Government Revenue Levels Effect On Public Spending In Nigeria

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Abstract
This study investigated the effect of government revenue on public spending in Nigeria. Data which covered the periods of 1986 to 2018 were sourced from Central Bank of Nigeria Statistical Bulletin (2018). Techniques employed for analysis were Augmented Dickey-Fuller Test, Bound Co-integration test, Autoregressive Distributed Lag and Pairwise Granger Causality. The result of the Bound co-integration test showed the existence of long run relationship between government total expenditure and government total revenue. The study found that government total revenue had positive and significant effect on government total expenditure both in the short and long run. Finally, it was found that there was unidirectional causality between government total expenditure and government total revenue. It was thus concluded that, government revenue played an important role in determining government expenditure in Nigeria and rinsing government expenditure precede and determine government revenue. The study recommended that there should be increased attention to other sectors like agriculture, and solid minerals so as to increase the revenue base of the country, and that more spending be channeled into capital expenditure in order to adequately provide the much needed enabling environment for long-term economic growth.

I.   Introduction

The governments of both developed and developing countries over the world are shouldered with the responsibilities of catering for their citizens. Governments are saddled with the responsibilities of providing amenities, economic and social overhead, defense and maintenance of law and order which require spending. Public spending which involves the outlay of financial resources is captured in the annual budget through the adoption of fiscal policy to control the level of economic activity and stimulate economic growth. The adoption of public spending as a fiscal policy tools can be used to stimulate economic activity either through expansionary or contractionary policy. Expansionary policy involves increase in government spending during recessionary period or economic downturn to enhance economic activities and promote growth while contractionary policy deals with reduction of government expenditure during inflationary or economic boom to control the economy (Lojanioca, 2016).

However, for government expenditure to stimulate economic activity and growth there must be increase in government generated revenue. Government revenue which involves the various sources of income to the nation is an important tool of budget adopted by government to finance government expenditure especially during economic downtown (Welham, Hedger & Krause, 2015). Understanding of the relationship between government revenue and expenditure is important and significant in having adequate knowledge of the working of an economy (Chang & Chiang, 2009). Theoretically, the relationship between government revenue and public spending can have three outcomes. Friedman (1978) opined that revenue could be used by government to stimulate economic activities via government spending which implied that revenue determined government spending. Also, Peacock and Wiseman (1961, 1979) stated that government expenditure could be adopted to enhance economic activity through the generation of revenue indicating that public spending would determine the proportion of revenue. Finally, Musgrave (1966) and Meltzer and Richards (1981) based their assertion on the fiscal synchronization indicating that there must be simultaneous decision between spending and revenue. Ibrahim (2018) opined that the actual relationship between government revenue and public spending had policy implication regarding the macroeconomic objectives of the economy.

In Nigeria, public spending has been increasing recently following the transition to democracy regime and from high demand for public utilities like roads, communication, power supply, education, defense and health. Public spending on recurrent expenditure rose from ₦36.22 billion in 1999 to ₦38.24 billion in 1991, ₦53.03 billion, 1992 and ₦136.73 billion 1993 (Central Bank of Nigeria, 2018). Government total recurrent expenditure increased from ₦3,214.95 billion in 2013 to ₦3,426.94 billion in 2014 and further to ₦3,831.95 billion in 2015. Likewise, recurrent expenditure rose to ₦4,160.11 billion in 2016, ₦4,779.99 billion in 2017

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and ₦5,675.20 in 2018 (CBN, 2018). In addition, government capital expenditure fell from N1,108.39 billion in 2013 to N783.12 billion in 2014 before rising to N818.35 billion in 2015. In 2016 government spending on capital expenditure fell to N634.79 billion before rising significantly to N1, 242.30 billion in 2017 and 1,163.20 in 2018 which result from the adoption of expansionary fiscal policy in order to move the nation out of recessionary crisis which plunge the economy (CBN, 2018).

