Asian Economic and Financial Review

journal homepage: http://www.aessweb.com/journals/5002

GOVERNMENT REVENUE AND EXPENDITURE IN NIGERIA: A DISAGGREGATED ANALYSIS

Damian C. Nwosu

Department of Economics, University of Ibadan, Ibadan, Nigeria

Harrison O. Okafor

Research Division, National Institute for Legislative Studies, National Assembly, Abuja, Nigeria

ABSTRACT

This paper examined the relationship between both total (TEXP) and disaggregated government expenditure (current (TREXP) and capital expenditures (TCEXP)), and total (TREV) and disaggregated revenue (oil (OILREV) and non-oil revenues (NOREV)) in Nigeria using time series data from 1970 to 2011. The study utilized co-integration techniques and VAR models which included an Error Correction Mechanism (ECM) as the methods of analyses. The Co-integration tests indicate the existence of long run equilibrium relationships between government expenditure variables and revenues variables. The VAR results also show that total government expenditure, capital and recurrent expenditures have long run unidirectional relationships with total revenue, oil and non-oil revenue variables as well as unidirectional causalities running from expenditures to revenue variables. The findings support spend-tax hypothesis in Nigeria indicating that changes in government expenditure instigate changes in government revenue. The policy implication derivable from this study is that increase in government expenditure without a corresponding increase in revenue could widen the budget deficit. Therefore, government should explore other sources of revenue especially the non oil minerals sector, and also reduce the size of large recurrent expenditure and move towards capital and other investment expenditures. Government should also consider expenditure reforms analysis vis-à-vis taxes and all other revenues sources (oil and non oil) reforms in other to help set targets for revenue mobilization and utilization as well as device a way of expenditure spreading over the entire economy.

Keywords: Government expenditure, Government revenue, Disaggregated analyses, Unit root tests, Co-integration techniques, VAR model, Error correction model.

Jel Classification: E60, E61, E62, E63.

1. INTRODUCTION

The growing disparity between revenue and expenditure in many countries has been a source of concern to many economists, analysts and researchers. Such fiscal imbalances with the attendant adverse effects on economies have provoked intensive research on the causes and effects of such disparities, resulting to four alternative hypotheses relating to the relationship between government expenditure and revenue. The hypotheses are; the revenue-and-spend hypothesis, the spend-and-revenue hypothesis, the fiscal synchronization hypothesis or the fiscal neutrality hypothesis and the institutional separation hypothesis. In other to test the validity of these hypotheses, many authors have employed different methodologies, and their results have shown conflicting outcomes as shown in the literature. The main objective of this study is to ascertain the direction of causality between the disaggregated values of government revenue and expenditure in Nigeria by deploying a robust econometric methodology. The result would assist policy makers to recognize the source(s) of any fiscal imbalance that might exist and consequently, direct efforts to developing suitable strategies for a sound fiscal framework.

The rest of this study is organized as follows; Section two presents review of the relevant theoretical and empirical literature. Section three showcases the revenues and expenditures profiles of Nigeria. Section four provides an overview of the methodology applied to test for these relationships. Section four discusses the empirical findings while section five, concludes the study with policy implications.

2. LITERATURE REVIEW

The search for the validity or otherwise of the relationship between government expenditure and revenue has evoked mixed views. Theoretically, four alternatives hypotheses have been developed in the literature to explain the nature of the relationship between government revenues and expenditures. The first is the revenue-and-spend hypothesis which theorized that the rise in tax revenues will lead to an increase in government expenditures and consequently worsens the governmental budgetary balance. The hypothesis suggests that government would spend all its revenues; therefore, raising government revenues would lead to higher government expenditures. Under this hypothesis, empirical results preempt a unidirectional causality running from government revenues to government expenditures. If the revenue-spend hypothesis holds, then budget deficits can be eliminated or avoided by implementing policies that stimulate or increase government revenue.

Empirical confirmations of this view include Craigwell *et al.* (1994) who examined government revenue and expenditure causality in the presence of seasonality in Barbados. Applying seasonal unit roots, co-integration test, Granger causality and vector error correction methodologies, their results established that the variables are significantly co-integrated, and that a unidirectional causality from government revenue to total government expenditure exists. In Botswana, Moalusi (2004) examined the causal relationship between government spending and

government revenue. The results of both bivariate and multivariate models provided evidence of a unidirectional causal link running from revenue to spending.

Furthermore, Tracy and Kester (2009) investigated the interrelationship between total government expenditure and total tax revenue in Barbados applying Granger Causality on both bivariate and multivariate co-integrating models. The result of the multivariate error correction model suggests that a unidirectional causality exists from tax revenue to government expenditure. Emelogu and Uche (2010) studied the relationship between government revenue and government expenditure in Nigeria using time series data from 1970 to 2007. They utilized the Engel-Granger two-step co-integration technique, the Johansen co-integration method and the Granger causality test within the Error Correction Modeling (ECM) framework and found a long-run relationship between the two variables and a unidirectional causality running from government revenue to government in Nigeria. Saeed and Somaye (2012) investigated the causality and the long-run relationships between government expenditure and government revenue in oil exporting countries during 2000-2009 using P-VAR framework. Using oil revenue as proxy for total revenue, their result revealed that there is a positive unidirectional long-run relationship between oil revenue and government expenditures. Ogujiuba and Abraham (2012) also examined the revenue-spending hypothesis for Nigeria using macro 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.

