Total Revenue And Economic Growth In Nigeria: Empirical Evidence

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Abstract
The revenue profile of Nigeria consists of revenue from oil and gas, and non-oil revenue (taxation) with the oil sector accounting for over 70% of the total revenue. The main objective of this study therefore is to provide empirical evidence of the long and short run equilibrium relationships between total revenue and economic growth in Nigeria. The outcome of this study will not only assist government in making growth enhancement adjustments in fiscal policy but will be of benefit to the larger reading public. Time series data ranging from 1986 to 2012 of total revenue and real gross domestic product was collected from the Central Bank of Nigeria and the National Bureau of Statistics. The ordinary least square of univariate regression method and the Error Correction Method were used to analyze the data. The findings were that total revenue has long and short run equilibrating relationship with economic growth in Nigeria. The adjusted R² indicates that 63.6% of the total variation in real gross domestic product is as a result of variation in total revenue. We therefore recommend that government should intensify efforts in generating tax revenue, establish a strong fiscal responsibility and transparency system in the country, adopt tax reforms that would encourage increase in investment, particularly attracting foreign direct investment, fight corruption, invest generated revenue in critical infrastructure so as to provide the enabling environment to foster stability and economic growth in the economy.

Keywords: total revenue, economic growth, oil and non-oil revenue, petroleum profit tax, error correction method.

INTRODUCTION
Nigeria’s revenue profile consists of oil and gas, and non-oil sectors with the former contributing over 70% of the total revenue to the Federation. Available data from the Central Bank of Nigeria (CBN) indicate that the oil and gas sector contributed 77.5% from 1986 to 2012 on the average while the non-oil sector generated only 22.5% during the same period. This mono-product nature of the Nigerian economy is currently being worsened by volatility in the international price of oil and observable shortfalls in production resulting from occasional social and political unrest. No doubt, these circumstances put the nation’s earnings at risk and portend severe consequences to the economy.

To stimulate economic activities, the nation’s economy had undergone several restructuring programmes starting with the deregulation of the economy through the introduction of the Structural Adjustment Programme (SAP) in 1986 yet, there have been macroeconomic imbalances. As part of the reform agenda, government introduced an economic blueprint known as the National Economic Empowerment Development Strategy (NEEDS) which anchored the tax system as a critical part of the reform agenda that enunciated the National Tax Policy with a view to enhancing tax revenue on a year to year basis through stimulation of domestic and foreign investment and other economic measures. The reality is that, tax revenue generated has not matched the revenue from oil with all the concerted efforts by government. The fact remains that often, implementation has been a bane due to a combination of lack of commitment to set objectives, delay in implementation, leakages, and wastages, endemic corruption and the vast unorganized informal sector.
A comparative review of tax revenue as a percentage of Gross Domestic Product (GDP) index of some African countries by the World Bank Group (2014) for the period 2009 to 2012 showed that Nigeria has the lowest tax revenue as a percentage to GDP.

Nigeria’s tax revenue percentage of GDP is the lowest amongst its’ counterparts in all the selected African countries. The nation’s tax revenue % of GDP is far below the average of 18.3%, 17.6% and 17.6% for years 2009, 2010 and 2011 respectively.
One significant feature is that while the ratio of tax revenue % of GDP in most of the countries are progressively increasing annually, that of Nigeria declined from 5.1% in 2009 to 1.6% in 2012.

