Tax Revenue and Economic Growth in Nigeria: A Bi-Directional Approach

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Abstract:
The study examined the bi-directional effect of tax revenue and economic growth in Nigeria from 2011 to 2022 by employing total tax revenue and nominal Gross Domestic Product at current price. Data was extracted from 2011 to 2022 quarterly reports published on the website of the Central Bank of Nigeria, National Bureau of Statistics and Federal Inland Revenue Service. Unit Root test using Augmented Dickey-Fuller (ADF) test shows that at first difference, the variables are stationary at 1%, 5%, and 10% level of significance while Engle and Granger co-integration test reveals significant evidence of a long-run relationship between the variables of the study’s models. Findings from Error Correction Model (ECM) estimation show that Total Tax Revenue has a positive and significant effect on Nominal Gross Domestic Product (t-stat 4.777; P-value 0.000) and Nominal Gross Domestic Product has a positive and significant effect on Total Tax Revenue (t-stat 5.552; P-value 0.000). The Granger Causality test revealed that there exists a positive and significant bi-directional effect between Total Tax Revenue and Nominal Gross Domestic Product in Nigeria. The study concludes that tax revenue has a positive and significant effect on economic growth and economic growth has a positive and significant effect on tax revenue. The study recommends that the government ensure continuous economic growth by providing human capital, security, employment, and foreign investment. This would increase the standard of living of citizens, increase tax payer’s income, and attract foreign investors who would pay tax on their income and properties.

Keywords: Economic Growth, Gross Domestic Product, Tax Revenue

1. Introduction
The responsibility of the government of any nation is to ensure the achievement of economic growth. This achievement of economic growth provides the basis for measuring the economic prosperity of a nation (Agunbiade & Idebi, 2020). For a country to achieve economic growth, the government must ensure the adequate provision of quality goods and services necessary for improving the standard of living of the citizenry. Consequently, the provision of these essential amenities and infrastructure will enable businesses and individuals to perform at full capacity, therefore contributing their quota through tax returns towards sustainable economic growth. Government generates revenue from various sources such as tax, oil, sale of government properties, investments and loans. However, Etim et al., (2020) posited that the most reliable and efficient source of government revenue is through the imposition of tax which is used in both developed and
developing countries. It represents the significant percentage of government revenue used in fulfilling its economic responsibilities.

Tax is a compulsory levy imposed by government on the taxable income and properties of taxable individuals and businesses and the revenue generated from the imposition represents an important aspect of a nation’s growth and investment (Abomaye-Nimenibo et al., 2018). According to Asaolu et al., (2018), tax revenue can improve the standard of living of every citizen in a particular jurisdiction by enabling the government to have adequate fund necessary for achieve economic growth through the investment in human capital and infrastructures, provision social goods and redistribution of wealth.

According to Etim et al., (2021) tax revenue is as an important instrument recognized globally for economic growth due to its contribution towards the Gross Domestic Product of a country. Global revenue statistics provided by Organization for Economic Co-operation and Development [OECD] (2022) revealed that on average, global tax revenues as a percentage of Gross Domestic Product [GDP] were 34.1% in 2021, which was an increase of 0.6%, compared to 2020. Particularly in Nigeria, National Bureau of Statistics [NBS], (2023) reported that the percentage of tax revenue to GDP were 10.86% in 2021 indicating a 29.29% increase from 2020. The critical contribution of tax revenue to GDP has made the Nigerian government to focus on tax as an alternative source of revenue generation, thereby attracting debates on its effect on economic growth.

Over the years, prior studies in Nigeria (Osamor et al, 2023; Ihenyen & Ogbise, 2022; Uket et al. 2020; Obaretin & Ohonba, 2018; Okwara & Amori, 2017) have studied tax revenue and economic growth in Nigeria. These studies have only examined the unilateral causality of tax revenue and economic growth with no empirical evidence of the bi-directional effect of tax revenue and economic growth in Nigeria. This study therefore seeks to examine the bi-directional effects of tax revenue and economic growth in Nigeria.