The second is the spend-and-revenue hypothesis, a reverse of the revenue-and-spend hypothesis in which revenue responds to prior spending changes. This hypothesis suggests that government would raise the funds to cover its spending, and therefore, higher government expenditures lead to higher government revenues. Thus, empirical results are expected to show a unidirectional relationship running from government expenditure to revenue. If the spend-revenue hypothesis holds, it suggests that government's behaviour is such that it spends first and raises taxes later in order to pay for the spending. Several studies have tried to establish this relationship (Mithani and Khoon, 1999; Zinaz and Samina, 2010).

Mithani and Khoon (1999) incorporated the effect of seasonality to examine the causal relationship between quarterly government revenue and government expenditure in Malaysia between 1970 -1997. They report evidence of seasonal cointegration of biannual frequency while the seasonal error correction model indicates a unidirectional causal influence from government expenditure to government revenue. The implication of this result is that spending decision determines the size and growth of the public sector and consequential tax burden as well as fiscal deficit in Malaysia. In the case of Pakistan using data range of 1972 and 2007, Zinaz and Samina (2010) employed Granger causality test on a bivariate model to study the causality between government expenditure and tax revenue. They concluded that there exists a unilateral stable long run relationship running from expenditures to revenues in Malaysia.

The third hypothesis, the fiscal synchronization hypothesis or the fiscal neutrality hypothesis indicates bidirectional relationship between revenue and spending. If the bidirectional causality between government revenue and government expenditure does not hold, it means that government expenditure decisions are made independent of government revenue decisions and vice versa. To justify this hypothesis, Al-Qudair (2005) examined the long run equilibrium relationship between government expenditure and revenues in the Kingdom of Saudi Arabia using cointegration technique, Error Correction Model (ECM) and Granger causality test. The cointegration test indicates the existence of long run equilibrium between government expenditure and revenues. The causality tests show the existence of a bi-directional causal relationship between government expenditure and revenues in the long and the short run. In Romania, Hye and Jalil (2010) adopted the autoregressive distributive lag approach to cointegration, variance decomposition and rolling regression method to determine the causal relationship between expenditure and revenue of government. The results indicate that bidirectional long run relationship exists between government expenditure and revenue. The variance decomposition result further suggests that government revenue shock has sharp impact on the government expenditure compared to the revenue collection response to shock in government expenditure.

Elyasi1 and Rahimi (2012) also investigated the relationship between government revenue and expenditure in Iran by applying the bounds testing approach to cointegration. They showed that there is a bidirectional causal relationship between government expenditure and revenues in both the long run and short run. Al-Qudair (2005) and Elyasi1 and Rahimi (2012) however, could not give relevant policy prescriptions on the implications of their results.

The final hypothesis is the institutional separation hypothesis where decisions on revenue are taken independently from allocation of government expenditure, and therefore no causal relation between revenue and spending is expected. Empirical work to test this hypothesis has been done in the case of Pakistan by Ali and Shah (2012), who examined government revenue and expenditure nexus using annual data for the period 1976-2009. They applied the Johansen co-integration and Granger causality techniques and found no relationship among the variables both in the long run and the short run granger. This result supports institutional separation hypothesis.

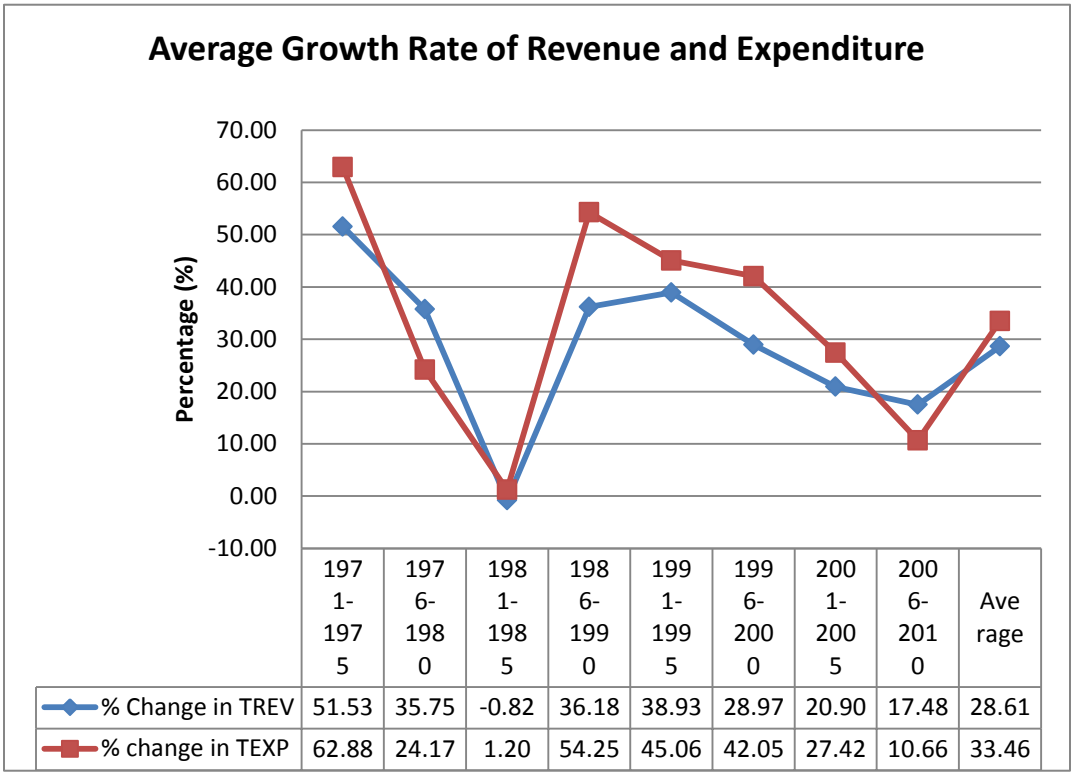
Evidently, there is little empirical study in the case of Nigeria to determine the appropriate hypothesis that can establish the right framework that explains this relationship. Nonetheless, most of the studies that tested these hypotheses do not recognize the underlying structures that could influence revenue and expenditure relationship. This paper tries to examine this relationship in Nigeria using a disaggregated framework to account for the different sources of revenue in Nigeria.

