Fiscal Policy Instruments and Wagner's Hypothesis: The Nigerian Experience

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Authors' contributions

This work was carried out in collaboration between both authors. Author AKA designed the study, wrote the protocol, wrote the first draft of the manuscript and reviewed the literature. Author YOO performed the statistical analysis and managed the analyses of the study. Both authors read and approved the final manuscript.

Article Information

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ABSTRACT

The study examines the impact of fiscal policy instruments on the Nigerian economic growth using time series annual data from 1981-2016. Data on fiscal policy instruments was proxied with government recurrent expenditure, government capital expenditure, public domestic debt, and public external debt while data on economic growth was proxied with GDP. The data were analysed through vector error correction model. The study found that recurrent expenditure exerts negative impact on economic growth while capital expenditure exerts positive impact on economic growth in Nigeria. Also, public domestic debt exerts negative impact on economic growth in the long-run while public external debt exerts positive impact in the long run on economic growth. The study concludes that Wagner's hypothesis partially holds in Nigeria due to high level of corruption in the country. In view of this conclusion, Nigeria government should refocus and redirect government expenditure towards production of goods and services so as to develop the real sector of the economy and enhance economic growth in the country.

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1. INTRODUCTION

Fiscal policy is a fundamental instrument that can be used to lessen short-run fluctuations in output and employment. This corroborates with the assertion of [1] who posits that macroeconomic issues such as high unemployment, inadequate national savings, excessive budget deficits, and large public debt burdens on fiscal policy have been acknowledged to hold centre stage in policy debate in both developed and developing economies. In view of this, the realization of macroeconomic goals undoubtedly is not automatic but requires policy guidance, which is contained in fiscal and monetary policies. The monetary policy regulates the supply of money and the cost and availability of credit in the economy. It deals with both the lending and borrowing rates of interest for commercial banks. On the other hand, fiscal policy can be used to overcome recession and control inflation in any country. Fiscal policy consists of the manipulation of government finances by raising or lowering taxes or levels of spending to promote economic stability and growth. Fiscal policy is designed to achieve the objective of price stability, growth, balance of payments equilibrium, full employment, mobilization of resources and investment. These objectives have influenced government's economic policy design and development efforts in Nigeria since independence. It is also a deliberate change in government revenue and expenditure to influence the level of national output and prices and also be used to cure recession and maintain economic stability in the country. The basic fiscal policy instruments are Government expenditure and tax revenue. To most economists all over the world, fiscal policy has been an important growth determinant of any country. Over time, the general belief had being that increase in taxation, public investment, maintaining surplus budget, wage control, inflation and other aspect of fiscal policy instruments contribute more to the growth determinant of any country both in developed and developing countries. On the contrary, it has been discovered that every economy attempts to promote its economic growth through increasing government expenditures and reducing taxes.

Based on the importance of fiscal policy instrument in promoting the economic growth, the researcher consider this area of interest and intends to look at it from time series approach in examining the impact of fiscal policy instruments on economic growth. The main objective of the study is to examine the impact of fiscal policy instrument on the Nigerian economic growth within the period of 1981 to 2016. The fundamental questions in this study are: What impact does government expenditure have on the Nigerian economic growth? What impact does government debt have on the Nigerian economic growth? In line with these research questions the following hypotheses were formulated: Government expenditure has no significant impact on the Nigerian economic growth; Government debt has no significant impact on the Nigerian economic growth. To answer these questions and test the hypotheses the remaining part is structured thus: section two reviewed literature on fiscal policy and economic growth, section three outlines the methodology adopted for the study. Data analysis and discussion were presented in section four while section five concludes the paper and suggests recommendations.

2. LITERATURE REVIEW AND THEORY

The term fiscal policy has conventionally been associated with the use of taxation and public expenditure to influence the level of economic activities. The concept of public expenditures arises from the perception of individual that expenditures undertaken by the government is for public benefit. Public debt is the total monetary obligations of the government to both its citizens and foreigners. In Nigeria the domestic debt stock comprises treasury bills, treasury certificates, treasury bonds, ways and means advances, development and Federal Government Bonds, while external debt consists of Paris and London Club debts, Multilateral debt, Bilateral debts, and promissory notes. Economic growth has long been considered an important goal of economic policy with a substantial body of research dedicated to explaining how this goal can be achieved [2].

