

## **EFFECT OF TAX REVENUE ON FISCAL SUSTAINABILITY IN NIGERIA**

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**Abstract:** This study examines the effect of tax revenue on fiscal sustainability in Nigeria from 2016 to 2024. Using an ex post facto research design, we extracted quarterly time series data from the FIRS annual report and the Central Bank of Nigeria's statistical bulletin 2024, and we used the OLS estimation test based on the unit root test result. The dependent variable was proxied by the debt-to-GDP ratio, while the independent variable was proxied by company income tax (CIT), petroleum profit tax (PPT) and value added tax (VAT). The results showed that company income tax and petroleum profit tax had a significant negative effect on the debt-to-GDP ratio in Nigeria, while value-added tax had a significant positive effect on the debt-to-GDP ratio in Nigeria. Therefore, the study recommended that company income tax shows that by expanding the tax system, tax avoidance and evasion can be reduced by improving the government's ability to generate more revenue. Cutting CIT may spur private investment, boost employment, and raise GDP over time. The government should minimize or find ways to eliminate the widespread corruption and leakages in the PPT administration with sufficient tax reforms. A well-balanced PPT can strengthen government revenue and reduce debt dependency. With regard to VAT, a downward review of the VAT should be conducted, from the current 7.5% to about 6% on essential goods in other to help reduce the debt-to-GDP ratio by boosting non-oil revenue, which will help decrease the burden on low-income households.

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**Keywords:** Tax Revenue, Company Income Tax, Petroleum Profit Tax, Value Added Tax, Fiscal Sustainability, Debt-GDP Ratio.

### **Introduction**

The Nigerian economy is highly dependent on oil and gas revenue, making it vulnerable to fluctuations in global oil prices. Consequently, the volatility in oil revenues has intensified the country's fiscal challenges, leading to persistent budget deficits and rising debt levels. According to recent reports from the International Monetary Fund (IMF) and the Central Bank of Nigeria (CBN), Nigeria's public debt has ballooned in recent years, raising concerns about the country's fiscal sustainability (Andrey, et al., 2021). The sustainability of fiscal policy is arguably one of the most debated issues in current financial accounts. Following the high debt levels experienced by several developed economies since the early 1980s, academic literature and policy debates have attracted considerable interest in increasing government debt and deficits and their negative consequences for financial stability. The need to keep government debt under control and to maintain the ability to issue debt when needed is also essential for the economy's smooth functioning (Uremadu et al., 2020).

Tax revenue plays a pivotal role in achieving fiscal sustainability in Nigeria, a country heavily reliant on government financing from oil exports. In Nigeria, low tax-to-GDP ratios have contributed to recurring budget deficits and rising public debt levels, posing significant threats to fiscal stability (Worlu & Nkoro 2012). Tax revenue provides a predictable and stable income source that can reduce dependence on volatile oil revenues. Despite various tax reforms and initiatives by agencies such as the Federal Inland Revenue Service, Nigeria's tax base remains narrow, with widespread evasion, weak enforcement, and an informal sector that is largely untaxed. This limits the capacity of the government to fund public services, invest in infrastructure, and respond to economic shocks (Worlu & Emeka, 2020).

Company income tax (CIT) provide a relatively stable and predictable revenue stream compared to volatile oil earnings. It contributes to funding essential public services, infrastructure, and development programs. However, by increasing government revenue, reducing budget deficits, and limiting dependence on borrowing, enhancing company income tax collection and compliance can significantly improve fiscal sustainability. It also strengthens macroeconomic stability by providing a reliable source of funds for long-term planning and investment (Adegbie et al., 2020).

The petroleum profit tax (PPT) is a major source of government revenue in Nigeria, especially given the country's dependence on the oil and gas sector. This tax is levied on the income of companies engaged in petroleum operations and has historically contributed significantly to national revenue. The relationship between PPT and fiscal sustainability is particularly crucial in Nigeria, where oil revenues account for a large proportion of the country's income and export earnings. The transition to the PIA framework, which replaces PPT with the Hydrocarbon Tax and Companies Income Tax under a restructured system, aims to increase accountability and attract investment while safeguarding revenue. In this context, PPT plays a vital role by providing a substantial revenue base that supports public spending and infrastructure development. However, Nigeria's heavy reliance on PPT also makes it vulnerable to global oil price shocks and production disruptions, which can lead to revenue shortfalls and fiscal instability (Akrani, 2010).

Value-added tax (VAT) is a crucial indirect tax in Nigeria's revenue system, significantly contributing to non-oil government income. VAT is levied on the consumption of goods and services, making it a relatively stable and broad-based source of revenue compared with volatile oil earnings. The role of VAT in enhancing fiscal sustainability in Nigeria is increasingly important as the country seeks to diversify its revenue base and reduce reliance on oil. VAT contributes to this by providing a steady flow of revenue that can fund public services, infrastructure, and social programs. Its consumption-based nature also makes it less susceptible to economic cycles than corporate or petroleum taxes. However, Nigeria's VAT collection system faces several challenges, including widespread tax evasion, a large informal economy, and administration system inefficiencies. With a relatively low VAT rate (currently 7.5%) and compliance issues, the revenue generated remains below potential (Akwe, 2014).