3. REVENUE AND EXPENDITURE PROFILES IN NIGERIA

The characteristics of the total government revenues and expenditures in Nigeria are examined to support the econometric analysis in this work. For the purpose of this study, the authors adopted recurrent (TREXP) and capital (TCEXP) expenditures as components of expenditure (TEXP),

while total revenue (TREV) is made up of oil (OILREV) and non-oil revenues (NON-OIL). Figure 1 x-rays the average percentage changes in these variables under study.

Figure-1. Average Percentage Change in Revenue and Expenditure between 1970 and 2010



	1971-1975	1976-1980	1981-1985	1986-1990	1991-1995	1996-2000	2001-2005	2006-2010	Average
% Change in TREV	51.53	35.75	-0.82	36.18	38.93	28.97	20.90	17.48	28.61
% change in TEXP	62.88	24.17	1.20	54.25	45.06	42.05	27.42	10.66	33.46

Source: Author's computation.

This figure shows sharp increases in expenditure and that Nigeria has spent more than she has earned. Within the period under study, total revenue has witnessed an average increase of 29%, while total expenditure exceeded that by 15%. Between 2006 and 2010, average increase in expenditure was lower than revenue. This may be partly due to the negative impact of the global financial meltdown that significantly reduced government revenue and also warranted the government to think in the direction of savings via the Sovereign Wealth Fund (SWF) for the rainy day, hence reducing the amount of money left for government expenditure. The figure also shows that government expenditure responds to changes in total revenue. Between 1981 and 1985 when government revenue dropped on the average by 0.82% due to significant decline in oil prices, government expenditure also shaded an average of 1.20% within the period. Also between 2006 and 2010 when the global financial meltdown affected negatively many economies, the average reduction in total government revenue by 18% also led to the reduction in government expenditure by a yearly average of 11%. This suggests that Nigerian economy follows procyclical fiscal policies to changes in government revenue. Figure 2 below provides evidence of this because for the majority of times during the period of analysis, the expenditure to GDP ((TEXP/GDP) ratio has

followed the same direction as the ratio of revenue to GDP (TREV/GDP) except since this democratic dispensation. Also, the ratio of revenue to GDP has exceeded expenditure to GDP ratio.

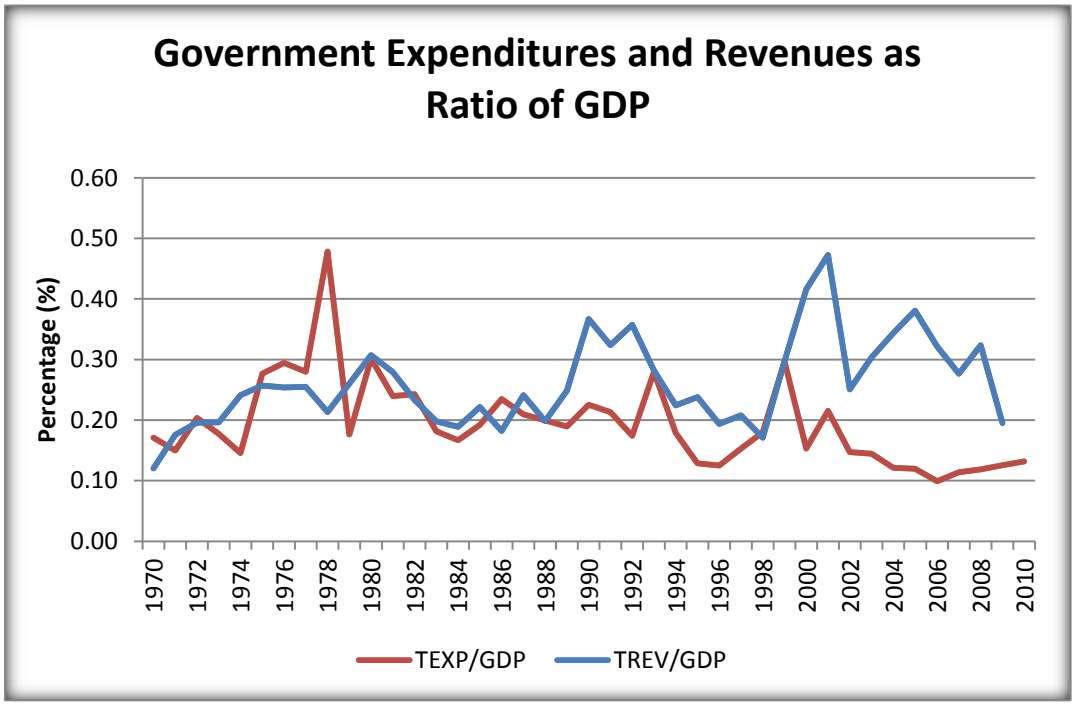
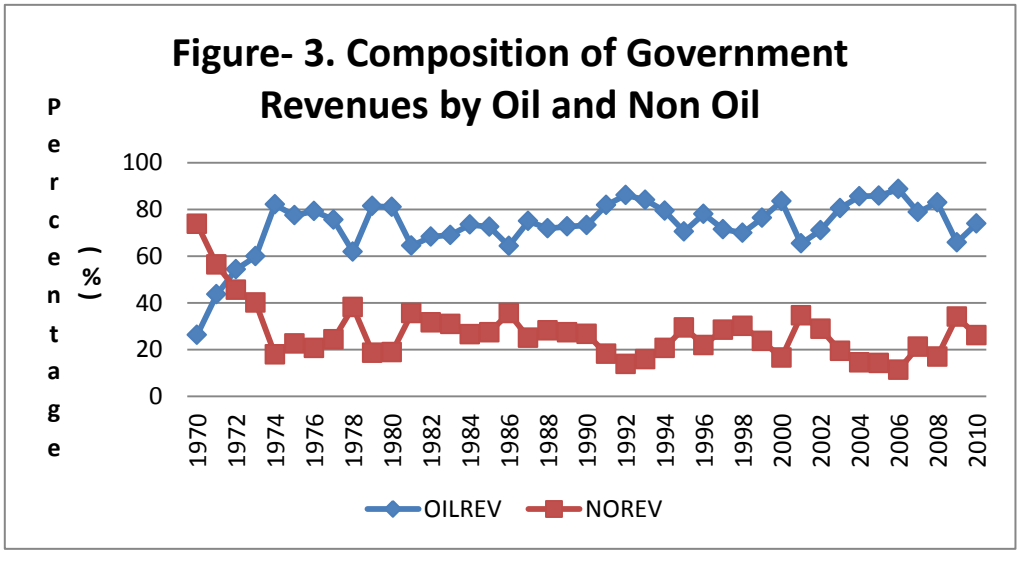