Several researchers have carried out various empirical studies on fiscal policy and economic growth. Some of such previous research works and their empirical conclusions that are related to the study are as follows: Onodje [3] conducted an empirical study on the effects of fiscal policy shocks on private consumption to the Nigerian situation. It examines whether government

expenditure shocks and tax revenue shocks have Keynesian effects. Data spanning the period 1980 to 2004 were used to estimate a vector error correction model. The estimation results show that both government consumption and tax revenue shocks have Keynesian effects; thereby validating the position of the empirical literature. However, the measure of the variable is not well-defined because the study did not specify how tax revenue was computed. In a similar study, Dauda [4] examined the effect of investment spending in education on economic growth in Nigeria using thirty-one (31) years' time series data from 1977-2007. The study employs co-integration and error correction model techniques. The result shows positive and significant effect of educational expenditure on economic growth. However, the study does not justify the method use for the unit root test in the study.

Starr and Joharji [5] in their study investigated whether government spending can boost the pace of economic growth as is widely debated. The study examines the relationship between government spending and non-oil GDP in the case of Saudi Arabia. The researchers use the methods of co integration and error correction model. Using time-series methods and data for 1969-2005, they found that increases in government spending have a positive and significant long-run effect on the rate of economic growth. Estimated effects of current expenditure on growth turn out to exceed those of capital expenditure – suggesting that government investment in infrastructure and productive capacity has been less productive in Saudi Arabia than programs to improve administration and operation of government entities and support purchasing power. Alm [6] ask in their research: what factors influence state economic growth in the United States? The study employs annual state (and local) data for the years 1947 to 1997 for the 48 contiguous states to estimate the effects of a large number of factors, including taxation and expenditure policies, on state economic growth. The study used orthogonal distance regression (ODR) to deal with the likely presence of measurement error in many of the variables. The results indicate that the correlation between state (and state and local) taxation policies is often statistically significant but also quite sensitive to the specific regressor set and time period; in contrast, the effects of expenditure policies are much more consistent. Baum and Koester [7] searched for the answer to the question: does the state of the business cycle

matter for the effects of fiscal policy shocks on GDP? This study analyzes quarterly German data from 1976 to 2009 in a threshold structural vector autoregressive model. The analysis finds that hiking spending results to a short-term fiscal multiplier of around 0.70, while the fiscal multiplier resulting from an increase in taxes and social security contributions yields -0.66. Moreover, the threshold model derives basically new revelations on the impact of shocks, depending on when in the business cycle they occur, their size and their direction. Fiscal spending multipliers are much bigger in periods of an inverse output gap but have only a very weak effect in periods of a positive output gap.

Taiwo and Agbatogu [8] in their paper analyse the implications of government spending on the growth of Nigerian economy over the period 1980-2009. Using Johansen co-integration, unit root test and error correction model, it was discovered that total capital expenditure, inflation rate, degree of openness and current government revenue are significant variables to improve growth in Nigeria. In the final analysis, future expenditure on capital and recurrent should be managed along with adequate manipulation of other macroeconomic variables to ensure steady and accelerate growth. The research was well conducted and the methodology was well specified. Medee and Nembee [9] conducted a study on empirical investigation of the impact of fiscal policy variables on economic growth in Nigeria between 1970 and 2009, while adopting vector auto regression (VAR) and error correction mechanism techniques, the researchers found that there exist a mild long-run equilibrium relationship between economic growth and fiscal policy variables in Nigeria.

