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Impact of Government Revenue on Economic Growth in Nigeria

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Abstract
The study- "Impact of Disaggregated Government Revenue on Economic Growth in Nigeria (1980-2022)" aims to investigate the impact of government revenue, both oil and non-oil, on economic growth in Nigeria. The study focuses on analyzing the short-run and long-run effects of government revenue on economic growth and determining the magnitude of this effect on economic growth in Nigeria. The research methodology is the ARDL methodology which involves data analysis, correlation studies, stationarity tests, hypothesis testing, cointegration analysis for long-run relationships, estimation of coefficients for short and long runs, stability and diagnostic tests, and interpretation of results. The source of data is the World Bank Development Indicators data base and the Central Bank of Nigeria Statistical Bulletin. The study shows that oil and non-oil revenue have positive impact on economic growth in Nigeria in the long run. It was recommended that the government needs to fashion out sustainable strategies that could boost revenue collection with positive implication for the economy. Appropriate policy mix such as monetary and fiscal policies should be adopted to enhance revenue generation and capital expenditure that would further facilitate economic activities and income generation. The diversification policy of the Nigerian economy should be vigorously and religiously pursued with a view to developing the non-oil sector alongside the oil sector. This will boost all the sectors of the Nigerian economy. Given the significant positive relationship between the oil revenue and non-oil revenue and GDP, the study equally recommends that the government should embark on human capital development programs and acquisition of modern and improved technology that would enhance the productivity of the agencies and personnel in charge of revenue collection.
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1.0 Introduction

Revenue generation is the main source of concern for every government for economic and social development. The policy-makers try hard to increase government revenue by focusing on different variables and policy reforms. Unfortunately, the revenue generation has been very low in many Nigeria, resulting in a serious budget deficit and growing public debt problem. There are different sources through which revenue can be generated. Developing countries mainly generate revenue from taxes. Such as income, property, trade, sales, and value added taxes. There are some non-tax sources of revenue generation such as fee, fine and social contributions. Government revenue is defined as the revenue received by government to finance its operations and development projects. It is an important tool of fiscal policy of the government as it facilitates spending of the government (OECD, 2008). Government revenue is the receipts collected from taxes, appropriation of aid, borrowings, grants and revenue from public investments. Revenue is an increase in net worth resulting from a transaction. Governments need to perform various functions in the field of economic, political and social activities to maximize welfare of citizens. In order to perform these activities governments, require large amount of resources. These resources are called public revenues. Public revenues are components of taxes, revenues from administrative activities such as fines, fees, grants and gifts.

Illyas and Siddiqi (2010) stated that public revenue can be classified into two types that is tax and non-tax revenue. Taxes are the most important sources of public revenue. Taxes are compulsory payments to government without any direct benefit or return by the tax payer. Taxes collected by Government are used to provide common benefits to all, mostly in form of public welfare services. It is not based on direct quid pro quo principle. The Government collects tax revenues by way of direct and indirect taxes. Direct taxes include; Corporate tax, personal income tax, capital gain tax and wealth tax. Indirect taxes include custom duty, excise duty, Value Added Tax (VAT) and service tax (Chaudhry and Munir, 2010). Non tax revenue is another source of Government revenues which refers to the revenue obtained by the Government from sources other than tax. Aguola (2004) noted that though taxation may not be the most important source of Government revenues in terms of the magnitude of revenue derivable from taxation, however taxation is the most important source of revenues to the Government, from the point of view of certainty, and consistency of taxation. He further mentioned that tax is the most important source of revenue to the

Government. Owing to inherent power of Government to impose taxes, the Government is assured at all times of its revenues no matter the circumstances. Tax is one of the important sources of Government revenues. Stability and continuity of the flow of tax collection play an important role in the Government planning for providing variety of the required public services in different areas. However, despite the various tax reforms, the government has always had a deficit budget which suggests that the revenue generated via tax is not sufficient in financing government expenditure.

Oil is another source of government revenue. It provided approximately 90 percent of foreign exchange earnings and about 80 percent of federal revenue and contributes to the growth rate of Gross domestic product (GDP) of the Nigerian economy. The decline in the price of oil has affected the revenue generation of the government. Specifically, the prices of crude oil fell from about $114 per barrel in 2014 to about $50 per barrel in recent time. The current price of crude oil (Brent Crude) is $76.30. The fall in the crude oil price has resulted in fall in government revenues, which has thwarted the efforts of governments both at local, state and national levels to finance their developmental projects and to fulfil other mandated responsibilities. This is because the country as a whole depends almost entirely on the oil revenues to finance its developmental projects. This has degenerated into many socio-economic crises such as non-payment of workers' salaries, weak demand for industrial products, closing of factories and retrenchment of workers, a high rate of serious crimes and overall decline in the aggregate economy.

Therefore, the main objective of this research is to analyse the effect of government revenue (both oil and non-oil) on Economic growth in Nigeria. The remainder of the study is organized as follows: two presents background literature. In three, the data, variables, and empirical models are described. four presents empirical results. five offers discussions of the results obtained, shedding light on their policy significance, conclusions and recommendations.