Nigeria's low revenue mobilization has been identified as a threat to fiscal sustainability (Adamu & Chandana, 2019). The Nigerian government's fiscal policy has been found to be unsustainable due to revenue shortfalls and increased government spending, resulting in huge budget deficits. Abomaye and Usoro (2018) showed that Nigeria's revenue is correlated with global movement in oil prices, as the oil sector remains the only mainstay of the Nigerian economy, providing approximately 80% of its revenue receipt and foreign earnings. According to the NBS report, the 36 states and FCT IGR figure was N612.87bn in H1 2020, indicating a negative growth of -

11.7% year on year compared to N693.91bn recorded in 2019. Moreover, despite numerous reforms, Nigeria continues to grapple with fiscal challenges. The implementation of measures such as the Treasury Single Account (TSA) and various tax modernization initiatives has not yielded the desired fiscal outcomes, pointing to possible inefficiencies and governance issues.

Several studies have investigated the link between tax revenue and economic growth, such as Chirculescu (2023), Onofrei et al. (2021), Maulid et al. (2022), Udeh (2021), Olowo et al. (2020), Adegbe et al. (2020), Okonkwo and Chukwu (2019), and Ogba et al. (2018). This study differs from previous studies in that it further examines the impact of tax revenue on fiscal sustainability from the angle of debt-GDP ratio. This study examines the effect of tax revenue on fiscal sustainability in Nigeria. Specifically:

- i. The effect of company income tax on fiscal sustainability in Nigeria is examined.
- ii. The effect of petroleum profit tax on fiscal sustainability in Nigeria is evaluated.
- iii. It assesses the effect of value added tax on fiscal sustainability in Nigeria.

The null hypotheses were developed in line with the following specific objectives:

**H<sub>01</sub>:** Company income tax has no significant effect on Nigeria's fiscal sustainability.

**H<sub>02</sub>:** The petroleum profit tax has no significant effect on Nigeria's fiscal sustainability.

**H<sub>03</sub>:** Value-added tax has no significant effect on Nigeria's fiscal sustainability.

## Literature Review

### Fiscal sustainability concept

Fiscal sustainability is a macroeconomic concept that refers to the solvency of a government's finances. When current public fiscal obligations do not jeopardize future government responsibilities, it is achieved. Fiscal sustainability is considered sustainable if an economy is expected to finance its debts without significant changes to the equilibrium of revenue and expenditure (Udeh, 2021). Unsustainable fiscal policy can threaten macroeconomic stability, balance of payment equilibrium, and the ability of the government to provide essential goods and services. Fiscal sustainability refers to a government's ability to maintain its current spending, tax, and other policies eventually without threatening government solvency or defaulting on some of its liabilities. It is concerned with the financial position of the government and its ability to meet its financial obligations over time. Fiscal sustainability is often assessed using indicators such as the debt-to-GDP ratio, the debt-to-revenue ratio, and the primary balance (Maulid et al., 2022).

The notion of fiscal sustainability indicates the government's ability to smoothly finance its budget without excessive long-term public debt accumulation. The government should be able to repay its debt at a certain point in the future (Onofrei et al., 2021). More often, a technical definition of fiscal sustainability can be derived from the government's IBC. A sustainable budget process requires the expected present discounted value of all future stock of debt to converge to 0.

Fiscal sustainability based on a positive responsiveness of primary balance to changes in government debt is closer to achieving fiscal sustainability.<sup>1</sup> For instance, Andrey et al. (2022) found heterogeneous responses of primary balances to government debt increases. In particular, the authors' results provide two different regimes marked by a 60% threshold value for the public debt ratio: the fiscal reaction function seems to be non-significant for low debt levels, whereas fiscal authorities positively respond to the other regime.

### **The concept of tax revenue**

Tax revenue refers to the revenue that governments generate from various sources, such as taxes, fines and fees, licenses, earnings and sales, rent on government property, interest, and dividends. This revenue is crucial for state and local governments' financial autonomy and sustainability, enabling them to fund essential services, infrastructure development, and other public expenditures without solely relying on federal allocations. Governments' ability to generate revenue internally is a key factor in their financial independence and capacity to meet constituents' needs (Saibu, 2018).

