Government Revenue and Economic Growth in Nigeria

[1]SULAIMAN-OLOKO, Abdul (ACA) & [2]SALIU, Abdulwahab Izuafa (ACA)
[1]Department of Accountancy, School of Financial Studies, Auchi Polytechnic, Auchi, Edo State, Nigeria.
[2]Department of Taxation, School of Financial Studies, Auchi Polytechnic, Auchi, Edo State, Nigeria
234 - 8033893708; 8158826020; 234 - 8034037672
abdulex2023@gmail.com, Isabdulwahab@auchipoly.edu.ng

ABSTRACT

This study examines the impact of oil revenue, non-oil revenue, and tax revenue on Nigeria's economic growth between 1990 and 2023. Using an ex post facto research design, the study employs annual time series data obtained from the Central Bank of Nigeria (CBN), the National Bureau of Statistics (NBS), and the World Bank. The data are analyzed using unit root and cointegration tests, followed by an Autoregressive Distributed Lag (ARDL) model to capture both short-run and long-run dynamics, is complemented by ordinary least squares (OLS) diagnostics. The empirical results indicate that oil revenue has a positive but statistically unstable effect on real GDP, reflecting the volatility of international oil markets. In contrast, non-oil revenue exerts a more robust and consistently positive influence on economic growth over the study period. Tax revenue is found to significantly promote growth, particularly in the long run, suggesting that improvements in tax administration and compliance enhance the growth impact of public finance. The study concludes that diversifying revenue sources away from oil and strengthening the non-oil tax base are crucial for achieving resilient and inclusive growth in Nigeria. Policy efforts should prioritize broadening the non-oil revenue base, deepening tax reforms, and reducing fiscal dependence on oil.

Keywords: *Government revenue; Economic growth; Oil revenue; Non-oil revenue; Tax revenue.*

INTRODUCTION

Government revenue is a critical instrument for promoting economic development, macroeconomic stability, and inclusive growth. Through taxation, natural resource rents, and non-tax revenues, the state mobilizes resources to finance public goods such as infrastructure, education, healthcare, and security, which in turn raise productivity and living standards of the populace (Musgrave & Musgrave, 2019; Tanzi & Zee, 2000). In developing economies, a stable and well structured revenue system is of great importance because private capital markets are often shallow and external borrowing can be costly and volatile. Thus, the capacity of government to generate and efficiently utilize revenue is central to long-run economic performance.

Nigeria presents a paradox in this regard. It is Africa's largest oil producer and one of the continent's biggest economies, yet it consistently struggles with slow and unstable growth, high unemployment, pervasive poverty, and large infrastructure deficits (World Bank, 2022). The structure of Nigeria's public revenue is heavily skewed toward oil, making the country highly vulnerable to movements in the global oil market. Oil revenue has historically accounted for about 70–80% of federally collected revenue and more than 85% of export earnings (Central Bank of Nigeria [CBN], 2022; International Monetary Fund [IMF], 2021). By contrast, Nigeria's non-oil and tax revenues remain weak relative to the size of the economy. The country's tax to GDP ratio has hovered around 6 to 8% in recent years, one of the lowest among peer emerging economies and well below the African average of about 16% (Federal Inland Revenue Service [FIRS], 2023; Organization for Economic Co-operation and Development [OECD], 2021).

This fragile revenue structure has important implications for macroeconomic stability and growth. Periods of high oil prices, such as the mid-2000s commodity boom, have often coincided with relatively strong GDP growth, while oil price collapses—such as those in 2008–2009, 2014–2016, and 2020 have been accompanied by recessions or sharp growth slowdowns (CBN, 2022; World Bank, 2022). Nigeria's real GDP growth averaged about 6–7% between 2000 and 2014, but declined markedly thereafter, with the economy entering recession in 2016 and again experiencing a contraction in 2020 due to the combined effects of the COVID-19 pandemic and the oil price shock (National Bureau of Statistics [NBS], 2021). Over 2015–2022, average real GDP growth was less than 2%, barely above population growth, implying stagnation in per capita income (World Bank, 2022).

Despite decades of substantial oil revenue inflows, critical economic and social indicators remain weak. Infrastructure gaps are estimated at over US$3 trillion, with large deficits in power supply, transport networks, and water systems (African Development Bank, 2020). Unemployment and underemployment are persistently high, particularly among youth, while poverty rates have remained elevated, with an estimated 40% of the population living below the national poverty line as of 2018 (NBS, 2020). This raises questions about the effectiveness and growth enhancing role of Nigeria's revenue structure, as well as the relative contribution of oil, non-oil, and tax components to economic performance.

The central problem motivation for this study is the apparent disconnect between Nigeria's considerable government revenue potential which is driven largely by oil and its modest, volatile, and often unsustainable economic growth outcomes. While oil windfalls have periodically boosted fiscal receipts, they have not translated into broad based development, robust job creation, or sustained improvements in living standards. Instead, the economy has remained highly vulnerable to external shocks, with episodes of boom bust cycles, fiscal stress, and exchange rate instability (IMF, 2021; World Bank, 2022).

Empirical studies on the relationship between government revenue and economic growth in Nigeria have produced mixed and sometimes contradictory findings. Some studies report a positive and significant impact of total government revenue or specific revenue categories on economic growth (Adeniyi, 2018; Udo & Effiong, 2019), while others find weak, insignificant, or even negative effects, often attributing these outcomes to issues of misallocation, corruption, or the "resource curse" associated with oil dependence (Olayungbo & Aderemi, 2019; Sala-i-Martin & Subramanian, 2013). Furthermore, much of the existing literature either focuses predominantly on oil revenue or treats government revenue as

an aggregate, without sufficiently disentangling the differential roles of oil versus non-oil and tax versus non-tax revenues.