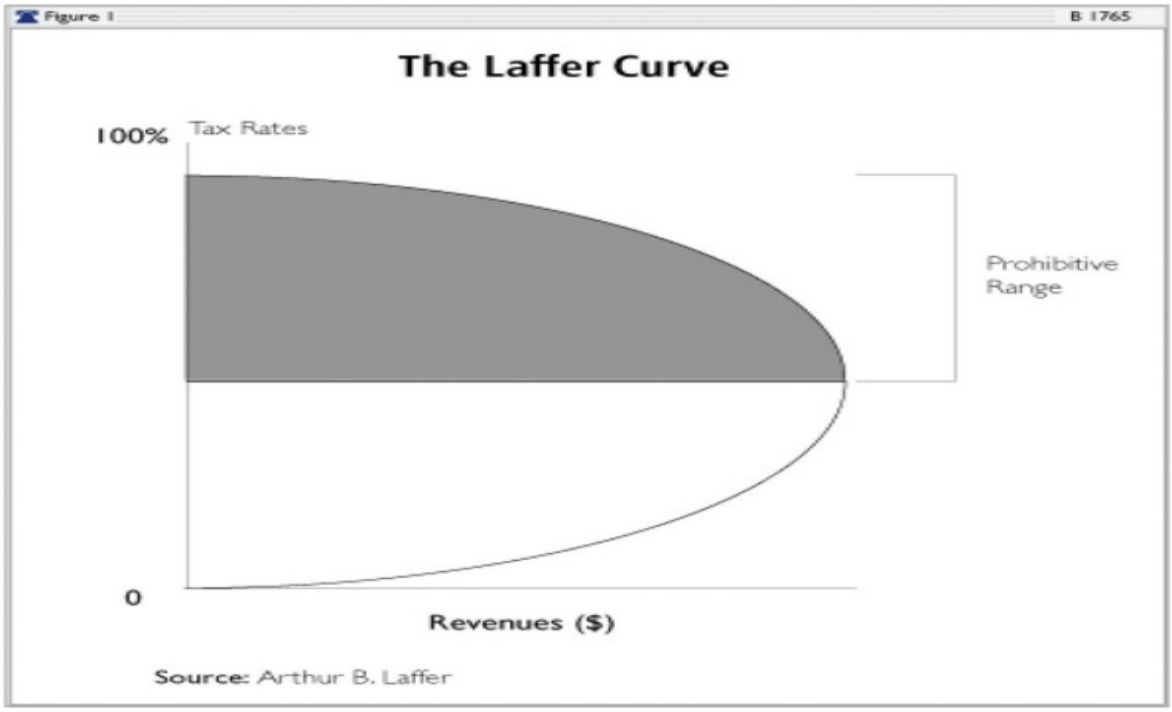
2.0 Literature Review

2.1 Theoretical Review

The issue of public financing for economic growth and sustainable development, especially in the world of uncertainty, has become a burning issue for both academics and policymakers. Little wonder policymakers, business tycoons and academics gather at one time or the other to discuss the best way to finance public projects to achieve socio-economic goals in the best possible way. Turing to the literature, there have been a plethora of theories, hypothesis and theoretical models that link government revenues and government expenditure with economic growth through different channels, either at micro or macro levels. This extensive literature dates back to Ricardo's pioneer work on the financing system. According to Ricardo (1820), the best way to finance government expenditure is through tax financing. According to Wagner (1893), real per capita income of an economy increases as the share of public expenditures in total revenues increases. Ramsey (1927) pioneered the theory of optimal taxation and this theory was expanded by Mirrlees (1971). Specifically, the theory of optimal taxation states that the purpose of collecting taxes is to improve social welfare. Thus, social planners should design tax system in such a way to maximise the overall social welfare, taking into consideration the individual economic agent's preference. Such a tax system as posited by the theory, is required to cut down inefficiency and any forms of distortions in the market under a given economic consideration (Slemrod, 1990). Furthermore, Keynes (1936) argued that to stimulate effective aggregate demand, increase in government expenditure serves as an appropriate policy instrument to achieve the desired objective.

2.1.1 Laffer Curve Theory

Professor Arthur Laffer proposed the Laffer curve theory in 1974 which explicates the theoretical relationship between the tax rate and government revenue derived from taxation. The Laffer curve in Figure below, simply demonstrates the idea that a change in tax rate will have an effect on tax revenue in two different ways which are the Arithmetic Effect and the Economic Effect (Laffer, 2004).



The Arithmetic Effect states that a depletion in tax rate will bring about a cutback in tax revenue (per currency of the tax base) proportionate to the reduction in tax rate, and vice versa. The Economic Effect, on the other hand, recognizes that a lower tax rate will have a favorable influence on work, output, employment, and, as a result, the tax base, by helping to grow activities through incentives. The Arithmetic Effect is the polar opposite of the Economic Effect. As a result, when the Economic and Arithmetic Effects of tax rate transposes are combined, the impact of a change in tax rates on total tax collection is less apparent. In the Laffer curve figure above, the bottom of the curve shows that there are no taxes which will bring about no government revenue thereby resulting in no government. In the beginning, when taxes are raised from 0 the tax revenue increases but as the government continues to raise taxes, tax revenue decreases, resulting in the steepness of the curve. Subsequently, increased taxes will pose a large burden on economic growth of any nation. The heavy tax burden makes consumers spend more money and thereby leading to a decrease in demand which makes, in the long term, the reduction in the tax base balance off the rapid increase in tax revenue. This is the shaded part of the Laffer curve called the Prohibitive Range where the curve moves backwards. A tax increase above the Prohibitive Range will result in a reduction in government revenue (Laffer, 2004).