However, in modern time public spending usually grows faster than revenue which is due to rising government responsibilities and expanding population growth rate. In Nigeria, government has been experiencing higher expenditure over revenue in the recent years. Abdulrasheed (2017) opined that this resulted from the country's over reliance on oil revenue which negatively affected other revenue sources. This is worsened by the recent fluctuation in oil revenue, unstable oil price, vandalisation of oil pipelines, illegal bunkering and theft. Furthermore, high rate of corruption and mismanagement of oil revenue reduced the expected revenue from oil which is the major source of financing expenditure (Rafiu & Raheem, 2018). In 2013, government revenue fell from N6,809.23 billion to 6,793.82 billion in 2014, 3,830.10 billion in 2015, 2,693.90 billion in 2016 before rising to 4,109.80 billion in 2017 and 5,545.80 in 2018 (CBN, 2018). These challenges is compounded by the inability of the government to take necessary steps to diversify the resources based of the economy in spite of the reorganizations by successive governments which has resulted in fluctuation in non oil revenue of the nation. For example, non oil revenue fell from 3,275.03 billion in 2014, to 3,082.41 billion and 2,922.50 billion in 2015 and 2016 respectively and later rose 3,335.20 billion in 2017 and 4,006.00 billion in 2018 (CBN, 2018). However, studies conducted in the subject area mainly focused on the effect of government expenditure on economic growth in Nigeria, with few studies focused on the effect of government revenue on public spending (Emelogu & Uche, 2010; Ogujiuba & Abraham, 2012: Aregbeyen & Taofik, 2012; Nwosu & Okafor, 2014; Abdulrasheed, 2017; Ibrahim, 2018). The recent situations and patterns of government expenditure and revenue have led to the need to conduct more research in the subject area. Given the yearly increases in government expenditure, rising fiscal deficit, unstable oil revenue resulting from oil price fluctuations and heavy reliance on oil sector, there is need to examine the effect of government revenue and aggregate income growth factor, capital formation, on public expenditure.

II.   Literature Review

The fiscal synchronization theory of Musgrave (1966) and Meltzer and Richard (1981) opined that decision on public revenue and public expenditure were jointly predetermined. Thus, the linkage between government spending and revenue were based on simultaneous bidirectional relationship (Chang & Hoo, 2002). Studies by Craigwell, Leon and Mascoll (1994), and Al-Mashreqi (2007) on the relationship between government expenditures and revenues, revealed unidirectional causality between government revenues and government expenditures in Jordan and Barbados respectively. The same result was established by Emelogu and Uche (2010); Obioma and Ozughalu (2010); Saeed and Somaye (2012) estimating the relationship between public revenue and government expenditure using granger causality test in Nigeria. However, Li (2001) by applying the co integration and error correction models over the period 1950-1997 for China found that there was bi-directional causality between government expenditure and revenue.

Also, Owoye (1995); Qudair (2005); Ogujiuba and Abraham (2012) using error correction mechanism established long run significant relationship between expenditure and revenue for seven (7) European countries and Nigeria. However, Aregbeyen and Taofik (2012) on the interactions between the government revenues and expenditures in Nigeria between 1970 and 2008 found evidence of no long run relationship between government revenues and expenditures. Similar to this finding, Baharumshah, Jibrilla, Sirag, Ali and Muhammad (2016) employed threshold autoregressive and momentum threshold autoregressive models to investigate the linkage between government revenue and expenditure and found lack of co-integration between expenditure and revenue Nwosu and Okafor (2014) assessed the relationship between both total expenditure and total revenue in Nigeria. The VAR results revealed long run and unidirectional relationships with total revenue and government exnditure.

In the Republic of Serbia and Nigeria, Lojanica (2015); Mainoma and Aruwa (2015) adopted autoregressive distributed lag and error correction model to investigate the linkage between government revenue and government expenditure; long run and unidirectional causality was discovered between government expenditure and government revenues. Abdulrasheed (2017) applied Error correction model technique to determine the nature of relationship between government expenditure and government revenue in Nigeria and suggested government expenditure not fully revenue supported. Ghazo and Abu-Lila (2018) investigated the causal relationship between public revenues and public expenditure in Jordan based on error correction model, bidirectional causality was established between direct tax revenues and capital expenditures.

It was found from the reviewed literature that, empirical findings on the relationship between government revenue and expenditure were scarce in developing countries like Nigeria. Also, studies found different and diverse results on the relationship between government revenue and expenditure. Empirical studies

were divided alongside unidirectional, bidirectional, co-integration and lack of co-integration on the nature of relationships between government revenue and expenditure. Perhaps, this largely resulted from differences in study periods, analytical techniques, variables captured and even the region of studies. Thus, this study is an updated research on the linkage between government revenue and expenditure in Nigeria. This study is timely given the continuous rise in government spending and concern over whether government revenue are large enough to support this spending.

