take as priority to sail the country through the period of challenges currently being experienced. In a time like this, all government policies and programs require review in a way to channel a new course, as such, to replace policy where necessary and reposition others in strategic ways. In a period of recession, one of the best tools at the government disposal is the expenditure management strategy. Theoretically, two prominent positions on how the economy could be enhanced using the duo of national income and expenditure are founded in Wagner's Law and Keynesian propositions. Wagner's Law posits that during the industrialization process, as the real income per capita of a nation increases, the share of public expenditures in total expenditures increases. The position of Wagner is in a sharp contrast with the Keynesian who identified government expenditures as good policy instrument for increasing national incomes.

The two positions in the literature have different implications for the nature of policies that government should promote, especially when it goes through economic recess such as the current experience in Nigeria. Economic recess in Nigeria is motivated by shortage in revenue vis-à-vis global crash in the price of crude oil, which is the economic mainstay of the country. The effects feedback into the economy as the country began to record negative growth rates. Meanwhile, an economy where Wagner's law is evidenced might not be advised to rest its oak on the government expenditure as a major tool to stimulate national income. Invariably such policy might be counterproductive, having tendency to cause inflationary trend with possibility of rising unemployment, leading to stagflation. However, if the Wagner's law is invalidated and Keynesian proposition is upheld, the economy profits when expenditure is mainstreamed as critical tool to sail the economy through recess hurdles. There are diverse studies on income and expenditure nexus in Nigeria, but unfortunately, three things are inherent in the studies which make a revisit inevitable. In the first instance, there are no study earlier than five years, secondly, the existing studies hold contradictory positions. For instance, Babatunde [1] used data between 1970 and 2006 inclusive, but could not establish long run relationship between income and expenditure, meanwhile in his short-run analysis, Wagner's law could not be established but argued for weak validity of Keynesian position. In another study by Chimobi over the same period of 1970 to 2005 but published in 2016, it is validated that there is no long-run relationship between the expenditure and income, but short run analysis shows that Wagner's law could not be established rather the Keynesian position, Chimobi [2]. The same argument is supported by Igodharo and Oriakhi [3] who used data from 1961 to 2007 and concluded that Wagner's law could not be established.

Meanwhile, when the data is extended to 2008, 2009 and 2010 from 1970, the findings changed drastically. For instance, Oyinlola and Akinbosun [4] used data over a period between 1970 and 2009 inclusive and employed disaggregated public expenditure data to confirm the validity of Wagner's law in the end. So also, Ayo, Ifeakachukwu and Ditimi [5] when employed data from 1970 to 2010 confirmed bi-directional relationship between the government expenditure and economic growth in the end, but in the short-run only wagner's law is established which supports the argument that growth is exogenous to expenditure in Nigeria, although they employed inflation as a third variable in their analysis. The major discrepancy between Ayo et al. and Oyinlola and Akinbosun is that former allow the effect of inflationary trend in their analysis but failed to test and account for possible

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structural break, which is accounted for by the later. In another related finding, Akpan [6] employed data from 1970 to 2008 and confirmed Wagner's Law in the long-run, although in the short-run, Keynesian proposition is also supported.

In the cited studies, three key discrepancies could be identified, first, most of the studies failed to test for structural breaks in the data employed which could have introduced spurious position in the findings, in fact, the only one study that did so only accounted for a single break in 1993. Secondly, the results of various findings are completely different for those who maintained upper bound before 2007 and those who have a bound of years after 2007, this suggests a specific need to account for possible break in 2007. Finally, the most recent data employed in the studies ended in 2010 while data till 2014 are now available. This study would therefore provide up-to-date information for policy recommendation as regards the position of Nigeria economy within the Wagner's Law and Keynesian positions. We employed data from 1981 to 2014 to account for relevant periods and most recent data. The choice of 1981 has a clearer policy relevance for the 'New' Nigeria, grappling from the argument that, the global commodity price shocks of early 1980s still stands as the basis for various policies and programmes of the government in the country over the years till date. Any attempt to include earlier data might appear as deliberate introduction of structural shift into the analysis. More also, all regime shifts within 1981 and 2014 are accounted for in the analysis.

Literature Review

The Wagner's law and the Keynesian theory

Wagner's law is a principle named after the German economist Adolph Wagner (1835-1917). He advanced his 'law of rising public expenditures' by analyzing trends in the growth of public expenditure and in the size of public sector. He thus postulates that the extension of the functions of the states leads to an increase in public expenditure on administration and regulation of the economy. It also leads to the development of modern industrial society which would give rise to increasing political pressure for social progress and call for increased allowance for social consideration in the conduct of industry. So also he argued that with expansion of an economy, government welfare expenditures would rise particularly on education and health. He further argued that the rise in public expenditure would be more than proportional increase in the national income and will thus result in a relative expansion of the public sector. Musgrave [7] in support of Wagner's law, opined that as progressive nations industrialized, the share of the public sector in the national economy grows continually. The Wagner's also submitted that progress in technology requires government to take on certain economic services for which private sector may downside, Cooray [8].