2.1.2 Ability to Pay Theory: Taxation is also based on the basic premise that everyone in society should bear the burden of taxation in a fair and equitable manner (Ayeni et al., 2017). The theory was advocated by Adam Smith who is referred to as the Father of Economics, it is widely accepted as it is on the basis of the real meaning of "ability" of tax payer due to this many economies in the world believe that income is the best measurement of one's ability to pay (Peter & Adesina, 2015).

2.1.3 Benefit Received Theory: This theory establishes that government and tax payers have an exchange relationship in which the state supplies public goods and services and any other benefit to individuals in the society and these individuals in return pay for all goods and services supplied in proportion to the benefit received (Ayeni et al., 2017). Such benefits include: infrastructure, regularized labour, and capital markets, among other things (Amadi & Alolote, 2019). Under the benefit theory, tax levels are automatically determined, because taxpayers pay proportionately for the government benefits they receive. In other words, the individuals who benefit the most from public services pay the most taxes.

2.2 Empirical Review

In order to examine the relationship between government revenues and economic growth, there are ample empirical findings, particularly in oil producing countries, albeit the findings are mixed. While some reported positive effects of tax revenue, oil revenue and non-oil export on economic growth, others posited that its impact on economic growth is negative. There are studies that found no significant relationship between revenues and economic growth. The mixed empirical results may not be unconnected to different approaches employed by researchers; the nature of the economy under consideration, the types of revenues that the study focused on and the kind of controlled variables included in their growth model. Nwoba and Abah (2017) conducted a study of crude oil revenue on economic growth in Nigeria. The study made use of time series data for the period 1960 to 2010 and an ex post facto research design and a simple regression analysis to estimates its variables. The study discovered a long-run association between the variables under study. The results revealed that oil revenue has a positive and significant association with the growth of the agricultural sector and further revealed that there is an insignificant impact of government budget deficit on the performance of Nigeria. The study further suggests that the government should expand its oil revenue policies so as to consolidate the budget discipline, accountability and transparency so as to improve the living standards of its population, increase income, improve education, increase income and cultural and human's values.

Ugwo et al (2019) conducted a study of crude oil export and economic growth of Nigeria for the period 1980 to 2017. The study used ex post facto and correlational research designs. The study utilized time-series data from the Central Bank of Nigeria (CBN) and the time series were analysed using unit root test, cointegration and multiple regressions. The study used crude oil revenue and crude oil barrels as measures for crude oil export and real gross domestic product as a proxy for economic growth. The empirical analysis disclosed a positive impact of crude oil export and the economic growth of Nigeria for the period under review. The study, therefore, recommended that crude oil and its natural components should be utilized for the development of the country. Eganga et al (2020) conducted a study on the oil revenue and economic growth of Nigeria for the period 1981 to 2018. The study used ex post facto and correlational research designs. The study collected secondary data from the Central Bank of Nigeria for the period under review. The data collected from CBN was analysed using Auto-Regressive Distributed Lag (ARDL) model, other diagnostic tests such as; unit root test, a test of Normality, Autocorrelation test, heteroskedasticity test and Breusch-Godfrey Serial Correlation LM test. The results disclosed that oil revenue positively and significantly affects the economic growth of Nigeria for the period between 1981 and 2018. The study, therefore, recommended that since oil revenue had a significant positive influence on the economic growth of Nigeria within the period under review and also makes up about 70% of Nigeria's annual budget, it was vital for the government to improve oil exploration and guarantee that the actions of militants and oil facilities criminals are minimized to the barest minimum if not completely eliminated so as to increase oil production in Nigeria and in turn assist the improvement of economic growth in Nigeria. Ilori and Akinwunmi (2020) analyzed the effect of oil and non-oil revenue on the economic development of Nigeria. The study used ex post facto and correlational research design. The study collected secondary data from the Central Bank of Nigeria for the period 1989 to 2018. The secondary data used in the investigation were collected from the Central Bank of Nigeria Statistical Bulletin for the period under review. The data collected was analyzed using cointegration and error correction analysis. The multivariate analysis was conducted on oil and non-oil revenue, exchange rates, and real gross domestic product. The analysis disclosed that oil and non-oil revenues negatively affect real gross domestic products in Nigeria. However, the exchange rate contributes a positive and statistical significance on real gross domestic products in Nigeria.

Akinleye et al (2021) conducted a study of oil revenue and economic growth in Nigeria for the period 1981 to 2018. The study used ex post facto and correctional research designs and secondary data was collected on the economic variables from the Central Bank of Nigeria Statistical Bulletin and National Bureau of Statistics. The secondary data collected was analyzed using the Augmented Dickey-Fuller unit root test, autoregressive distributive lag (ARDL) method and ARDL bound to test for co-integration with various other diagnostic techniques. The result exposed that exchange rate (EXCR), real gross domestic product (RGDP), petroleum profit tax (PPT) and oil revenue (OREV)were stationary at the first difference (I(1)) and it was discovered that the inflation rate (INF) was at stationary level (I(0)); on ARDL, the result showed that the previous values of the economic growth (RGDP (-1)) and oil revenue were directly related with the economic growth (RGDP) in Nigeria; it was also discovered that the petroleum profit tax (PPT), inflation rate (INF) and exchange rate (EXCR) were inversely related with the economic growth (RGDP) in both the short and long run. The fitted ARDL model was statistical significance and as such reliable and appropriate for examining the impact of oil revenue and other identified economic variables on economic growth in Nigeria during the period under study.