1.2 Hypothesis Development

H₀₁: Tax Revenue has no significant effect of Economic Growth in Nigeria

H₀₂: Economic Growth has no significant effect of Tax Revenue in Nigeria

2.0 Literature Review

2.1 Conceptual Review

2.1.1 Economic Growth

The relevance of economic growth in any country cannot be over-emphasized. Historically, the issue of economic growth has been a major concern for government and policy makers in economic discourse (Agunbiade & Idebi, 2020). Okwara & Amori, (2017) posited that the primary objective of a nation is to increase the rate of its economic growth which otherwise increases standard of living of citizens of such country. An increase in a country’s economic growth serves as an indication of the expansion of its economy. Osamor et al., (2023) described the economic growth of a country as the increase in its value of goods and services over a given period measured via its gross domestic product. It involves the provision of social goods, economic regulatory policies, income distribution, and stabilization of the economy through fiscal and monetary policies (Dang & Bala, 2018).

According to Etim et al., (2021), increased government expenditure such as government investment in human resources, technological development, national resources and capital formation facilitates increased economic growth. However, for government to be able to finance these expenses there must be adequate revenue generation mechanisms. The various government investments increases the capacity of the economy to produce goods and services that ensures the maximum satisfaction of the needs of citizens, thereby improving the gross domestic product of such country Error! Reference source not found..

2.1.2 Tax Revenue

Tax is a legally required payment or charge imposed on business entities and individuals by the government of a jurisdiction in accordance with specified standards for which the taxpayer receives or expects to get a specific benefit (Salawu, 2023). According to Osho et al., (2018) the resources of corporate bodies and individuals is chargeable to tax directly or indirectly in order to supply government with the quantum of money needed to provide social and economic benefit to the public such as building of large dams, construction of good road network, schools, hospitals and other basic social infrastructures.

The proceeds from the collection of tax is pivotal to the sustainability of a nation’s economy and as such various mechanism are often put in place by the government to ensure the stringent collection of tax when the
obligation to pay arises Error! Reference source not found.. In Nigeria, certain regulatory policies that guides tax payer on the payment of their taxes. According to Osamor et al., (2023), the Nigeria government through authorized tax agencies has established appropriate guidelines for the payment and collection of tax, basis of taxation, period of payment, bodies authorized to collect certain taxes and penalty for defaulters. According to Ibanichuka et al., (2016), the federal government of Nigeria through the Federal Inland Revenue Service generate revenue from taxes such companies income tax, petroleum profit tax, value added tax and custom and excise duties.

2.2 Theoretical Framework
Benefit Received Theory
This theory was propounded by Lindahl in 1919 and assumes that a two-way relationship exists between taxpayers and the government. According to Ibanichuka et al., (2016), the benefit-received theory is otherwise known as the voluntary exchange theory. It is based on the assumption of the provision of goods and services by the government to the public who in turn generate revenue to the government in the form of tax according to the proportion of goods and services benefited.

Anyanfo, (1996) supported the benefit received theory by noting that the basis of levying tax on taxpayers should be according to the benefits enjoyed from the government. However, Ojong et al. (2016) criticized it for its inability to quantify the direct "quid pro quo" relationship between taxes and the benefits of government spending. Aliyu & Mustapha, (2020) also noted the theory overlooked the use of tax fiscal policies in ensuring economic growth and stabilization.

Prior studies such as Osamor et al., (2023); Ideh, (2019); Okwara & Amori, (2017) have employed benefit received theory in explaining the relationship between tax revenue and economic growth of a country. There is a transactional relationship between tax revenue and economic growth because the revenue generated from the imposition of tax is used in providing facilities and social development that leads to economic growth. When there is efficient and sufficient growth in the economy, the income level of businesses and individuals would also increase leading to the payment of more tax and more revenue to the government.