According to Adekanola (2007), tax revenue refers to the revenue generated by the government from sources within its jurisdiction or operations. This revenue is not derived from federal funding, allocations, or subsidies. At the state and local government level in Nigeria, IGR includes taxes, rates, fees, fines, and other charges collected by the government from individuals and businesses within its jurisdiction. The National Bureau of Statistics (NBS) publishes reports on IGR at the state level, and the 36 states and the Federal Capital Territory (FCT) generated a total of N1.89 trillion in IGR in 2021, up 22% from the previous year. Lagos State generated the highest IGR in the country, with N267.2 billion in the first half of 2021. Experts suggest that state governments can boost their IGR by leveraging technology, especially in the tax collection process (NBS, 2021). This study defines tax revenue as the income that governments generate through the imposition of taxes on individuals, businesses, and other entities. It is a primary source of government funding and is crucial for the financing of public services, infrastructure, and development projects.

### **Company income tax**

Company Income Tax (CIT) is a tax imposed on the profits of registered companies operating in Nigeria, excluding those engaged in petroleum operations, which are subject to Petroleum Profits Tax. The Companies Income Tax Act (CITA) governs CIT, which is a key component of the country's non-oil revenue. The standard CIT rate is 30% for large companies (with annual turnover above ₦100 million), 20% for medium-sized companies (₦25–₦100 million), and 0% for small companies (with turnover less than ₦25 million) (Adegbe et al., 2020).

### **Petroleum Profit Tax**

Petroleum Profit Tax (PPT) is a specialized tax levied on the profits of Nigerian companies engaged in petroleum exploration and production. It is governed by the Petroleum Profits Tax Act (PPTA) and applies specifically to upstream operations, that is, those involved in the extraction and initial processing of crude oil. PPT has historically been one of the largest contributors to Nigeria's federal revenue, reflecting the country's heavy reliance on oil. The PPT rates vary depending on the nature of the oil operation: joint ventures (JVs) with the Nigerian National Petroleum Corporation (NNPC) are taxed at 85%, while production sharing contracts (PSCs) are taxed at 50%. These high rates reflect the sector's profitability but have also made it less attractive to foreign investors (Udeh, 2021).

### **Value-added Tax**

Value-added tax (VAT) is a consumption tax levied on the supply of goods and services in Nigeria, payable at every stage of the production and distribution chain. Introduced in 1993 to replace sales tax, the Value Added Tax Act governs VAT and is administered by the Federal Inland Revenue Service (FIRS). The current VAT rate in Nigeria is 7.5%, which was increased from 5% in 2020 to boost government revenue. VAT is a crucial source of non-oil revenue, making it vital for Nigeria's fiscal sustainability. Unlike oil revenues, which are subject to

international market volatility, VAT provides a relatively stable and predictable income stream (Olowo et al., 2020).

### **Empirical Review**

Chirculescu (2023) explored the issue of fiscal sustainability in Romania, focusing on the interplay between government revenue and expenditure within the context of EU fiscal rules. Considering Romania's significant budget deficit of -9.79% of GDP in 2020, the country became subject to the EU's Excessive Deficit Procedure. This study discusses the fiscal adjustment path recommended by the Council of the European Union, which aims to reduce the deficit to 2.9% of GDP by 2024. The study found that achieving these targets is essential for correcting macroeconomic imbalances and ensuring sufficient fiscal space to support investments, particularly those co-financed by EU funds. The research underscores the importance of reducing the medium-term budget deficit as a means of correcting macroeconomic imbalances. Furthermore, it highlights the necessity of creating sufficient fiscal space to accommodate public investments, particularly those financed through EU funds available to Romania.

Onofrei et al. (2021) investigated the impact of fiscal behavior of governments on the sustainability of public finances, with a particular focus on developing EU countries. This study aimed to underscore the specific nature of fiscal sustainability in these states by examining how fiscal rules influence government behavior. Using panel data from 2000 to 2014, the authors assess fiscal responsibility convergence by calculating a fiscal responsibility convergence score. Their interdisciplinary approach integrates legal and financial perspectives, contributing to the literature on the relationship between governance frameworks and PFS. The study found the importance of strengthening the interaction between legal and institutional frameworks, particularly through the development of effective independent fiscal institutions capable of advising governments and promoting sound, sustainable fiscal policies. The study's contribution is its focus on developing EU countries, offering insights into fiscal risk management and the role of institutional control mechanisms in improving fiscal performance.

Maulid et al. (2022) analyzed the causality between tax revenue, state expenditure, and economic growth in Indonesia during the 1973-2019 period to provide policy advice to the Indonesian government. This country was selected as an object with the consideration that its economy has grown impressively and has been able to recover from the Asian economic crisis. A brief overview of the policies developed during the research period is presented to provide insight into the policies adopted by the government. The use of quantitative methods through the VECM and Granger causality test was carried out to provide an in-depth analysis. The result showed a positive long-term two-way causality relationship between tax revenues and state expenditures and between tax revenues and economic growth. This indicates that the government's efforts to implement state expenditure have succeeded in increasing tax revenues. Conversely, an increase in tax revenue allows the government to make state expenditures, both in development and other activities, to improve people's economy, leading to increased economic growth. However, the result of tests on inflation show that this variable is caused by economic growth and does not apply the other way around. However, this variable has a negative effect on tax revenue, state expenditure, and economic growth, so it needs to be suppressed to ensure stable economic growth. Conversely, most of the in-text citations were not referenced in the manuscript.

