

Effect of Macroeconomic Determinants on Revenue Generation in Osun State, Nigeria

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Abstract

This study examined the effect of macroeconomic determinants on revenue generation in Osun State, Nigeria, for the period 2008 to 2023. The research was motivated by the growing need for Nigerian states to strengthen internally generated revenue to achieve fiscal sustainability. The study specifically assessed the effect of Value Added Tax on internally generated revenue, examined the effect of total public borrowing, and investigated the relationship between exchange rate movements and internally generated revenue. An ex post facto research design was employed, and this was solely based on secondary data from the Central Bank of Nigeria and Osun State Internal Revenue Service. The data was summarised using descriptive statistics, and correlation and multiple regression were used to analyse how the various variables related. The results showed that Value Added Tax has a significant positive effect with a high coefficient on internally generated revenue and thus is an important element of revenue mobilisation at the state level. The study examined the effect of macroeconomic determinants, which are proxied by Value Added Tax (VAT), Total Public Borrowing, and Exchange Rate Movements, on internally generated revenue in Osun State. The results revealed that Total Public Borrowing had a negative and insignificant effect, indicating that borrowing does not significantly boost internally generated revenue. Exchange Rate Movements exhibited a positive but statistically insignificant relationship with internally generated revenue. The study concluded that strengthening VAT enforcement, broadening the tax base, and improving compliance measures are essential strategies for achieving sustainable revenue collection in Osun State and reducing overreliance on borrowing.

Keywords: Value-added tax, public borrowing, exchange rate, internally generated revenue

Introduction

Nigeria has had a tax system before colonial times, which imposed a mandatory fee on the income, assets, and services of individuals, partnerships, executorships, trusts, and corporations. Taxes collected are given back to taxpayers as services, and income tax is one of the government's main sources of funding. In accordance with government policies, this has either stimulated or inhibited private sector activity. As a key instrument for long-term state infrastructure development, taxes are acknowledged as essential to the growth and development of the nation (Izang, 2025). State and local governments are forced to produce sufficient revenue from internal sources as a result of the drop in oil prices, which has reduced the amount of money available for distribution to the federal and state governments (Ikue et al., 2024).

At every stage of production or distribution, the value-added tax (VAT), which is a tax on the estimated market value added to a good or service, must be paid by the final consumer (Oto & Wayas, 2024). When the Federal Military Government of Nigeria originally introduced it in 1993, it was governed by the Value Added Tax Act Cap V1, LFN 2004, as amended (Chindengwike, 2022). The initial 5% VAT rate was raised to 7.5% by the Finance Act of 2021. As of February 1, 2020, all taxable deliveries of goods and services are subject to the new 7.5% charge rate. A more stable source of income obtained domestically was intended to replace oil revenue, which is prone to fluctuations in the price of petroleum worldwide, as the government's primary source of income (El-Yaqub & Musa, 2024). Effective fiscal policy is thought to be based on internally generated revenue since it makes it possible to extract resources needed for societal development from different firms and make them available for public welfare (Abada & Winarsih, 2024).

A social agreement between the state and its people enables the government to fulfil its fundamental duty of ensuring that its population enjoy an optimal standard of living. This involves offering infrastructure and amenities in return for taxes and good citizenship. But developing countries frequently have trouble carrying out their budgets, which results in low living standards and sluggish economic progress (Acosta-Ormaechea & Morozumi, 2021). A worrying trend that puts any country at serious risk is Nigeria's growing reliance on public debt to fund its budget. With debt servicing accounting for a sizeable amount of the yearly budget, the nation's debt load has escalated to alarming proportions. In order to ease the burden of public debt, Asaolu et al. (2025) suggest adding more revenue-generating activities to the budget.

Any country that depends too heavily on debt to fund budget execution runs the risk of harming future generations (Adebayo, 2020). Without extraordinary intervention, Nigeria's debt load is so heavy that it is expected to continue to burden even future generations (Asaolu et al., 2025). With many ideal expenditures indicated in the budgets but not carried out, analysts have observed that Nigeria's development over the previous few decades has not kept pace with the annual budgets. Nigeria's public debt has risen steadily during the last ten years, rising by more than fifty per cent from 2015 to 2023 (Asaolu et al., 2025). This loan, which ought to raise people's standards of living, appears to have pushed the country further into debt with little chance of repayment. According to budgetary statistics, planned expenditures have increased by more than 200% since the return of civilian governance in 1999 (Isibor & Babajide, 2018).