In the other hand, Keynes is among the most noted economists who discussed the relationship between public expenditures and national income. He regards public expenditures key factor, which could be utilized as a policy instruments to promote economic growth. From the Keynesian thought, public expenditures contribute positively to economic growth. Hence, he argued that an increase in the government consumption would lead to an increase in employment, profitability and investment through multiplier effects on aggregate demand. As a result, government expenditure augments the aggregate demand, which provokes an increased output depending on expenditure multipliers.

Empirical literature

Studies on the test of validity or otherwise of Wagner's law is widely studied and cut across various economies; both developed and developing countries. Meanwhile, the results and findings are diverse, some support the validity of Wagner's law, and some others are not, but rather support the Keynesians propositions, while some others are neutral. The distribution of the evidences is random across time and space, without any specific bias for or against the countries in the developed or developing economies. Mudaki and Masaviru [9] studied the impact of disaggregated public spending on economic growth in Kenya and showed that education component of expenditure significantly determined economic growth while other expenditure components weakly determined it, which means Wagner's law could not be validated. In the same trend Tan [10] examined the relevance of Wagner's law in Malaysia using data from 1980 to 1997 and conclude on the irrelevance of Wagner's law in favour of Keynesian proposition, but in an earlier study, Tang [11] investigated the relationship between national income and Government expenditure in Malaysia using data from 1960 to 1998 and found *no* long *run* relationship among the non-stationary variables, but established unidirectional causality running from national income to Government expenditure. Thus, Wagner law was supported in the short run. Meanwhile, Govindaraju et al. [12] examines Wagner's law and the Keynesian hypothesis using Auto Regressive Distributed Lag (ARDL) approach to investigate cointegration in Malaysia, using time series data from 1970 to 2006. The analysis revealed that aggregate government spending Granger causes the real GDP, which supports Wagner's law within bivariate framework. But multivariate framework, support Keynesian hypothesis which suggested that omitted variables bias could significantly alter the validity of Wagner's law in some cases.

In a study by Abrishami et al. [13] on Iranian economy, they examined causal relationships between Government Recurrent Expenditure (GRE) and GDP for Iran using the Gregory-Hansen cointegration technique, which allowed for the presence of potential structural breaks in data and found existence of long-run relationship between the variables. The Granger Causality test indicates strong unidirectional that run from GDP to GRE. But there is no evidence that total expenditure promotes long-term economic growth. The study confirmed Wagner's law. Ghorbani and Zarea [14] in an earlier study on Iran also validated the Wagner's law in the country. More also, Dandan [15] investigate the impact of public expenditures on economic growth in Jordan using time series data for the period 1990-2006, the study found that the government expenditure at the aggregate level has positive impact on the growth of GDP which also support the Keynesian's theory. Also, studies by Demirbas [16] could not establish Wagner's law for Turkey.

The findings in Asia countries are diverse ranging from evidence for Wagner's law, Keynesian proposition and some cases neutral positions. Kumar [17] investigated Wagner's Law for some East Asian countries: China, Hong Kong, Japan, Taiwan and South Korea, for the period 1960 to 2007. Using the Gregory and Hansen structural break techniques, they found cointegrating relationship between real government spending and real income. They inferred that Wagner's Law hold for China, Japan, Taiwan and South Korean countries, but could not validate the law for Hong Kong. More also, Dogan and Tang [18] studied five Asian countries which include, Indonesia, Malaysia, Philippines, Singapore, and Thailand but only found support for Keynesian proposition for Philippines, while there is no evidence for either Wagner's law and Keynesian proposition for other four countries. Meanwhile, in earlier studies Chang [19] examined different

versions of Wagner's law by employing annual time-series data on six countries over the period of 1951-1996. Three countries are part of the emerging industrialized countries of Asia (South Korea, Taiwan, Thailand) and three are industrialized countries (Japan, USA, and the United Kingdom) [20]. The results indicated that there exist a long-run relationship between income and government spending for sample countries except Thailand. The validity of Wagner's Law was also found for the countries excluding the Thailand.

Meanwhile Huang [21] in a later study tested Wagner's Law for China and Taiwan, using annual time series data of 1979-2002. He employed Bounds Test based on Unrestricted Error Correction Model and found that there exists no long-run relationship between government expenditures and output in China and Taiwan. The Toda and Yamamoto's Granger non-causality test results also show that Wagner's Law does not hold for China and Taiwan.

Liu and Hsu [22] in their study on the United States used both the aggregated and disaggregated data sub-categorized to five federal expenditures, which include, national defense, human resources expenditure, physical resources expenditure, net interest payment, and other expenditure. They found that total federal government expenditure is more consistent with Keynesian's theory while there are diversified causal relationships among five sub-categories. Magazzino [23] examined the empirical evidence of Wagner's Law in EU-27 countries over time period of 1970-2009. He used six alternative functional forms of Wagner's law specification. As regards to Keynesian hypothesis, they found no clear evidence of government expenditure causing national income. In other words, the Keynesian proposition of government expenditure as a policy instrument to encourage and lead growth in the economy is not supported by the data used. However, he suggested further research in line with new "Augmented" version of the law, which considers inclusion of some relevant omitted variables, such as urbanization and industrialization' effects. So also, Magazzino [24] investigated wagner's law in Italy for the period 1960-2008 at a disaggregated level, using a time series approach. He employed the specifications of Wagner's Law for some specific items of public spending (for interests, for final consumption, for labor dependent income, for grants on production, and for public investments), according to the Bank of Italy classification. He found a cointegration relationship for three out of five items and the results from Granger causality tests show evidence in favor of Wagner's Law only for passive interests spending in the long-run, and for dependent labor income spending in the short-run.