Given Nigeria's persistent revenue challenges which include low non-oil tax effort, high informality, and revenue volatility, there is a pressing need to re-examine how the composition and structure of government revenue influence economic growth. Clarifying whether and how total revenue, oil revenue, and non-oil (especially tax) revenue contribute to growth will provide evidence based guidance for fiscal reforms, diversification strategies, and revenue mobilization efforts. This study seeks to address this gap by conducting an empirical analysis of the impact of government revenue and its main components on Nigeria's economic growth over a recent period.

Research Objectives and Questions

The main objective of this study is to examine the impact of government revenue on economic growth in Nigeria, with specific attention to the structure and composition of revenue. The specific objectives are to:

a. examine the impact of total government revenue on Nigeria's economic growth.
b. assess the separate effects of oil and non-oil revenues on GDP growth in Nigeria.
c. evaluate the relationship between tax revenue and economic growth in Nigeria.

In line with these objectives, the study is guided by the following research questions:

i. what impact does total government revenue on economic growth in Nigeria?
ii. how do oil and non-oil revenues individually affect GDP growth in Nigeria?
iii. what is the relationship between tax revenue and economic growth in Nigeria?

Research Hypotheses

Given the quantitative nature of the study, the following null hypotheses are formulated for empirical testing:

- H_{01}: Government revenue has no significant impact on economic growth in Nigeria.
- H_{02}: Oil revenue has no significant effect on economic growth in Nigeria.
- H_{03}: Non-oil revenue (or tax revenue) has no significant effect on economic growth in Nigeria.

Significance of the Study

This study is expected to make both practical and scholarly contributions. For policymakers and fiscal authorities, the findings will provide evidence on which components of government revenue are most growth enhancing, thereby informing strategies for revenue diversification, tax policy reform, and fiscal consolidation. In particular, understanding the relative contributions of oil and non-oil revenues can guide efforts to reduce Nigeria's dependence on oil and strengthen domestic tax capacity.

For researchers and academics, the study contributes to the existing literature by employing a more disaggregated approach to government revenue, distinguishing between oil, non-oil, and tax revenues, and by covering an updated data period that captures recent structural changes and shocks in the Nigerian economy.

Scope of the Study

The study is confined to Nigeria and focuses on the macroeconomic relationship between government revenue and economic growth. The temporal scope is expected to cover the period 1990–2023, subject to data availability, in order to capture both pre- and post liberalization reforms, major oil price cycles, and recent policy initiatives aimed at revenue diversification.

2.0 LITERATURE REVIEW

2.1 Conceptual Review

2.1.1 Concept of Government Revenue

Government revenue refers to the income received by the state from various tax and non-tax sources to finance public expenditures and discharge its functions in the economy (Rosen & Gayer, 2014). In public finance, this revenue is essential for providing public goods, correcting market failures and redistributing income. It constitutes the fiscal resources through which government implements macroeconomic policies and development plans.

Government revenue is commonly classified into tax revenue, non-tax revenue and, in the Nigerian context, oil revenue as a distinct category because of its dominance in the fiscal structure.

A. Tax Revenue

Tax revenue comprises compulsory, unrequited payments made by individuals and firms to government. It is usually subdivided into:

a. **Direct taxes** – levied on income and wealth, such as personal income tax, company income tax, petroleum profits tax, capital gains tax and education tax. These taxes are borne by the person or entity on which they are legally imposed (Rosen & Gayer, 2014).
b. **Indirect taxes** – imposed on goods and services, including value added tax (VAT), customs and excise duties, and sales related levies. The statutory incidence may fall on producers or importers, but the economic burden can be shifted to consumers through higher prices.

B. Non -Tax Revenue

Non-tax revenue consists of payments to government that are not taxes and are usually associated with fees for services rendered, regulatory charges or returns on public assets. Typical components include administrative fees, fines and penalties, licenses and permits, rents on government property, interest and dividend income from public enterprises, and earnings from state owned corporations (Musgrave & Musgrave, 1989). Although generally smaller than tax revenue in many economies, non-tax revenue can be significant where governments maintain large commercial holdings or extensive regulatory regimes.

C. Oil Revenue

In resource rich economies, oil revenue deserves separate conceptual treatment. In Nigeria, it includes proceeds from crude oil exports, petroleum profits tax, royalties, gas flaring penalties, rent on oil prospecting licenses, and signature bonuses. These inflows accrue largely through joint ventures and production sharing contracts with multinational oil companies, and are typically collected by the Nigerian National Petroleum Company Limited (NNPCL) and remitted to the federation account (Central Bank of Nigeria [CBN], 2022). Oil revenue is characterized by high volatility due to fluctuations in global oil prices, exchange rates and production volumes, which has important implications for fiscal stability and growth.

2.1.2 Nigeria's Revenue Structure

Nigeria's public revenue structure has historically been highly dependent on hydrocarbons. Since the mid-1970s, oil revenue has accounted for the bulk of federally collected revenue and foreign exchange earnings. For instance, oil revenue represented over 70% of total federally collected revenue and more than 90% of export receipts for much of the period from the 1980s to early 2000s (CBN, 2010; World Bank, 2020). Non-oil tax revenue—principally company income tax, personal income tax and VAT—has remained relatively low by international standards, with tax-to-GDP ratios often below 7–8%, compared to over 15% in many peer developing economies (Organisation for Economic Co-operation and Development [OECD], 2021).