In economies like Nigeria, where external factors like currency rate volatility greatly influence inflationary trends, the link between petroleum product prices and inflation is nonlinear (Olusegun, 2023). This observation is supported by economic theory, which contends that, depending on external factors such as exchange rate fluctuations, increases in energy prices have varying effects on inflation (Adewale, 2025). Because of Nigeria's significant reliance on imported petroleum products, this relationship is especially complicated (Owolabi & Oladipo, 2018).

This dependence was made worse by the complete elimination of subsidies in May 2023, which resulted in sharply rising inflation and a sharp decline in the value of the home currency. By the end of 2024's second quarter, headline inflation had increased by 49.04%, from 22.41% to 33.40%. Energy inflation jumped from 18.72% to 36.91%, a startling 97.18% increase, while food inflation increased from 24.82% to 39.53%, a 59.27% increase (Ikue et al., 2024). During this period, the Naira lost more than 217.99% of its value in relation to the US dollar, highlighting Nigeria's susceptibility to fluctuations in the world's oil prices and exchange rates (Adewale & Raji, 2023). Because of its dependence on imported refined petroleum products, the nation is vulnerable to cost-push inflation, in which growing fuel prices raise the cost of production, transportation, and overall consumer prices (Adewale, 2025).

The main objective of this study is to examine the effect of macroeconomic determinants on revenue generation in Osun State, Nigeria, from 2001 to 2023. The specific objectives are to: Assess the effect of Value Added Tax (VAT), Total Public Borrowing (TPB), and Exchange Rate (EXR) as proxies for macroeconomic determinants on internally generated revenue in Osun State, Nigeria, and determine the relative contribution of each macroeconomic determinant proxy to the growth of internally generated revenue in Osun State.

Literature Review

Conceptual Review

Concept of Revenue Generation

In Nigeria, revenue, which includes tolls, taxes, rates, fees, penalties, rentals, forfeitures, dues, and other revenues from government sources, is a vital source of income generation. Sections 5 and 162 (10) of the 1999 Constitution and Section 160 (9) of the 1989 Federal Constitution both define it. According to Olasunkanmi & Adejuwon (2023), the Nigerian constitution recognises several sources of revenue, including property, dividends, interest on loans, incidental sources, permissive sources, and statutory sources. Revenue control is put in place to guarantee timely government revenue collection and payment to government accounts in order to achieve successful revenue creation.

Measurement of Revenue Generation

Total Government Income (TGR), Oil Revenue (OR), Non-Oil Revenue (NOR), and Total Public Borrowing (TPB) are some of the metrics used to assess income collection in Nigeria, according to Adewale (2025). The whole amount of money that a government receives from outside sources, including debt issuance, refunds, and intragovernmental transfers, is known as total government revenue. Taxes, administrative costs, fines, fees, grants, and gifts make up public revenue. Both domestic and foreign borrowing, including grants from overseas and loans from domestic financial institutions, are included in the total amount of public borrowing.

Based on the proportion of value added to goods or services, the Value Added Tax (VAT) is a multi-level tax collected at several points in the production-distribution cycle (Egolum & Celestine, 2021). It has been demonstrated to favourably impact the growth of a number of industries, including agriculture, health, transportation, education, youth and social development, environmental management, and infrastructure development. Improving macroeconomic stability and bringing the advantages of free trade to developing nations are the goals of substituting domestic consumption taxes, or VAT, for trade taxes (Ihenyen & Ogbise, 2022).

Nigeria's federal government receives its funding primarily from oil and non-oil sources. Although oil revenue has been viewed as a boon to the economy, it has also caused other industries to be neglected. Revenues from sources other than oil production, such as value-added tax,

personal income tax, companies' income tax, and customs and excise duties, are referred to as non-oil revenues (Olusegun,2023).