Table 1: Tax Revenue (% of GDP) of Selected African Countries

<table>
<thead>
<tr>
<th>Countries</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nigeria</td>
<td>5.1</td>
<td>2.3</td>
<td>1.8</td>
<td>1.6</td>
</tr>
<tr>
<td>South Africa</td>
<td>25.4</td>
<td>25.9</td>
<td>26.1</td>
<td>26.4</td>
</tr>
<tr>
<td>Ghana</td>
<td>12.6</td>
<td>13.4</td>
<td>14.9</td>
<td></td>
</tr>
<tr>
<td>Cote d’Ivoire</td>
<td>15.4</td>
<td>15.6</td>
<td>11.5</td>
<td>15.6</td>
</tr>
<tr>
<td>Benin</td>
<td>16.2</td>
<td>16.5</td>
<td>15.9</td>
<td>15.5</td>
</tr>
<tr>
<td>Sierra Leone</td>
<td>8.4</td>
<td>9.3</td>
<td>10.9</td>
<td>10.9</td>
</tr>
<tr>
<td>Ethiopia</td>
<td>6.7</td>
<td>8.3</td>
<td>9.4</td>
<td></td>
</tr>
<tr>
<td>Kenya</td>
<td>18.8</td>
<td>19.5</td>
<td>19.9</td>
<td>19.7</td>
</tr>
<tr>
<td>Burkina Faso</td>
<td>12.5</td>
<td>12.4</td>
<td>14.2</td>
<td>16.3</td>
</tr>
<tr>
<td>Angola</td>
<td>19.2</td>
<td>19.5</td>
<td>19.9</td>
<td>19.0</td>
</tr>
<tr>
<td>Namibia</td>
<td>29.7</td>
<td>22.1</td>
<td>14.9</td>
<td></td>
</tr>
<tr>
<td>Mauritius</td>
<td>18.7</td>
<td>18.5</td>
<td>18.4</td>
<td>19.0</td>
</tr>
<tr>
<td>Senegal</td>
<td>17.9</td>
<td>18.7</td>
<td>18.9</td>
<td>19.2</td>
</tr>
<tr>
<td>Algeria</td>
<td>35.1</td>
<td>34.4</td>
<td>37.4</td>
<td></td>
</tr>
<tr>
<td>Morocco</td>
<td>24.0</td>
<td>23.4</td>
<td>23.8</td>
<td>24.5</td>
</tr>
<tr>
<td>Botswana</td>
<td>27.7</td>
<td>22.0</td>
<td>23.8</td>
<td>27.2</td>
</tr>
</tbody>
</table>


The poverty head count ratio at $1.25 a day (PPP) (% of population) indicates that Sub-Saharan Africa constitutes a growing poverty

A report by World Bank Group (2014) indicates that the poverty headcount ratio at $1.25 a day (PPP) (% of population) for 2010 of Nigeria is 68%; a figure quite higher than 48.5% for Sub-Saharan Africa. The central problem/challenge of this study therefore, is based on the observable and consistent decline in tax revenue/GDP index with associated high poverty headcount ratio among other African countries and their possible adverse implications on the nation’s economic growth. These circumstances raise a real research question as to whether total revenue in Nigeria has long run and short run equilibrium relationship with economic growth. Therefore, the main objective of this study is to proffer empirical answer to the above question and hypothesize that Total Federally collected revenue does not have any significant effect on the economic growth of Nigeria. The significance of this investigation lies in the use of its outcome to enrich the knowledge of the general public and to provide guide for relevant government agencies in the area of fiscal policy formulation and adjustments.

**REVIEW OF RELATED LITERATURE**

**Conceptual Framework**

**Tax and Government Revenue**

Two main sources of federal government revenue exist in Nigeria - the oil revenue and the non-oil revenue. Oil revenue is revenue from crude oil and gas exports, receipts from petroleum profits tax and royalties and, revenue from domestic crude oil sales, while non-oil revenue comprises of revenue from companies income tax, value added tax, customs and excise duties, federal independent revenue, education tax, customs levies and others (CBN 2010).

In Nigeria’s National Tax Policy, tax is defined as a financial charge or levy imposed upon an individual or legal entity by a State or a legal entity of a State; it is a pecuniary burden laid upon individuals or property to support government expenditure. It is a monetary charge imposed by the Government on persons, entities, transactions or properties to yield revenue. It went further to state that tax is ‘the enforced proportional contributions from persons and property, levied by the State by virtue of its sovereignty for the support of Government and the public needs (National Tax Policy, 2013).