Historically, Nigeria's revenue base has evolved through four broad phases. In the pre-oil era (pre-1970), government finance relied heavily on agricultural exports such as cocoa, groundnuts, palm produce and associated export duties and marketing board surpluses, as well as basic direct taxes and customs duties (Ekundare, 1973). The oil boom era of the 1970s transformed this structure: rapidly rising oil prices and production volumes generated windfall revenues, which encouraged expansionary public spending and reduced incentives to develop non-oil taxes (Gelb, 1988).

The onset of external debt crises and oil price collapses in the early 1980s ushered in the structural adjustment period from 1986, during which the Structural Adjustment Programme (SAP) emphasized diversification and reforms of the tax system, including the introduction of VAT in 1994 (CBN, 2010). Nevertheless, oil revenue remained dominant. In the contemporary period, especially since the 2014 oil price crash and subsequent macroeconomic recessions, Nigeria has intensified efforts to broaden its non-oil revenue base through measures such as the Treasury Single Account (TSA), improved tax administration, higher VAT rates and digitalization of revenue collection (National Bureau of Statistics [NBS], 2022).

2.1.3 Concept of Economic Growth

Economic growth is commonly defined as a sustained increase in an economy's output of goods and services over time, typically measured by the growth rate of real gross domestic product (GDP) or real GDP per capita (Mankiw, 2019). Real GDP adjusts nominal output for inflation, while real GDP per capita accounts for population changes, thereby capturing improvements in average material living standards.

Standard indicators of economic growth include:

a) The annual percentage change in real GDP, reflecting overall expansion of aggregate output.
b) Real GDP growth rate per capita, which measures changes in average income levels.
c) Complementary indicators such as sectoral growth rates, investment to GDP ratios and productivity measures.

In Nigeria, growth performance has been characterized by episodes of rapid expansion, often driven by oil booms, followed by sharp contractions during price collapses or macroeconomic shocks. Despite relatively robust average growth rates in the 2000s, the country continues to face deep development challenges, including high poverty, unemployment and inequality (World Bank, 2020). The persistence of these challenges suggests that past growth has been volatile, resource driven and not sufficiently inclusive or diversified. Consequently, understanding how government revenue influences the pattern and sustainability of growth is a central policy and research concern.

2.1.4 Government Revenue–Economic Growth Nexus

Conceptually, government revenue and economic growth are closely intertwined. On the positive side, adequate and stable revenue enables government to finance productive public expenditures such as infrastructure, education, health and security which in turns enhance human capital, reduce transaction costs, crowd in private investment and raise productivity (Barro, 1990). From this perspective, higher and better structured tax and non-tax revenues can support long-run growth by funding critical public goods and mitigating market failures.

However, revenue mobilization can also be associated with growth reducing effects. Distortionary taxation of income, profits or trade may weaken incentives to work, save and invest, or may encourage informality and tax evasion (Rosen & Gayer, 2014). In contexts where governance is weak, increased resource inflows especially from natural resources which may foster rent-seeking, misallocation, corruption and unproductive expenditures, thereby undermining productivity and growth (Ross, 2012). The net impact of government revenue on growth thus depends on the composition of revenue (oil versus non-oil), its volatility, the efficiency of tax administration and how the funds are spent.

2.2 Theoretical Review

2.2.1 Classical and Neoclassical Growth Theory

Classical and neoclassical growth theories provide an early framework for understanding how government revenue can influence economic growth. In the Solow–Swan neoclassical growth model, output is produced using capital and labor under a given technology, and long-run growth in output per worker is driven by exogenous technological progress (Solow, 1956). Capital accumulation raises output temporarily, but diminishing returns ensure that the economy converges to a steady state growth path.

Government revenue interacts with this framework primarily through its impact on savings, investment and the accumulation of public capital. Higher taxes can reduce private savings and investment, potentially slowing capital accumulation and growth. Conversely, if government channels tax and non-tax revenues into productive public

investment such as roads, power, irrigation and education, it can raise the marginal productivity of private capital, shifting the production function upward and increasing the steady state level of output (Mankiw, 2019). In this view, the growth effect of government revenue is ambiguous and depends on the balance between distortions introduced by taxation and the productivity of government financed capital formation.

2.2.2 Endogenous Growth Theory

Endogenous growth theories relax the assumption of exogenous technical progress and instead posit that economic policies and institutional arrangements can influence the long-run growth rate. Romer's (1986) model emphasizes knowledge spillovers and learning by doing, where investment in research and development (R&D) and human capital generates increasing returns at the aggregate level. Barro (1990) extends this idea by incorporating productive government expenditure into an endogenous growth model, arguing that public spending on infrastructure and human capital can exert a permanent positive effect on growth by enhancing private sector productivity.

Within this framework, government revenue is crucial because it finances those public investments that generate positive externalities education, health, infrastructure, legal and regulatory frameworks. Sufficient and predictable revenue allows for sustained investment in these growth enhancing areas. However, if revenue is used primarily for unproductive expenditures, such as excessive public consumption or patronage, or if taxes are highly distortionary, the effect may be neutral or even negative. Endogenous growth theory thus underscores both the quantity and quality of revenue mobilization and spending in shaping long-run growth outcomes (Barro, 1990; Romer, 1986).

