Journal of Economics and Sustainable Development
ISSN 2222-1700 (Paper) ISSN 2222-2855 (Online)
Vol.9, No.24, 2018

Tax-and-Spend, Spend-and-Tax, Fiscal Synchronization, or Fiscal Separation: Emerging Evidence from Nigeria

Uche, Emmanuel[1*] Ogbonna, Ben M. Ph.D[2]
1.Department of Economics, Abia State University, Uturu, Abia State, Nigeria
2. Department of Economics, Abia State University, Uturu, Abia State, Nigeria

Abstract
The main thrust of this research was to explore the revenue and expenditure nexus on Nigeria from 1981 to 2016. It tried to uncover the expenditure hypothesis that Nigeria's government had adopted in her budgeting. Time series data obtained from the statistical bulletin of the Central Bank of Nigeria (CBN) was used for the study, and it was subjected to unit-root tests. The results from Augmented Dickey Fuller (ADF) and Philip-Perron tests indicated that the variables only became stationary after differencing once. Accordingly, Johansen cointegration test was conducted and results revealed a longrun relationship between the variables. An Error Correction Model (ECM) was carried out to tie the shortrun dynamics with longrun equilibrium. The ECM exhibited the right sign and significant in both models. The results equally provided empirical evidence that government expenditure has significant effect on revenue in Nigeria as there was a negative and significant relationship between them at various lags when expenditure was made the dependent variable. A positive and significant relationship existed between the variables at various lags when revenue was made the dependent variable. The results of Granger causality tests showed that unidirectional causality runs from expenditure to revenue in Nigeria and this confirmed the adoption of **Spend-Tax Hypothesis** in Nigeria. Based on these findings, it was recommended that the government should lay more emphases on revenue than expenditure to remove/reduce budget deficits; should explore other viable avenues other than oil to increase its revenue; emphases should be placed on capital expenditure than on recurrent expenditure as this will help in reducing the over bearing expenditure profile of the country and removal of fiscal imbalances.
Keywords: Revenue, Expenditure, Budgeting, Cointegration, Error Correction Model

1. Introduction

Understanding the interplay between government spending and revenue is important in evaluating the government's role in the distribution of resources. Therefore, it is necessary to have a good knowledge of the relationship between government revenue and expenditure especially in addressing fiscal imbalances in an economy (Eita & Mbazima, 2008). The task before the government is to raise public revenues to meet expenditure requirements for reconstruction and provision of basic public services and to enhance public financial management. In recent years, the association between government expenditure and revenue has generated the most important debates in macroeconomics. Government expenditure on its part is the engine of economic development in every sector of the economy and it is the engine that enhances the living standard of the masses (Easterly & Hebbel, 2004).

As demonstrated by Sriyana (2009), high growth and persistence of government deficits have been observed in a number of countries Nigeria inclusive. This unsustainable fiscal deficit causes general macroeconomic disequilibrium. The persistence of huge fiscal deficit in Nigeria is attributed mainly to the rapid increases in government spending amidst revenue shortfall.

Government spending or expenditure includes all government consumption, investment, and transfer payments. In national income accounting, the acquisition by governments of goods and services for current use, to directly satisfy the individual or collective needs of the community is classed as government final consumption expenditure. Government acquisition of goods and services intended to create future benefits such as infrastructure investment or research spending is classed as government investment (government gross capital formation). These two types of government spending on final consumption and on gross capital formation, together constitute one of the major components of gross domestic product. Government spending can be financed by government borrowing, seigniorage, or taxes. Changes in government spending are major components of fiscal policy tool used to stabilize the macroeconomic business cycle, (Wikipedia online). Adoghor, et al (2008) state that the expenses government incurs for the maintenance of government and the society is generally referred to as government or public expenditure. They further state that presently, the activities of government have gone beyond the shores of their respective economies, hence, it is possible to extend the expenditure of government to include that which is incurred for the peace, progress and stability of other countries. Adoghor et al (2008), equally observe that there are two major subdivisions of government expenditure; the first classification has to do with whether expenditure is productive or unproductive, while the second is categorized as transfer and non-transfer of expenditures. At present, the sources of financing expenditure in Nigeria is the total federally collected revenue which comprises of oil revenue, company income

tax, customs and excise duties, value added tax, and independent revenue. Other sources are loan (which can be external and /or internal) and aids.

As stated by Bhatia (2006), government revenue is public receipts, made up of revenue receipts (revenues arising from tax and non-tax receipts), and capital receipts (revenue arising from government's long and short-term investment). Ndubuisi (2014), further defined government revenue as the total income or returns accruing to or derived by government from defined sources such as government operation of any law, sales of government property, government investment in shares or stock and government net profit from its companies. He further states that government revenues are the total annual incomes or returns accruing to or derived from defined sources by the government. Every government has, at its disposal, different sources of income. The sources are dynamic, and cannot be easily exhausted. From time to time, the government defines its sources of revenue, the composition, level and pattern, according to the exigencies of the fiscal year's budget.