Hafidh, H. A. (2022) examine the relationship between revenue collections and economic growth in Zanzibar. The study investigates the cointegrating relationship and causality between the variables using VECM model covering the period from 2000Q1 through 2019Q4. The study employed modern time series econometrics techniques such as, unit root test, lag selection criteria, cointegration test. The econometric analysis established that total revenue collected has a positive effect on real GDP Zanzibar. The result shows that total revenue and capital formation have a positive and significant effect on economic growth. Whereas, inflation rate and labor have a negative effect on real GDP as a measure of economic growth in Zanzibar in the long run. The researcher recommended that the government should intensify efforts generating tax revenue, establish a strong fiscal responsibility in the country, adopt tax reforms that would encourage increase in investment and policy to improve labor productivity should be sustained while policy to improve non-tax revenue is needed in a country.

According to Maikano (2022) the government of Nigeria has of recent encountered dwindling revenue generation due to the global economic crisis and COVID-19 pandemic, thus making it difficult for the government to finance its expenditures and subsequently not achieving the desired economic growth. The paper examined the correlation between government revenue and economic performance of the Nigerian economy. The paper employed a mix of descriptive cum historical approach. Time series data spanning 2000 - 2019 were obtained and used. The sources of data were the Central Bank of Nigeria (CBN), National Bureau of Statistics (NBS) and Federal Ministry of Finance. Data were subjected to analysis and testing by means of Ordinary Least Square (OLS) multiple regression technique. The results revealed that significant positive relationship exists between the explanatory variables and explained variable. Arising from the findings, the paper made recommendations which include, among others, government's intensification of its policy of economic diversification from the oil sector to non-oil sectors so as to increase and sustain non-oil revenue; formulate enabling tax policy that will increase tax revenue as well as strengthening the anti-corruption institutions with a view to alleviating corruption which constitute monumental leakages in the revenue generation process. Mashkoor (2024) examined the relationship between tax revenues and the rate of economic growth in Pakistan narrowed on the "perception that the low ratio of direct to total taxation promotes high economic growth''. The author claims that higher taxes decrease the investment rate, discourage research and development activities (that are key to higher productivity), reduce the work effort and distort both labor and capital markets. By using Pakistani data for the period 1973-2008. The author concluded that the direct tax to GDP ratio Granger caused the growth in real GDP significantly and recommended that the country should decrease its heavy reliance on indirect taxation.

3.0 Methodology

3.1 Data Sources

The data set used in this study refers to time series data for Nigeria covering the period 1980 – 2022. The data used for the study were sourced from the World Development Indicators of the World Bank, the Central Bank of Nigeria and National Bureau of Statistics.

Table 3.1 Variables, Sources and Expectations

Variables	Expectation	Source
GDP per capita growth	Dependent variable	World Bank Development Indicators (2022)
Foreign Direct Investment Inflow (FDI)	Positive	World Bank Development Indicators (2022)
Trade Openness (OPT)	Positive	World Bank Development Indicators (2022)
Oil Revenue (OR)	Positive	National Bureau of Statistics (NBS)
Non –Oil Revenue (NOR)	Positive	National Bureau of Statistics (NBS)
Real Exchange Rate (REXR)	Positive	World Bank Development Indicators (2022)
Government Expenditure (GEXP)	Positive	World Bank Development Indicators (2022) World Bank Development Indicators (2022)
Inflation (INF)	Negative	

3.2 Model Specification

Following the Pesaran et al. (2001) framework discussed above, the estimated ARDL models for economic growth as a dependent variable that captures both short-run and long-run effects is presented as follows:

$$GDP_t = f(OR_t, NOR_t, GEXP_t, OPT_t, FDI_t, REXR_t, INF_t) \ldots\ldots \quad . (1)$$