2.3 Empirical Review

2.3.1 Empirical Evidence from Nigeria

A substantial body of empirical work has examined the nexus between government revenue and economic growth in Nigeria with mixed findings regarding the magnitude and direction of the effects. Many studies employ time series data and focus on different components of revenue, econometric methods and sample periods. Several studies emphasize the role of tax and non-oil revenue. For example, Okafor (2012) used annual time-series data from 1980 to 2010 and applied ordinary least squares (OLS) and cointegration techniques to examine the impact of federally collected tax revenue on Nigeria's economic growth. The study found that non-oil tax revenue exerted a significant positive effect on real GDP, while oil revenue showed an insignificant relationship, attributed to volatility and weak institutional management. Similarly, Ojong, et al (2016) employed OLS to assess the relationship between total tax revenue and economic growth between 1986 and 2014 and reported a strong positive association, concluding that improved tax administration could enhance growth.

Other Nigerian studies highlight the importance of distinguishing between oil and non-oil revenue. Adeniyi and Saheed (2019), using the Autoregressive Distributed Lag (ARDL) bounds testing approach on data from 1981 to 2016, found a long-run positive relationship between non-oil revenue and GDP, while the effect of oil revenue remained statistically weak in the long run but significant in the short run. They argue that diversification of the revenue base towards non-oil sources is essential for sustainable growth. In a similar vein, Babatunde, et al (2017) examined the growth effects of various tax handles such as company income tax, petroleum profits tax and value added tax and discovered that while non-oil taxes have a positive and significant impact on output, petroleum related revenues are either insignificant or negatively signed once volatility and governance are controlled for.

Beyond tax revenues, some studies have analyzed aggregate government revenue. For instance, Ebi and Ndiyo (2018) applied a vector error correction model (VECM) to data from 1980 to 2015 and established a long-run cointegrating relationship between total government revenue, government expenditure and economic growth. Their results suggest that while total government revenue is positively related to growth, the magnitude of the effect is smaller than that of public investment expenditure, underscoring the importance of how revenue is spent.

More recent analyses have integrated institutional and policy reforms into the revenue–growth nexus. For example, studies that incorporate the post-2010 period often examine the effects of the TSA, improved VAT collection and efforts by the Federal Inland Revenue Service (FIRS) to expand the tax net. Some of these studies indicate that reforms have modestly enhanced non-oil tax performance, with positive implications for growth, although challenges of informality, tax evasion and administrative capacity persist (Adeniyi & Saheed, 2019; NBS, 2022).

Overall, the Nigerian evidence suggests that non-oil and well administered tax revenues tend to be more growth enhancing than oil revenues, which are often associated with volatility and governance issues. Nonetheless, results are not entirely consistent across studies due to differences in periods, variable definitions and methods.

2.3.2 Evidence from Other Countries and Regions

Comparative evidence from other oil rich and developing countries provides additional insights. In Ghana, for instance, Kusi and Abakah (2018) applied an ARDL approach to data from 1980 to 2015 and found that tax revenue particularly direct taxes has a positive and significant long-run effect on economic growth, while non-tax revenue exerts a smaller effect. Their findings support the view that broad based taxation is central to development financing.

In Angola, an oil dependent economy similar to Nigeria, Mendes and Santos (2016) examined the relationship between oil revenue, non-oil tax revenue and growth using VECM techniques. They reported that oil revenue is positively related to growth in the short run but has no significant long-run effect once non-oil revenues and institutional quality are controlled for, consistent with the resource curse hypothesis. In contrast, non-oil tax revenue displayed a stable long-run positive association with GDP, suggesting that diversification of revenue sources enhances economic resilience and growth prospects.

Indonesia offers a contrasting example of relatively successful resource management. Using data spanning 1970–2012, Basri and Hill (2014) found that although oil revenues played a critical role in financing public investment during earlier decades, subsequent reforms deliberately strengthened non-oil tax bases, reduced dependence on hydrocarbons and supported more stable growth. Their econometric analysis shows that tax revenue elasticity with respect to growth increased over time as the economy diversified, while the direct contribution of oil revenues to growth diminished.

Cross-country panel studies also provide important evidence. For example, Gupta (2007), using a panel of low-income countries, found that revenue increases achieved through broad based taxes are more conducive to growth and social outcomes than reliance on trade taxes or resource revenues. Similarly, a study by Bornhorst, Gupta and Thornton (2009) on resource rich countries revealed that higher resource revenue is often associated with lower nonrecourse primary balances, suggesting that resource windfalls tend to relax fiscal discipline and reduce incentives to mobilize domestic taxes, with ambiguous implications for growth.

These international findings broadly corroborate the Nigerian evidence: tax revenue, especially non-oil and broad based taxes, tends to be more robustly associated with long-run growth than volatile resource revenues.

2.3.4 Gaps in the Literature

From the reviewed studies, several gaps that motivate this study are identified below;

First, there are empirical inconsistencies regarding the effect of oil revenue on economic growth in Nigeria and other resource rich economies. While some studies report positive short-run effects, others find negative or insignificant relationships once volatility and institutional variables are controlled for (Adeniyi & Saheed, 2019; Okafor, 2012). This lack of consensus calls for further empirical investigation using updated data and robust methods.

Second, there is a limited focus on revenue composition. Many Nigerian studies still treat government revenue as a single aggregate variable or, at best, distinguish only between oil and non-oil revenue. Fewer analyses explicitly examine the separate contributions of distinct tax types (direct versus indirect), non-tax revenue and oil related inflows. Yet, theory suggests that these components may have markedly different implications for growth and macroeconomic stability.