Over the years Nigeria had witnessed different forms of government and each was saddle with the responsibility of harnessing the available resources to execute her annual budget. This being the case, there is need to understand the possible relationship existing between government expenditure and revenue. Narayan and Narayan (2005) aptly demonstrate that the knowledge of government expenditure and income nexus is important for three obvious reasons; government can avoid budget deficits by implementing fiscal policies that would stimulate tax revenue if the tax-and-spend hypothesis holds. Secondly, the independence of government spending decision from government revenue decision, imply that the fiscal synchronization hypothesis does not hold. Thirdly, if government spends first and pays for their expenditure by increasing tax in the future, then the spend-and tax hypothesis holds. This implies that there would be outflow of capital from the economy due to the fear of paying more tax in the future. This being the case, this research has it major focus as to critically examine the inter-temporal relationship between government revenues and expenditures in Nigeria and to ascertain whether casualty runs from government revenue to expenditure or vice versa. The remaining parts of the paper is structured as follows: section two elucidates the theoretical and empirical literature, section three focused on the methodology, section four demonstrates the data analysis and discussion of findings, while section five concludes the paper with some policy recommendations.

2. Theoretical Literature

There are four hypotheses put forward that form the basis for public revenue and public expenditure relationship:

Tax and spend hypothesis

Firstly, Friedman (1978) put forward the tax and spend hypothesis which states that changes in government revenue bring about changes in government expenditure. It is characterized by unidirectional causality running from government revenue to government expenditure. By this, Friedman noted that increases in tax or revenue will lead to increases in public expenditure, and this may result in the inability to reduce budget deficits (Chang, 2009).

Spend and tax hypothesis:

Secondly, Peacock and Wiseman (1961, 1979), writing on the spend and tax hypothesis, noted that changes in public expenditure bring about changes in public revenue. This is characterized by a unidirectional causality running from public expenditure to government revenue. They argued that temporary increases in government expenditures due to economic and political forces can result in permanent increases in government revenues from taxation; a phenomenon usually referred to as the displacement effect.

Fiscal synchronization hypothesis:

Thirdly, the fiscal synchronization hypothesis, associated with Musgrave (1966) and Meltzer and Richard (1981), is based on the belief that there is a joint determination of public revenue and public expenditure decisions. Chang (2009), noted that it is characterized by a contemporaneous feedback or bidirectional causality between government revenue and government expenditure. It is opined that voters compare the marginal costs and marginal benefits of government services when making a decision in terms of the appropriate levels of government expenditure and government revenue.

Fiscal independence or institutional separation hypothesis

Lastly, the fiscal independence or institutional separation hypothesis, advocated by Baghestani and McNown (1994), has to do with the institutional separation of the tax and expenditure decisions of government. It is characterized by non-causality between government expenditure and government revenue (Chang, 2009). This situation implies that government expenditure and government revenue are independent of each other.

2.1 Empirical Literature

Considerable empirical works have been done in respect to the relationship between government revenue and expenditure. Using different econometrics methods, studies have produced different results. Different studies have focused on different countries, time periods, and have used different proxies for government revenues and expenditures.

Mehrara and Elyasi (2009) examine the association between the US government expenditures and revenues, applying fractional cointegration and Error Correction Model (ECM) techniques. The results show no evidence of cointegration at any degree while at a structural break in 1973, fractional cointegration was found.

Zapf and Payne (2009) empirically review the long-run association between aggregate state and local government revenue and expenditures in the case of US by using Engle Granger cointegration test associated with the Threshold Autoregressive (TAR) and Momentum Threshold Autoregressive (MTAR) cointegration techniques and error correction model (ECM). They indicated that state and local government expenditures reflect the budget disequilibrium in the long run, while in the short- run; state and local government expenditure have a significant effect on the state and local government revenues

Obioma and Ozughalu (2010) examine the relationship of government revenue and expenditure in Nigeria from 1970 to 2007. The study indicates that there is a long-run relationship between government revenue and government expenditure in Nigeria. There is also evidence of a unidirectional causality from government revenue to government expenditure. Thus, the findings support the revenue-and-spend hypothesis for Nigeria, indicating that changes in government revenue induce changes in government expenditure.

Owoye and Onafowora (2011) examine the causal relationship between tax revenue and government expenditures in twenty-two OECD countries, eleven EU member states, and eleven non-EU states, using ARDL bounds test and the Toda-Yamamoto approach to test for causality. The results show that the long-run and short-run causal patterns differ across these groups within OECD. For the long-run causal patterns, they found evidence to confirm the tax and spend hypothesis in eight of the twenty-two countries; but the evidence is more prevalent within the EU countries, where tax burdens are much higher than in the non EU OECD countries.

Ogujiuba and Abraham (2012) study the revenue-spending hypothesis for Nigeria using macroeconomic data from 1970 to 2011. Applying correlation analysis, granger causality test, regression analysis, lag regression model, vector error correction model and impulse response analysis, they report that revenue and expenditure are highly correlated and that causality runs from revenue to expenditure in Nigeria. The vector error correction model also proves that there is a significant long run relationship between revenue and expenditure.