In [10], the researchers aimed at testing the argument that only three fiscal variables (productive expenditure, distortionary tax and fiscal deficit) contribute to growth by using annual time-series data of Nigeria from 1981 to 2010. The study finds that in the case of Nigeria, five fiscal variables (productive government expenditure, unproductive government expenditure, distortionary taxes, non-distortionary taxes, government budget deficit) contribute immensely to growth either positively or negatively. However, the study does not specify how distortionary and non-distortionary was computed. Dickey and Wayne [11] studied the impact of government expenditure on economic growth in Nigeria. This study

investigates the effects of public expenditure in education on economic growth in Nigeria over a period from 1977 to 2012, using co integration error correction model (ECM). The results indicated that total expenditure on education is highly and statistically significant and has positive relationship with economic growth in Nigeria in the long run. The researchers concluded that economic growth is clearly impacted by factors both exogenous and endogenous to the public expenditure in Nigeria. The research specified the method of collecting data in a clear manner.

Ogunbiyi and Okoye [12] investigated the relationship between fiscal policy and economic growth of the Nigerian economy, for the period 1970 to 2014. The study employed ordinary least square method (OLS), Johansen co-integration, and error correction model. The study found that there exist a long-run equilibrium relationship between economic growth and fiscal policy variables in Nigeria. The estimated ECM model which is rightly signed and statistically significant indicates that 92% disequilibrium in our variable can be corrected with changes in our explanatory variables over a year. As such, the study recommends among others that government should adopt fiscal mechanism that will encourage increment in revenue through tax instead of borrowing and over dependent on oil revenue.

From the studies reviewed above, it was found that varying outcome of the findings and conclusions emanates and these may be due to differences in methodology, variables used and the period of study. The disparities in these studies reveal that there is no consensus among researchers and this area of study remain afresh earnestly awaiting further investigation. Thus, this justifies the importance of carrying out this study. The study adopts Endogenous growth theory and Wagner's hypothesis. Endogenous growth theory posits that fiscal policy can affect both the level and growth rate of per capita output, while the Wagner's hypothesis advocates positive relationship between government expenditure and economic growth.

3. METHODOLOGY AND MODEL SPECIFICATION

Expost-factor research design is employed and annual time series data which span from 1981 to 2016 is employed. Data were obtained from the statistical bulletin of the Central Bank of Nigeria

(CBN). To capture the long-run and short-run relationship dynamism between the fiscal policy instrument and economic growth, the study employs vector error correction model. The model is specified below:

$$\Delta^{ko}LGDP_t = \Theta_o + \Sigma_{i=1}^{n}\Theta_1(\Delta^{k1}LREC_{t-i}) + \Sigma_{i=1}^{n}\Theta_2(\Delta^{k2}LCEX_{t-i}) + \Sigma_{i=1}^{n}\Theta_3(\Delta^{k3}LPED_{t-i}) + \Sigma_{i=1}^{n}\Theta_4(\Delta^{k4}LPDB_{t-i}) + \Sigma_{i=1}^{n}\Theta_5(ECM_{t-i}) + \mu_t \quad (3.1)$$

Where; LGDP is natural logarithm of gross domestic product, LREC is natural logarithm of recurrent expenditure, LCEX is natural logarithm of capital expenditure, LPED is natural logarithm of public external debt, LPDB is natural logarithm of public domestic debt, Δ represents Difference Operator, Θi represents parameters to be estimated, $t-i$ represents unknown lags to be estimated, ECM represents the error correction mechanism and μt represents the error term. The use of natural logarithm, rather than levels and percentage changes, mitigates correlations among the variables. Also, it helps in reducing heteroscedasticity as it compresses the scale in which variables are being measured [13]. A priori highlights the theoretical relationship between independent variables and the dependent variables. It is expected that based on a priori functional relationship between dependent and independent variables that β_1, β_2, β_3 and $\beta_4 > 0$ for the model. The functional relationship between dependent and independent variables are presumed to exist based on the assumptions mentioned above.

4. RESULTS AND DISCUSSION

This section presents the unit roots tests, the co integration test, vector error correction mechanism and the discussion of the findings.

4.1 Unit Root Test

The researcher subjected each of the variables to unit root test using ADF test to check for stationarity, this is because there is now a growing consensus that the stationarity test procedure due to [11] (hereafter ADF) has superior sample properties compared to its alternatives [14]. Table 1 shows that all the variables were not stationary at level form but at their first differences, indicating here that they are all integrated of order 1 i.e. I(1). This is in confinement with other researches concerning economic variables, that economic variables are

stationary at either at first or at their second differences.