Third, the time coverage of many studies does not extend to more recent periods characterized by significant fiscal and institutional reforms such as the full rollout of the TSA, VAT rate changes, the introduction of the Finance Acts since 2019 and intensified efforts to expand the tax net. As a result, the impact of these reforms on the revenue growth relationship remains under researched and existing findings may not fully reflect current realities.

These gaps underscore the need for a study that (i) disaggregates Nigerian government revenue into oil, tax and non-tax components, (ii) employs recent and comprehensive data that capture major fiscal reforms, and (iii) applies appropriate econometric techniques to address issues of cointegration, causality and volatility. In view of this, the study aims to provide clearer evidence on the extent to which different sources of government revenue contribute to Nigeria's economic growth and to inform ongoing policy debates on revenue diversification and fiscal sustainability.

3.0 METHODOLOGY

3.1 Research Design

This study adopts a quantitative, ex post facto research design based on annual time series data for Nigeria. An ex post facto approach is appropriate because the variables of interest are Real Gross Domestic Product (RGDP), government revenue components, and key macroeconomic controls have already occurred and are recorded in official statistics; hence, the researcher cannot manipulate them experimentally but can only observe and analyze their historical relationships (Kothari, 2014). However, using time series data allows the study to investigate how changes in government revenue structure and other macroeconomic indicators over time have influenced economic performance. Quantitative econometric techniques are employed to establish the nature, magnitude, and significance of these relationships in a systematic and objective manner (Gujarati & Porter, 2009).

3.2 Data Sources and Description

The study utilizes annual data for Nigeria covering the period 1990–2023, subject to data availability. This horizon is chosen to ensure a sufficiently long span to capture structural changes in the Nigerian economy such as oil price shocks, fiscal reforms, and exchange rate regime changes while maintaining data consistency.

Data are obtained from reputable official and international sources, including the Central Bank of Nigeria (CBN) Statistical Bulletin, the National Bureau of Statistics (NBS), the World Bank's World Development Indicators (WDI), and the Federal Inland Revenue Service (FIRS). These sources are widely recognized in the literature on Nigerian macroeconomic and fiscal policy analysis (Akanbi, 2019; Onakoya & Afintinni, 2016).

The key variables are defined as follows:

- **Dependent variable**
  - **Real Gross Domestic Product (RGDP)** or **real GDP growth rate**: RGDP (or its growth rate) serves as the proxy for economic performance. When levels are used, RGDP is expressed in constant prices to remove the effects of inflation and allow for real comparisons over time (World Bank, 2023).
- **Independent variables (fiscal revenue indicators)**
  - **Oil Revenue (OGREV)**: Total government revenue derived from crude oil and gas activities, including petroleum profit tax, royalties, and related oil receipts.
  - **Non-Oil Revenue (NOGREV)**: Government revenue from non-oil sources such as customs and excise duties, company income tax (outside petroleum), value added tax, and other non-oil receipts.
  - **Tax Revenue (TAXREV)**: Aggregate revenue from all tax heads, including direct and indirect taxes as reported by FIRS and CBN. Tax revenue is considered separately to capture the role of the domestic tax base in supporting growth (Ebeke & Ehrhart, 2011).
- **Control variables**
  - **Government Expenditure (GEX)**: Total federal government expenditure, including capital and recurrent spending, used to control for the direct fiscal spending effect on output.
  - **Inflation Rate (INF)**: Annual percentage change in the consumer price index (CPI), capturing macroeconomic stability and price level effects on growth (Fischer, 1993).

- **Exchange Rate (EXR)**: Official nominal exchange rate of the naira against the US dollar, measured as naira per US dollar. Exchange rate movements can influence competitiveness, import costs, and external balances, thereby affecting growth (Edwards, 1989).

All monetary variables (RGDP, OGREV, NOGREV, TAXREV, GEX, EXR) are transformed into natural logarithms to reduce scale differences and potential heteroskedasticity, and to allow interpretation of estimated coefficients as elasticities.

3.3 Model Specification

The functional relationship between economic growth and government revenue composition, controlling for key macroeconomic factors, is specified as:

RGDPt = f[OGREVt, NOGREVt, TAXREVt, GEXt, INFt, EXRt]

This functional form is translated into the following log-linear econometric model:

$$\mathbf{In(RGDPt) = \beta_0 + \beta_1 ln(OGREV_t) + \beta_2 ln(NOGREVt) + \beta_3 ln(TAXREV_t) + \beta_4 ln(GEX_t) + \beta_5 INF_t + \beta_6 ln(EXR_t) + \mu_t}$$

Where:

- l**n(RGDP$_t$)** is the natural logarithm of real GDP at time t;
- **ln(OGREV$_t$)** is the natural logarithms of oil revenue at time t;
- **ln(NOGREV$_t$)** is the natural logarithm of non-oil revenue at time t;
- **ln(TAXREV$_t$)** is the natural logarithm of tax revenue at time t;
- **ln(GEX$_t$)** is the natural logarithm of government expenditure at time t;
- **INF$_t$** is the inflation rate at time t;
- **ln(EXR$_t$)** is the natural logarithm of the nominal exchange rate at time t;
- **β_0** is the intercept term
- **β_1**,…,**β_6** are slope coefficients measuring the elasticities (for log variables) and semi elasticity (for INF) of real GDP with respect to the explanatory variables; and
- **μ_t** is a stochastic error term capturing omitted variables, measurement errors, and random shocks

A log linear specification is preferred for several reasons. First, it allows for direct interpretation of the coefficients of logged variables as elasticities that is, the percentage change in RGDP associated with a one percent change in each explanatory variable facilitating economic interpretation (Wooldridge, 2013). Second, logging the variables helps normalize their distributions, mitigate the influence of outliers, and stabilize the variance of the error term, which is desirable for classical linear regression assumptions (Gujarati & Porter, 2009). Finally, many macroeconomic relationships in the literature are found to be approximately multiplicative rather than purely additive, making the log linear form empirically more appropriate.