Musgrave & Musgrave (2004), Dwivedi (2008), Ijeh (2008), Bhatia (2008) and Jhingan (2011) all noted that taxes are compulsory levies imposed on individuals and corporate bodies for the purpose of generating revenue by the government

Ihendinihu, Jones & Ibanichuka (2014) posits that taxation is a veritable fiscal policy and offers to be a major source of revenue to government and a mechanism for regulating economic and social policies. For tax to be a main source of revenue and impact on economic growth to, the tax system ought to be designed on the basis of appropriate set of principles to be seen as fair, equitable, effective and efficient.

**Oil Revenue and Economic Growth**

Natural resource is one of the most important determinants of economic growth and as posited by Dwivedi (2008), natural resources includes resources on land surface and underground but the exploitation and use of the natural resources would depend on the quality of skilled and motivated labour force, availability of capital and technology. The contribution of the oil sector to the economic growth of Nigeria need not be over emphasized occasioned by the monolithic nature of her economy. OPEC (2014) noted that the oil and gas sector in Nigeria accounts for about 35% of the gross domestic product and petroleum exports revenue accounts for about 70% of total exports revenue.

**Theoretical Framework**

This study is predicated mainly on the optimal taxation theory which considers the productivity or buoyancy of the taxes collectable in which taxes are structured to give the best outcome in cost. Slemrod (1990) noted that the theory is “the study of designing and implementing a tax that reduces inefficiency and distortion in the market under given economic constraints. It takes into account preferences of individuals and technology in collection of tax. Taxation usually distorts the behavior of tax payers particularly where there are options between two
mutually exclusive economic projects that have the same probability of risk and returns but different tax rates. A rational investor will choose the project with lower tax or with tax exemption. Therefore, for taxation to be optimal, it should minimize these distortions.

Empirical Review

Ihendinihu et al. (2014) used Autoregressive Distributed Lag (ARDL) / Bounds Test General-to-Specific Approach to Co-integration to assess the long run equilibrium relationship between tax revenue and economic growth in Nigeria (1986-2012) and found that total tax revenue has significant effect on economic growth. With about 73.4% of the total variations in the real gross domestic product (economic growth) explained by aggregate changes in all the tax revenue components in the model, the study however, identified no significant causal link between Petroleum Profit Tax (PPT) and economic growth in Nigeria both on the long and short run equilibrium position. Their study correlated CBN (2008) report that the industrial output fell by 2.2 percent due mainly to the poor performance of the oil sector. Also, they argued that the mean value of the percentage point growth of petroleum profits tax has a value of -9.36% during the period covered by their study and that the bane of the poor performance could be attributable to the unstable growth rate in the petroleum sector, allusion of fiscal indiscipline, corruption and financial mismanagement in the oil sector.

Ogbonna and Appah (2012) investigating the impact of tax reforms and economic growth of Nigeria using time series data from 1994 to 2009 (a period of 11 years) utilizing Petroleum profit tax, Companies income tax, Value added tax, Education tax, Personal income tax and Customs and Excise duties as proxy for tax reforms (independent variables) and Gross domestic product (GDP) as the dependent variable, claimed that there is a positive relationship between tax revenue and economic growth of Nigeria. They argued that 54% variation in the dependent variable (GDP) is as a result of change in tax revenue and that there exists long run equilibrium relationship between GDP and the independent variables. They used the Augmented Dickey-Fuller test for the unit root test and the Johansen’s Cointegration test and Error correction technique to run the regression analysis. The Augmented Dickey-Fuller test conducted on the variables showed that all the series were stationary at 1(1) and that the series were significant between 1 and 5 percent except for companies’ income tax and customs and excise duties that were significant at 5 percent.

In a similar study by Okafor (2012) on tax revenue generation and economic development of Nigeria (1981-2007) using multiple correlation and regression methods, she argued that there exists significant relationship between the gross domestic product (GDP) used as the dependent variable and the independent variables (petroleum profit tax, companies income tax, customs and excise duties, and value added tax). She claimed that 99 percent of changes in the total GDP were influenced by changes in the independent variables (petroleum profit tax, companies’ income tax, customs and excise duties, and value added tax).

In another study by Worlu & Nkoro (2012) on tax revenue and economic development in Nigeria utilizing least square regression method of analysis, claimed that tax revenue stimulates economic growth through infrastructural development but that tax revenue has no independent effect on growth through infrastructural development and foreign direct investment.