III.   Methodology

This study utilized data sourced Central Bank of Nigeria (CBN) Statistical Bulletin (2018). The time series data for the study covers the period of 1986 to 2018. This study adopted fiscal synchronization theory propounded by Musgrave (1966) and Meltzer and Richard (1981) which opined that government expenditure and revenue are jointly determine which formed the basis for the drawing of government proposed spending and expected revenue through the drawing of annual budget. The model was built on the model of Abdulrasheed (2018) who regressed government expenditure as a function of government revenue with little modification. By modification, capital formation is included in model for this study as a control variable thus:

GTE = (GOV, CF)

The linear equation of this model can be written as:

$LGTE = \beta_0 + \beta_1 LGTR + \beta_2 LCF + e$

Where:

LGTE = Log of Government Total Expenditure

LGTR = Log of Government Total Revenue

LCF = Log of Capital Formation

β_0 = Constant Term

$\beta_1 - \beta_2$ = Parameters of the variables to be estimated

e = Error Term

IV.   Method of Data Analysis

In order to evaluate the effect of government revenue and capital formation on government expenditure, this study employed Augmented Dickey-Fuller Unit Root Test, Bound Co-integration Test and Autoregressive Distributed Lag Model. Augmented-Dickey Fuller Unit Root Test was employed to test the stationarity of the variables. Also, Bound Co-integration Test was used to test for the long run relationship among the variables while Autoregressive Distributed Lag Model was employed to test for the speed of adjustment among the variables and also examine the short and long run effect of the government expenditure and capital formation on total expenditure. Finally, Pairwise Granger Causality test was adopted to determine the direction of causality between government expenditure and government revenue.

V.   Findings and Discussion

Correlation Matrix

Table 1: Pearson Correlation Matrix

	LGTE	LGTR	LCF
LGTE	1.000000		
LGTR	0.347595	1.000000	
LCF	0.108692	0.016287	1.000000

Source: Researcher's Computation, 2020

The result of the correlation matrix was presented in table 1. The result showed that log of government total revenue and log of capital formation were not perfectly correlated to log of total expenditure which indicated the absence of multi co-linearity among the variables. However, the result showed that log of government total revenue and log of capital formation were positively related to log of government total expenditure.

Test of Stationarity

Table 2: Summary of Unit Root

Var.	At Level		At 1st Difference		
	T-stat	P-value	T-stat	P-value	Remarks
LGTE	-4.205135	0.0026	-	-	1(0)
LGTR	-2.895214	0.0570	-5.608064	0.0001	1(1)
LCF	-1.359061	0.5896	-4.097404	0.0034	1(1)

Source: Researcher's Computation, 2020

This study employed Augmented Dickey-Fuller unit root test to check the stationarity and order of integration of the variables. The result of the ADF reported in Table 2 showed that log of government total expenditure was stationary at level while log of government total revenue and log of capital formation were not stationary at level. However, when tested at first difference, log of government total revenue and log of capital formation were stationary. Since log of government total expenditure was 1(0) and log of government total revenue and log of capital formation were I(1), the study employs ARDL technique for analysis suggested by Peseran and Shin (1991).

VAR Lag Order Selection Criteria
Table 3: Optimum Lag Result

Lag	LogL	LR	FPE	AIC	SC	HQ
1	24.17517	NA	7.55e-05*	-0.979043*	-0.562724*	-0.843334*
2	31.99963	12.62009	8.26e-05	-0.903202	-0.070564	-0.631782

Source: Researcher's Computation, 2020

The result of the lag selection criterion which was reported in Table 3 showed that the optimum lag for the estimation of ARDL is lag 1.

Long Run Relationship
Table 4: ARDL Bounds Co-integration Test

Null Hypothesis: No long-run relationships exist		
Test Statistic	Value	K
F-statistic	5.959923	2
Critical Value Bounds		
Significance	I0 Bound	I1 Bound
5%	2.72	3.83

Source: Researcher's Computation, 2020

Table 4 presented the result of the long run relationship among the variables employed in the study. The result showed a calculated F-statistic value of 5.959923 which was greater than the lower critical value bound of 2.72 and significant at 5%. Thus, it was concluded that there was long run relationship among log of government total expenditure, log of government total revenue and log of capital formation.