Ilori and Akinwunmi (2020) examined the effects of generating non-oil revenues on Nigeria's fiscal sustainability and economic development from 1989 to 2018 using secondary data extracted from the Central Bank of Nigeria's statistical bulletin. The model for analytical co-integration and error correction was employed. This study

employed the co-integration and error correction models. To test the stationarity of the time series, the Augmented Dickey-Fuller (ADF) test was applied. Similar analytical processes were applied to the multivariate data on oil and non-oil revenue, exchange rates, and real gross domestic product components. The results indicated that oil revenue harms Nigeria's real gross domestic product, but this is the same as the effects reported from non-oil revenue. Consequently, the study concludes that the continuing decline in global crude oil prices, resistance from insurgents in Nigeria's oil-producing area, the Nigerian government's profligate expenditure, and the global COVID-19 health pandemic, among other factors, are harming Nigeria's economic development.

Akinleye et al. (2021) examined the impact of government revenue on Nigeria's economic growth from 1981 to 2018. The secondary data collected on the economic variable used in the study were sourced from the Central Bank of Nigeria Statistical Bulletin and the National Bureau of Statistics. An augmented Dickey-Fuller unit root test, autoregressive distributive lag (ARDL) method, and ARDL bound test for co-integration with various other diagnostic techniques were employed for this study. The result revealed that the 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 the inflation rate (INF) was stationary at the level (I (0)). On ARDL, the result showed that the previous values of the economic growth (RGDP (- 1)) and oil revenue were directly related to the economic growth (RGDP) in Nigeria. The petroleum profit tax (PPT), inflation rate (INF), and exchange rate (EXCR) were inversely related to the economic growth (RGDP) in both the short and long run. The fitted ARDL model was statistically significant, reliable, and appropriate for examining the impact of oil revenue and other identified economic variables on economic growth in Nigeria during the study period. Hence, the ARDL model was not properly presented.

Udeh (2021) ascertained the effect of government revenue on Nigeria's fiscal sustainability. The scope of the research covers a 35-year period from 1981 to 2015. This study adopted an ex-post facto research design to achieve the objectives. The researcher used multiple linear regression models. Secondary data on government oil and non-oil revenue for the period were collected from the CBN statistical bulletin. Economic growth, which is the dependent variable, is represented by gross domestic product (GDP). The researcher applied the augmented Dickey-Fuller unit root test, co-integration test, and error correction model in data analysis. The findings indicate that oil and non-oil revenue exerted a positive and significant effect on gross domestic product. On this premise, no post-estimation test was conducted.

Uremadu et al. (2020) investigated the impact of non-oil revenue on economic growth in Nigeria from 1994 to 2017. Data were sourced from the Statistical Bulletin of the Central Bank of Nigeria (2017). The RGDP proxy for economic growth was adopted as the dependent variable, while agricultural revenue (AR), manufacturing revenue (MNR), mining revenue (MR), and value-added tax revenue (VATR) were adopted as the independent variables. The ADF unit root test was used to test the stationarity of the variables. The results revealed a mixed order of integration; hence, the ARDL bounds test was used to test the long-run relationship (co-integration) among the variables in the model and to determine a long-term relationship among the variables. The ARDL results showed that agricultural and mining revenues had a negative and insignificant effect on Nigeria's economic growth in both the short and long run. Manufacturing revenue had a positive and insignificant effect on short-run economic growth and a positive and significant effect on long-run economic growth in Nigeria. However, VAT revenue had a positive and very significant effect on Nigeria's economic growth both in the short and long run.

Shili and Panjwani (2020) examined the impact of non-oil tax revenue (NOTR) and nonoil nontax revenue (NONTR) on economic sustainability in Saudi Arabia. The study applied various essential statistical tools, such as descriptive and correlation tests and paired sample t-tests. The results demonstrate that NONTR and NOTR were positive and firmly associated with nominal domestic product with coefficient ( $r = .888$ ,  $p > 0.05$ ) and ( $r = .960$ ,  $p < 0.05$ ). The findings outline a significant divergence between the impact of NONTR and NOTR on nominal gross domestic product as shown ( $t_3 = 23.310$ ,  $p < 0.05$ ) and ( $t_3 = 23.099$ ,  $P < 0.05$ ) based on data from 2016 to 2020. This paper explores the revenue composition of Saudi Arabia and its impact on its economy.