Success, Success & Ifurueze (2012) studied the impact of petroleum profits tax on economic development (2000-2010) using the ordinary least square method of analysis and posited that petroleum profits tax has significant and positive impact on the gross domestic product (used as proxy for economic growth) of Nigeria. They claimed that the coefficient of determination indicates that petroleum profits tax contribute 72% to the gross domestic product using oil revenue and petroleum profits tax as regressors. They argued that petroleum profits tax and oil revenue are determinants of growth of the gross domestic product of the Nigerian economy which will subsequently lead to economic development via the multiplier effect. They showed no evidence of whether a unit root test was conducted for the time series data collected to ascertain the stationarity effect.

In a similar work, Abdul-Rahamoh, Taiwo & Adejare (2013) examined the effect of petroleum profits tax on Nigeria economy for the period 1970-2010 and posited that petroleum profits tax has a significant effect on the economic growth of Nigeria with an adjusted R² of 86.3%. They utilized multiple regression and correlation to analyze the time series data collected. The variables used were gross domestic product (GDP), petroleum profits tax, inflation and exchange rate. As in the study undertaken by Success et al (2012) above, they did not indicate evidence of unit root test.

Also, in another study, Ogbonna and Appah (2012a) used time series data from year 2000 to 2009 to investigate the causal link between petroleum income and Nigerian economic growth. They used simple regression model to analyze the data and found significant positive relationship between petroleum income and GDP at 5% level of significance. The study suggested that an increase in petroleum income
in the form of increasing petroleum profits tax/royalties would result in an increase in the value of goods and services produced in the economy and therefore improves economic growth. Though a review of their results showed no evidence of a unit root test, one would not be inclined to affirm a generalized statement as claimed by them with a study which considers a period of 10 years.

**METHODOLOGY**

This section shows the research methodology used to evaluate the long run and short run equilibrating relationships to achieve the set objective of the study. The data collected and used as variables were based on evidences provided by other empirical studies carried out by researchers. The data collected are annual figures stated in millions of naira of real gross domestic product (used as proxy for economic growth), Federal government total revenue comprising oil and non-oil revenue from the Central Bank of Nigeria and the National Bureau of Statistics. The data collected for this study is limited to the figures officially available with relevant government agencies for the period 1986 to 2012. Therefore, the study acknowledges that minor errors of measurement (quite unknown to the authors) might have been committed by the primary data collecting agencies.

The technique used in analyzing the data is the ordinary least square method of univariate regression. The software engaged in implementing the various estimation techniques is Eviews version 7.

**Model Specification and Operational Definition of the Variables**

\[ \text{RGDP} = f(\text{GTR}) \]  
\[ \text{RGDP} = \beta_0 + \beta_1 \text{GTR} + u, \]  
\[ \text{lnRGDP} = \beta_0 + \beta_1 \text{lnGTR} + u, \]

Where: RGDP=Real gross domestic product  
GTR=Government total revenue  
Where; \( \beta_0 = \) Intercept term (parameter). This gives the mean or average effect (value) on RGDP of all the variables excluded from the model. In other words, it is the average value of RGDP when GTR is a set equal to zero. \( \beta_1 = \) the parameter known as partial regression coefficients or partial slope coefficients (Gujarat and Porter 2009; Gujarati 2006; Osuala 2010 and Osuala and Jones, 2014). \( \beta_1 \) measures the change in the mean value of RGDP per unit change in GTR. 
\( u = \) Represents the random or stochastic disturbance term or error term or unexplained variables. 
\( \ln = \) Natural logarithm (i.e., log to base e, and where \( e = 2.718 \))

This model is linear in the parameters and linear in logarithms of the dependent and independent variables and can be estimated by OLS regression. One attractive feature of the log linear model, which has made it popular in applied work is that, the slope coefficient measures the elasticity of the dependent variable (Y) with respect to the independent variable (X), that is, the percentage change in Y for a given (small) percentage change in X (Gujarati and Porter, 2009). Thus in this model, \( \beta_1 \) measures the elasticity of RGDP with respect to GTR. In other words, the percentage changes in RGDP for a given percentage change in GTR. The sum of the parameters gives information about the returns to scale, that is, the response of the RGDP to a proportionate change in the independent variable. Gujarati and Porter (2009) stated that if the sum is 1, then there is constant return to scale; that is doubling the independent variables will double the dependent variable, while tripling the independent variables will triple the dependent variable and so on. But if the sum is less than 1, there are decreasing returns to scale-doubling the regressors will less than double the dependent variable. If the sum is greater than 1, there are increasing returns to scale- doubling the regressors will more than double the dependent variable.