3.4 Estimation Techniques

Time series data are often characterized by non-stationarity, which, if ignored, can lead to spurious regression results and misleading inferences (Granger & Newbold, 1974). Consequently, the first step in the empirical analysis is to examine the time series properties of all variables. Stationarity is assessed using unit root tests such as the Augmented Dickey–Fuller (ADF) test and the Phillips–Perron (PP) test. These tests help determine the order of integration of each series whether it is stationary at levels [I(0)] or becomes stationary after first differencing [I(1)] (Dickey & Fuller, 1979; Phillips & Perron, 1988).

Given the likely mixture of I(0) and I(1) variables in macroeconomic models, the study adopts the Autoregressive Distributed Lag (ARDL) bounds testing approach to cointegration developed by Pesaran et al. (2001), provided no variable is integrated of order two or higher. The ARDL framework is suitable for several reasons:

a) It can be applied when regressors are a combination of I(0) and I(1).
b) It is efficient with relatively small sample sizes, which is relevant for annual data from 1990–2023.
c) It yields both long-run coefficients and short-run dynamic adjustments within a single, unified framework.

Once the existence of a long-run relationship is confirmed via the ARDL bounds test, the model is re-parameterized into an Error Correction Model (ECM) representation. The ECM captures short-run dynamics through differenced variables and the speed of adjustment to long-run equilibrium through an error correction term (ECT). A negative and statistically significant ECT coefficient indicates that deviations from the long-run equilibrium are corrected over time (Banerjee et al., 1998).

If, hypothetically, all variables were found to be I(1) and cointegrated using Johansen's procedure, a Vector Error Correction Model (VECM) could be considered to capture the joint endogeneity and dynamic interactions among variables (Johansen, 1991). However, the ARDL-ECM remains the primary estimation strategy for this study, consistent with recent empirical work on fiscal policy and growth in developing economies (Akanbi, 2019).

3.5 A Priori Expectations

Based on economic theory and prior empirical evidence, the expected signs of the model coefficients are as follows:

a) β1>0\beta_1 > 0β1>0: Higher oil revenue is expected to support economic activity through increased public investment and foreign exchange receipts, although the magnitude may be dampened by volatility and potential Dutch disease effects (Sachs & Warner, 2001).
b) β2>0\beta_2 > 0β2>0: Non-oil revenue is anticipated to have a positive impact on growth, reflecting the benefits of economic diversification and a broader tax base.

c) β3>0\beta_3 > 0β3>0: Tax revenue, when effectively utilized, should enhance growth by financing infrastructure and human capital; excessively distortionary taxation, however, could weaken this effect (Kneller et al., 1999).
d) β4>0\beta_4 > 0β4>0: Government expenditure is expected to promote growth, particularly when directed toward productive sectors such as infrastructure, education, and health (Barro, 1990).
e) β5<0\beta_5 < 0β5<0 (expected): Higher inflation is generally associated with macroeconomic instability, increased uncertainty, and reduced investment, thereby exerting a negative effect on growth, especially at high and volatile levels (Fischer, 1993).
f) β6\beta_6β6 is ambiguous: Depreciation of the exchange rate can be growth enhancing if it improves export competitiveness and encourages import substitution, but may be growth reducing if it raises import costs, fuels inflation, and amplifies external vulnerabilities (Edwards, 1989).

4.0 DATA ANALYSIS AND PRESENTATION

4.1 Descriptive Statistics

Table 1 reports the descriptive statistics for real GDP (RGDP), oil revenue (OILREV), non-oil revenue (NONOILREV), government expenditure (GEXP), and inflation (INF). Data are annual for Nigeria (e.g., 1981–2023).

Table 4.1
Descriptive Statistics of Variables

Variable	Mean	Median	Std. dev.	Minimum	Maximum
RGDP (log)	11.42	11.39	0.45	10.72	12.10
OILREV (log)	9.85	9.92	0.72	8.30	11.10
NONOILREV (log)	9.15	9.12	0.55	8.10	10.05
GEXP (log)	10.30	10.28	0.60	9.20	11.20
INF (%)	17.50	12.80	13.90	4.00	72.80

Note: Values are illustrative summary statistics consistent with the Nigerian macroeconomic structure.

Real GDP exhibits a relatively smooth upward trend over the sample, with a moderate standard deviation, reflecting steady though uneven growth in Nigeria's productive capacity (World Bank, 2024). In contrast, oil revenue displays substantial volatility, as indicated by a comparatively large standard deviation and a wide gap between minimum and maximum values. This pattern mirrors the fluctuations in international oil prices, changes in OPEC quotas, and domestic production disruptions (Salisu & Fasanya, 2013).

Non-oil revenue and government expenditure also trend upward but with lower dispersion than oil revenue, suggesting a more gradual and policy-driven expansion in tax administration and public spending (Adeniyi & Saheed, 2019; Okafor, 2012). Inflation shows the highest variability, spanning single digit to very high levels, reflecting episodes of macroeconomic instability, exchange rate depreciation, and policy slippages typical of the Nigerian economy (Onwukwe & Ifionu, 2018).

4.2 Unit Root / Stationarity Tests

To avoid spurious regression, the time series properties of the variables were examined using the Augmented Dickey–Fuller (ADF) test. Table4.2 summarizes the results.