Model and Econometric Processes

Recursive residual tests for structural breaks

The unidentified data instability is a major source of biasness in studies. Structural break in time series data ends up in researcher making spurious conclusion and wrong policy recommendation. In order to avoid this, studies such as ours require testing for existence of structural shift and thus apply appropriate correction during the analysis.

In this study, recursive test for stability is conducted using CUSUM test to ascertain the stability of the variables and use of one-step forecast test to identify where the break(s) exist. The two approaches are the popular procedures to test for structural breaks in variables. CUSUM test is suggested by Brown et al. [25] based on cumulative sum of the recursive residuals. It plots the cumulative sum together with 5% critical lines. if the cumulative sum goes outside the area between the two critical lines, one then conclude that parameter instability is found. Subsequently one-step forecast test assist in identifying the period(s) of break(s).

Meanwhile, minimal structural break is expected given that the variable specifications is in logarithm form. The results of CUSUM and one-step forecast tests are presented in Figure 1 as presented all the variables are stable except that of expenditure on economic activities (LECO). The break points are identified in 1987, 1993 and 2014.

The econometric model

We adopt Toda and Yamamoto and Dolado and Lutkepohl (YTDL) Granger Causality/Block Exogeneity test between the National Income (GDP) and government expenditure (EXP) within the augmented VAR structure.

In the bi-variate VAR which describe variables x and y, y does not granger cause x if the coefficient matrix $ø_j$ are lower triangular for all values of J:

$$\begin{pmatrix} x_t \\ y_t \end{pmatrix} = \begin{pmatrix} \alpha_1 \\ \alpha_2 \end{pmatrix} + \begin{pmatrix} ø^1_{11} & 0 \\ ø^1_{21} & ø^1_{22} \end{pmatrix} \begin{pmatrix} x_{t-1} \\ y_{t-1} \end{pmatrix} + \begin{pmatrix} ø^2_{11} & 0 \\ ø^2_{21} & ø^2_{22} \end{pmatrix} \begin{pmatrix} x_{t-2} \\ y_{t-2} \end{pmatrix} + \cdots\cdots\cdots + \begin{pmatrix} ø^\rho_{11} & 0 \\ ø^\rho_{21} & ø^\rho_{22} \end{pmatrix} \begin{pmatrix} x_{t-\rho} \\ y_{t-\rho} \end{pmatrix} + \begin{pmatrix} \mu_{1t} \\ \mu_{2t} \end{pmatrix} \quad (1)$$

From the first row of the above system, the optimal one-period upfront forecast of x does not depend on lagged value of y but on its own lagged values, that is;

$$\text{If } E(x_{t+1} | x_t, x_{t-1}, \ldots\ldots, y_t, y_{t-1} \ldots..) = \alpha_1 + ø^1_{11} x_t + ø^2_{11} x_{t-1} + \cdots + ø^\rho_{11} x_{t-\rho+1} \quad (2)$$

But, having the knowledge that the variables are integrated of order 1, the optimal lag length ρ suggested by various criteria is adopted and eq. 3 below is estimated within the Vector Auto Regressive (VAR) structure.

$$W_t = (GDP_t, EXP_t)' \quad (3)$$

The W_t is the column vector of the variables. Explicitly:

$$GDP_t = \alpha_1 + \alpha_1 GDP_{t-1} + \alpha_2 GDP_{t-2} + \ldots + \alpha_\rho GDP_{t-\rho} + b_1 EXP_{t-1} + b_2 EXP_{t-2} + \ldots + b_\rho EXP_{t-\rho} \quad (4)$$

$$EXP_t = \alpha_2 + \alpha_1 EXP_{t-1} + {}_2 EXP_{t-2} + \ldots + \alpha EXP_{t-\rho} + b_1 GDP_{t-1} + b_2 GDP_{t-2} + \ldots + b_\rho GDP_{t-\rho} \quad (5)$$

Eqs. (4) and (5) shows that the optimal one-period-ahead forecast of GDP_t (EXP_t) does not depends on lagged values of EXP_t (GDP_t), but its own lagged values.

For possible pairs of GDP_t and EXP_t, and ρ is the optimal lag length adopted. Reported F-Statistic are the Wald-statistic for the joint hypothesis

$$b_1 = b_2 = \ldots\ldots\ldots = b_\rho = 0 \quad (6)$$

The null hypothesis in eq. (6) states that EXP_t (GDP_t), does not granger cause GDP_t and (EXP_t) in equation (4) and (5) respectively.