Olowo et al. (2020) examined the sectorial contributions of revenue to economic sustainability in Nigeria from 1981 to 2018 to examine the effects of revenue from the environmental, information and communication technology, and financial sectors on economic growth in Nigeria. The autoregressive distributed lag model was the main estimation technique used. The time series data for the study on environmental sector revenue, information and communication technology sector revenue, financial sector revenue, and real gross domestic product were secondarily sourced from the Statistical Bulletin of the Central Bank of Nigeria. The study found that environmental sector revenue has positive and insignificant contributions to economic growth, whereas revenue from the information and communication technology and financial sectors contributed positively and significantly to economic growth in Nigeria. Thus, the study implies that the sectorial contributions of non-oil revenue are undermined. It is concluded that non-oil revenue sectorial contributions are positive and significant to economic growth in Nigeria.

Adeusi et al. (2020) examined the effect of non-oil revenue on Nigeria's economic growth. The four specific variables proxy for non-oil revenue are: Value Added Tax, Companies Income Tax, Personal Income Tax and Custom & Excise Duties, while gross domestic product was used to represent economic growth in Nigeria. The study population consists of all individuals, sole corporations, and corporations whose taxes were paid to the Nigerian government, except for firms operating in the upstream industry. The study sample consists of the entire study population using the census sampling approach. The secondary source of data collection method was used to generate data from the Federal Inland Revenue Service Statistical Bulletin of 2018 and the National Bureau of Statistics of 2019 for the period 1994-2018. Descriptive statistics and ordinary least square (OLS) regression techniques were used to analyze the collected data. The study findings revealed that indirect taxes (Custom & Excise Duties and Value Added Tax) have a more significant positive effect on Nigerian economic growth than direct taxes (Companies Income Tax and Personal Income Tax). Direct taxes have a significant but negative effect on Nigerian economic growth, especially in the long run.

Adegbie et al. (2020) investigated the effect of non-oil taxes on Nigeria's economic growth and development. The study employed an ex-post facto research design. Macrodata for the period 1994Q1- 2017Q4 representing seventy-six (76) observations were obtained from the CBN statistical bulletin and the National Bureau of Statistics. The documents were already exposed to the scrutiny of the appropriate regulatory agencies. The data were analyzed using descriptive and inferential statistics and multiple regressions. Non-oil taxes (custom and excise duties, capital gain tax, company income tax, tertiary education tax, and value-added tax) have a significant effect on economic growth. This study concluded that Nigeria's non-oil taxes significantly influenced both economic growth and development. However, 2018 or 2019 data should have been added to the revised manuscript since it was published in 2020.

**Theoretical Framework**

**Keynesian economic theory**

Maynard Keynes advanced this postulation in 1936. According to the Keynesian economist, fiscal policy is a key tool of sustainability management, and the government’s role is crucial in maintaining the economy’s fiscal sustainability. This is accomplished by managing the level of aggregate demand until the economy attains fiscal sustainability. Therefore, an increase in government tools increases aggregate demand. A minimal personal income tax (PIT) reduction increases disposable income, which in turn increases aggregate demand. Nevertheless, government expenditure is a component of aggregate demand. Keynes (1934) focused on the aggregate demand function to curb fiscal unsustainability. The core idea is that governments must ensure that debt does not grow faster than the economy. Tax revenues should cover expenditures consistently, and borrowing should be limited to productive investments. The intertemporal budget constraint is a key principle underlying this theory, which holds that governments must balance spending and revenues over time to avoid insolvency.

In supporting this theory, Wagner’s Law (Adolf Wagner, 1883) stated that public expenditure increases as an economy grows due to expanding social needs. Therefore, tax systems must evolve to support higher spending, reinforcing the need for fiscal sustainability. While Peacock-Wiseman Hypothesis (1953) suggested that government expenditure tends to rise during periods of social disruption (e.g., war or economic crisis), requiring increased tax revenue to sustain fiscal balance. Optimal tax theory opined on designing tax systems that efficiently raise revenue while minimizing economic distortions. This supports sustainability by ensuring stable and efficient revenue collection.

This theory provides a strong theoretical foundation for the analysis of the relationship between tax revenue and fiscal health. Keynesian economic theory supports the need for effective tax systems and responsible fiscal policies to ensure long-term economic stability.

**Methodology**

The research design employed in this study is an ex post facto research design. Positivism is a research philosophy that adheres to the view that only factual knowledge, including measurement, is gained through observation. The study employed quarterly data from the Central Bank of Nigeria Statistical Bulletin, National Bureau of Statistics (NBS), and Ministry of Finance (MOF) Medium Term Fiscal Framework from 2016 to 2024. The technique adopted in this research requires the use of empirical analysis of Johanssen cointegration test, descriptive statistics, unit root test, variance inflation factor statistics (VIF), error correction model, and auto-regressive distribution lag (ARDL) because it recognizes that different factors can affect or establish the effect of tax revenue on fiscal sustainability in Nigeria. The following model was estimated:

$$DGR = f(CIT, PPT, VAT) \dots\dots\dots (1)$$

$$DGR = a + \beta_1 CIT_t + \beta_2 PPT_t + \beta_3 VAT_t + e \dots\dots\dots (2)$$

Where:

DGR = Debt-GDP Ratio (logged)