Omo and Taofik (2012), analyze the long-run relationships and dynamic interactions between the government revenues and expenditures in Nigeria over the period 1970 to 2008. They adopted the Autoregressive Distributed Lag (ARDL) bound test in their study. From their results, it was evident that there is the existence of a long run relationship between government expenditures and revenues when government expenditure is made the dependent variable. When revenue was made the dependent variable, no evidence of a long run relationship was found. The tax- spend hypothesis was therefore confirmed which was attributed to perhaps, oil revenue dominance in Nigeria's government revenue profile and fiscal operations over time.

Emelogu and Uche (2012), empirically analyze the relationship between government revenue and government expenditure in Nigeria, using time series data from 1970 to 2007. In particular, the study examines the validity of four of the aforementioned hypotheses to Nigeria. It employs the Engel-Granger two-step cointegration technique, the Johansen cointegration method and the Granger causality test within the Error Correction Modeling (ECM) framework. Empirical findings from the study indicate, among other things, that there is a long-run relationship between government revenue and government expenditure in Nigeria. There is also evidence of a unidirectional causality from government revenue to government expenditure. Thus, the findings support the revenue-spend hypothesis for Nigeria, indicating that changes in government revenue induce changes in government expenditure

Abiodun (2013) attempts to find out if a long-run relationship exists between government expenditure and revenue in Nigeria. He also explores the direction of causality between the government expenditure and revenue growth. These were with a view to examining the nexus between government expenditure and revenue growth in Nigeria between 1961-2010. The study employed econometric techniques such as unit root tests, cointegration test, error correction mechanism and Granger causality tests. The finding of this study has a serious implication on fiscal sustainability in Nigeria. Government spending should be based on revenue yields to reduce large fiscal deficits that are unsustainable to economic growth in Nigeria. The study concluded that institutional separation hypothesis holds in Nigeria during the period under investigation.

Takumah (2014) studies the causal relationship of government revenue and expenditures in Ghana for the period of 1986 – 2012. Using a Cointegration Technique, his study found a bidirectional causal relationship between government expenditure and revenues in both the long and the short run hence confirming the Fiscal synchronization hypothesis. The results suggest that there is interdependence between government expenditure and revenues. That the government should make its expenditure and revenues decision simultaneously.

Mainoma and Aruwa (2015) using time series data covering a period of 30 years between 1979-2008, employs the impulse response functions and Vector Autoregressive (VAR) model for the purpose of analysis discovered that causality runs from Revenue to Public expenditure by supporting Revenue-spend hypothesis

Balogun (2017) evaluates the causality between government expenditure and government revenue in Nigeria between 1986 and 2015. Making use of cointegration test, error correction test and Granger causality test,

his result revealed the existence of spend-tax hypothesis in Nigeria.

2.2 Summary of literature

The summary of the literature from the foregoing and generally is that understanding the relationship between government expenditures and revenues is best done through country specific analysis. In addition, the hypothesis regarding the relationship between government revenues and expenditure has no discernable pattern among countries, in terms of whether developed or developing. Lastly, the results obtainable are sensitive to the nature of the data utilized as well as the estimation approach.

3. Methodology and Model Specification:

Our selected variables to measure the relationship between government revenue and expenditure nexus are aggregate government income and expenditure obtained from the statistical bulletin of the Central Bank of Nigeria (CBN) 2017. From the theoretical and empirical expositions in the literature, two empirical models that connect revenue and expenditure as both a regressor and a regressand are discernable. In general terms, they are expressed as:

$GEXPt = f(GREVt)$ (1a)

$GREVt = f(GEXPt)$ (1b)

where *GEXPt* and G*REVt* are Government expenditure and revenue respectively.

Before estimating the model, the series will be investigated for stationarity using the Augmented Dickey-Fuller and Philips-Peron tests. If the series are integrated of the same order, Johansen's (1988) procedure can then be used to test for the long run relationship between them. The theorem of Granger representation states that if a set of variables is cointegrated (*I, I*), it implies that the residual of the cointegrating regression is of order *I*(0), thus there exists an Error Correction Mechanism (ECM) describing that relationship.

A statistically significant ECM_{t-1} term represents the long-run causality running from the explanatory variables to the dependent variable. For instance, if two variables are non-stationary, but become stationary after first differencing and are cointegrated, the pth-order vector error correction model test assumes the following equations:

$\Delta GOVREV_t = a_0 + \sum_{i=1}^{n} a_{1i}\, \Delta GOVEXP_{t-i} + \lambda_1 ECM_{t-1} + u_{1t}$ ……(2)

$\Delta GOVEXP_t = b_0 + \sum_{i=1}^{n} b_{1i}\, \Delta GOVREV_{t-i} + \lambda_1 ECM_{t-1} + u_{2t}$ ……(3)

Where α_{1i}*'s and* b_{1i}*'s are the regression coefficients,* u_{1t} *and* u_{2t} *are error terms.*

The presence of short-run and long-run causality can only be tested if the estimated coefficients of y in Eqs. 2 and 3 are statistically significant. The long-run causality can be found by testing the significance of the estimated coefficient of ECM_{t-n} (λ). ECM_{t-1} is the error correction term obtained from the cointegration model. The error coefficients λ indicate the rate at which the cointegration model corrects its previous period's disequilibrium or speed of adjustment to restore the long run equilibrium relationship. A negative and significant ecm_{t-1} coefficient implies that any short run movement between the dependent and explanatory variables will converge back to the long run relationship. Indeed it recovers any long-run information that is partially lost in the system with differenced coefficient so that these terms are needed to gain model stability in the longrun (Narayan and Smyths, 2008).