If any of the coefficient b_i; i=1,2..... ρ is significantly different from zero, null hypothesis (6) is rejected in either or both cases in eq. (4) and (5). In case any of coefficient b_i is significantly different from zero in both equation (4) and (5), then bi-directional causality holds.

Data Sources and Measurement

Time series data on Gross Domestic Product (GDP) and Government Expenditure (EXP) at aggregate and disaggregated levels measured at current price, over the period from 1981 to 2014 were collected from Central Bank of Nigeria's Statistical Bulletin, Volume 25, published December 2014 being the most recent volume available

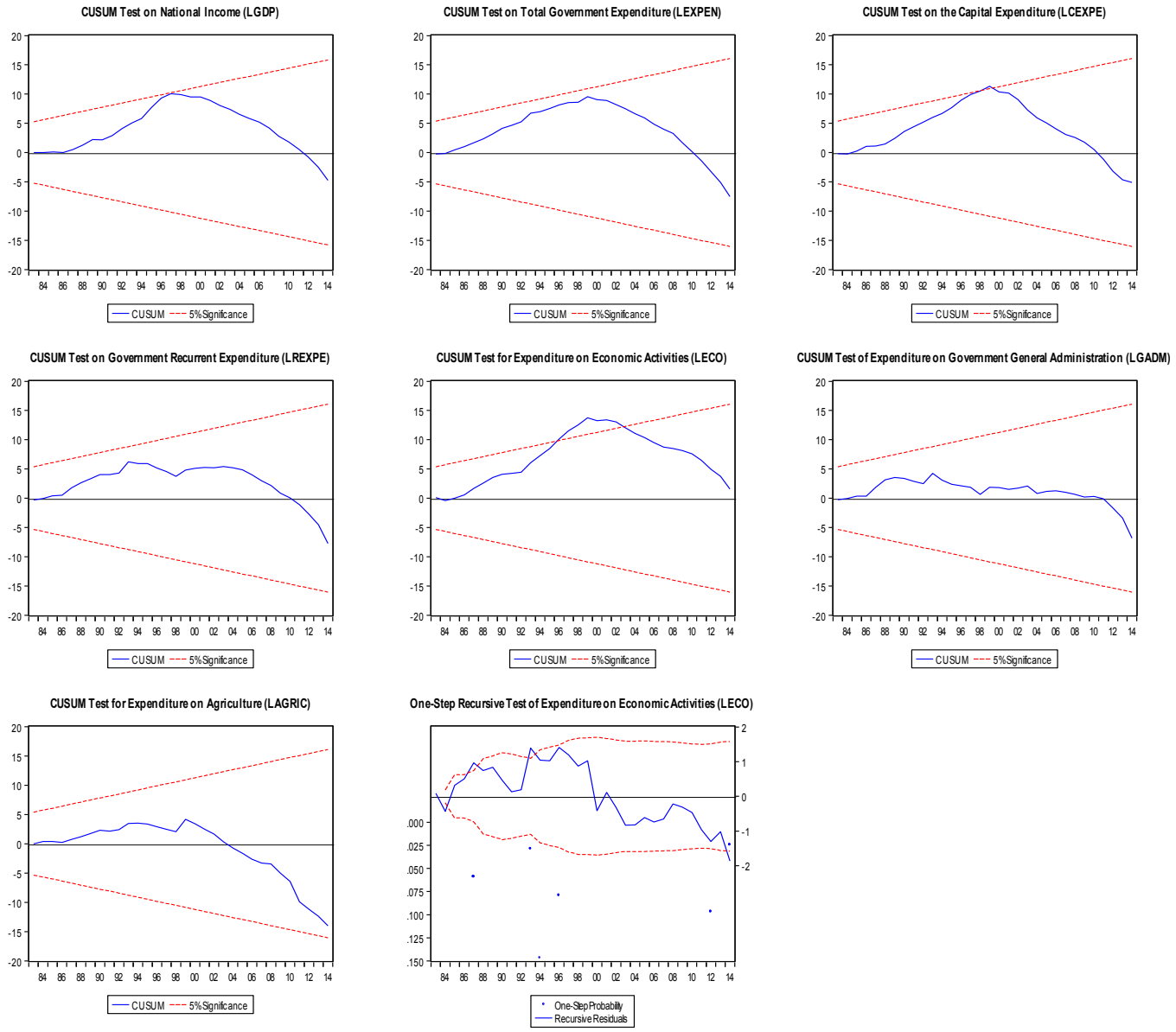

Figure 1: Recursive CM SUM and one step forecast tests of the variables.

as at the time this study is carried out in 2016. The total government expenditure (EXPEN) is measured as total federal government expenditure for both the recurrent and capital projects. In its first layer of disaggregation, the recurrent federal government expenditure (REXP) and federal government capital expenditure (CEXP) are collected [26-28]. The disaggregated federal government expenditure on Economic activities (ECO), General Administration (GADM), and Agriculture (AGRIC) are also employed.