It represents the residual term of all the other variables not included in the model. The error term follows normal distribution with mean zero and constant variance \( \sigma^2 \). Sweeney et al (2006) stated that it accounts for the variability in the dependent variable that cannot be explained by the linear effect of the independent variable in the model.

Where \( t \) denotes the value of the variable at time \( t \).

**Unit Root Test**

The unit root or stationarity test was carried out using the Augmented Dickey-Fuller test. (Pesaran and Shin, 1999)

The following generic equation is used to check the stationarity of the time series data used in the study.

\[ \Delta Y_t = \beta_0 + \beta_1 t + \delta Y_{t-1} + \sigma \sum_{m=1}^{\infty} \Delta Y_{t-m} + \varepsilon_t \]  

where \( \varepsilon_t \) is white noise error term and  
\( \Delta Y_{t-1} = Y_{t-1} - Y_{t-2} \); and \( \Delta Y_{t-2} = Y_{t-2} - Y_{t-3} \); and where \( \delta \) is the coefficient of the lagged length, \( Y_{t-1} \).

In general, \( \delta \), the coefficient of the lagged length \( Y_{t-1} \) is expected to be negative, and the estimated t statistic will have a negative sign. Therefore, a large negative t value is generally an indication of stationarity.

The null hypothesis is \( H_0: \delta = 0 \) (i.e., there is a unit root or the time series is non-stationary or it has a stochastic trend).

The alternative hypothesis is \( H_1: \delta \neq 0 \) (i.e., the time series is stationary, possibly around a deterministic trend).
The next step was to conduct an unrestricted error correction model (ECM) of Pesaran and Shin equation (3.5.1) as given generically in its log-linearized form as:

\[ \Delta \ln Y_t = \alpha_0 + \sum_{i=1}^{n} \alpha_i \Delta Y_{t-1} + \alpha_{11} \Delta X_{t-1} + \alpha_{12} \Delta Y_{t-1} + \beta_1 \ln Y_{t-1} + \beta_2 \ln X_{t-1} + \epsilon_t \]  

Where \( \Delta \) denotes the first difference operator.

The reverse causation is measured using:

\[ \Delta \ln X_t = \alpha_0 x + \sum_{i=1}^{n} \alpha_i \Delta X_{t-i} + \alpha_{11} \Delta Y_{t-1} + \beta_1 \ln X_{t-1} + \beta_2 \ln Y_{t-1} + \epsilon_t \]  

The error correction mechanism (ECM) as developed by Engle and Granger is a means of reconciling the short-run behavior of an economic variable with its long-run behavior (Gujarati and Porter, 2009).

According to Hylleberg and Mizon (1989), the error correction formulation provides an excellent framework within which it is possible to apply both data information and the information available from economic theory.

**RESULTS AND DISCUSSION**

**H_0:** Total Federally collected revenue does not have any significant effect on the economic growth of Nigeria.

**H_1:** \( \beta_1 = 0 \)

The first step is to test the unit root of the variables in their log form and below is the result.

The result of the ECM is shown in Table 4.

### Table 2: UNIT ROOT TEST RESULT

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>t-Statistic (Ordinary Level)</th>
<th>Prob</th>
<th>t-Statistic (First Difference)</th>
<th>Prob</th>
</tr>
</thead>
<tbody>
<tr>
<td>LogR</td>
<td>-1.447734</td>
<td>0.5428</td>
<td>-4.707264</td>
<td>0.0011</td>
</tr>
<tr>
<td>LogG</td>
<td>-1.840233</td>
<td>0.3535</td>
<td>-4.383118</td>
<td>0.0024</td>
</tr>
</tbody>
</table>

**Source:** Author’s Computation using Eviews version 7

The result shows that the variables are stationary at first difference, and hence we also conducted unit root test of the residual to confirm the existence of a long-run equilibrium relationship. The unit root test result on the residual (RES) is in Table 3.