4. Data Analysis

The first stage in this empirical investigation was to analyze the time series properties of the data by making use of Augmented Dickey-Fuller (ADF) and Philip-Perron unit root test to determine whether the variables are stationary or not as time series data are usually not stationary in their natural form. The test was undertaken to avoid the problem of spurious regression and the basic assumption underlying the application of causality test is that the time series data in question should be stationary. The Unit Root test will equally give the direction of integration existing among the variables and this will guide us in adopting the appropriate conintegration technique.

The general form of ADF can be estimated as follows;

$$\Delta Y_t = \beta_1 + \delta Y_{t-1} + \sum_{i=1}^{n} \alpha_i \Delta Y_{t-1} + \varepsilon_t \quad (1)$$

$$\Delta Y_t = \beta_1 + \beta_2 t + \delta Y_{t-1} + \sum_{i=1}^{n} \alpha_i \Delta Y_{t-1} + \varepsilon_t \quad (2)$$

Where, Y=is the time series variable under study

t= is a linear time trend, ε_t = stochastic error term.

β_1 = is the constant, n= is the optimal number of lags in the dependent variable.

Hypothesis

H_o: $\beta = 0$ (y_t is non-stationary- There is unit root)

H_o: $\beta < 0$ (y_t is stationary- There is no unit root)

Table 1: ADF Unit Root Test Result

ADF Stat			**Phillip-Peron (PP) Stat**		
Variables	Level	1st Diff	Variable	Level	1st Diff
GREV	-1.201269	-5.641277	GREV	-1.278646	-5.633247
GEXP	-1.023441	-3.808509	GEXP	-2.056121	-5.6307616

Source: Author's computation

The results in table 1 shows that the variables – government revenue (GREV) and government expenditure (GEXP) became stationary after differencing once i.e integrated of order I(1). The summarized result presented in the tables above show that at various levels of significance (1% and 5%), the ADF and PP statistics were more negative than any of the critical values. Having determined that all the variables are integrated of the same order and therefore stationary, we moved on to verify whether a longrun relationship exists among the variables within each model by applying the Johansen Cointegration test.

Cointegration Test

The co-integration test is a statistical property of time series variables. Two or more time series are co-integrated if they share a random stochastic drift (Wooldridge, 2010). The test assumes that the co-integrating vector is constant during that period of study.

This study adopts a dynamic autoregressive regression study which explores co-integration. The Johansen co-integration equation with the autoregressive function of order p is given by:

$$y_t = \mu + A_1 y_{t-1} + \ldots\ldots\ldots + A_p y_{t-P} + \varepsilon_t \quad (3)$$

Where $\mathrm{y_t}$ is a $(\mathrm{n} \times 1)$ vector of variables under considertion in log form that are integrated at order one- commonly denoted I(1), n=2 $\mathrm{A_P}$ are the parameters to be estimated, ε_t are the random errors. This (VAR) can be re-written as;

$$\Delta y_t = \mu + \prod y_{t-1} + \sum_{i=1}^{p=1} \Gamma_i \Delta y_{t-i} + \varepsilon_t \quad (4)$$

$$\text{Where, } \Pi = \sum_{i=1}^{p} A_i - 1 \text{ and } \Gamma_i = -\sum_{j=i+1}^{p} A_j \quad (5)$$

Where Y_t is a column vector of the n variables, Δ is the difference operator, Γ_i and Π are coefficient matrices, k denotes the lag length and μ is a constant. In the absence of co-integrating vector, Π is a singular matix, indicating that the co-integrating vector rank is equal to zero.

Table 2: Cointegration Test Result (Unrestricted Cointegration Rank Test -Trace)

Series: GREV GEXP

Hypothesized No. of CE(s)	**Eigenvalue**	**Trace Statistic**	**5 Percent Critical Value**	**Prob. ****
None *	0.394622	17.10088	15.49471	0.0284
At most 1	0.001065	0.036220	3.841466	0.8490

* denotes rejection of the hypothesis at 5% level of significance

Table 3: Cointegration Test Result (Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Series: GREV GEXP

Hypothesized No. of CE(s)	**Eigenvalue**	**Max-Eigen Statistic**	**5 Percent Critical Value**	**Prob. ****
None *	0.394622	17.06466	14.26460	0.0176
At most 1	0.001065	0.036220	3.841466	0.8490

* denotes rejection of the hypothesis at 5% level of significance

From the cointegration results above, tables 2 and 3, there is a longrun relationship between government revenue and government expenditure within the years under investigation as the results of both the ***Trace Statistic*** and ***Max-Eigen Statistic*** show one cointegrating vector in the model. It has clearly shown that a longrun relationship exists between government revenue and expenditure in Nigeria.