Estimation and Analysis

Unit root test

To avoid spurious findings, it is important to carry out test and ensure that time series data are stationary. If the data are not stationary, trend removal is required and the most common approach of de-trending procedure is to first difference the data. First differencing is appropriate for I(1) time series. Unit root tests are used to determine if trending data should be first differenced or be differenced at higher order to make it stationary. Phillips and Perron and Augmented Dickey–Fuller (ADF) unit root tests are employed in this analysis. The two methods differ on how they deal with serial correlation and heteroscedasticity in errors [29]. While the ADF tests use a parametric autoregression to approximate the structure of errors, PP tests ignore any serial correlation in the test regression using non-parametric method. Usually, it is important to use multiple unit root test approaches to provide robustness check and ensure that the limitations inherent in the use of a single approach do not lead to wrong conclusion about the nature of the data analysed.

Table 1 presents the results of the unit root test on all the variables. It shows that ADF and Philip Perron (PP) results are the same, supporting the stationarity of the variables at first difference I(1), but not at levels I(0).

Variable Unit Root Tests	ADF level	1st diff.	PP level	1st diff.
With intercept only				
LGDP	-1.0168	-4.5427*	-1.0168	-4.5143*
LEXPEN	-2.2201	-1.3887*	-1.171	-6.8868*
LCEXPE	-0.4292	-5.3517*	-0.4265	-5.3389*
LREXPE	-1.4364	-7.2386*	-1.3725	-7.2377*
LGADM	-1.37	-7.9768*	-1.3686	-7.9768*
LECO	-0.8559	-5.7563*	-0.8777	-5.7613*
LAGRIC	-1.5207	-8.4355*	-1.5379	-9.7993*
With intercept and trend				
LGDP	-0.589	`-3.6396*	-0.7426	-4.5444*
LEXPEN	0.2983	-4.6448*	-0.6133	-7.2112*
LCAEXPE	-1.7068	-5.2569*	-1.8995	-5.2489*
LREXPE	-1.4364	-7.4567*	-1.0498	-7.5287*
LGADM	-2.8481	-8.1027*	-2.8406	-8.7711*
LECO	-1.4727	-5.6868*	-1.7824	-5.6887*
LAGRIC	-2.64616	-8.5065*	-2.4834*	-22.817*

ADF is the Augmented Dickey Fuller test and PP is the Phillips Perron test. *Indicate rejection of the null hypothesis of non- stationary at 1%.

Table 1: ADF and Phillip Perron Unit Root Test on national income, Aggregate expenditure and Disggregated expenditure.

	H_o: No of CE	Eigen value	Trace test		Max. Eigen Value Test	
			Static	**Prob	Static	**Prob
LGDP and LEXPEN	0	0.4162	17.3106	0.0264*	15.6057	0.0305*
	1	0.0571	1.705	0.1916	1.705	0.1916
LGDP and LCEXPE	0	0.245	9.0344	0.3622	8.1495	0.3637
	1	0.0301	0.8849	0.3469	0.8849	0.3469
LGDP and LREXPE	0	0.2778	11.4292	0.1864	9.4389	0.2514
	1	0.0663	1.9904	0.1583	1.9904	0.1583
LGDP and LGADM	0	0.2336	9.5068	0.3206	7.7167	0.4082
	1	0.0599	1.7901	0.1809	1.7901	0.1809
LGDP and LECO	0	0.448	22.0103	0.0284*	16.0458	0.0473*
	1	0.1982	5.9645	0.1935	5.9645	0.1935
LGDP and LAGRIC	0	0.4446	25.5703	0.0084*	17.0536	0.0328*
	1	0.2545	8.5168	0.0663	8.5168	0.0663

Trace test indicates 1 cointegrating eqn(s) at the 0.05 level.

*Rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values. Rejection of the hypothesis at 5% significance level for both the Trace and Maximum Eigen Value Tests.

Table 2: Trace and maximum Eigen value cointegration Test among the GDP and the components of expenditure.

The I(1) attributes of all the variable suggest a need to carry out cointegration test to ascertain the existence of long run co-movement between the expenditure variables and national income [30]. It is based on the result of cointegration that the outcome of the causality test is concluded on the short-run or long run relationship within the framework of VAR and VECM.

Cointegration test

In theory, if non-stationary time series data have the same order of integration and there is linear combination of the series, the variable is stationary Engel and Granger. Cointegration implies that time series data move together in the long run, which implies that the error term resulting from the linear combination of time series quantifies the deviation of the time series from their common long-r un relationship and can be used to predict their future values Granger. Johansen technique proposed by Johansen is adopted in this study to test for cointegration of the data. Results are presented in Table 2.

The results of trace and maximum Eigen value test show co-integration between the pairs of national income (LGDP) and total government expenditure (LEXPEN); national income (LGDP) and government expenditure on economic activities (LECO); and national income (LGDP) and government expenditure on agriculture (LAGRIC). It implies there is long run relationship between the variable pairs, thus provides basis to conclude on long-run causality between them after the variables are subjected to Toda and Yamamoto Approach to causality test [31]. However, the pairs of national income (LGDP) and capital expenditure (LCEXPE); national income (LGDP) and recurrent expenditure (LREXPE); and national income (LGDP) and expenditure on general administration (LGADM) are not co-integrated, although they are stationary implying a means of robustness heck to conclude on only short-run causality.