2.3 Empirical Review
Osamor et al., (2023) empirically examined the effects of tax revenue (PPT, CIT, VAT, CTD) on economic growth (GDP) in Nigeria. Time series quarterly data were collected from the statistical bulletins of CBN and FIRS between the periods of 2011t0 2020and analyzed using descriptive analysis, unit root test, bounds co-integration test and ARDL. The findings revealed that PPT, CIT, VAT and CTD had positive insignificant effects on economic growth and as such tax revenue had insignificant effects on the economic growth of Nigeria.

Agunbiade & Idebi, (2020) examined the relationship between tax revenue and economic growth in Nigeria between the periods of 1981 to 2019. Vector Error Correction Model (VECM) was employed to establish the nature and strength of the relationship between the variables. While Johansen test of co-integration revealed that there is at least one co-integrating equation in the long-run between the variables, Granger causality test found a causal relationship among Real GDP and the different tax components.

Muttaqin & Halim, (2019) investigated the effects of economic growth and inflation on tax revenue between the periods of 2010 to 2016. The data were analysis using panel data regression analysis. Results from the analysis revealed known that the GDP/Economic Growth and Inflation variables significantly influence the income of Income-tax and VAT.

Abomaye-Nimenibo et al., (2018) empirically examined the effect of tax revenue (CIT, PPT and CED) on economic growth (GDP) in Nigeria from 1980 to 2015. Using multiple regression analysis to analyze the data, the co-integration results revealed that there was a long run relationship among the variables while the short run regression result also showed that petroleum profit tax and company income tax has no significant relationship with economic growth in Nigeria. Custom and excise duties were found to have a significant relationship with economic growth in Nigeria.

Onakoya et al., (2017) investigated the impact of taxation on economic growth in Africa from 2004 to 2013. Findings from the study’s analysis revealed a positive relationship between tax revenue and GDP and economic growth in Africa at 5% level of significance.

Zeng, Li, & Li, (2013) studied the mechanisms of how economic growth and tax reform affect total tax revenue and structure over the period of 1950 to 2011. Descriptive statistics, multi-segment linear regression
model and principal component analysis were employed in analyzing the effect of economic growth and tax reform on total tax revenue and structure. Findings from the analysis show that economic growth has a long-term stability relationship and a significant effect on tax revenue and structure. The results also revealed that in the long term, there is no extraordinary growth of tax revenue.

3.1 Research Methods
The study adopted ex-post facto research design since the data already exist for the analysis. In order to investigate the bi-directional effects of tax revenue and economic growth, quarterly reports covering the periods of 2011 to 2022 was obtained from the websites of National Bureau of Statistics, Central bank of Nigeria and reports of the Federal Inland Revenue Services. The variables are economic growth measured by Nominal Gross Domestic Product current price and tax revenue measured by the total tax revenue reported by the Federal Inland Revenue Service (FIRS) within the study period. Preliminary analysis were descriptive statistics, unit root test and co-integration test. The post estimating techniques includes Error Correction Model (ECM) estimation and Pairwise Granger Causality Test, which examined the long run relationship and causality of the variables.

3.2 Model Specification
The econometric model for the study is specified as:

\[ NGDP = \beta_0 + \beta_1 TTR_t + \epsilon_t \] \hspace{1cm} \text{Model 1}

\[ TTR = \beta_0 + \beta_1 NGDP_t + \epsilon_t \] \hspace{1cm} \text{Model 2}

Where:
NGDP = Gross Domestic Product
TTR = Total Tax Revenue
\( \beta \) = Coefficient term
\( t \) = Time period
\( \epsilon \) = Error term

4.1 Results And Discussions
Table 1: Descriptive Statistics

<table>
<thead>
<tr>
<th></th>
<th>TTR</th>
<th>NGDP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>1298969.7</td>
<td>29381752.21</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>482441.60</td>
<td>10669282.82</td>
</tr>
<tr>
<td>Skewness</td>
<td>2.037537</td>
<td>0.660071</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>7.882270</td>
<td>2.585624</td>
</tr>
<tr>
<td>Minimum</td>
<td>563869</td>
<td>14501450</td>
</tr>
<tr>
<td>Maximum</td>
<td>3186220</td>
<td>56757889.95</td>
</tr>
<tr>
<td>Observations</td>
<td>48</td>
<td>48</td>
</tr>
</tbody>
</table>