### Table 3: Unit Root Test Result on the Residual

<table>
<thead>
<tr>
<th>t-statistic</th>
<th>Prob</th>
</tr>
</thead>
<tbody>
<tr>
<td>-3.021274</td>
<td>0.0465</td>
</tr>
</tbody>
</table>

**Source:** Author’s Computation using Eviews version 7

From the result of the residual unit root test, it is stationary at 5% level of significance and we therefore conclude that there is long-run equilibrium relationship between RGDP and GTR. In other words, on the long-run, government total revenue has significant effect on the economic growth of Nigeria. With a negative coefficient t statistic and p value of 4.65% of the residual, it implies that there is short run equilibrium relationship between real GDP and government total revenue and hence we ran an Error Correction Mechanism to confirm the existence of a short run equilibrium relationship between the variables.

### Table 4: Result of the ECM

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>D(LOGGTR)</td>
<td>0.088746</td>
<td>0.016117</td>
<td>5.506285</td>
<td>0.0000</td>
</tr>
<tr>
<td>RES(-1)</td>
<td>-0.563783</td>
<td>0.194018</td>
<td>-2.905821</td>
<td>0.0082</td>
</tr>
<tr>
<td>C</td>
<td>-0.000379</td>
<td>0.003016</td>
<td>-0.125646</td>
<td>0.9012</td>
</tr>
</tbody>
</table>

**R-squared** 0.666361  **Mean dependent var** 0.010136  **Adjusted R-squared** 0.636030  **S.D. dependent var** 0.019441  **S.E. of regression** 0.021729  **Akaike info criterion** -5.941393  **Sum squared resid** 0.003026  **Schwarz criterion** -5.795128  **Log likelihood** 77.26741  **Hannan-Quinn criter.** -5.900825  **F-statistic** 21.96979  **Durbin-Watson stat** 1.793718  **Prob(F-statistic)** 0.000006

**Source:** Author’s Computation using Eviews version 7
From the result above, adjusted $R^2$ that is, the coefficient of multiple determination indicated that 63.6% of the total variation in the real GDP is explained by the federally collected total revenue. In order words, 63.6% of the total variation in the real gross domestic product (economic growth) the dependent variable, is as a result of variation in federally collected total revenue.

Again, the p value 0.0006% of the F statistic is sufficiently low, the p value of the t statistic corresponding to LogGTR is zero while that of the values of the coefficient and t statistic of the Residual is negatively signed and its p value less than 1% level of significance. We therefore reject the null hypothesis and conclude that total federally collected revenue has significant effect on the economic growth of Nigeria. The above result implies that total revenue in Nigeria has both long run and short run equilibrium relationships with economic growth.

5.0 CONCLUSION AND RECOMMENDATIONS

The ordinary least square method of univariate regression was utilized, adopting Log Linear Model in analyzing the relationship between total revenue and economic growth in Nigeria. The Error Correction Model was used to establish the existence of long-run and short-run relationship between the economic variables. The findings were that about 63.6% of the total variation in real gross domestic product was as a result of variation in total revenue which confirms the existence of long run equilibrium relationship between total revenue and economic growth in Nigeria. Specifically, the error correction model indicates the existence of short run equilibrium relationship between total revenue and economic growth in Nigeria. The study therefore contributes to existing body of knowledge by determining the short and long run dynamics of the components of tax revenue and economic growth in Nigeria. We however recommend that government should intensify efforts in generating tax revenue, establish a strong fiscal responsibility and transparency system in the country, adopt tax reforms that would encourage increase in investment, particularly attracting foreign direct investment, fight corruption, invest revenue in critical infrastructure so as to provide the enabling environment to foster stability and economic growth in the economy.

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