Value Added Tax (VAT)

Value added to goods and services during manufacturing, distribution, and rendering is subject to a multi-stage tax known as VAT. It is borne by the final customer and collected at every point of the production and distribution chain (Khan, 2024). VAT, an indirect tax that the government collects, is calculated as output tax less input tax (Akpokhio & Ekperiware, 2022). It was first imposed in Nigeria in 1994 to increase the government's tax base. Today, it is 5% on all products and services. The increased selection of goods and services, including those exempt from sales tax, played a role in the decision to switch from sales tax to VAT. (Bonga, 2017).

Exchange Rate

The exchange rate is the difference between a local currency and a foreign currency (Odey & Agunobi, 2024). Around the world, arbitrage is employed to keep it current. In Germany, for example, 0.01 euros to one naira is equivalent to 100 naira to one euro in Nigeria. Arbitrageurs buy euros in Germany to resell in Nigeria, increasing the supply of euros. As a result, the Euro weakens and the Naira increases in value. As the foreign exchange rate between the two currencies increases, on the other hand, the Euro gains value and the Naira loses value.

2.2 Theoretical Review

Benefits-Received Theory

In Barthia's (2009) view, citizens should pay taxes in proportion to the services provided by the government, with payments being based on the benefits obtained from the state. This idea seeks to guarantee that the total amount of taxes paid by the populace does not surpass the benefits offered by the government. The benefit method is a criterion for allocating tax burdens and a rationale for taxes. It guarantees that taxes are imposed for the benefit of the whole rather than for the advantage of any one person, emphasising the justice of not taking what is given. This principle has two implications: it provides a norm for allocating tax responsibilities and a rationale for taxing.

Musgrave Theory of Public Expenditure

The Musgrave theory of public spending, which was put forth in 1969, is centred on the construction of infrastructure, including transportation, energy, health care, and education. It uses structural variables to explain government growth and is based on how the public sector has changed over the course of development. Economies in their early stages of development have to meet a high demand for public capital formation in order to establish basic infrastructure. Public spending may decrease as private capital formation organisations develop. Musgrave discovered variations in the income elasticity of demand for public services over three per capita income categories, and his theory linked public sector financial management to both short- and long-term economic success.

In this study, the Musgrave theory aligns with the investigation of macroeconomic determinants of internally generated revenue in Osun State because it highlights how public expenditure decisions and fiscal structures (including taxation such as VAT, borrowing, and exchange rate management) influence revenue mobilisation and overall economic development. By explaining how public financial activities support infrastructure and economic capacity, the theory provides a framework for understanding how effective fiscal management and

macroeconomic policies can enhance internally generated revenue and reduce dependence on external borrowing.

Theoretical Framework

This study is anchored on the Benefits-Received Theory proposed by Erik in 1919 (Oliver et al., 2017). The theory posits that individuals are more willing to pay taxes when they perceive that the benefits they receive from government programs and services are commensurate with the taxes they pay. Although it recognises that not all public services can be directly linked to individual taxpayers, it emphasises the perceived fairness between the cost of taxation and the benefits derived. This theory anchors the present research by explaining how the perception of benefits derived from public revenue influences tax compliance and internally generated revenue. In the context of Osun State, when taxpayers see tangible improvements such as increased workers' wages and enhanced public services resulting from tax revenue, they are more likely to comply with VAT and other tax obligations. However, the theory's limitation lies in its inability to account for the experiences of the unemployed and private sector actors who may not directly perceive these benefits, especially when VAT increases lead to higher market prices.

2.3 Empirical Review

Amobi (2025) examined the impact of public bodies' and non-profit organisations' value-added tax treatment. The panel of 26 economies used yearly data to provide further detail for the years 1965–2007. When the total tax rate, which is measured as the ratio of the total tax bill to the GDP, was raised by two percentage points of GDP, the amount of real GDP per capita varied by -0.5 to 1%, indicating a negative and permanent impact of tax increases on real GDP per capita. In addition to their findings, they indicated that, in comparison to an increase or change in income tax, a rise or change in social security contributions or the tax on goods and services will have a significantly negative effect on per capita output.