Consequently, the presence of co-integration forms the basis for Error Correction Model (ECM) specification which the Parsimonious test will be carried out to check the speed of adjustment. The error correction model is designed to capture the shortrun deviations that might have occurred in estimating the long run co-integration equations (Engle and Granger, 1987).

A statistically significant $\mathrm{ECM_{t-1}}$ term represents the long-run causality running from the explanatory

variables to the dependent variable. For instance, if two variables are non-stationary, but become stationary after first differencing and are cointegrated, the pth-order vector error correction model test assumes the following equations:

$$\Delta GOVREV_t = a_0 + \sum_{i=1}^{n} a_{1i}\, \Delta GOVEXP_{t-i} + \lambda_1 ECM_{t-1} + u_{1t} \quad \ldots\ldots\ldots\ldots\ldots\ldots(6)$$

$$\Delta GOVEXP_t = b_0 + \sum_{i=1}^{n} b_{1i}\, \Delta GOVREV_{t-i} + \lambda_1 ECM_{t-1} + u_{2t} \quad \ldots\ldots\ldots\ldots\ldots\ldots(7)$$

Where $\alpha_{1i}'s$ and $b_{1i}'s$ are the regression coefficients, u_{1t} and u_{2t} are error terms.

The presence of short-run and long-run causality can only be tested if the estimated coefficients of y in Eqs. 6 and 7 are statistically significant. The long-run causality can be found by testing the significance of the estimated coefficient of ECM_{t-n} (λ). ECM_{t-1} is the error correction term obtained from the cointegration model. The error coefficients λ indicate the rate at which the cointegration model corrects its previous period's disequilibrium or speed of adjustment to restore the long run equilibrium relationship. A negative and significant ecm_{t-1} coefficient implies that any short run movement between the dependent and explanatory variables will converge back to the long run relationship. Indeed it recovers any long-run information that is partially lost in the system with differenced coefficient so that these terms are needed to gain model stability in the longrun (Narayan and Smyths, 2008).

Table 4: Error Correction Test – Model 1

Dependent Variable: GEXP				
Variables	Coefficient	Std. Error	t-Statistic	Prob.
D(GEXP(-1))	0.361551	0.240998	1.500228	0.1472
D(GEXP(-2))	0.913992	0.229908	3.975478	0.0006
D(GREV(-1))	-0.218884	0.089176	-2.454533	0.0221
D(GREV(-2))	-0.161543	0.077876	-2.074361	0.0494
ECT-1	-0.373682	0.207952	-1.096963	0.0255

R-Square = 0.45, Adjusted R-square = 0.28, F-stat = 2.685 (0.034), DW = 2.1411

Table 5: Error Correction Test – Model 2

Dependent Variable: GREV				
Variables	Coefficient	Std. Error	t-Statistic	Prob.
D(GREV(-1))	0.282099	0.244738	1.152655	0.2614
D(GREV(-3))	0.171543	0.217578	0.788419	0.4389
D(GEXP(-1))	-0.366812	0.950492	-0.385917	0.7033
D(GEXP(-5))	-3.407697	1.208381	-2.820051	0.0100
ECT-1	-0.684625	0.298001	-2.297392	0.0315

R-Square = 0.55; Adjusted R-square = 0.41; F-stat = 3.832 (0.007); DW = 2.263

Table 6: Granger Causality Tests:

Model One		**Model Two**	
Null Hypothesis	F-Stat (Prob)	Null Hypothesis	F-Stat (Prob)
GEXP does not Granger Cause GREV	3.87306 (0.0323)	TOTREV does not Granger Cause TOTEXP	0.72301 (0.4938)
GREV does not Granger Cause GEXP	0.72301 (0.4938)	TOTEXP does not Granger Cause TOTREV	3.87306 (0.0323)

Source: Authors computation, 2018.

4.1 Findings and Discussion

From table 4, government expenditure (GEXP) was made the dependent variable and this was to ascertain the nature of the association between the government revenue-expenditure profiles of Nigeria. The result shows that about 45% changes observed in government expenditure was as a result of changes in government revenue leaving a whopping 55% of the changes to other factors not included in this study. The Error correction term is -0.37 with probability of (0.0255), this means that about 37% of short-run errors are corrected annually. The model is free from any form of autocorrelation as indicated by the DW statistic of approximately 2 which falls within the acceptable region. The result of the F-statistic equally lends credence that the fact that the overall regression is significant at 5% level of significance (2.685593) with probability value of 0.034.

Looking at the line of relationship between the dependent (GEXP) and independent (GREV) variable at various lags, the results become more interesting and indicating critical policy implications. At various lags 1, 2 and 4, (-0.21884), (-0.161543) and (-0.1225) respectively and their respective probability values of (0.0221), (0.0494) and (0.02), it shows that a negative but significant relationship exists between government expenditure

and government revenue. This means that government expenditure is not been determined by its revenue rather the other way round.