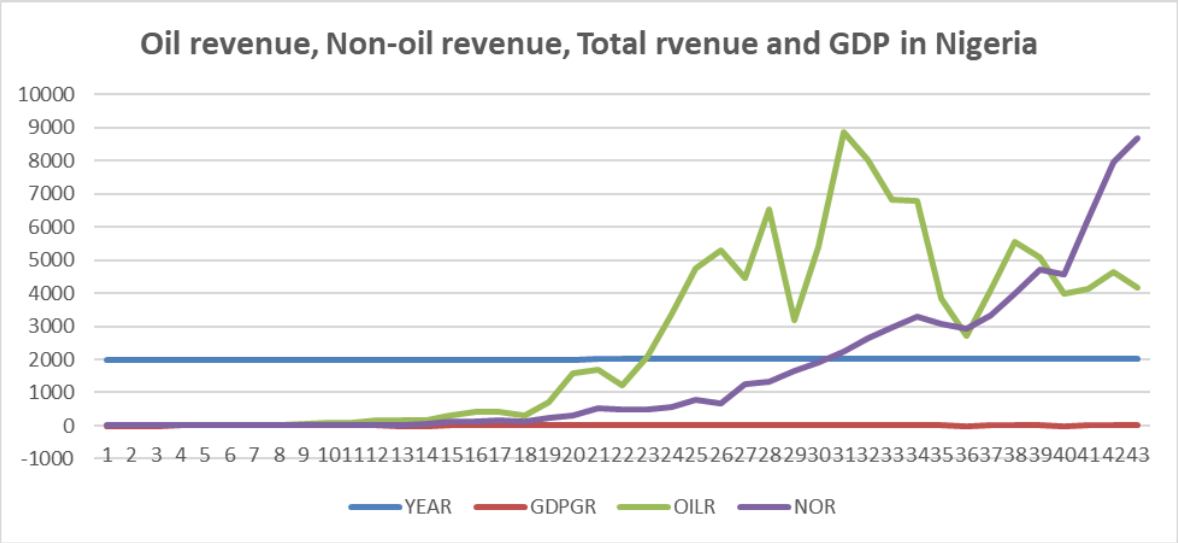
$$\Delta GDP_t = \alpha_1 + \lambda_1 GDP_{t-1} + \lambda_2 OR_{t-1} + \lambda_3 GEXP_{t-1} + \lambda_4 NOR_{t-1} + \lambda_5 OPT_{t-1} + \lambda_6 FDI_{t-1} + \lambda_7 REXR_{t-1} + \sum_{i=1}^{n} \beta_t \Delta GDP_{t-1} + \sum_{i=0}^{n} \beta_t \Delta OR_{t-1} + \sum_{i=0}^{n} \beta_t \Delta NOR_{t-1} + \sum_{i=0}^{n} \beta_t \Delta GEXP_{t-1} + \sum_{i=0}^{n} \beta_t \Delta OPT_{t-1} + \sum_{i=0}^{n} \beta_t \Delta FDI_{t-1} + \sum_{i=0}^{n} \beta_t \Delta REXR_{t-1} + \epsilon_{2t} \ldots\ldots (2)$$

where GDP, OR, NOR, GEXP, OPT, FDI, REXR and their lags represent economic growth, oil revenues, government expenditure, non-oil revenue, trade openness, foreign direct investment and real exchange rate and their lags respectively. λ's and β's are coefficient parameters. Moreover, going by the error correction framework specified above, we therefore specify the error correction method model as follows:

$$ect = rGDP_t - (\alpha_0 + \lambda_1 OR_t + \lambda_2 GEXP_t + \lambda_3 OPT_t + \lambda_4 REXR_t) \ldots\ldots \quad (3)$$

where ect = error correlation term, and other variables are as defined above. To determine the appropriate parameters, it incorporates the empirical models created earlier. The model estimation would be based on the enhanced model that is being suggested and used in this study. Previous literature observed mixed opinion on the impact government revenue on macroeconomic performance in Nigeria. Specifically, though, credible research is lacking on effect and relationship between government revenue and macroeconomic performance.

In light of this, it will be important to use the analytical framework procedures that will be adequate for the accomplishment of the research main goal without biases based on the established growth model. An ARDL model of co-integration will be meticulously constructed in this section in order to determine the immediate and long-term effects of the independent variables on the dependent variable. The section would provide a summary of several important preliminary statistical studies that will be used to support the model, describe the behaviour of the data, and define the outcome of the empirical investigations. Different models were constructed to address the objectives of the study. These include the oil revenue model which is used to determine the impact of oil revenue on economic growth in Nigeria and the non-oil revenue model which is used to determine the effect of non-oil revenue on economic growth in Nigeria. The graphical illustration below shows that total, oil and non-oil revenue has been on the increase in Nigeria. Though some years recorded some decline.



4.0 Empirical Results and Discussion

4.1.1 Summary Statistic and Correlation

This subsection reports the summary statistics and correlation coefficients. Table 4.1 displays the Summary Statistics, while table 4.2 shows the correlation matrix. The descriptive statistics are reported table 4.1 for economic growth (GDPGR), government expenditure (GEXP), Foreign Direct Investment (FDI), Non-oil revenue (NOR), trade openness (OPT), oil revenue (OR) and real exchange rate (REXR) in Nigeria. The summary statistics revealed that the data set is balanced.

Table 4.1: Summary Statistics

	GDPGR	GEXP	FDI	NOR	OPT	OR01	REXR
Mean	3.0680	3.9707	1.2114	1572.2254	31.4540	2587.0673	146.6343
Median	3.6472	2.1234	1.0695	500.9863	31.2226	1707.5628	101.4399
Maximum	15.3292	9.4483	4.2821	8695.0303	51.0163	8878.9699	536.9108
Minimum	-13.1279	0.9112	-0.0395	2.9841	3.0308	7.2530	49.7763
Std. Dev.	5.2576	2.8382	0.9555	2199.2925	12.1581	2633.9147	113.0455
Skewness	-0.8531	0.6100	0.9197	1.6739	-0.6768	0.6121	2.0058
Kurtosis	4.8560	1.9444	3.6890	5.2619	3.0540	2.1852	6.3483
Jarque-Bera	11.3876	4.6632	6.9129	29.2468	3.2884	3.8746	48.9199
Probability	0.0034	0.0971	0.0315	0.0000	0.1932	0.1441	0.0000
Sum	131.9229	170.7396	52.0907	67605.6918	1352.5224	111243.8953	6305.2740
Sum Sq. Dev.	1160.9966	338.3295	38.3431	203149274.6645	6208.4497	291375285.3636	536730.2208
Observations	43	43	43	43	43	43	43