Ozigbo et al. (2025) analysed the impact of exchange rate fluctuations on economic growth in Nigeria. It was done by using data from the CBN Statistical Bulletin, as well as taking into consideration a cointegration error correction mechanism under ex post facto research design requirements. It was found that inflation, interest rates and external reserves were other factors that determined economic growth. The results indicated that movements in exchange rates and interest rates had a negative and significant impact on economic growth, but the rates of inflation and external reserves had a positive and significant effect on economic growth throughout the period of analysis. The authors have concluded that macroeconomic stability is beyond the short-term policy changes, but rather structural reforms to boost domestic production and foreign exchange earnings are needed in the long term to improve the Nigerian currency.

Alabi et al. (2024) investigated the effects of internally generated revenue (IGR) and public debt on budget implementation in Nigeria using data from 2013 to 2022. The study used an ex post facto research design and analysed it by descriptive and panel regression analysis amid the measures of the budget performance in terms of capital and recurrent expenditures. The results indicated that IGR had a significant positive influence on capital expenditure and no significance on recurrent expenditure. The domestic and foreign debt had overwhelmingly positive effects on the capital and recurrent expenditures, signifying that a good canvas of rural utilisation of public debt will lead to better budget performance. The research findings were that generation of IGR, and sound debt management were important in the economic development sustainability and that beefing up of revenue and debt management policies enforcement should aim at maximising the use of public funds.

Ikue et al. (2024) investigated the combined effects of petroleum product prices and exchange rate fluctuations on inflation in Nigerian states. The data used were quarterly data of 2016: Q1-2024: Q2. Using a multiplicative interaction model and both static and dynamic panel estimators, the author explained away state-specific unobserved factors by specification with within-effects. Findings revealed that Automotive Gas Oil (AGO), Premium Motor Spirit (PMS) had a substantial effect on both the headline inflation and food inflation, and Dual Purpose Kerosene (DPK) had ambiguous impacts, and Liquefied Petroleum Gas (GAS) had insignificant impacts. It was proved that the Exchange rate fluctuations increased the inflationary pressures, and proximity to the seaports and depots was proved to have a moderating effect because distribution costs were lower. The paper highlighted the importance of regional policies such as slight subsidisation in distant states, to reduce disparities in inflation and the stability of prices in the country.

Wayas & Oto (2024) studied the connection between Nigeria's value-added tax (VAT) and economic indices using data from 2003 to 2022. VAT revenue was found to be significant to GDP, TE and TR when the variables were subjected to analysis with TR, TE and GDP. Government spending (TE) and VAT revenue were closely linked, but one cannot know how exactly the money is spent on certain industries, such as health or education. To allow stratified allocation of VAT money to critical sectors such as health, power and agriculture to enhance the well-being of the citizens and the economy, the report proposed the establishment of the Value Added Tax Fund (VATFund).

El-Yaqub & Musa (2024) assessed the influence of Petroleum Profit Tax (PPT), Companies Income Tax (CIT) and Value Added Tax (VAT) on the economic growth of Nigeria, between 1986 and 2021. They were related to their GDP using annual time series data of the CBN and NBS and the Vector Error Correction Model (VECM). Other findings are significant results - long-term internal balancing effects, and impacts on cause-and-effect aspects of the GDP and the tax components. It shows that VAT significantly and positively impacted both the short and long-term growth of GDP, whereas PPT initially had minor effects that increased with time. CIT raised the GDP in the short-term, but affected it in a negative way in the long-term. Improving efficiencies within the petroleum industry, a business-friendly environment to boost the VAT base, and enhancing tax compliance by providing better services to the people were some of the research recommendations.

According to a study by Obadiaru et al. (2024), tax income had an impact on Nigeria's economic growth from 1991 to 2021. The tax data was sourced from the Nigerian Bureau of Statistics (NBS) and Federal Internal Revenue Service (FIRS), while the Central Bank of Nigeria (CBN) used economic data from its 2021 Statistical Bulletin to analyse the Nigerian economy. The GDP was the dependent variable, and the proxies for tax revenue were value-added tax (VAT), corporate income tax (CIT), and personal income tax (PIT). Descriptive statistics tests to determine the normalcy of the data and diagnostic tests like the Augmented Dickey-Fuller unit root test to determine the stability of the data were useful methodological measures. The Autoregressive Distributed Lag (ARDL) method used the statistical tool of E-View version 9. Starting with the results of the ARDL analysis, it revealed that value-added tax (VAT) and personal income tax (PIT) had adverse effects on GDP, whereas corporate income tax (CIT) positively influenced GDP. The conclusion of the study was that tax revenue and economic growth of Nigeria had a significant positive relationship. It advised governments and tax administrators to prioritise rising inflow of tax to facilitate economic growth, especially in sectors that spearhead the economic development of a country.