CIT = Company Income Tax (Logged)

PPT = Petroleum Profit Tax (Logged)

VAT = Value Added Tax (Logged)

a = intercept (value of Y when Xj is zero)

e = error term

$$\Delta DGR_t = \mu + \alpha_1 DGR_{t-1} + \alpha_2 CIT_{t-1} + \alpha_3 PPT_{t-1} + \alpha_4 VAT_{t-1} + \sum_{i=1}^{p-1} \lambda_1 \Delta DGR_{t-i} + \sum_{i=0}^{q-1} \lambda_2 \Delta CIT_{t-1} + \sum_{i=0}^{q-1} \lambda_3 \Delta PPT_{t-1} + \sum_{i=0}^{q-1} \lambda_3 \Delta VAT_{t-1} + \varepsilon_t \text{----- (3)}$$

Once a long-run association was established between the variables in equation (3), the study examined the long-run effect using the unrestricted ARDL approach.

**Table 1: Variables and Measurements**

S/N	Variables	Nature	Measurement/Proxy	Source
1	Debt to GDP ratio	Dependent	Measured as debt interest payments and economic growth (debt-to-GDP ratio).	Saibu (2018).
2	Company income tax	Independent	Measured as total payable tax by all incorporated entities in Nigeria on profits.	Ilori and Akinwunmi (2020).
3	Petroleum Profit Tax	Independent	Measured as total tax on the company's profit from petroleum operations under the provision of PPTA	Udeh (2021)
4	Value-added Tax	Independent	Measured as total consumption of tax on goods and services	Adeusi et al. (2020)

Source: Author's compilation, 2025.

**Results and Discussions**

**Table 2: Descriptive Statistics for the study**

	DGR	CIT	PPT	VAT
Mean	1.553079	2.655491	2.722326	2.649847
Median	1.556902	2.609556	2.697472	2.626630
Maximum	1.723456	3.285537	3.285537	3.289326
Minimum	1.369216	2.183042	2.247359	2.226600
Std. Dev.	0.114026	0.268839	0.260279	0.272812
Skewness	0.047804	0.422422	0.398018	0.774840
Kurtosis	1.762260	2.726285	2.297596	2.998760
Jarque-Bera	2.311710	1.183022	1.690568	3.602261
Probability	0.314788	0.553490	0.429435	0.165112
Sum	55.91085	95.59768	98.00375	95.39449
Sum Sq. Dev.	0.455068	2.529606	2.371072	2.604929
Observations	36	36	36	36

Source: E-Views 13, 2025.

Table 2 shows that the mean values of DGR, CIT, PPT, and VAT were 1.553079, 2.655491, 2.722326, and 2.649847, respectively, while the deviation from the mean (standard deviation) was 0.114026, 0.268839, 0.260279, and 0.272812. The means of DGR, CIT, PPT, and VAT were normally distributed because the standard

deviation value was lower than the mean value. DGR, CIT, PPT, and VAT had medians of 1.556902, 2.609556, 2.697472 and 2.626630 with Jarque-Bera of 2.311710, 1.183022, and 1.690568, respectively. And 3.602261 respectively.

**Table 3: Correlation matrix**

	DGR	CIT	PPT	VAT
DGR	1	0.858304	0.582737	0.88676
CIT	0.858304	1	0.625600	0.89668
PPT	0.582737	0.625600	1	0.59833
VAT	0.886762	0.896681	0.598331	1

**Source: E-Views 13, 2025.**

Table 3 shows the relationship between tax revenue and fiscal sustainability in Nigeria. The result reveals that DGR was correlated with CIT to the extent of 0.85. DGR was correlated with PPT to the extent of 0.58, while DGR was correlated with VAT to the extent of 0.88. Furthermore, CIT was correlated with DGR to the extent of 0.85. CIT was correlated with PPT to the extent of 0.62, while CIT was correlated with VAT to the extent of 0.89. PPT was correlated with DGR to an extent of 0.58. PPT was correlated with CIT to the extent of 0.62, whereas it was correlated with VAT to the extent of 0.59. Finally, VAT was correlated with DGR to an extent of 0.88. VAT was correlated with CIT to the extent of 0.89, while VAT was correlated with PPT to the extent of 0.59. However, the correlation matrix result implies multicollinearity as all values were positive.

**Table 4: Variance of inflation factors**

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
DEBT_GDP(-1)	0.031337	112293.5	534.2388
DEBT_GDP(-2)	0.035588	125852.7	611.0952
CIT	5.39E-05	574.6763	5.389085
PPT	2.10E-05	235.6153	1.909550
VAT	0.000138	1456.247	14.46629
C	0.000247	364.8874	NA

**Source: E-Views 13, 2025.**

Variance inflation factors (VIFs) correct the multicollinearity among the variables in the correlation matrix. Consequently, VIFs represent the factor by which the predictors' correlations inflate the variance. A positive centered VIF indicates that there is no correlation between the predictor and the remaining predictor variables.