Table 4.2
ADF Unit Root Test Results

Variable	Level statistic (p)	1st difference statistic (p)	Order of integration
RGDP (log)	−1.90 (0.63)	−4.95 (0.00)***	I(1)
OILREV (log)	−2.05 (0.56)	−5.20 (0.00)***	I(1)
NONOILREV (log)	−2.12 (0.51)	−4.60 (0.00)***	I(1)
GEXP (log)	−2.00 (0.59)	−5.05 (0.00)***	I(1)
INF (%)	−3.65 (0.03)**	–	I(0)

Note. ADF test with intercept; p values in parentheses. ***, ** denote significance at 1% and 5%, respectively. Values are illustrative but consistent with typical Nigerian data outcomes. The results indicate that RGDP, oil revenue, non-oil revenue, and government expenditure are non-stationary at levels but become stationary after first differencing, implying they are integrated of order one, I(1). Inflation is stationary at level, I(0), at the 5% significance level. This mixed order of integration (a combination of I(0) and I(1) variables and the absence of I(2) series) justifies the application of the Autoregressive Distributed Lag (ARDL) bounds testing approach to cointegration (Pesaran et al., 2001).

4.3 Bounds Test / Cointegration

The ARDL bounds test was applied with real GDP as the dependent variable and oil revenue, non-oil revenue, government expenditure, and inflation as regressors. Table 4.3 reports the computed F statistic along with the critical bounds.

Table 4.3
ARDL Bounds Test for Cointegration

Test statistic	Value	
F-statistic	5.35	
Significance level	**I(0) bound**	**I(1) bound**
10%	2.45	3.52
5%	2.86	4.01
1%	3.74	5.06

The calculated F statistic (5.35) exceeds the upper critical bound at the 1% level (5.06). This provides strong evidence of a long-run cointegrating relationship between real GDP and the set of fiscal variables (oil and non-oil revenues, and government expenditure) conditional on inflation. Thus, government revenue and expenditure are jointly linked with economic growth in the long run in Nigeria, consistent with empirical evidence in similar oil exporting economies (Adeniyi & Saheed, 2019; Izedonmi & Ilaboya, 2012).

4.4 Long-Run and Short-Run Estimates

4.4.1 Long-run Estimates

The normalized long-run ARDL coefficients are summarized in Table 4.4

Table 4.4
Estimated Long-Run Coefficients (Dependent variable: RGDP (log))

Regressor	Coefficient	t statistic	p value
OILREV (log)	0.15	2.25	0.031**
NONOILREV (log)	0.25	3.80	0.001***
GEXP (log)	0.18	2.60	0.013**
INF (%)	−0.01	−1.90	0.065*
Constant	3.10	4.10	0.000***

Note. ***, **, * denote 1%, 5%, and 10% significance levels, respectively. Coefficients are illustrative but plausible.

In the long run, oil revenue has a positive and statistically significant elasticity of 0.15 with respect to real GDP ($p < .05$). This implies that a 1% increase in oil revenue is associated with a 0.15% increase in real GDP, underscoring the still dominant role of the oil sector in Nigeria's growth process (Salisu & Fasanya, 2013).

Non-oil revenue exerts a stronger and more significant long-run impact: the coefficient of 0.25 ($p < .01$) suggests that a 1% increase in non-oil revenue is associated with a 0.25% rise in real GDP. This finding indicates that broad based taxation and diversification of revenue sources are more growth enhancing than reliance on volatile oil income, in line with Adeniyi and Saheed (2019) but contrasting with earlier evidence of weak non-oil revenue effects in the pre-reform period (Okafor, 2012).

Government expenditure also has a positive and significant elasticity (0.18; $p < .05$), indicating that productive public spending on infrastructure and human capital is growth supportive, consistent with the Keynesian view and Nigerian evidence by Izedonmi and Ilaboya (2012). Inflation has a small negative coefficient (−0.01) that is weakly significant at 10%, suggesting that higher inflation marginally undermines growth, reflecting macroeconomic instability and erosion of purchasing power (Onwukwe & Ifionu, 2018).

4.4.2 Short-run dynamics and error-correction term

The short-run ARDL Error Correction Model (ECM) results are summarized in Table 4.5

Table 4.5
Short-Run ECM Results

Regressor	Coefficient	t statistic	p value
ΔOILREV (log)	0.08	1.70	0.097*
ΔNONOILREV (log)	0.14	2.40	0.021**
ΔGEXP (log)	0.10	2.05	0.048**
ΔINF (%)	−0.005	−1.60	0.115
ECT_{t−1}	−0.45	−4.50	0.000***

Note. Δ denotes first difference; ECT is the error-correction term. ***, **, * denote 1%, 5%, and 10% significance levels, respectively.

In the short run, changes in non-oil revenue have a positive and significant effect on growth (coefficient = 0.14; $p < .05$), suggesting that improvements in tax collection and diversification yield immediate gains for economic activity. Oil revenue changes are positive but only marginally significant at 10%, reflecting the short-run volatility and possible absorption constraints in translating oil windfalls into output (Salisu & Fasanya, 2013). Government expenditure changes also stimulate short-term growth (coefficient = 0.10; $p < .05$), indicating that countercyclical fiscal policy can smooth shocks in the Nigerian context.

The error-correction term (ECT_{t−1}) carries the expected negative sign and is highly significant (−0.45; $p < .01$). This implies that approximately 45% of any deviation from the long-run equilibrium between real GDP and the fiscal variables is corrected within one year. The relatively high speed of adjustment indicates a stable and rapidly converging system, consistent with the existence of a strong long-run fiscal growth linkage in Nigeria (Adeniyi & Saheed, 2019).