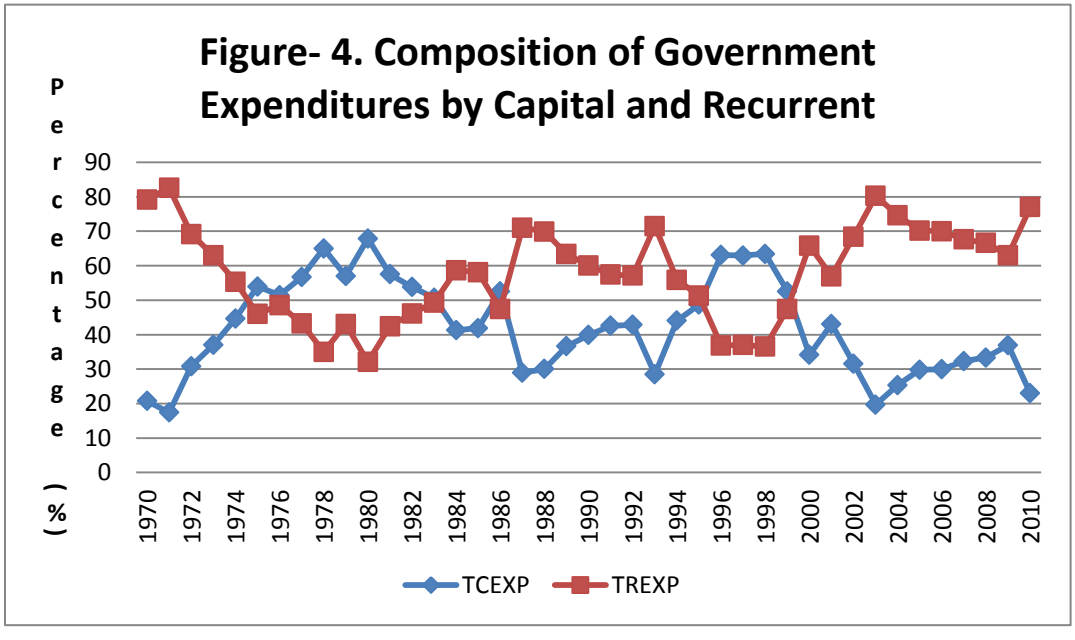
Figure 3 shows the composition of revenues by oil and non oil. It shows that non oil revenue was higher than oil revenue before 1972. Since then, oil revenue which has remained the main source of Nigeria revenue has contributed on the average 60% of government revenue peaking in 2006 when it brought 89% to the pool. This is a clear indication that government expenditure is predominantly financed with oil revenue.



The expenditure side is represented in figure 4. The figure shows that capital expenditure started increasing immediately after the Nigerian/Biafran war in 1970 because of the need to undertake the 3R's (Reconciliation, Rehabilitation and Reconstruction), which followed the war. This development continued during 1975 and 1983 as a result of the need to fund the new states created by the Murtala Mohammed administration and also the duplication of structures occasioned by the democratic dispensation of the second republic that lasted till 1983.

In other to reverse the worsening economic conditions that emerged prior to 1985, government introduced the Fourth National Development Plan (1981-1985) which re-emphasized the need for agricultural-based self reliance. This suffered from foreign exchange shortages, which led to widespread scarcity of essential commodities and high food cost. The structural adjustment programme was put in place in 1985 because of the need to liberalize and to reduce government involvement in the economy and as such put an end to the observed hardships. Government policies towards actualizing this caused recurrent expenditure to rise above capital expenditure from 1986. This trend continued till 1994 because of the need to service the new democratic structures of the third republic and to organize the aborted presidential elections.

Between 1995 and 1998, capital expenditure was higher than recurrent expenditure. The government in power faced sanctions from the international community as a result of the botched elections and the incarceration of the acclaimed winner of the June 1992 elections. The only option was to undertake some developmental projects in other to win the support of the people. Since 1999 when the present democratic dispensation started, recurrent expenditure has remained higher than capital expenditure. This is attributed to the duplication of offices and personnel, hence the allocation of huge resources to service and maintain them.