4.2 Co-integration Result

Since all the variables were all stationary at first difference as showed in Table 1, the researcher performed the Johansen multivariate co-integration test to examine the existence of co-integrating relationship. The p-value of the trace statistics for the null hypothesis of no co-integrating relationship in Table 2 is less than 0.05, meaning that the null hypothesis can be rejected. In addition, the value trace statistic (75.21968) is greater than the 0.05 critical values of 69.81889, affirming that the null hypothesis that there is no co-integrating relationship among the variables cannot be accepted. However, the p-value of the trace statistic corresponding to 'At most 1" is 0.2102, which is greater than 0.05, meaning that the null hypothesis that there is at most one co-integrated equation or co-integrating relationship between the variables cannot be rejected (meaning it can be accepted).

Furthermore, the value of the trace statistic corresponding to 'At most 1', is 40.34978 which is lesser than the 0.05 critical value at that point (47.85613), indicating that the null hypothesis that "At most 1" co-integrating relationship exists between the variables could not be rejected (i.e. it can be accepted). This also conforms to the Max-Eigen statistic. In effect, there exists at most

1 co-integrating relationship among the variables GDP, CEX, PDB, PED and REC as confirmed by both co-integrating test. When only one co-integrating vector is established, its parameters can be interpreted as estimates of long run co-integrating relationship between the variables [15].

4.3 Nature of Long-run and Short-run Relationship

The result below shows the long run relationship between the dependent variable (economic growth proxy with GDP) and independent variables (government expenditure and government debt).

Having established the number of co-integrating equations, the coefficients of the variables are estimated from the result presented in the Table 2. From the result, it reveals that recurrent expenditure and public domestic debt exert negative relationship while the capital expenditure and external debt exert positive relationship in the long run on the economic growth (GDP). The public domestic debt and capital expenditure variables are significant at 5% while recurrent expenditure and public external debt are not significant at 5%. The explanation for this is that LREC (Recurrent expenditure) has a co-efficient of -1.184846 which means that a 1 unit increase in recurrent expenditure will result in

Table 1. Augmented dickey-fuller unit root test

Variables	ADF Statistics	1% critical value	5% critical vaule	10% critical vaule	Integration order
LGDP	-5.378235	-3.653730	-2.957110	-2.617434	I(1)
LCEX	-5.746844	-3.653730	-2.957110	-2.617434	I(1)
LPDB	-4.306972	-3.653730	-2.957110	-2.617434	I(1)
LPED	-4.443952	-3.653730	-2.957110	-2.617434	I(1)
LREC	-7.827426	-3.653730	-2.957110	-2.617434	I(1)

Source: Authors' Computation

Table 2. Results from Johansen's Co-integration test, (Trace and maximum eigenvalue test)

Hypothesis No of CES	Eigen value	Trace statistics	0.05 critical value	Prob.**	Max-Eigen Statistics	0.05 critical value	Prob.**
None *	0.675294	75.21968	69.81889	0.0174	34.86990	33.87687	0.0380*
At most 1	0.413143	40.34978	47.85613	0.2102	16.52222	27.58434	0.6211
At most 2	0.351748	23.82757	29.79707	0.2078	13.43773	21.13162	0.4128
At most 3	0.234230	10.38983	15.49471	0.2519	8.273062	14.26460	0.3516
At most 4	0.066004	2.116772	3.841466	0.1457	2.116772	3.841466	0.1457

Trace and Max-eigenvalue test indicate 1 co-integrating equation at the 0.05 level
*denotes rejection of the hypothesis at the 0.05 level
**Mackinnon-Haug-Michelis (1999) P-values
Source: Authors' Computation

Table 3. Nature of long-run relationship

Variable	Coefficients	Standard error	T-Value
LREC(-1)	-1.184846	(1.07598)	[-6.84913]
LCEX(-1)	0.079484	(2.52737)	[7.16288]
LPED(-1)	0.113411	(2.73403)	[-7.31950]
LPDB(-1)	-0.045963	(1.53205)	[4.73649]

Source: Authors' Computation

decrease of 1.184846 in LGDP (economic growth). A unit change in capital expenditure will result in 0.079484 increases in economic growth. With regard to Public external debt, the results show that, an increase in LPED by 1% will lead to an increase in LGDP by 11.3411%. Furthermore, LPDB (public domestic debt) exerts a negative influence on the LGDP. A 1% rise in LPDB results in decrease of LGDP by about 4.60%.