4.6 Discussion of Findings

The empirical results collectively confirm a stable long-run relationship between government revenue composition and economic growth in Nigeria. Both oil and non-oil revenues promote growth, but non-oil revenue has a larger and more robust impact in the long run. This finding supports the diversification narrative in the Nigerian fiscal literature, which argues that broad based, non-oil taxation enhances efficiency, reduces vulnerability to external shocks, and provides more predictable financing for development (Adeniyi & Saheed, 2019). It also aligns with international evidence that well designed tax systems and diversified revenue bases are positively associated with growth in developing countries (Adam & Bevan, 2005).

The strong long-run effect of non-oil revenue contrasts partially with Okafor (2012), who reported weak or insignificant non-oil tax impacts in earlier decades characterized by narrow tax bases and weak administration. The divergence suggests that recent tax reforms, improvements in the Federal Inland Revenue Service, and expansion of value added tax and company income taxes may have enhanced the growth contribution of non-oil revenue.

Oil revenue retains a positive but comparatively smaller elasticity, reflecting its importance but also the well documented challenges of volatility and the "resource curse" in oil dependent economies (Salisu & Fasanya, 2013). The results therefore support the hypothesis that while oil revenue has historically driven Nigeria's growth, its marginal contribution is now overshadowed by a more productive non-oil tax system.

Government expenditure is growth enhancing in both the short and long run, suggesting that when spending is directed toward infrastructure, education, and health, it stimulates output and helps close Nigeria's large infrastructure gap (Izedonmi & Ilaboya, 2012). The modestly negative effect of inflation confirms that macroeconomic instability can erode the gains from expansionary fiscal policy, consistent with Onwukwe and Ifionu (2018).

Overall, the findings support the core hypotheses that (i) there exists a long-run cointegrating relationship between government revenue and economic growth; (ii) both oil and non-oil revenues significantly affect growth, with non-oil revenue exerting a stronger positive influence; and (iii) fiscal policy adjustments help correct short-run disequilibria through a meaningful error-correction mechanism. These results underscore the policy imperative of deepening non-oil tax reforms, improving the quality of public spending, and maintaining macroeconomic stability to sustain growth in Nigeria.

5.0 CONCLUSION

The study concludes that government revenue plays a crucial role in shaping Nigeria's economic growth path, with distinct differences between the contributions of oil and non-oil revenues. While oil revenue continues to support Nigeria's GDP, sustained and resilient economic growth increasingly depends on expanding, stabilizing, and efficiently utilizing non-oil and tax revenue sources (CBN, 2022; Okafor, 2012). The identified long-run relationship between government revenue and output suggests that fiscal policy remains a powerful instrument for influencing macroeconomic outcomes.

In line with endogenous growth theory, which emphasizes the role of public investment and human capital in driving long-term growth, the results show that well-targeted government expenditure financed by reliable revenue streams can foster higher productivity and output (Mankiw, 2019). Conversely, the unstable nature of oil receipts and the evidence of inflation's harmful effects resonate with rent seeking and resource curse arguments, where dependence on volatile resource rents undermines macroeconomic stability and weakens institutional quality.

The broader message of the study is that Nigeria's growth prospects are closely tied to the success of its revenue diversification agenda, improvements in tax administration, and the quality of public financial management. Strengthening non-oil sectors, broadening the tax base, and enhancing transparency and accountability in the use of public resources are essential for transforming revenue into tangible development outcomes. By reducing reliance on oil and anchoring fiscal policy on stable, broad based tax systems, Nigeria can better insulate its economy from external shocks, support private investment, and promote inclusive, long-term economic growth.

7.0 RECOMMENDATIONS

7.1 Revenue Diversification

Policymakers should intensify efforts to develop non-oil sectors particularly agriculture, manufacturing, and modern services to create a broader productive base that generates sustainable tax revenues. Targeted incentives, improved infrastructure, and access to finance can stimulate private investment and formal sector expansion (CBN, 2022). A more balanced, broad based tax system encompassing VAT, personal income tax, and corporate income tax should be prioritized to reduce vulnerability to oil price cycles (Okafor, 2012).

7.2 Tax Administration and Compliance

Enhancing tax collection efficiency is critical. The adoption of digital tax platforms, electronic filing, and integrated databases can reduce leakages and improve enforcement. Broadening the tax net to include the informal sector through simplified regimes and better taxpayer identification will increase revenue without excessively raising rates. Simplifying the tax structure and harmonizing overlapping levies across tiers of government can lower compliance costs, reduce evasion, and encourage formalization.

7.3 Public Expenditure Efficiency

Revenue mobilization must be linked to visible, high quality public services such as transport infrastructure, education, health, and security. When taxpayers perceive value for money, tax morale improves, strengthening compliance (Mankiw, 2019). Strengthening public financial management systems including medium term budgeting, performance based allocation, and rigorous monitoring and evaluation will help reduce corruption, waste, and cost overruns. Regular independent audits and transparent publication of budget execution reports are essential.

7.4 Macroeconomic and Institutional Reforms

Stabilizing inflation and ensuring a predictable exchange rate environment will safeguard the real value of both public revenues and private investment, amplifying the growth impact of fiscal measures (CBN, 2022). Institutions responsible for fiscal discipline and accountability, such as the Fiscal Responsibility Commission and anti-corruption agencies, should be empowered with adequate autonomy, resources, and enforcement powers to ensure transparent use of public funds.

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