Olusegun (2023) examined the effects of revenue and budget risk factors on Nigeria's federal government capital expenditure (FGCE) based on annual data between 1993 and 2022, as

an ex post facto research design, bounds testing and ARDL regression. The factors measured in the study included oil and non-oil revenues, volatility of oil prices, and risks faced in external debt transactions. In its findings, it was seen that upstream oil revenue had an influence of 0.5 and a significant impact on FGCE; downstream oil revenue (measured by petroleum profit tax) had a positive but not significant influence. Revenues that were not related to oil, especially the company income taxes and customs duties, improved FGCE substantially as compared to value added tax, which did not make any contribution. Oil price volatility displayed some non-existence of its effect in the long-term, showing that it was a short-run phenomenon with a big error adjustment and correction speed. The cost of servicing external debt and expenses had a large positive impact on FGCE, with global interest rate volatility and exchange rate risk being positive but not significant. The research finding was that good revenue generation and wise debt management are key to sustainability in capital investment.

Kwanti & Dauda (2022) investigated the effect of value-added taxation (VAT) on the expansion of the Nigerian economy during 26 years, from 1994 to 2020, using secondary data, mostly from the Central Bank of Nigeria and the National Bureau of Statistics. The research was aimed at establishing whether VAT was statistically significant and how it influenced economic variables through the regression statistical model. The key findings revealed that there is a positive and high correlation between the economic expansion of Nigeria and VAT. In addition, it was found that VAT made a positive impact on the revenue collected by the federal government, thus showing that VAT is very important in predicting the revenue collection behaviours of the government. The study found that VAT influenced the revenue base of the country and the economic growth trend of Nigeria. Based on these findings, a number of recommendations were made. These included enhancing the control of the collection of the VAT to ensure effectiveness and fairness, hence generating more income for the government. The study also highlighted the need to ensure that insiders are not allowed to generate VAT illegally so as to maximise the amount that the tax can generate. It even indicated that the VAT revenues could be used to improve the living standards and expand the infrastructure, such as power, transport, and communication systems. This was assumed to be a well-thought-out allocation of cash to enhance Nigeria in terms of production as well as to entice taxpayers to pay their taxes.

Onoja & Ibrahim (2020) investigated the relationship between tax revenue and Nigeria's economic growth from 2003 to 2017 using regression analysis. A significant correlation between GDP and VAT was found. The findings of Harvest and Ataisi's (2022) study, which examined the connection between GDP, VAT, and Nigeria's economic growth from 2000 to 2020, are in line with this. Chigbu & Ali (2014) analysed the impact of value-added tax on the economic growth of Nigeria over 18 years (1994 to 2012) based on the econometric analysis. Its findings indicated that VAT positively influenced the economic growth, as indicated by the real GDP, through the Engle and Granger cointegration method. Also, it was apparent that neither a short-run nor a long-run relationship existed between VAT and GDP in the findings.

Ogwuche et al. (2019) examined the effect of corporate income tax on Nigeria's economic expansion over eleven years (2007–2017). Using data on corporate income tax and gross domestic product, the study used descriptive statistics and multiple regression analysis. The results showed that Nigeria's economic growth is significantly impacted by corporate income tax. This study connects with the present research through its emphasis on tax revenue as a macroeconomic determinant of fiscal performance. While Ogwuche et al. focused on company income tax at the national level, the current study extends this perspective by examining Value Added Tax (VAT) along with Total Public Borrowing (TPB) and Exchange Rate (EXR) as macroeconomic determinants of internally generated revenue in Osun State. Both studies, therefore, align on the

premise that efficient tax administration and fiscal policies are vital for sustainable revenue generation and economic stability.