4. ECONOMETRIC METHODOLOGY

4.1. Methodology

This study follows the Fasano and Wang (2002) method. However, where the variables are stationary and there is no co-integration between the variables in any of the equations, we adopt the normal granger causality method where the error correction term is not taken into account. The work also updates the data used for Nigeria by Emelogu and Uche (2010), but segregates annual data on Government expenditure (TEXP) and government revenue (TREV) into current (TREXP) and capital expenditures (TCEXP), and into oil (OILREV) and non-oil revenues (NOREV) respectively. This enables us determine the impact of individual variables on others and vice versa, an aspect that this study seeks to unravel. The data are obtained from the Central Bank of Nigeria (CBN) Statistical Bulletin, and were transformed to logarithms to eliminate the problem of heteroskedasticity.

The relationships between government revenues and expenditures are specified empirically below:

$$TEXP = \beta_0 + \beta_1 TREV + \varepsilon_t \quad \text{.....(1)}^{A}$$

$$TREV = \beta_0 + \beta_1 TEXP + \varepsilon_t \quad \text{.....(1)}^{B}$$

$$TEXP = \beta_0 + \beta_1 OILREV + \varepsilon_t \quad \text{.....(2)}^{A}$$

$$OILREV = \beta_0 + \beta_1 TEXP + \varepsilon_t \quad \text{.....(2)}^{B}$$

$$TEXP = \beta_0 + \beta_1 NOREV + \varepsilon_t \quad \text{.....(3)}^{A}$$

$$NOREV = \beta_0 + \beta_1 TEXP + \varepsilon_t \quad \text{.....(3)}^{B}$$

$$TREV = \beta_0 + \beta_1 TCEXP + \varepsilon_t \quad \text{.....(4)}^{A}$$

$$TCEXP = \beta_0 + \beta_1 TREV + \varepsilon_t \quad \text{.....(4)}^{B}$$

$$TREV = \beta_0 + \beta_1 TREXP + \varepsilon_t \quad \text{.....(5)}^{A}$$

$$TREXP = \beta_0 + \beta_1 TREV + \varepsilon_t \quad \text{.....(5)}^{B}$$

The variables are as defined above. The constant terms are represented by $\beta_0\, s$, β_1 s are the coefficients to be estimated and $\varepsilon_t\, s$ are the stochastic error terms with all the standard attributes. A priori, we expect the independent variables in all the equations to be positively signed, i.e. $\beta_{1\,s} \succ 0$.

4.1.1. Time Series Properties of the Variables

(a) Unit Root Tests

We will determine the stationarity properties of the variables using two tests of unit roots, namely the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) Tests. While the ADF procedure is perhaps the most commonly used test, it nevertheless requires homoscedastic and uncorrelated errors in the underlying structure. The PP non-parametric test generalizes the ADF procedure, allowing for less restrictive assumptions for the time series in question. Thus, we apply both stationarity tests to guarantee our inferences regarding the important issues that stationarity are unlikely driven by the choice of the testing procedure used.

(b) Co-integration Tests

To test for co-integration, we adopt the Johansen maximum-likelihood approach because the Engle-Granger approach can be extremely weak under mild cases of autocorrelation. The Johansen-Juselius also provides likelihood ratio statistics with exactly known distributions. If the variables are co-integrated, the final stage of the Time-Series analysis is to construct dynamic error correction models (ECMs) that take into account the underlying co-integration properties. The ECM differs from the standard Granger-Causality models in equations in that they add another regressor in each equation, namely, the estimated residuals (the error correction, EC, terms) obtained from the associated co-integrating equations.

(c) Error Correction Mechanism and Granger Causality

After determining that the variables of the model are co-integrated, an Error Correction Model (ECM) would be estimated. The error-correction model arises from the long-run co-integration relationship. To check for the speed of adjustment of the model from the short run to the long run equilibrium state, then we also consider the error correcting term (ECM). The greater the coefficient of the error correction term, the faster the speed of adjustment of the model from the short run to the long run.

5. EMPIRICAL RESULTS

5.1. Descriptive Statistics

Before estimating the models, we examined the descriptive statistics of the variables. This is to enable us unravel the nature of the distribution from which the data emanate. The Jaeque-Bera statistic was used to consider the normality, and this was fortified by the values of the skewness and kurtosis of the variables. The skewness is a measure of the symmetry of the histogram while the kurtosis is a measure of the tail shape of the histogram. For a symmetrical distribution such as a normal distribution, the skewness should be zero while the kurtosis should be three.

Table 5. 1: Results of the Descriptive Statistics

	Norev	Oilrev	Tcexp	Texp	Trev	Trexp
Mean	10.2	11.3	10.3	11.3	11.6	10.7
Median	10.0	11.3	10.2	11.1	11.5	10.5
Maximum	14.5	16.0	14.0	15.3	16.1	14.9
Minimum	6.1	5.1	5.2	6.8	6.5	6.6
Std. Dev.	2.7	3.0	2.5	2.6	2.9	2.7
Skewness	0.1	0.0	-0.2	0.0	0.1	0.1
Kurtosis	1.6	1.8	2.0	1.7	1.7	1.6
Jarque-Bera	3.7	2.3	2.2	2.9	3.0	3.4
Probability	0.2	0.3	0.3	0.2	0.2	0.2
Sum	429.1	474.1	434.0	474.1	487.7	449.4
Sum Sq. Dev.	299.8	377.2	265.4	273.7	347.4	290.6
Observations	42	42	42	42	42	42

Source: Author's computation.