**Table 5: Summary of the Unit Root Test**

Variables	Adj. T-Statistic	Prob. Values	Order of integration
DGR	-4.462541	0.0013	I(0)
CIT	-8.677847	0.0000	I(2)

PPT	-5.825517	0.0000	I(1)
TBL	-3.778956	0.0079	I(1)

Source: Researcher’s Computation Using E-view 13, 2025

This study established the order of integration of individual time series through unit root tests to examine the existence of stochastic nonstationarity. The test of the stationarity of the variables adopted was the Philips-Perron test. The variables tested were DGR, CIT, PPT, and VAT, and the results are presented in Table 4. Since the variables were found to be stationary at order I (0), order I (1), and order I (2), the OLS regression was applied to determine the relationship among the variables.

**Table 6: OLS results**

Dependent variable: DEBT\_GDP

Method: Least Squares

Sample: 2016Q1 2024Q4

Included observations: 36

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.509724	0.100980	5.047759	0.0000
CIT	-0.608277	0.144136	-4.220150	0.0002
PPT	-0.075183	0.022241	-3.380321	0.0021
VAT	0.246732	0.073640	3.350491	0.0021
R-squared	0.807619	Mean var dependent		1.553079
Adjusted R-squared	0.789584	S.D.-dependent var		0.114026
S.E. of the regression	0.052305	Akaike information criterion		-2.959006
Sum squared resid	0.087546	Schwarz criterion		-2.783060
Log likelihood	57.26211	Hannan-Quinn writer.		-2.897596
F-statistic	44.77895	Durbin-Watson stat		0.684426
Prob(F-statistic)	0.000000			

**Source: Output of E-View 13, 2025**

The regression model examined the relationship between key tax revenues—company income tax (CIT), petroleum profit tax (PPT), and value-added tax (VAT)—and Nigeria’s debt-to-GDP ratio from 2016Q1 to 2024Q4. The model is statistically robust, with an R-squared value of 0.81, showing that the selected tax variables explain approximately 81% of the variation in the debt-to-GDP ratio. The F-statistic further confirms that the overall model is highly significant, indicating that these tax revenues play an important role in determining debt sustainability.

The results show that company income tax has a strong and significant negative effect on debt-to-GDP. This suggests that the government’s reliance on borrowing decreases as corporate tax revenues increase. In other

words, stronger corporate taxation performance directly contributes to debt reduction. Similarly, petroleum profit tax also demonstrates a significant negative impact, though its magnitude is smaller than that of company income tax. Given Nigeria’s dependence on the oil sector, this result indicates that petroleum tax revenues still provide critical fiscal space for managing debt levels.

Value-added tax was found to have a positive and significant effect on the debt-to-GDP ratio. This outcome is counterintuitive because VAT is typically expected to ease fiscal pressure. The positive relationship may be due to the way VAT revenues are allocated, which is often channeled into recurrent expenditures, such as wages and administrative costs, rather than debt repayment. Thus, while VAT collections increase, they do not necessarily translate into reduced borrowing and may coincide with rising debt levels in some cases.

From a policy perspective, the findings underscore the importance of strengthening corporate and petroleum taxation as tools for debt sustainability. Expanding the corporate tax base, reducing leakages, and ensuring efficient collection from oil revenues could significantly reduce the debt burden. On the other hand, the VAT administration may require reforms to ensure that the additional revenue contributes more directly to capital expenditure and debt reduction than recurrent spending. However, the low Durbin-Watson statistic indicates potential serial correlation in the residuals, suggesting that further analysis using dynamic models may be necessary to capture the time-dependent nature of the debt-tax relationship.

**Table 7: Heteroskedasticity test results**

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.829922	Prob. F(3,32)	0.4873
Obs*R-squared	2.598788	Prob. Chi-Square(3)	0.4577
Scaled explained SS	2.909268	Prob. Chi-Square(3)	0.4058

**Source: Computation of Researchers, 2025 (E-views 13)**

The Breusch–Pagan–Godfrey test was conducted to examine whether the regression model residuals suffer from heteroskedasticity. The null hypothesis assumes homoskedasticity, implying that the variance of the residuals is constant across observations. The F-statistic (0.83, p = 0.4873), Obs\*R-squared statistic (2.60, p = 0.4577), and scaled explained SS statistic (2.91, p = 0.4058) are all statistically insignificant at conventional levels. Because all the probability values are well above the 5% threshold, the null hypothesis of homoskedasticity is not rejected. This outcome implies that the residuals are homoskedastic, and systematic variance in the error terms across observations is not evident. Therefore, the regression estimates can be considered efficient and reliable because the presence of heteroskedasticity would otherwise have biased the standard errors and undermined statistical inference. Taken together with the earlier results, the model appears well-specified in terms of variance stability, though other issues, such as serial correlation (as indicated by the low Durbin–Watson statistic), may still require further attention in subsequent robustness checks.