From the result obtainable from table six (6), government revenue (GREV) was made the dependent variable while government expenditure (GEXP) was made the independent variable. The result shows that about 55% changes in government revenue were occasioned by the changes in government expenditure while only 45% was as a result of changes in other factors not included in our model. The error correction term is -0.68 with probability value of (0.0315), indicating that about 68% deviations in the shortrun are corrected annually. There is no form of autocorrelation in the model as the DW statistic of 2.2 fell within the acceptable region. Looking at the F-statistic, the overall regression is significant 3.832 with probability value of (0.007).

Looking at the line of relationship between the dependent (GREV) and independent (GEXP) variable at various lags, the results become more interesting and indicating critical policy implications. At various lags 2 and 3 (1.930977) and (3.176658) respectively and their respective probability values of (0.0334) and (0.0278) show that a positive and significant relationship exists between government revenue and government expenditure when GREV was made the independent variable. At lag 5, there was a negative and significant relationship existing between the two variables. The positive and significant relationship as shown in lags 2 and 3 shows that Nigerian government expenditure projection determines her revenue projections. At lag 5, such projections becomes negative (adverse), and this shows that the continuation of such projections will lead to more devastating economic effects.

The result of the Granger-Causality test presented in tables 7 and 8 equally supports the results obtained from the earlier results of causality running from expenditure to revenue. From the result, it is clearly evident from either direction (making expenditure the dependent variable while revenue as the independent variable or turning it the other way round) that Nigeria's government expenditure profile dictates its revenue programme. The result supports the ***Spend-Tax Hypothesis***, showing causality runs from public expenditure to revenue in Nigeria. This finding rejects Revenue-Spend hypothesis of Buchanan and Wagner (1977) and Friedman (1978) but agrees with the spend-tax hypothesis of Barro (1974); Peacock and Wiseman. (1979) and supported by findings of Nwosu and Okafor (2014); Islam (2001); Fasano and Wang (2002), it equally supports the recent study of Balogun (2017) and contradicts that of Dada (2013).

5. Conclusion

This paper studies the nature of relationship between government expenditure and revenue in Nigeria, using time series data from 1981 to 2016. The study adopted an autoregressive model which included; Stationarity Test, Cointegration Test, Error Correction Model (ECM) and Granger causality test as the method of analysis. The results from the analyses show that expenditure has long run unidirectional relationships of Spend-Tax between government revenue and public expenditure in Nigeria. This causality runs from expenditures to revenue. This however confirms the Spend-Tax hypothesis of Peacock and Wiseman. (1979) and agrees with the studies of Nwosu and Okafor (2014); Islam (2001); Fasano and Wang (2002). The policy implication derivable from this study is that increase in government expenditure without corresponding increase in revenue will expand the budget deficit and government will have to resort to borrowing which could increase indebtedness to multilateral creditors. To make Nigeria budget less expenditure driven but by revenue availability, government should explore a medium term revenue framework, so that expenditure can be planned and projected from unstable short term revenue availability. Based on the findings of this research, the following are recommended; government should discover other sources of revenue especially the non-oil minerals sector, and also reduce the size of huge recurrent expenditure and move towards capital and other investment expenditures. Government should also try as much as possible to begin expenditure restructuring that is implementable and result- oriented through effective budget packaging and not legislative paddling. Federal Government should also as a matter of urgency help to set targets for revenue mobilization and utilization as well as device a way of expenditure spreading over the entire economy. Nigeria's government could improve on the effectiveness of fiscal policy by making budget expenditure less driven by only one source of revenue (oil) but should explore other viable means of revenue generation so that expenditure can be planned effectively within the available revenue.

References

Abiodun, M. D. (2013) Empirical investigation of government expenditure and revenue nexus; implication for fiscal sustainability in Nigeria. Journal of Economics and Sustainable Development, Vol.4, No.9.

Adoghor, G. J, Onuchkuwu O. & Ewubara, D. B. (2008). Principles of Economics a contemporary Volume 2 pearl publishers Njamanze street Port Harcourt.

Al-Khulaifi, A.S. (2012). The Relationship between Government Revenue and Expenditure in Qatar: A Cointegration and Causality Investigation. *International Journal of Economics and Finance,* 4(9): 142 – 148.

Aregbeyen, O. & Insah, B. (2013) A Dynamic analysis of the link between public expenditure and public