Table 5.1 provides the summary statistics of the variables for the study. Given the scope of the study (1970-2011) and the frequency of the annual data, all the variables have 42 observations. As shown in Table 5.1, the mean, median, standard deviation as well as the skewness and kurtosis of our variables of interest are evident. The various statistics indicate that the variables have different distributions. The skewness statistic reveals that all the variables have normal distributions while the reverse is the case for all the variables with the kurtosis statistic. The Jarque-Bera (JB) test of normality which is large –sample asymptotic test is also reported in the table. Based on the probability scores, the JB statistic result shows that none of the variables was normally distributed.

Another descriptive statistic that was computed is the correlation matrix between the series. This is calculated to gain insight into the nature of the relationship between the variables in models. This relationship falls between 0 and 1, measuring the strength of the linear association between the observed values. The correlation matrix presented in the table reveals that all the variables have strong positive correlation with each other, with coefficients above 0.9.

Table 5.2. Correlation Matrix

Correlation	Norev	Oilrev	Tcexp	Texp	Trev	Trexp
Norev	1.000					
Oilrev	0.985	1.000				
Tcexp	0.976	0.983	1.000			
Texp	0.991	0.991	0.991	1.000		
Trev	0.992	0.998	0.982	0.994	1.000	
Trexp	0.992	0.990	0.974	0.994	0.995	1.000

Source: Author's computation.

5.1.2. Time Series Tests Results

Since this study deals with time series macroeconomic variables, there is need to test for unit root in each of the variables employed. The importance of this drives from the fact that estimation in the presence of non-stationarity in variables usually leads to unbiased and inconsistent estimates of the standard errors of the coefficients, and this could lead to misleading inference if appropriate technique is not applied to overcome the problem.

(a)Unit root Results

The unit root tests are carried out using Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) teats. It was found that all the variables are stationary at level, i.e. I(0) except TCEXP and NOREV that are stationary after first-differencing and hence I(1).

Table- 5.3. Augmented Dickey-Fuller (ADF) Test

		Level form			First Difference			
Variable		**Model 1**	**Model 2**	**Model 3**	**Model 1**	**Model 2**	**Model 3**	**Decision**
Texp		10.816*	4.329*	11.663*	3.309**	1.090	3.124*	I(0)
Tcexp		0.378	0.087	0.134	0.198	-2.346	0.846	I(1)
Trexp		9.005*	6.396*	9.932*	2.733***	1.093	3.401*	I(0)
Trev		-6.917*	-6.503*	-7.063*	-8.889*	-9.922*	-8.775*	I(0)
Oilrev		-4.783*	-4.848*	-4.762*	-7.295*	-8.090*	-7.172*	I(0)
Norev		0.066	0.633	-0.244	2.311	-0.249	3.393*	I(1)
	1%	-3.606	-4.263	-2.624	-3.621	-4.227	-2.639	
	5%	-2.937	-3.553	-1.949	-2.943	-3.537	-1.952	
Critical Values	10%	-2.607	-3.210	-1.612	-2.610	-3.200	-1.611	

*The Null hypothesis is the presence of unit root. Model 1includes a constant, model 2 includes a constant and a linear time trend while model 3 includes none in the regression as exogenous lags are selected based on Schwarz info criteria. (*), (**) and (***) indicate significance at 1%, 5% and 10% significance levels respectively.

Table- 5.4. Phillips-Perron (PP) test

		Level form			First Difference			
Variable		**Model 1**	**Model 2**	**Model 3**	**Model 1**	**Model 2**	**Model 3**	**Decision**
Texp		16.795	7.785	19.865	-4.427	-6.970	-3.477	I(0)
Tcexp		0.170	-1.490	0.935	-7.387	-7.806	-7.034	I(1)
Trexp		9.396	4.307	11.471	-5.810	-7.746	-5.139	I(0)
Trev		4.502	1.278	5.763	-6.908	-8.773	-6.425	I(0)
Oilrev		3.706	0.197	4.779	-6.608	-8.142	-6.222	I(0)
Norev		-0.671	-2.170	-0.101	-6.433	-6.541	-6.295	I(1)
	1%	-3.601	-4.199	-2.623	-3.606	-4.205	-2.624	
	5%	-2.935	-3.524	-1.949	-2.937	-3.527	-1.949	
Critical Values	10%	-2.606	-3.193	-1.612	-2.607	-3.195	-1.612	

*The Null hypothesis is the presence of unit root. Model 1includes a constant, model 2 includes a constant and a linear time trend while model 3 includes none in the regression as exogenous. The Bandwith was chosen using Newey-West method with Barttlet Kernel spectral estimation. (*), (**) and (***) indicate significance at 1%, 5% and 10% significance levels respectively.

(b) Co-integration Tests Results

The co-integration results of the models are presented below. The results indicate that all the models show that both max-eigenvalue and trace statistics indicate at least two co-integrating equations at 5% significant levels, except in model 4 where the max-eigenvalue show no co-integrating equation while trace statistics shows two co-integrating equations.

(c) Johansen-Juselius Maximum Likelihood Co-integration Test Results: Maximum Eigenvalue and Trace Tests.

Table-5.5. Model 1: (TEXP and TREV)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	Critical Value 5 Percent	Trace Statistic	Critical Value 5 Percent
None *	0.781424	60.82487	14.2646	72.39793	15.49471
At most 1 *	0.251232	11.57306	3.841466	11.57306	3.841466

* denotes the rejection of the hypothesis at the 5% level.Both Max-eigenvalue and trace statistics indicate 2 co-integrating equations at 5% level.