Table 4.2: Correlation Matrix

	GDPGR	GEXP	FDI	INF	NOR	OPT	OR01	REXR
GDPGR	1	0.2245	0.3451	-0.2067	0.0683	0.3893	0.3305	-0.4817
GEXP	0.2245	1	0.1485	-0.3473	0.5773	0.3311	0.8721	-0.2639
FDI	0.3451	0.1485	1	0.1865	-0.3121	0.5899	0.1214	-0.5086
INF	-0.2067	-0.3473	0.1865	1	-0.1962	-0.2472	-0.3773	-0.1297
NOR	0.0683	0.5773	-0.3121	-0.1962	1	0.0086	0.6064	-0.1975
OPT	0.3893	0.3311	0.5899	-0.2472	0.0086	1	0.3970	-0.4318
OR01	0.3305	0.8721	0.1214	-0.3773	0.6064	0.3970	1	-0.3501
REXR	-0.4817	-0.2639	-0.5086	-0.1297	-0.1975	-0.4318	-0.3501	1

Mean is the average value of the series which is derived by dividing the total value of the series by the number of observations. In the data it takes into account all the series that make up the data. From table 4.1 the mean for economic growth (GDPGR), government expenditure (GEXP), Foreign Direct Investment (FDI), Non-oil revenue (NOR), trade openness (OPT), oil revenue (OR) and real exchange rate (REXR) are 3.0680, 3.9707, 1.2114, 1572.2254, 31.4540, 2587.0673 and 146.6343. Maximum and Minimum is the highest and lowest values of the series for the period under study. The table above indicates that the maximum values for economic growth (GDPGR), government expenditure (GEXP), Foreign Direct Investment (FDI), Non-oil revenue (NOR), trade openness (OPT), oil revenue (OR) and real exchange rate (REXR) during the period under study are 15.3292, 9.4483, 4.2821, 8695.0303, 51.0163, 8878.9699 and 536.9108 respectively while the minimum values of for economic growth (GDPGR), government expenditure (GEXP), Foreign Direct Investment (FDI), Non-oil revenue (NOR), trade openness (OPT), oil revenue (OR) and real exchange rate (REXR) -13.1279, 0.9112, -0.0395, 2.9841, 3.0308, 7.2530 and 49.7763 respectively.Standard Deviation is a measure of spread or dispersion in the series. From the table 4.1, the standard deviation of for economic growth (GDPGR), government expenditure (GEXP), Foreign Direct Investment (FDI), Non-oil revenue (NOR), trade openness (OPT), oil revenue (OR) and real exchange rate (REXR) are 5.2576, 2.8382, 0.9555, 2199.2925, 12.1581, 2633.9147 and 113.0455 respectively. This shows that the oil revenue has a large spread over the period under study while the foreign direct investment has comparatively a minimal spread. Table 4.2 displays the correlation coefficient for the variables used. The estimated correlation coefficient reports that none of the variables is highly correlated with each other; hence, the model is expected to have no multicollinearity issues when estimated. In other words, researchers have reasoned that when variables are correlated and estimated in the same regression there is likely to be multicollinearity issues and as such, to rescue such a situation, it is advisable to independently estimate correlated variables (Muhammad, 2020). The situation from estimated correlation does not warrant such a scenario rather all the variables can be estimated at once.

4.1.2 Stationarity Test and Lag Selection Criteria

The unit root results presented in table 4.3 are the IPS test proposed by Im et al. (2003) for the unit root test. The IPS unit root test is chosen for the panel because it is often used and is known to produce reliable results. Additionally, it was thought to be the best choice for balanced and imbalanced data. The stationarity test findings demonstrate that all variables are stationary at either first difference or at level, with no variables stationary at the second difference, making the proposed ARDL methodology appropriate for the study.

4.3 Unit root test

VARIABLES	LEVEL TEST		TEST IN DIFFERENCE		I(d)
	P-values	Level of Significance	P-values	Level of Significance	
GDPGR	0.2300	no	0.0000	***	I(1)
INF	0.3733	no	0.0000	***	I(1)
NOR	0.0034	***	0.0000	***	I(0)
FDI	0.0088	***	0.0020	***	I(0)
OR	0.0000	***	0.0000	***	I(0)
REXR	0.4632	no	0.0001	***	I(1)
GEXP	0.042	***	0.0000	***	I(0)
OPT	0.2300	no	0.0000	***	I(1)

Notes: (*)Significant at the 10%; (**)Significant at the 5%; (***) Significant at the 1%. and (no) Not Significant
*MacKinnon (1996) one-sided p-values.
Source: Author's computation using E-views 13

The Augmented Dickey Fuller (ADF) test shows that GDPGR, INF, REXR and OPT were not stationary at level. However, NOR, FDI, OR and GEXP were stationary at level at 5% level of significance. This mixed order of co-integration makes the ARDL suitable for the estimation of the variables. Given that the p-values for each of the variables listed in table 4.3 is less than 0.05, then NOR, FDI OR and GEXP are stationary at the level and statistically significant at 1%. In contrast, GDPGR, INF, REXR and OPT are stationary at first difference and statistically significant at 1%. The mixed order of integration confirms that the variables are appropriate for estimation using the ARDL technique. Lag selection is crucial and essential when estimating an equation with the ARDL model, whether it be for a panel or time series. According to (Bahmani-Oskooee and Nasir, 2004) and (Baek, 2014), the lag selection is very sensitive because the result of the F-statistic could be affected in case of time series which could also affect the outcome of the error correction term (in both time series and panel application). In order to choose the lags for each variable, the lags that occur the most frequently will be picked and used in all subsequent estimation. Indicated by the most prevalent lag, all variables' lag selection is (4,4,4,2,3,1).