Autoregressive Distributed Lag Model
Table 5: Short Run Cointegrating Form

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LGTR)	0.212108	0.048875	4.339796	0.0002
D(LCF)	0.104683	0.032059	3.265268	0.0029
CointEq(-1)	-0.387906	0.040851	-9.495612	0.0000

Source: Researcher's Computation, 2020

The result of the short run co-integrating coefficient was presented in Table 5. The result indicated that log of total revenue had positive and significant effect on log of total expenditure which implied that increased total revenue would lead to increase in government total expenditure. Also, it was found that log of capital formation had positive and significant relationship with log of total expenditure which indicated that increase in capital formation would lead to increase in government total expenditure. Finally, the result revealed that the co-efficient of CointEq(-1) was given as -0.387906 which was significant at 5% and conformed to the theoretical negative sign. This implied that the model had a self adjustment mechanism and any disequilibrium in the short run would be corrected at speed of 38%.

Table 6: Long Run Coefficient

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LGTR	0.546801	0.106134	5.151996	0.0000
LCF	0.269866	0.080812	3.339425	0.0024
C	1.304767	0.333038	3.917775	0.0005

Source: Researcher's Computation, 2020

Table 6 presented the result of the short run coefficient of the ARDL model. The result showed that log of total revenue had a coefficient of 0.546801 which was significant at 5%. This implied that 1% increase in government total revenue would lead to 54% increase in government total expenditure. Similarly, log of capital

formation was found to have positive and significant effect on log of government total expenditure with a coefficient of 0.269866 such that 1% increase in capital formation would lead to 26% increase in total expenditure of government in Nigeria in the long run.

Table 7: Residual Post Test

Test	Chi-Square	P-Value
Breusch-Godfrey Serial Correlation LM Test	2.192756	0.1318
Jarque-Bera	1.546326	0.4616
Heteroskedasticity Test: Breusch-Pagan-Godfrey	1.213008	0.3233

Source: Researcher's Computation, 2020

Table 8 presented result on diagnostic test of the regression residual. The result showed that the residual was not serially correlated as indicated by the probability value of 0.0993 which was greater than the acceptance region of 0.05. Also, the residual was normally distributed as indicated by the probability value of 0.461551 which was greater than the acceptance region of 0.05. Finally, it was concluded that that residual was Homoscedatic as indicated by the probability value of 0.2981 which was greater than the acceptance of region of 0.05.

Granger Causality Test

Table 9: Pairwise Granger Causality Result

Null Hypothesis:	Obs	F-Statistic	Prob.
GTR does not Granger Cause GTE	31	1.87295	0.1738
GTE does not Granger Cause GTR		5.38521	0.0110

Source: Researcher's Computation, 2020

The result of the Pairwise granger causality test was presented in Table 9. The result showed that there was unidirectional causality between log of total expenditure and log of total revenue. The result showed that government total revenue did not granger cause government total expenditure, with causality running from government total expenditure to government total revenue.

VI. Discussion of Findings

This study investigated the effect of government revenue on government expenditure in Nigeria. It was found that there was long run relationship government total revenue and government total expenditure. The implication of this finding was that, increase in government expenditure in the long run was followed by significant increase in government revenue. This result conformed with the empirical findings of Owoye (1995); Qudair (2005); Ogujiuba and Abraham (2012) but disconnected with result of Aregbeyen and Taofik (2012).

Finding from the study indicated that government total revenue had positive and significant effect on government expenditure both in the short run and long run. This implied that higher government spending to cater for its vast responsibilities was subjected to proportionate increase government revenue which supported Musgrave (1966) and Meltzer and Richards (1981) theory on fiscal synchronization between spending and revenue. This finding conformed to result of Ogujiuba and Abraham (2012) but disagreed with the finding of Lojanica (2015) who found negative relationship between government revenue and expenditure. Finally, the study revealed that there was unidirectional causality between government total expenditure and revenue. This indicated that proportionate increase in government expenditure precede and determine increase in government revenue. This conformed to the result of Craigwell, Leon and Mascoll (1994); Al-Mashreqi (2007); Emelogu and Uche (2010); Obioma and Ozughalu (2010); Saeed and Somaye (2012); Abdulrasheed (2017).

VII. Conclusion and Recommendations

Government revenue and expenditure are important fiscal policy tools that are use by government to control and regulate economic activities to stimulate economic growth. Government is always interested in increasing revenue base to cater for rising expenditure in the economy. Thus, this study assessed the effect of government revenue on government expenditure in Nigeria. This study concluded that government revenue plays important role in determining government expenditure in Nigeria and rinsing government expenditure precede and determine government revenue.

The study recommended that government should enlarge its revenue base through diversification to other potential revenue yielding sectors like agriculture, and solid minerals. Attention should be given to spending more on capital exnditure other than recurrent expenditure as a way of further increasing the revenue base of the economy and enhancing economic growth in the long run.

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