Table-5.6. Model 2: (TEXP and OILREV)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	Critical Value 5 Percent	Trace Statistic	Critical Value 5 Percent
None *	0.784681	61.42531	14.2646	75.70936	15.49471
At most 1 *	0.300298	14.28406	3.841466	14.28406	3.841466

* denotes the rejection of the hypothesis at the 5% level. Both Max-eigenvalue and trace statistics indicate 2 co-integrating equations at 5% level.

Table-5.7. Model 3: (TEXP and NOREV)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	Critical Value 5 Percent	Trace Statistic	Critical Value 5 Percent
None *	0.82798	70.40572	14.2646	89.955	15.49471
At most 1 *	0.386596	19.54928	3.841466	19.54928	3.841466

* denotes the rejection of the hypothesis at the 5% level. Both Max-eigenvalue and trace statistics indicate 2 co-integrating equations at 5% level.

Table-5.8. Model 4: (TREV and TCEXP)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	Critical Value 5 Percent	Trace Statistic	Critical Value 5 Percent
None	0.279264	13.09932	14.2646	23.08327	15.49471
At most 1 *	0.220887	9.983952	3.841466	9.983952	3.841466

* denotes the rejection of the hypothesis at the 5% level. Max-eigenvalue indicates no co-integrating equation at 5% while trace statistics indicates 2 co-integrating equations at 5% level.

Table-5.9. Model 5: (TREV and TREXP)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	Critical Value 5 Percent	Trace Statistic	Critical Value 5 Percent
None *	0.886241	86.94679	14.2646	94.63157	15.49471
At most 1 *	0.174792	7.684782	3.841466	7.684782	3.841466

* denotes the rejection of the hypothesis at the 5% level. Both Max-eigenvalue and trace statistics indicate 2 co-integrating equations at 5% level.

Table-5.10. Results of the Estimated Equations

The Relationship between Total Expenditure and Total Revenue

6A Dependent Variable: D(TEXP)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(TEXP(-1))	0.518	0.202	2.571	0.014
D(TREV(-1))	**-0.073**	**0.050**	**-1.453**	**0.155**
ECM(-1)	**-0.028**	**0.130**	**-0.216**	**0.830**
F-statistic	2.846	Prob(F-statistic)		0.051
Durbin-Watson stat				2.477

6B Dependent Variable: D(TREV)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(TREV(-1))	-0.117	0.205	-0.571	0.572
D(TEXP(-1))	**1.486**	**0.763**	**1.948**	**0.059**
ECM(-1)	**-0.601**	**0.222**	**-2.704**	**0.010**
F-statistic	6.430	Prob(F-statistic)		0.001
Durbin-Watson stat				2.014

The Relationship between Total Expenditure and Total Oil Revenue

7A Dependent Variable: D(TEXP)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(TEXP(-1))	0.429	0.200	2.146	0.039
D(OILREV(-1))	**-0.059**	**0.048**	**-1.230**	**0.227**
ECM(-1)	**0.039**	**0.105**	**0.372**	**0.712**
F-statistic	3.152	Prob(F-statistic)		0.037
Durbin-Watson stat				2.415

7B Dependent Variable: D(OILREV)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(OILREV(-1))	0.017	0.201	0.084	0.933
D(TEXP(-1))	**1.254**	**0.751**	**1.671**	**0.104**
ECM(-1)	**-0.785**	**0.222**	**-3.539**	**0.001**
F-statistic	8.536	Prob(F-statistic)		0.000
Durbin-Watson stat				1.947

The Relationship between Total Expenditure and Total Non Oil Revenue

8A Dependent Variable: D(TEXP)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(TEXP(-1))	0.300	0.214	1.398	0.171
D(NOREV(-1))	**0.130**	**0.326**	**0.399**	**0.692**
ECM(-1)	**-0.034**	**0.204**	**-0.167**	**0.868**
F-statistic	1.971	Prob(F-statistic)		0.136
Durbin-Watson stat				2.420

8B Dependent Variable: D(NOREV)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(NOREV(-1))	0.370	0.309	1.200	0.238
D(TEXP(-1))	**-0.336**	**0.201**	**-1.667**	**0.104**
ECM(-1)	**-0.825**	**0.387**	**-2.130**	**0.040**
F-statistic	3.552	Prob(F-statistic)		0.024
Durbin-Watson stat				1.576

The Relationship between Total Revenue and Total Capital Expenditure

9A Dependent Variable: D(TREV)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(TREV(-1))	-0.114	0.231	-0.493	0.625
D(TCEXP(-1))	**-2.263**	**1.471**	**-1.538**	**0.133**
ECM(-1)	**-0.207**	**0.193**	**-1.076**	**0.289**
F-statistic	1.520	Prob(F-statistic)		0.226
Durbin-Watson stat				1.809

9B Dependent Variable: D(TCEXP)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(TCEXP(-1))	0.031	0.145	0.212	0.833
D(TREV(-1))	**0.042**	**0.019**	**2.231**	**0.032**
ECM(-1)	**-0.280**	**0.125**	**-2.252**	**0.031**
F-statistic	6.766	Prob(F-statistic)		0.001
Durbin-Watson stat				2.131

The Relationship between Total Revenue and Total Recurrent Expenditure

10A Dependent Variable: D(TREV)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(TREV(-1))	-0.494	0.206	-2.396	0.022
D(TREXP(-1))	**2.970**	**0.931**	**3.189**	**0.003**
ECM(-1)	**-0.370**	**0.211**	**-1.748**	**0.089**
F-statistic	11.46	Prob(F-statistic)		0.00
Durbin-Watson stat				1.88

10B Dependent Variable: D(TREXP)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(TREXP(-1))	1.011	0.194	5.225	0.000
D(TREV(-1))	**-0.262**	**0.039**	**-6.737**	**0.000**
ECM(-1)	**-0.407**	**0.140**	**-2.903**	**0.006**
F-statistic	17.28	Prob(F-statistic)		0.00
Durbin-Watson stat				1.9

(d) Error Correction Results

Following Emelogu and Uche (2010), we used one-period lag in order to keep the model simple. In addition, one-period lag was found to be optimal based on consideration of the Schwarz and Akaike information Criterion (AIC).