Note: TTR and NGDP as earlier defined
Source: Computed using Eviews12

Table 1 describes the characteristics of data obtained on total tax revenue and nominal gross domestic product. The result shows that over 48 quarters from 2011 to 2022, the average total tax revenue (TTR) collected by the Federal Inland Revenue Service in Nigeria was ₦1,298,969.75 million while the standard deviation from the mean was ₦482,441.60 million. The minimum total tax revenue collected from first quarter of 2011 to the fourth quarter of 2022 was ₦59,381,752.21 million and the maximum amount collected during this period was ₦318,622,000.00 million. In addition, NGDP from first quarter of 2011 to the fourth quarter of 2022 had an average value of ₦29,381,752.21 million and ₦10,669,282.82 deviated from the mean value. The minimum and maximum NGDP for the study period was ₦14,501,450 and ₦56,757,889.95 respectively. The table also revealed that TTR and NGDP are positively skewed. The kurtosis statistics indicate that while TTR is...
leptokurtic, NGDP is platykurtic. This implies that TTR is heavy tailed with lots of outliers while NGDP is light tail with few outliers.

**Table 2: Correlation Analysis**

<table>
<thead>
<tr>
<th></th>
<th>TTR</th>
<th>NGDP</th>
</tr>
</thead>
<tbody>
<tr>
<td>TTR</td>
<td>1</td>
<td>0.68422</td>
</tr>
<tr>
<td>NGDP</td>
<td>0.68422</td>
<td>1</td>
</tr>
</tbody>
</table>

*Source: Computed using Eviews 12*

The correlation result presented in Table 2 indicates a positive correlation of 68% between total tax revenue generated by the Federal Government of Nigeria and the real time Gross Domestic Product growth rate in Nigeria between the first quarters of 2011 to the fourth quarter of 2022.

**Table 3: Unit Root Test**

<table>
<thead>
<tr>
<th>Variables</th>
<th>ADF test</th>
<th>Critical Values: Constant</th>
<th>1(d)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TTR</td>
<td>-8.45846</td>
<td>-2.612</td>
<td>-1.947</td>
</tr>
<tr>
<td>NGDP</td>
<td>-10.3219</td>
<td>-3.584743</td>
<td>-2.928142</td>
</tr>
</tbody>
</table>

*Source: Computed using Eviews 12*

Unit root test is a test for the stationarity of data that shows whether a time series data is non-stationary. The null hypothesis of this test is that the variables have a unit root. The result of the unit root test using Augmented Dickey Fuller (ADF) test as presented in Table 3 shows that at various levels of significance (1%, 5% and 10%), the variables were stationary. The result also indicated that all variables were stationary at first difference because they were non-stationary at level 1(0). This implies that the null hypothesis is rejected.

**Table 4: Engle and Granger co-integration test**

<table>
<thead>
<tr>
<th>Variables</th>
<th>ADF test</th>
<th>Critical Values</th>
<th>Prob</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residual (NGDP/TTR)</td>
<td>-5.20065</td>
<td>-4.17058</td>
<td>-3.51074</td>
</tr>
<tr>
<td>Residual (TTR/NGDP)</td>
<td>-3.35001</td>
<td>-2.61736</td>
<td>-1.94831</td>
</tr>
</tbody>
</table>

*Note: *NGDP/TTR indicates model 1 as specified in the model specification while TTR/NGDP represents model 2*

*Source: Computed using Eviews 12*

Engle and Granger co-integration test examines the long-run relationship of the dependent and independent variables when they are assumed stationary at similar levels. Table 4 presents the result of the Engle and Granger unit root test using Augmented Dickey Fuller (ADF) test on the residuals obtained from the regression estimates in order to obtain the co-integration among the variables. The results indicated that the residual series of both models are stationary at level at 1%, 5% and 10% significance level respectively. This implies that there is a significant evidence of long-run relationship between the variables of both models.