4.1.3 Bounds Test for Co-integration and Long-run relationship

Table 4.4 reports the bounds co-integration test of the ARDL approach. Thus, since the F-statistics (6.13) exceeds all the critical values for the upper bound at 1%, 5% and 10% levels of significance respectively, there is evidence of long run relationship or liner combination among the variables. In other words, foreign direct investment(FDI), government expenditure (GEXP), trade openness (OPT) appear to have long run relationship in spite of having different orders of integration among the variables. Thus, the oil revenue model is free from spurious regression.

Table 4.4: BOUND TEST

Null hypothesis: No levels relationship
Number of cointegrating variables: 5
Trend type: Rest. constant (Case 2)
Sample size: 39

Test Statistic	Value
F-statistic	6.1268

	10%		5%		1%	
Sample Size	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)
35	2.331	3.417	2.804	4.013	3.900	5.419
40	2.306	3.353	2.734	3.920	3.657	5.256
Asymptotic	2.080	3.000	2.390	3.380	3.060	4.150

* I(0) and I(1) are respectively the stationary and non-stationary bounds.

4.1.4 Stability and Diagnostic Tests

The post estimation tests include the Serial Correlation test, Heteroscedasticity test and stability test (CUSUM test). Table 4.5A below shows the presence of Serial Correlation based on the P-values obtained from the estimated results. Hence, to address this problem, the Newey–West variance estimator was used in the estimation. The model is, however, free from the problem of heteroscedasticity as indicated in table 4.5B

Table 4.5A: Serial Correlation Test

Breusch-Godfrey Serial Correlation LM Test:
Null hypothesis: No serial correlation at up to 2 lags

F-statistic	4.9652	Prob. F(2,13)	0.0250
Obs*R-squared	16.8898	Prob. Chi-Square(2)	0.0002

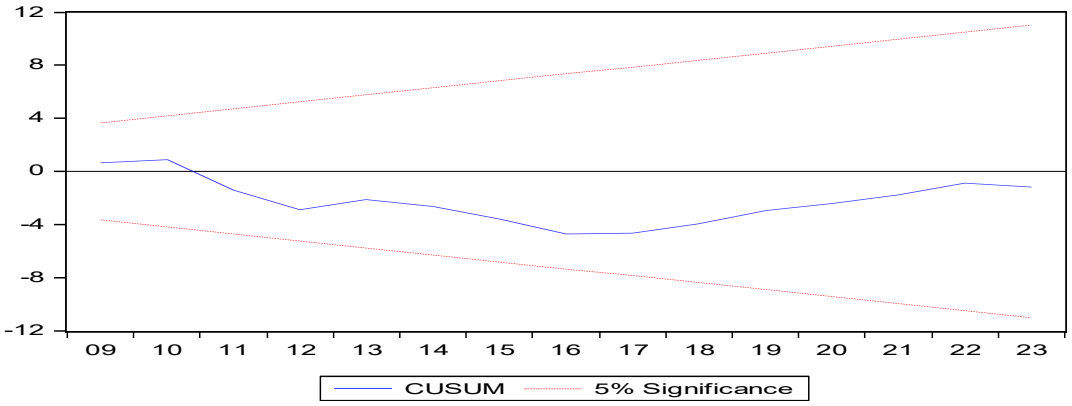
Table 4.6B: Heteroskedasticity- White Test

Heteroskedasticity Test: Breusch-Pagan-Godfrey
Null hypothesis: Homoskedasticity

F-statistic	1.3533	Prob. F(23,15)	0.2759
Obs*R-squared	26.3175	Prob. Chi-Square(23)	0.2861
Scaled explained SS	2.7560	Prob. Chi-Square(23)	1.0000

4.1.5 Stability Test

To ensure dependability and trustworthiness of the outcomes, it is essential to assess the model for stability. Hence the CUSUM test was conducted which indicated that the plotted line remained within the critical bounds at 5% level of significance, implying that the estimated model is structurally stable. In other words, the estimated ARDL long-run estimates are appropriate for long run decision making. Overall, the post estimation test results suggest that the short and long run estimated ARDL model are valid and reliable for forecasting and policy making.



4.1.6 Estimation Procedure

ARDL Coefficients for short-run result

Here we estimate error the correction mechanism using the ADRL method to examine the short-run relationship among the variables. The results are presented in the table below. We can observe that the coefficients of ECT follow a priori expectation. Specifically, the coefficients are not only negative but also statistically significant at the 1% level of significance. This shows that there is a short-run dynamic adjustment towards the long-run equilibrium. The magnitudes of this coefficient is quite higher which depict a quicker return to the long-run equilibrium in case there is disequilibrium in the system. To be specific, the error correction term coefficients in the models is -0.68. This shows that 68% errors are corrected for and that it will take less than one-half years for the economics to converge to the long-run equilibrium. As in the case of the long-run estimated model, oil revenue and non-oil revenue are positively and significantly related to economic growth.