The results as presented in Table 5. 10 above show that total expenditure has long run relationships with total revenue, oil revenue and non oil revenue. The parameter estimates associated with the error correction term is statistically significant at 5 per cent level of significance, while other relevant parameter estimates in the equations are not statistically significant at the conventional 1 per cent or 5 per cent level. This is an evident that there is a unidirectional relationship between the variables emanating from total expenditure. The result for the relationship between total revenue and capital expenditure also shows that there exists a short run as well as a long run unidirectional relationship between them, with causality running from capital expenditure. These results support the spend-and-revenue hypothesis, where budget policy makers determine how much to spend and then look for revenue from oil, non oil sector and borrowing to finance such level of spending. This result is in line with the findings of Zinaz and Samina (2010) for Pakistan that report the existence of a stable long run relationship with causality unilaterally running from expenditures to revenues.

The result for the relationship between total revenue and recurrent expenditure supports the fiscal synchronization hypothesis or the fiscal neutrality hypothesis because it indicates a bidirectional relationship between the variables. However, while recurrent expenditure granger causes total revenue in the short as well as in long run, total revenue only proved to cause recurrent expenditure in the short run. This result confirms the fact that expenditure consistently granger causes revenue in Nigeria.

6. CONCLUSION, POLICY IMPLICATIONS AND RECOMMENDATIONS

The study examined a disaggregated analysis of the relationship between government expenditure and revenue in Nigeria using time series data from 1970 to 2011. The study adopted a VAR model which included a mechanism of error correction model (ECM) as the method of analysis. The results from the analyses show that expenditure, whether in absolute or disaggregated forms have long run unidirectional relationships with revenue and that these causalities run from expenditures to revenue. The study therefore supports spend-tax hypothesis.

The policy implication derivable from this study is that the increase in government expenditure without corresponding revenue will widen the budget deficit. Thus, government will be left with an option to borrow which could increase indebtedness to lending countries and institutions. This could further widen the budget deficit in and the provisions for debt servicing. Internal borrowing also reduces the amount meant for private investment in the country. It is therefore recommended that;

(i) Government should reduce the size of large recurrent expenditure and move towards capital and other investment expenditures. The cost of running the government should be reduced,

ghost workers as well as redundant ones should be terminated and funds recovered from such put to investment use. Deliberate efforts should be made to check inflation of contracts sums, these will help reduce budget deficit.

(ii) Government should diversify the economy. Other sources of revenue should be explored especially the non oil minerals sector so as to correct the disparity between revenue and expenditure and reduce the attendant budget deficit.

(iii) Taxes have a role to play in the economy especially in deemphasizing the mono-economic (petroleum sector) nature of Nigeria. Expenditure reforms analysis should be considered vis-à-vis taxes and all other revenues sources (oil and non oil) reforms; this will help set targets for revenue mobilization and utilization as well as expenditure spreading over the entire economy.

REFERENCES

Al-Qudair, K.H.A., 2005. The relationship between government expenditure and revenues in the Kingdom of Saudi Arabia: Testing for co-integration and causality. JKAU: Econ. & Adm., 19(1): 31-43.

Ali, R. and M. Shah, 2012. The causal relationship between government expenditure and revenue in Pakistan. Interdisciplinary Journal of Contemporary Research in Business, 3(12): 323-329.

Craigwell, R.C., H. Leon and C. Mascoll, 1994. Government revenue and expenditure causality in the presence of seasonality in Barbados. Social and Economic Studies, 43(4): 197-218.

Elyasi1, Y. and M. Rahimi, 2012. The causality between government revenue and government expenditure in Iran. International Journal of Economic Sciences and Applied Research, 5(1): 129-145.

Emelogu, C.O. and M.O. Uche, 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.

Fasano, U. and Q. Wang, 2002. Testing the relationship between government spending and revenue: Evidence from GCC countries. IMF Working Paper WP/02/201.

Hye, Q.M.A. and M.A. Jalil, 2010. Revenue and expenditure nexus: A case study of Romania. Romanian Journal of Fiscal Policy, 1(1): 22-28.

Mithani, D.M. and G.S. Khoon, 1999. Causality between government expenditure and revenue in Malaysia: A seasonal cointegration test. ASEAN Economic Bulletin, 16(1): 68-79.

Moalusi, D., 2004. Causal link between government spending and revenue: A case study of Botswana, Fordham Economics Discussion Paper Series, Number dp 2007-07.

Ogujiuba, K. and T.W. Abraham, 2012. Testing the relationship between government revenue and expenditure: Evidence from Nigeria. International Journal of Economics and Finance, 4(11): 172-182.

Saeed, K.P. and S. Somaye, 2012. Relationship between government spending and revenue: Evidence from oil exporting countries. International Journal of Economics and Management Engineering (IJEME), 2(2): 33-35.

Tracy, M. and G. Kester, 2009. The causal relationship between government expenditure and tax revenue in Barbados. Presented at the Annual Review Seminar, Research Department Central Bank of Barbados, July: 27-30.

Zinaz, A. and K. Samina, 2010. Government expenditure and tax revenue, causality and co-integration. The Experience of Pakistan 1972-2007.