**Table 5: ECM Estimations**

<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>$H_{31}: \Delta NGDP = \beta \Delta TTR_t + \gamma TTR_{t-1} + \epsilon_t$</td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

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Error Correction Model (ECM) shows the deviation of variables from their longrun relationship and estimates the speed of convergence to equilibrium after a shock. The ECM result presented in Table 5 provides evidence of a long run relationship between the variables of both models. The results show that model 1 and model 2 are a good fit as reported by their respective values of $R^2$ and Adjusted $R^2$. The Error Correction Term (ECT) of model 1 at $-0.2271$ and probability of $0.0077$ implies that the long run adjustment is possible at a statistical significance of 5%. The ECT coefficients of model 1 shows a 22.71% speed of adjustment to equilibrium. In addition, the Error Correction Term (ECT) of model 2 at $-0.49330$ and probability of 0.0003 shows that there is a 49.33% speed of convergence in the long run equilibrium after a shock. Therefore, a long run adjustment is possible at a statistical significance of 5%.

Hypotheses Testing

H$_{01}$: Tax Revenue has no significant effect of Economic Growth in Nigeria

Findings from the ECM estimation reveals that total tax revenue positively and significantly predicts nominal gross domestic product at $F$-Stat = 14.86, $t$-Stat = 4.78, $P$-Value = 0.00. Since the $P$-value at 0.00 is less than the significant value of 0.05, the Null hypothesis is rejected.

H$_{02}$: Economic Growth has no significant effect of Tax Revenue in Nigeria

Findings from the ECM estimation presented in Table 5 shows that nominal gross domestic product positively and significantly predicts total tax revenue product at $F$-Stat = 20.29, $t$-Stat = 5.55, $P$-Value = 0.00. Since the $P$-value at 0.00 is less than the significant value of 0.05, the Null hypothesis is rejected and alternative hypothesis accepted.

**Table 6 : Pairwise Granger Causality Test**

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>TTR does not Granger Cause NGDP</td>
<td>46</td>
<td>5.14355</td>
<td>0.0102</td>
</tr>
<tr>
<td>NGDP does not Granger Cause TTR</td>
<td>3.73088</td>
<td>0.0325</td>
<td></td>
</tr>
</tbody>
</table>

Source: Computed using Eviews 12

Pairwise Granger Causality Test is a test that measures the predictive power of an independent variable on the dependent variable. Table 7 shows the Granger Causality of total tax revenue and gross domestic product performed on lag 2. The result shows that Total Tax Revenue statistically and significantly predicts Nominal Gross Domestic Product at $P = 0.01$. The result also shows that Nominal Gross Domestic Product statistically and significantly predicts Total Tax Revenue statistically at $P = 0.03$. This implies that there is a bi-directional
causality between NGDP and TTR. That is tax revenue significantly predict an economic growth and economic growth significantly predict tax revenue at 5% statistical significance.

Conclusion
The study examined the bi-directional effects of tax revenue and economic growth in Nigeria between the first quarters of 2011 to the fourth quarters of 2022. The unit-root test result showed that the variables NGDP and TTR were stationary at 5% significant level. Results from Granger Causality test revealed that there exists a positive and significant bi-directional effect between tax revenue and gross domestic product (GDP) in Nigeria. The finding of this study is line with the granger causality result of Error! Reference source not found. but contrary to the findings of Egbonike et al., (2018) that reported a unidirectional effect between tax revenue and economic growth. The study concludes that tax revenue has an effect of economic growth in Nigeria and that economic growth significantly and positively affects tax revenue.

Recommendations
The study recommends that government should ensure continuous economic growth through the provision of human capital, better security, employment and foreign investment. This would increase the standard of living of citizens, increase tax payer’s income and attract foreign investors who would pay tax on their income and properties.

References