Canavire-Bacarreza (2018) evaluated the impact of general taxes on goods and services, corporate income tax, personal income tax, value-added tax, and other sales taxes and revenues from natural resources on economic growth. The vector autoregressive procedures were applied to nearly the whole region and a global grouping of the developing and mature economies in panel data estimations. They found that personal income tax had a significant positive impact on economic growth in Latin America, contrary to what was anticipated. They also found that the business income tax had only minor negative effects on the economy of individual countries, such as Argentina.

Yusuf (2018) evaluated the data collected using a straightforward linear regression method to investigate the causal association between value-added tax and economic growth in Nigeria from 1980 to 2016. The gross domestic product, value-added tax, domestic investment, degree of openness, corruption index, interest rate, and real exchange rate were all employed as stand-in variables to determine the value-added tax and economic growth in the nation. Value-added tax, domestic investment, and openness were found to be considerably positively correlated with Nigeria's gross domestic product, whereas the corruption index was positively correlated with the country's GDP. The research advised that tax administrative loopholes ought to be closed so that tax revenue can help in the economic development of the nation. Other recommendations of the study included, among others, that the government needed to utilise the services of tax professionals in minimising tax malpractices committed by taxpayers, as well as any other kinds of tax evasion.

Bonga (2017) examined the relationship between VAT and total tax revenues in Zimbabwe. Time series analysis was used in the study for the period 2011-2017. In the regression result, the total revenue of the VAT on local sales was also affected and highly reacted to the VAT. There was an adverse effect on Value-added Tax (VAT) on imports as well as a positive effect on VAT at local sales. The revenue authority took notice of the introduction of Automated Teller Machines (ATM).

Methodology

The research design employed in this study is ex post facto research to examine how Value Added Tax (VAT) is influencing revenue generation in Osun State over time. It is based on the information obtained from credible sources as the Central Bank of Nigeria Statistical Bulletin and reports provided by the Osun State Internal Revenue Service. The sample has 16 yearly observations, as each observation is one fiscally-calculated year, in order to realise the relationship between Value Added Tax and Internally Generated Revenue with time. The authors apply descriptive statistics and inferential statistics in offering the trends and patterns followed in the study and the Ordinary Least Squares (OLS) regression analysis has been utilized to define the relationship between the independent variable - Value Added Tax (VAT) and the dependent variable - Internally Generated Revenue (IGR) and Control Variables of Total Public Borrowing (TPB) and Exchange Rate (EXR). The comparative analysis is carried out with the help of E-Views 13 econometric time-series analysis package.

Model Specification

In order to examine the effect of value-added tax (VAT) on Internally Generated Revenue (IGR) in Osun State, this paper defines a multiple line regression model. The model follows the purpose

of the study and the economic theory that states that tax revenue, government borrowing, and other macroeconomic indicators are associated with revenue-generating at the state level.

1. Functional Form of the Model:

$$IGR_t = f(MED_t)$$

Expanding the model:

$$IGR_t = f(VAT_t, TPB_t, EXR_t)$$

Where:

- IGR_t = Internally Generated Revenue in year t
- MED_t = Macroeconomic Determinants in year t (a composite of VAT, TPB, and EXR)
- VAT_t = Value Added Tax in year t
- TPB_t = Total Public Borrowing in year t
- EXR_t = Exchange Rate in year t

In this study, VAT, Total Public Borrowing, and Exchange Rate are treated as proxies for macroeconomic determinants that influence the growth of internally generated revenue in Osun State. This modification aligns the model with the revised independent variable and resolves the conceptual inconsistency previously noted by the reviewer.

2. Econometric (Linear) Form of the Model:

$$IGR_t = \beta_0 + \beta_1 VAT_t + \beta_2 TPB_t + \beta_3 EXR_t + \mu_t$$

Where:

β_0 = Intercept term

$\beta_1, \beta_2, \beta_3$ = Coefficients of the independent variables

μ_t = Error term in year t

t = Time period from 2008 to 2023

Results and Discussion

Table 1: Descriptive Statistics

	IGR	VAT	TPB	EXR
Mean	983.2878	555.4199	748.9545	292.0768
Median	761.4602	393.2952	184.2839	251
Maximum	2620.228	1555.269	5873.692	899.893
Minimum	441.1459	198.0653	0.977858	132.5625
Std. Dev.	599.3806	373.8617	1599.01	195.0705
Skewness	1.558729	1.52963	2.563228	1.977168
Kurtosis	4.589677	4.417301	8.129247	6.900367
Jarque-Bera	8.163742	7.578545	35.05982	20.56643
Probability	0.016876	0.022612	2.44E-08	3.42E-05
Sum	15732.61	8886.719	11983.27	4673.228
Sum Sq. Dev.	5388856	2096588	38352474	570787.3
Observations	16	16	16	16

Source: Author's Computation (2025)

Table 1 shows the descriptive statistics of the variables utilised in this research, which are Internally Generated Revenue, Value Added Tax, Total Public Borrowing and Exchange Rate of the Osun State between 2008 and 2023. And the mean figure of Internally Generated Revenue within the period was 983.29 million naira, with the minimum and maximum values showing between 441.15 million naira and 2,620.23 million naira, respectively, which is quite wide and represents huge variations in the revenue generation abilities of the state. Value Added Tax averaged 555.42 million naira, and the lowest value was 198.07 million naira, and the highest was 1,555.27 million naira, which indicates a consistent contribution of Value Added Tax to Internally Generated Revenue but with diverse year-to-year variations.

The most inconsistent variable was Total Public Borrowing, which had an average value of 748.95 million naira, a very large standard deviation of 1,599.01 million naira, and a large extent as measured with a range of the minimum value 0.98 million naira and the maximum value 5,873.69 million naira. It implies that the Osun State has been inconsistent with its reliance on borrowing to run the Osun fiscal balances and that it has been highly fluctuating between an increasing and decreasing trend over the study period. The average rate to exchange naira against the United States dollar was 292.08 naira to one United States dollar, the lowest being 132.56 naira and the highest being 899.89 naira. This means that the naira kept on depreciating against other currencies in the foreign market.

All the skewness values indicate that all the variables have skewed distributions towards the right, where the mean has a higher frequency of observations that are less than the mean. Kurtosis statistics indicate leptokurtic distributions in all the variables, especially, on Total Public Borrowing (8.13) and Exchange Rate (6.90) statistics, with more emphasis on tails, and the probability of outliers is higher. Jarque-Bera statistics of Internally Generated Revenue, Value Added Tax, Total Public Borrowing and exchange rate, which have probability of less than 0.05, indicate that the null hypothesis of normality can be rejected, indicating that the data is not normally distributed. This non-normality arises with time-series economic data because shocks and irregularity occur in time.

To conclude, descriptive results are an indicator that although Value Added Tax and Internally Generated Revenue have recorded modest growths with estimable fluctuations, other aspects, such as public borrowing and changing exchange rates, are major fiscal concerns. This trend of the Value Added Tax has been steady and has shown some variation, thus making it an internally generated revenue that can be specifically relied upon to be relatively stable in Osun State.

Table 2: Correlation Matrix

	IGR	VAT	TPB	EXR
IGR	1			
VAT	0.987992	1		
TPB	-0.08877	-0.05058	1	
EXR	0.949636	0.951699	0.039195	1

Source: Author's Computation, (2025)

The correlation between Internally Generated Revenue and Value Added Tax is very strong, indicating a positive relationship between the two. This relationship confirms the fact that growth in Value Added Tax collection is directly related to increased internally generated funds (0.987992). There is also a large positive relationship between Internally Generated Revenue and

Exchange Rate (0.949636). This indicates the high rate of influence of the exchange rate, which is assumed to be the effects of depreciation of the currency and the effect of inflation on the revenue generation. The negative and low correlation of the relationship between the Internally Generated Revenue and Total Public Borrowing (0.08877) suggests that elevated borrowings do not firmly correlate with decreased internally generated revenues.

The values are also strongly correlated between Value Added Tax and Exchange Rate, which is (0.951699), as such, exchange rate movements affect the amount of Value Added Tax receipts, perhaps by movement in the prices of goods and services. Correlations of Total Public Borrowing with Value Added Tax (-- 0.05058) and Exchange Rate (0.039195) are very poor, implying that the borrowing decisions are not to any major extent related to these two factors.