revenue in Nigeria and Ghana. Journal of Economics and Sustainable Development, 4(4), 18-31.
Aregbeyen, O. & Mohammed, I. T. (2012) Testing the Revenue and Expenditure Nexus in Nigeria: An Application of the Bound Test Approach. *European Journal of Social Sciences*, 27 (2/4), 374- 380.
Balogun, A. (2017). Causality between government expenditure and government revenue in Nigeria. Asian Journal of Economics and Empirical Research, 4(2): 90-98.
Bhatia, H. I. (2006) Public Finance, Vikas Publishers New Dehli India.
Baghestani, H. & McNown, R. (1994) Do revenues or expenditures respond to budgetary disequilibria? Southern Economic Journal, 61(2): 311-322.
Barro, R., (1974) Are government bonds net worth? Journal of Political Economy, 82(6): 1095- 1117.
Buchanan, J. & Wagner, R.W. (1978) Dialogues concerning fiscal religion. Journal of Monetary Economics, 4(3): 627-636.
Buiter, W. H. (2003). Measurement of public sector deficit and its Implications for policy Evaluation and Design. International Monetary fund staff papers 30th (June).
Central Bank of Nigeria Statistical Bulletin (2017) Edition.
Chang, T. (2009) Revisiting the Government Revenue-Expenditure Nexus: Evidence from 15 OECD Countries based on the Panel Data Approach. *Czech Journal of Economics and Finance*, Vol. 59, No. 2, pp. 165-172.
Chang, T., Liu, W.R. & Caudill, S.B. (2002) Tax-and-spend, spend-and-tax, or fiscal synchronization: New evidence for ten countries. Applied Economics, 34(12): 1553- 1561.
Easterly, W. & Hebbel, K. S. (2004) Fiscal and macroeconomic performance: A synthesis in Rodnguez et al, (eds); public sector deficit and macroeconomic performance (15)78.
Eita, J.H. and Mbazima, D. (2008). The Causal Relationship between Government Revenue and Expenditure in Namibia, *Munich Personal Repec Archive (MPRA) Paper No. 9154.*
Emelogu, C.O. & Uche, M.O. (2010) An examination of the relationship between government revenue and government expenditure in Nigeria: Co-integration and causality approach. Central Bank of Nigeria Economic and Financial Review, 48(2): 35-57.
Engle, R.F. & Granger, C.W.J. (1987) Co-integration and error-correction: Representation, estimation and testing. Econometrica, 55(2): 251-276.
Fasano, U. & Wang, Q. (2002) Testing the relationship between government spending and revenue: Evidence from GCC countries. International Monetary Fund Working Paper, No. E62 H50 N15.
Friedman, M. (1978) The Limitations of Tax Limitation. *Policy Review,* 5 (78) 7- 14.
Islam, A.M. (2001) Wagner's law revisited: Cointegration and exogeneity Tests for the USA. Applied Economics Letters, 8(8): 509-515.
Mainoma, M.A. & Aruwa, S.A.S. (2015) Public expenditure and revenue: The Nigerian case in managing public finance for development. Kaduna, Nigeria: Felicity Publishers.
Mehrara, M. M. & Elyasi, Y (2011) Government revenue and government expenditure nexus in Asian Countries: Panel cointegration and causality. *International Journal of Business and Social Science, 2*(7)*,* 199-207. http://dx.doi.org/10.2139/ssrn.1977987
Meltzer, H. & Richard, S.F. (1981) A rational theory of the size of the government. Journal of Political Economy, 89(5): 914-927.
Musgrave, R. (1966) Principles of budget determination. In public finance: Selected readings, Edited by H. Cameron and W. Henderson. New York: Random House.
Narayan, P.K. & Narayan, S. (2006) Government revenue and government expenditure nexus: Evidence from developing countries. Applied Economics, 38(3): 285-291.
Narayan, P. K. & Smyth, R. (2008) Energy consumption and real GDP in G7 countries: New evidence from panel cointegration with structural breaks, Energy Economics, 30, 2331-41
Ndubuisi, P. (2014) Financial bulldozer; logical focus on public finance and economic policy. Willyrose Appleseed publishing company, Abakaliki, Ebonyi.
Nwogwugwu, N. & Okoronkwo, P.N. (2015) Effective revenue mobilization and sustainable development in Lagos State, Nigeria. IOSR Journal of Business and Management, 17(5): 15-21.
Nwosu, D.C. & Okafor, H.O. (2014) Government revenue and expenditure in Nigeria: A disaggregated analysis. Asian Economic and Financial Review, 4(7): 877-892.
Obioma, E. C. & Ozughalu, U. M. (2010) An examination of the relationship between government revenue and government expenditure in Nigeria: Cointegration and causality approach. *Economic and Financial Review,* 48(2): 35 – 57.
Ogujiuba, K. & Abraham, T. W. (2012) Testing the relationship between government revenue and expenditure: Evidence from Nigeria. International Journal of Economics and Finance, 4(11): 172-182.
Omo, A. & Baba, I. (2013) A dynamic analysis of the link between public expenditure and public revenue in Nigeria and Ghana: Journal of Economics and Sustainable Development, Vol.4, No.4
Owoye, O. & Onafowora, O. A. (2011) The relationship between tax revenues and government expenditures in