Table 4.7: Short-run Estimates

Dependent Variable: D(GDPGR)
Method: ARDL
Date: 01/16/25 Time: 06:55
Sample: 1982 2023
Included observations: 42
Dependent lags: 1 (Automatic)
Automatic-lag linear regressors (1 max. lags): INF NOR FDI OPT OR01 REXR GEXP
Deterministics: Restricted constant and no trend (Case 2)

Model selection method: Akaike info criterion (AIC)

Number of models evaluated: 128
Selected model: ARDL(1,0,0,1,0,0,0,0)

Variable	Coefficient	t-Statistic	Prob.
COINTEQ*	-0.6817	-5.7258	0.0000

* p-values are incompatible with t-Bounds distribution.

ARDL Coefficients for Long-run result

Having discovered that the variables are cointegrated, the next agendum is to proceed with the estimation of the long-run coefficient using the ARDL method of estimation. Table 4.8 presents the long-run form results for the model. From table 4.8, oil revenue has a positive impact on GDP in Nigeria. However, the impact is not statistically significant. A unit increase in oil revenue will cause GDP to increase by 0.0002 units. The impact of non-oil revenue is also positive but statistically insignificant. In the same vein, a unit increase in non-oil revenue will cause GDP to also increase. To be precise, a unit increase in non-oil revenue will cause GDP to increase by 0.0004 units.

Table 4.8: Long-run Estimates

Dependent Variable: GDPGR
Method: ARDL
Date: 01/16/25 Time: 06:55
Sample: 1982 2023
Included observations: 42
Dependent lags: 1 (Automatic)
Automatic-lag linear regressors (1 max. lags): INF NOR FDI OPT OR01 REXR GEXP
Deterministics: Restricted constant and no trend (Case 2)
Model selection method: Akaike info criterion (AIC)
Number of models evaluated: 128
Selected model: ARDL(1,0,0,1,0,0,0,0)

Variable	Coefficient	Std. Error	t-Statistic
GDPGR(-1)	0.3183	0.1583	2.0111
INF	-0.0760	0.0474	-1.6017
NOR	0.0004	0.0005	0.8571
FDI	0.3311	1.0848	0.3052
FDI(-1)	2.2629	0.8498	2.6628
OPT	-0.0010	0.0727	-0.0142
OR01	0.0002	0.0005	0.4656
REXR	-0.0003	0.0083	-0.0308
GEXP	-0.5439	0.4574	-1.1892
C	1.6898	3.3143	0.5099

R-squared	0.5032	Mean dependent var	
Adjusted R-squared	0.3635	S.D. dependent var	
S.E. of regression	3.7223	Akaike info criterion	

Sum squared resid	443.3808	Schwarz criterion	
Log likelihood	-109.0874	Hannan-Quinn criter.	
F-statistic	3.6011	Durbin-Watson stat	
Prob(F-statistic)	0.0034		

*Note: p-values and any subsequent test results do not account for model selection.

This implies that government needs to take the issue of management of its revenues seriously and channel its realised revenues to productive projects that will not only lead to growth but sustained and inclusive development. This is important considering the source from which the largest chunk of revenues is coming. Any internal or external disturbances to the source of revenues will be detrimental for the economy and by extension increase poverty.

Conclusion and Recommendations

The dynamic relationship between government revenues and economic growth has been examined in this study using the autoregressive distribution lag model. The results reveal that all revenues considered (oil revenue and non-oil revenue) have positive effects on economic growth in the long-run. However, it is discovered that economic growth is more responsive to oil revenues than non-oil revenues. This explains in part the rationale for economic problem whenever there is revenue shortage, occasioned most of the time by a declining oil price in the international market. Therefore, the self – sufficiency of any country depends upon its ability to generate revenue. A developing country like Nigeria face serious difficulties in raising the revenue. As a result, they are unable to make proper expenditures on economic and social development. This study tried to identify the main economic variables that can be focused on by the policy-makers to raise revenue. The results obtained suggest that oil and non-oil revenue has positive effect on economic growth in Nigeria.

Based on the results above, it is recommended that the revenues accrued to government should be frugally channelled to the critical sectors of the economy for rapid and sustainable economic growth. Specifically, government should make a concerted effort to ensure that accrued revenues are invested in infrastructural facilities such as electricity, good roads, health care, pipe-borne water and tourism that will improve the environment and encourage economic activities. During the oil boom particularly when the oil price increases in the international market and revenues are accrued to the government, the latter should set aside money for rainy days so as to avoid the current socioeconomic crisis in the country which is caused by insufficient revenue. This can be achieved by keeping excess oil revenue in a special account which will be solidly backed by the law that will prevent exuberant spending. Examples of this revenue management can be adopted from other oil-producing countries such as Norway, South Arabia and the United Arab Emirates, which have been able to manage their oil revenues successfully. The saved money can be used to reflate the economy during economic recession in the future. Above all, the other sectors of the economy should be improved upon or made attractive for foreign investors so that more revenues that will serve as shock absorbers against oil price volatility can be generated.

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