The table shows that the coefficients of the lagged value of the entire variables have positive influence except LREC (recurrent expenditure) on the economic growth (LGDP). The entire variables were insignificant at 5% except capital expenditure. The coefficient of the error in the model has (-0.191205) and it is significant at 0.05. This sign indicates that the economic growth will converge to its long run equilibrium when there is short-term relationship in between all the fiscal policy variables, this also means that the error will continue to be corrected in the long run at about 19.12%. The short term dynamic can be interpreted thus: A one unit increase in recurrent expenditure will immediately produces a 0.324732 unit decrease in economic growth. Also, a 1 unit increase in capital expenditure will immediately cause economic growth to increase by 0.27134. A 1 unit change in public external debt on the other hand causes economic growth to increase by 0.007209. Also when public domestic debt increases by 1 unit, economic growth increases by 0.341696.

4.4 Discussion of Result

From the result, it reveals that recurrent expenditure exerts negative impact on economic growth in Nigeria and this is contrary to the findings of Muritala and Taiwo [16]. The explanation for this is that most of the recurrent expenditure in Nigeria is diverted for other uses different from slated purposes and also due to the pervasive level of corruption in Nigeria; there are lots of ghost workers that earn salaries without any productive efforts. The capital expenditure exert positive impact on economic growth in Nigeria and this conform to the findings of Nurudeen and Usman [17]. The explanation is that capital expenditure impact was minimally felt in the area of transportation system in terms of road construction which enhances easy movement of people and goods from one place to another.

Public domestic debt exerts negative impact on economic growth in the long-run. This is in contrary to the finding of Tajudeen [18]. The explanation for this is that loans obtained are not used for the development of the economy rather the funds were channelled to the benefit of few opportunists. For instance, Nigeria has borrowed large amounts, often at high concessional interest rates with the hope that it will be put on a faster route to development through higher investment that will facilitates faster growth and poverty reduction but on the contrary economic growth and poverty situations are increasing amidst excess debt. Similarly, public external debt exerts positive impact in the long run on the

Table 4. Nature of short-run relationship

Regressor	Coefficients	Std error	t-ststistic
Constant	0.102823	(0.07816)	[0.71690]
(LGDP(-1))	0.047413	(0.19199)	[0.24695]
D(LREC(-1))	-0.324732	(0.17040)	[-1.90567]
D(LCEX(-1))	0.271340	(0.12063)	[2.24928]
D(LPED(-1))	0.120192	(0.08081)	[1.48742]
D(LPDB(-1))	0.341696	(0.22495)	[1.51902]
ECM(-1)	-0.191205	(0.10721)	[-1.78340]

Source: Authors' Computation

economic growth. This is not significant because there is a growing concern over the amount of borrowing indulged in the servicing of such foreign debt, and the future strain on regional schemes and general sustainable development Resources transferred abroad for debt servicing represents a reduction in what can be devoted to regional schemes and economic development. This conform with the finding of Yahya et al. [19].

5. CONCLUSION AND RECOMMENDA-TION

From the result, it was revealed that recurrent expenditure and public domestic debt exert negative relationship while capital expenditure and external debt exert positive relationship in the long run on the economic growth. Conclusively, the Wagner's hypothesis partially holds in Nigeria due to the high level of corruption in the country. In view of this conclusion, government should refocus and redirect government expenditure towards production of goods and services so as to develop the real sector of the economy and enhance economic growth in the country. One of the limitations of this study is that it is more of quantitative whereas, the use of combination of quantitative and qualitative methods may produce more comprehensive results because qualitative methods through interview, questionnaire, among others may provide richer data and enhances robust findings and conclusion.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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