European Union and Non-European Union OECD Countries: *International Journal of Economic and Management* Engineering (IJEME), 2 (2), pp. 33-35.
Peacock, A.T. & Wiseman, J. (1961) The growth of public expenditures in the United Kingdom. Princeton, NJ: Princeton University Press.
Peacock, A.T. & Wiseman, J. (1979) Approaches to the analysis of government expenditures growth. Public Finance Quarterly, 7(1): 3-23
Sriyana, J. (2009) A causality relationship between tax revenue and government expenditure in Indonesia. *Economic Journal of Emerging Market,* 1(2): 93 – 101.
Takumah, W. (2013) Tax Revenue and Economic Growth in Ghana: A Cointegration Approach. Munich Personal RePEc Archive Paper No. 58532. Online at http://mpra.ub.uni- muenchen.de/58532/
Wikipedia online. Retrieved from www.wikipediaonline.com
Wooldridge, J. (2013). Introductory Econometrics: A Modern Approach. South Western- Cengage Learning.
Zapf, M. & Payne, E. (2009). Asymmetric modeling of the revenue-expenditure nexus: evidence from aggregate state and local government in the US. *Applied Economics Letters*, 16(9), 871-876.
Zinaz, A. & Samina, K. (2010) Government expenditure and tax revenue, causality and co- integration: The experience of Pakistan 1972 – 2007.

Biographies

UCHE EMMANUE: *Uche Emmanuel is a faculty member of Economics Department of Abia State University, Uturu, Abia State Nigeria; he is also a Full Member of Nigerian Economic Society. He has published a lot of articles in the field of Social and Management Sciences in both national and international journals. He holds B.Sc, M.Sc in Economics and currently a Ph.D Student of Economics. His areas of interests include Development Economics, Monetary Economics, Econometrics and Economic Planning.*

DR OGBONNA BEN M. (PhD): *Dr Ogboonna, Ben M. is an Associate Professor of Economics in the Department of Economics, Abia State University, Uturu, Abia State Nigeria. He has spent over two decades teaching and supervising both undergraduate and post-graduate students. He has published extensively in national and international journals of repute. His areas of specialization are Industrial Economics, History of Economic Thought, Labour Economics and Macroeconomics. He holds B.Sc, M.Sc, and PhD in Economics and a Full Member of Nigerian Economic Society.*

APPENDICES

Error Correction Model (ECM 1)
Dependent Variable: D(GEXP)
Method: Least Squares
Date: 06/10/18 Time: 05:42
Sample (adjusted): 1986 2016
Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GEXP(-1))	0.361551	0.240998	1.500228	0.1472
D(GEXP(-2))	0.913992	0.229908	3.975478	0.0006
D(GREV(-1))	-0.218884	0.089176	-2.454533	0.0221
D(GREV(-2))	-0.161543	0.077876	-2.074361	0.0494
D(GREV(-3))	-0.061963	0.054856	-1.129556	0.2703
D(GREV(-4))	-0.122546	0.052568	-2.331184	0.0289
GEXPECM(-1)	-0.373682	0.207952	-1.096963	0.0255
C	111.6852	58.74805	1.901088	0.0699

R-squared	0.449750	Mean dependent var	166.0548
Adjusted R-squared	0.282282	S.D. dependent var	286.1848
S.E. of regression	242.4507	Akaike info criterion	14.03711
Sum squared resid	1351994.	Schwarz criterion	14.40717
Log likelihood	-209.5752	Hannan-Quinn criter.	14.15774
F-statistic	2.685593	Durbin-Watson stat	2.141140
Prob(F-statistic)	0.034551		

Error Correction Model (ECM 2)
Dependent Variable: D(GREV)
Method: Least Squares
Date: 06/10/18 Time: 06:02
Sample (adjusted): 1987 2016
Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GREV(-1))	0.282099	0.244738	1.152655	0.2614
D(GREV(-3))	0.171543	0.217578	0.788419	0.4389
D(GEXP(-1))	-0.366812	0.950492	-0.385917	0.7033
D(GEXP(-2))	1.930979	0.850720	2.269817	0.0334
D(GEXP(-3))	3.176658	1.348458	2.355770	0.0278
D(GEXP(-5))	-3.407697	1.208381	-2.820051	0.0100
GREVECM(-1)	-0.684625	0.298001	-2.297392	0.0315
C	-67.17204	274.9515	-0.244305	0.8093

R-squared	0.549383	Mean dependent var	188.8810
Adjusted R-squared	0.406004	S.D. dependent var	1349.654
S.E. of regression	1040.194	Akaike info criterion	16.95538
Sum squared resid	23804060	Schwarz criterion	17.32903
Log likelihood	-246.3307	Hannan-Quinn criter.	17.07491
F-statistic	3.831702	Durbin-Watson stat	2.262553
Prob(F-statistic)	0.007194		

Granger Causality Test (1)
Pairwise Granger Causality Tests
Date: 06/07/18 Time: 05:39
Sample: 1981 2016
Lags: 2

Null Hypothesis	Obs	F-Statistic	Prob.
GEXP does not Granger Cause GREV	34	3.87306	0.0323
GREV does not Granger Cause GEXP		0.72301	0.4938

Granger Causality Test (2)
Pairwise Granger Causality Tests
Date: 06/07/18 Time: 04:57
Sample: 1981 2016
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
TOTREV does not Granger Cause TOTEXP	34	0.72301	0.4938
TOTEXP does not Granger Cause TOTREV		3.87306	0.0323