Meanwhile, the choice of lag length plays critical role in causality test. The study subjected the pair of variables to various lag length selection criteria and coincidentally all the pairs selected lag of 1 as presented in the Appendix A.

The Toda–Yamamoto approach to Granger causality test

The Granger causality by Granger is limited by specification bias and spurious regression. Engel and Granger in their definition stated that X and Y are cointegrated if the linear combination of X and Y is stationary but each variable is not stationary. The study by Engel and Granger pointed out that while the two variables are non-stationary

but cointegrated, the standard Granger-causal inference would be invalid. The alternative, which stands as a way out is the use of Toda and Yamamoto and Dolado and Lutkepohl referred in short form as TYDL which is based on augmented VAR modeling. It involves a modified Wald test statistic [32].

It is argued that, the procedure has been found to be superior to ordinary Granger-causality tests given that it does not require pre-testing for the cointegrating properties of the system as such it is void of possible biaseness that are associated with unit roots and cointegration tests. In a nutshell it can be applied regardless of whether a series is I(0), I(1) or I(2), non-cointegrated or cointegrated in any form. The TYDL approach, involves finding the maximum order of integration of the series that are to be included in the model specification. TYDL involve specifying a well behaved kth optimal lag order vector autoregressive model in levels (not in the difference). The number of optimal lags that are determined by selection criteria. TYDL approach involve intentionally over-fits the underlying model with additional maximum order of integration. The appropriate specification of the TYDL process provide superior causal analysis. In the TYDL framework, the initial cointegration test is a mere basis to decide on the short-run condition for the causality derived through the process. In other word, it serves as a mere robustness check on the nature of the underlining causality test result.

The causality result based on TYDL are presented in Table 3 below. Three of the pairs satisfied short and long run causality conditions and exhibit unidirectional causalities in two cases and bidirectional causality in a case. Causality runs from national income to government expenditure, also from national income to expenditure on economic activities, which support Wagner's law in the two cases. In the third case, national income and expenditure on agriculture exhibit bidirectional causality running from agricultural expenditure to national income and vice versa, which support both the Wagner's law and Keynesian proposition. The other three pairs of variables satisfied only short-run causality condition. Two of the tree cases shows unidirectional short-run causality, while no causality is evidenced in a case. Causality runs from national income to capital expenditure and from national income to expenditure on general administration. In the case of national income and recurrent expenditure, no causality is established.

Discussion of Results and Economic Implications

It is evidenced that national income is a predictor of government expenditure in Nigeria both at aggregate expenditure and various disaggregated levels where the existence of causality was established. For instance, it is found that National income predicts the total government expenditure, government expenditure on economic activities and expenditure on general administration, which comprises the expenditure on the political office holders at the executive and legislative arms of the government. In some other cases neither national income nor either capital expenditure or recurrent expenditure in isolation could predict each other. It is only the national income and government expenditure that predict each other. In summary, Wagner's law is entrenched and prominent in Nigeria.

The proposition of Wagner's law supports the extension of the functions of the states as a key to increased public expenditure on administration and regulation of the economy. It also leads to the development of modern industrial societies, which give rise to increasing political pressure for social progress, thus call for increased allowance for social consideration in the conduct of industry. So also, he argued that with expansion of an economy, government welfare expenditures would rise particularly on education and health. In a simple statement, Wagner's law postulated that government expenditure depends on the national income. Nigeria evidently supports Wagner's law, which implies that increase in government expenditure, as strategy to increase national income is not a right policy to grow the economy. So also, it is not reliable as a main strategy to scale the country through the current economic recess.

In an economy where Wagner's law is supported, government has the primary mandate to device strategies that enhance the increase in the national incomes without stressing the increase government expenditure, given that the increase in expenditure is the effect of the growing national income and not its cause. In such case, alternative approaches to improving national income ought to be devised. In the case of Nigeria, more relevance tools include private sector led

TYDL-VAR Granger Causality/Block Exogeneity Wald Tests (Short and Long-Run)				**TYDL-VAR Granger Causality/Block Exogeneity Wald Tests (Short-Run Only)**			
Dependent variable: LGDP				Dependent variable: LGDP			
Excluded	Chi-sq	df	Prob.	Excluded	Chi-sq	df	Prob.
LEXPEN	3.5897	1	0.0581	LCEXP	1.573	1	0.2098
Dependent variable: LEXPEN				Dependent variable: LCEXP			
Excluded	Chi-sq	df	Prob.	Excluded	Chi-sq	df	Prob.
LGDP	4.4137	1	0.0357**	LGDP	7.1045	1	0.0077*
Dependent variable: LGDP				Dependent variable: LGDP			
Excluded	Chi-sq	df	Prob.	Excluded	Chi-sq	df	Prob.
LECO	0.1511	1	0.6975	LREXP	0.5252	1	0.4686
Dependent variable: LECO				Dependent variable: LREXP			
Excluded	Chi-sq	df	Prob.	Excluded	Chi-sq	df	Prob.
LGDP	5.5243	1	0.0188**	LGDP	0.4384	1	0.5079
Dependent variable: LGDP				Dependent variable: LGDP			
Excluded	Chi-sq	df	Prob.	Excluded	Chi-sq	df	Prob.
LAGRIC	5.1335	1	0.0235**	LGADM	0.8915	1	0.3451
Dependent variable: LAGRIC				Dependent variable: LGADM			
Excluded	Chi-sq	df	Prob.	Excluded	Chi-sq	df	Prob.
LGDP	8.0451	1	0.0046*	LDGP	6.8536	1	0.0088*

*Rejection of null hypothesis of no causality at 1% significant level. **The rejection of null hypothesis of no causality at 5% significant level.