**Discussion of the Findings**

The study results revealed that company income tax had a significant negative effect on fiscal sustainability in Nigeria. This implies that more CIT tax revenue can reduce the need for government borrowing, potentially lowering the debt-to-GDP ratio. This is consistent with the findings of Adegbe et al. (2020) and Uremadu et al. (2020).

Furthermore, the study found that petroleum profit tax had a significant negative effect on fiscal sustainability in Nigeria. This means that higher petroleum profit tax revenue boosts government income, reducing budget deficits and the need to borrow. This can lower the debt-to-GDP ratio, assuming GDP remains stable or grows, especially in oil-dependent economies where oil revenue may form a large share of government income. This finding aligns with that of Udeh (2021) but contradicts the finding of Okonkwo and Chukwu (2019), whose result shows an insignificant effect.

Finally, the study found that value added tax had a significant positive effect on fiscal sustainability in Nigeria. This means that high VAT may slow consumption. Thus, if the VAT is set too high, it may reduce consumer spending. This can slow down GDP growth, potentially raising the debt-to-GDP ratio even if revenue rises. This finding aligns with that of Maulid et al. (2022) but contradicts the finding of Ilori and Akinwunmi (2020). et al. (2020), whose result shows an insignificant effect.

### **Conclusions and Recommendations**

This study examines the effect of tax revenue on fiscal sustainability in Nigeria. The result concluded that company income tax and petroleum profit tax had a significant negative effect on the debt-to-GDP ratio in Nigeria. Therefore, the study also concluded that value added tax had a significant positive effect on the debt-to-GDP ratio in Nigeria.

The study recommends that

- i. Companies' income tax goes to show that tax by expanding the tax system, reducing tax avoidance and evasion, by improving the government's ability to generate more revenue. Cutting CIT may spur private investment, boost employment, and raise GDP over time.
- ii. The government should minimize or find ways to eliminate the widespread corruption and leakages in the PPT administration with sufficient tax reforms. A well-balanced PPT can strengthen government revenue and reduce debt dependency.
- iii. With regard to VAT, a downward review of the VAT should be conducted, from the current 7.5% to about 6% on essential goods in other to help reduce the debt-to-GDP ratio by boosting non-oil revenue, which will help decrease the burden on low-income households.

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**Appendix**

Year	QUARTERLY	Debt-GDP Ratio	CIT (N'B')	PPT (N'B')	VAT (N'B')
2016Q1	Mar	23.4	166.02	176.75	168.5
2016Q2	Jun	23.9	305.4	328.09	421.86
2016Q3	Sep	24.4	297.34	323.58	365.38
2016Q4	Dec	24.9	164.79	329.39	168.98
2017Q1	Mar	25.4	152.42	338.3	221.38
2017Q2	Jun	26.225	364.24	297.87	246.3
2017Q3	Sep	27.05	384.93	390.7	250.56

2017Q4	Dec	27.875	313.46	493.61	254.1
2018Q1	Mar	28.7	199.11	644.78	269.79
2018Q2	Jun	29.075	421.8	523.85	266.73
2018Q3	Sep	29.45	348.1	626.38	273.5
2018Q4	Dec	29.825	371.32	672.57	298.01
2019Q1	Mar	30.2	229.83	493.22	293.04
2019Q2	Jun	31.55	506.95	502.99	311.94
2019Q3	Sep	32.9	513.38	592.55	275.12
2019Q4	Dec	34.25	354.54	525.51	309.88
2020Q1	Mar	35.6	278.65	522.33	324.58
2020Q2	Jun	35.9	324.32	440.3	327.2
2020Q3	Sep	36.2	390.67	353.11	424.71
2020Q4	Dec	36.5	281.73	201.25	454.69
2021Q1	Mar	36.8	392.65	409.21	427.51
2021Q2	Jun	37.7	456.99	327.23	547.95
2021Q3	Sep	38.6	472.52	316.91	480.92
2021Q4	Dec	39.5	425.83	305.14	483.15
2022Q1	Mar	40.4	532.48	646.12	588.6
2022Q2	Jun	42.475	607.32	991.44	600.15
2022Q3	Sep	44.55	778.3	1,476.44	625.39
2022Q4	Dec	46.625	731.1	1,095.01	697.38
2023Q1	Mar	48.7	453.12	1,249.09	587.22
2023Q2	Jun	49.75	837.47	914.62	654.66
2023Q3	Sep	50.8	1,207.52	278.25	726.66
2023Q4	Dec	51.85	850.64	273.25	956.26
2024Q1	Mar	51.88	1,330.13	1,330.13	1,430.92
2024Q2	Jun	51.9	1,274.24	1,274.24	1,561.27
2024Q3	Sep	52.4	1,929.91	1,929.91	1,782.35
2024Q4	Dec	52.9	1,226.74	1,226.74	1,946.82