Table 3: Causality test on national income and the components of federal government expenditure.

strategies and not the public sector led. The economy needs strategic repositioning and mainstreaming of both the small and medium enterprises and other private organizations as core building blocks to a strong and sustainable national income growth. Unfortunately, Nigeria government operates more on the opposite direction, giving greater priority to the government expenditure driven approaches than private sector led. This is obvious, considering the size of government expenditure and its extra budgetary allocations on regular and consistent bases, while small and medium scale enterprises suffer and less supports are accorded private organizations.

In the past years, it appeared more convenience for the economy to encourage importation of foreign products using the foreign exchange through oil revenues than to encourage domestic organizations to provide substitutes. However, recently, it is naturally done on the economy to begin to look inward, not as a deliberate policy but due to gross shortage in the size of foreign exchange to the country because of global crash in the price of crude oil. The current economic reality in the country is forcing the government to increase the size of its expenditure through borrowing and extra budgetary allocation, as a way to fill in the gap and take the country out of economic recess.

The result of this study is a policy document that would assist the government to rethink and modify its economic strategies. The private sector has fundamental roles to play in the economy if any progress made towards the recovery. Instead of heavy spending through expansionary fiscal policy, which the federal government currently embarks, it should rather promote soft loan through the Central Bank of Nigeria and other specialized development banks to the small-scale businesses and encourage the apex bank to employ its monetary instruments to encourage private sector investments. A key role of the government during the current recession should be limited to the provision of enabling environments and good attention to the infrastructural development, the key tools for the efficient and effective private sector operations.

Requiring special attention is the expenditure of government on agriculture both as recurrent and capital. It stands as the only expenditure component that support Keynesian proposition alongside the Wagner's law, which implies that government expenditure on agriculture could serve as a key strategy to reposition the economy and sail it through the current economic recess. It is widely believed that Nigeria has greater potential in agriculture, giving its comparative cost advantage compared to many other countries across the globe. Historically, agriculture had been the mainstay of the economy before the discovery of crude oil in large quantities. In those days, the country was among the richest and less dependent. Consequently, in the wake of the current recess, reality has shown that, the country would be better off if special priority is redirected towards repositioning agriculture as a tool to generate alternative foreign exchange and as a well-established value chain system to provide import substitution for many agricultural allied products. This argument is validly supported by this study.

It is however worth to note that, while this study shows that capital expenditure is not relevant to the growth of national income, it might have occurred for two key reasons. In the first instance, the capital expenditure is not disaggregated into the investment on infrastructure and the expenditure on other capital equipment, thus, if the composition of the capital expenditure were dominated by other equipment aside the infrastructural facilities, the non-causality established would not imply that infrastructure is not a determinant of national income. Secondly, over the years, Nigeria has experienced high level of corruption and mass looting of government treasuries especially the fund allocated for capital expenditure, which might account significantly for the established irrelevance of capital expenditure on the national income growth in the country.

However, Nigeria is experiencing a new dawn with the inception of Muhamadu Buhari as the new president of the country through his unprecedented anti-corruption crusades. His actions and conducts are providing the assurance that public fund management in Nigeria would henceforth be effectively and efficiently utilized. It thus provides the basis to submit that, Nigerian government's deliberate efforts at providing formidable business environments and provision of adequate infrastructures would have strong effects on the growth of national income vis-à-vis the private sector led approaches to economic growth.

Conclusion

This study examines the validity of Wagner's law and Keynesian proposition in Nigeria using the Toda and Yamamoto (TYDL) approach to causality within the framework of augmented VAR and Block Exogeneity Wald test. The aggregate government expenditure and disaggregated expenditure under six different sub divisions were subjected to analysis. The results show that three of the variables exhibit short and long run causality. Two of the three pairs show causality that runs from national income to expenditure, while one shows bi-directional causality. The short-run analysis of other three pairs shows short run causality running from national income to expenditure in two of the pairs, while no causality is found in the national income and recurrent expenditure. It is validated that five of the six pairs of the expenditure components, which includes total government expenditure, capital expenditure, expenditure on economic activities, general administration expenditure and expenditure on agriculture support Wagner's law, only the expenditure on agriculture support Keynesian proposition on bidirectional causality while no causal evidence is found for recurrent expenditure.

References

1. Babatunde MA (2011) A bound testing analysis of Wagner's law in Nigeria: 1970-2006. Applied Economics 43: 2843-2850.
2. Chimobi OP (2016) Government expenditure and national income: A causality test for Nigeria. European Journal of Economic and Political Studies 2: 1-11.
3. Ighodaro CA, Oriakhi DE (2010) Does the relationship between government expenditure and economic growth follow Wagner" s law in Nigeria. Annals of University of Petrosani Economics 10: 185-198.
4. Oyinlola MA, Akinnibosun O (2013) Public expenditure and economic growth nexus: Further evidence from Nigeria. Journal of Economics and International Finance 5: 146.
5. Ayo OS, Ifeakachukwu NP, Ditimi A (2011) A trivariate causality test among economic growth, government expenditure and inflation rate: Evidence from Nigeria. The Journal of World Economic Review 6: 189-199.
6. Akpan UF (2011) Cointegration, Causality and Wagner's Hypothesis: Time Series Evidence for Nigeria (1970-2008). Journal of Economic Research 16: 59-84.
7. Musgrave B (1988) Public Finance in Theory and Practice, New York: McGraw-Hill Book Company.
8. Cooray A (2009) Government expenditure, governance and economic growth. Comparative Economic Studies 51: 401-418.
9. Mudaki J, Masaviru W (2012) Does the composition of public expenditure matter to economic growth for Kenya? Journal of Economics and Sustainable Development 3: 60-70.
10. Tan EC (2003) Does Wagner's law or the Keynesian paradigm hold in the case of Malaysia. Thammasat Review 8: 62-75.

11. Tang TC (2001) Testing the relationship between government expenditure and national income in Malaysia. Analisis 8: 37-51.

12. Govindaraju VC, Rao R, Anwar S (2011) Economic growth and government spending in Malaysia: a re-examination of Wagner and Keynesian views. Economic Change and Restructuring 44: 203-219.

13. Abrishami H, Boroujli M, Amin M, Mehrara M (2013) Government expenditure and economic growth in Iran. International Letters of Social and Humanistic Sciences 11: 76-83.

14. Ghorbani M, Zarea AF (2009) Investigating Wagner's law in Iran's economy. Journal of Economics and International Finance 1: 115-121.

15. Dandan MM (2011) Government expenditures and economic growth in Jordan. In International Conference on Economics and Finance Research IPEDR 4: 467-471.

16. Demirbas S (1999) Cointegration Analysis-Causality Testing and Wagner's Law: The Case of Turkey, 1950-1990.

17. Kumar S (2009) Further evidence on public spending and economic growth in East Asian countries.

18. Dogan E, Tang TC (2011) Government expenditure and national income: Causality tests for five South East Asian countries. International Business & Economics Research Journal 5: 49-59.

19. Chang T (2002) An econometric test of Wagner's law for six countries based on cointegration and error-correction modelling techniques. Applied economics 34: 1157-1169.

20. Dolado JJ, Lutkepohl H (1996) Making Wald tests work for cointegrated VAR systems. Econometric Reviews 15: 369-386.

21. Huang C (2006) Government Expenditures in China and Taiwan: Do they Follow Wagner's Law? Journal of Economic Development 31: 139-149.

22. Liu CHL, Hsu CE (2008) The Association between Government Expenditure and Economic Growth: Granger Causality Test of US Data, 1947-2002. Journal of Public Budgeting, Accounting, and Financial Management 20.

23. Magazzino C (2012a) Wagner's Law and Augmented Wagner's Law in EU-27-A Time-Series Analysis on Stationarity, Cointegration and Causality. In: Magazzino C (ed.) Wagner's Law and Augmented Wagner's Law in EU-27. A Time-Series Analysis on Stationarity, Cointegration and Causality, International Research Journal of Finance and Economics 89: 205-220.

24. Magazzino C (2012b) Wagner versus Keynes: Public spending and national income in Italy. Journal of Policy Modeling 34: 890-905.

25. Brown RL, Durbin J, Evans JM (1975) Techniques for testing the constancy of regression relationships over time. Journal of the Royal Statistical Society. Series B (Methodological) 37: 149-192.

26. Aregbeyen O (2006) Cointegration, causality and Wagner's Law: A test for Nigeria, 1970-2003. Central Bank of Nigeria Economic and Financial Review 44: 1-17.

27. Engle RF, Granger CW (1987) Co-integration and error correction: representation, estimation, and testing. Econometrica 55: 251-276.

28. Granger CW (1969) Investigating causal relations by econometric models and cross-spectral methods. Econometrica: Journal of the Econometric Society 37: 424-438.

29. Granger CW (1986) Developments in the study of cointegrated economic variables. Oxford Bulletin of economics and statistics 48: 213-228.

30. Johansen S (1991) Estimation and hypothesis testing of cointegration vectors in Gaussian vector autoregressive models. Econometrica 1551-1580.

31. Phillips PC, Perron P (1988) Testing for a unit root in time series regression. Biometrika 75: 335-346.

32. Toda HY, Yamamoto T (1995) Statistical inference in vector autoregressions with possibly integrated processes. Journal of econometrics 66: 225-250.

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