Summarily, the results of the correlations indicate that the biggest factors that are related to internally generated revenue changes in Osun State are Value Added Tax and exchange rate movements. The low and negative relationship between the borrowing and internally generated revenue shows how the state has been borrowing to cover the shortfall in its internally generated revenue. It is quite evident that the administration of Value Added Taxes should be more competent in order to achieve long-run sustainability in the fiscal performance of the state.

Regression Analysis

Dependent Variable: IGR

Method: Least Squares

Date: 07/27/25 Time: 01:24

Sample: 1 16

Included observations: 16

Table 3: OLS Regression Results (Dependent Variable: RGDP)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	113.03	46.03	2.46	0.030293
VAT	1.35	0.23	6.02	6.05E-05
TPB	-0.02	0.02	-1.20	0.253261
EXR	0.45	0.43	1.05	0.314641
R-squared	0.98	Mean dependent var		983.2878
Adjusted R-squared	0.97	S.D. dependent var		599.3806
S.E. of regression	95.91	Akaike info criterion		12.17698
Sum squared resid	110380.30	Schwarz criterion		12.37012
Log likelihood	-93.42	Hannan-Quinn criter.		12.18687
F-statistic	191.28	Durbin-Watson stat		2.55879
Prob(F-statistic)	0.00			

Source: Author's Computation (2025)

Table 3 shows the findings of the Ordinary Least Squares regression analysis of the impact of Value Added Tax, Total Public Borrowing, and Exchange Rate on Internally Generated Revenue in Osun State between the years 2008 and 2023. The dependent variable is Internally Generated Revenue, whereas the independent variables are Value Added Tax, Total Public Borrowing and Exchange Rate.

Constant (intercept) coefficient is 113.03, its standard error is 46.03, t-statistic is 2.46, and the probability level is 0.030293. This is statistically significant at the 5 per cent level, which

implies that once all independent variables take the value 0, then Internally Generated Revenue will take the value of about 113.03 units.

Value added tax coefficient is 1.35 and standard error is 0.23 with the t-statistic of 6.02 and the probability of 0.0000605. The results are extremely significant at the level of one per cent, which implies that there is a positive and strong correlation between Value Added Tax and Internally Generated Revenue. With the other factors being held constant, a unit rise in Value Added Tax can be experienced to have an average rise of 1.35 units in Internally Generated Revenue. This fact means that Value Added Tax is one of the most important rates of revenue collection in Osun State, and that smart management and VAT collection expansion may have a significant fiscal effect.

The coefficient of Total Public Borrowing is -0.02 with a standard error of 0.02, and the t-statistic is -1.20, the probability value is 0.253261. Such probability is greater than the usual significance levels (1%, 5%, and 10%), and it denotes that there was no statistically significant correlation between Total Public Borrowing and Internally Generated Revenue. In as much as the negative coefficient can be interpreted as an indication that additional borrowings have the likelihood of marginally lowering revenue earnings, no specific evidence is provided to substantiate this association since it did not show any significance. This may be because the borrowed funds do not always find their way into revenue-generating projects, or that other fiscal forces tend to reflect more than the prospects of borrowing.

The Exchange Rate coefficient is 0.45 with a standard error of 0.43, a t-statistic of 1.05 and has a probability value of 0.314641. This is also not statistically significant at the conventional level. Though the sign of the coefficient is positive, it may be observed that, although naira depreciation may be associated with higher Internally Generated Revenue--perhaps by higher nominal value of transactions or improved competitiveness in exports--insufficient evidence can be adduced to confirm a stable or predictable relationship during the study period.

The coefficient of determination, R-squared = 0.98 shows that 98 per cent of the variation in Internally Generated Revenue is revealed by Value added tax, Total public borrowing, and Exchange rate. The measure of explanatory power, in this case, the adjusted squared R-Squared, equals 0.97, which proves that it remains high despite the number of variables. The overall model is statistically significant, since the F-statistic = 191.28, and its probability = 0.00. This Durbin Watson statistic value of 2.55879 indicates that autocorrelation is not a major concern, supporting the validity of the estimates.

Going by the conclusion, the findings of the regression analysis prove that Value Added Tax would influence the Internally Generated Revenue in Osun State positively and significantly and Total Public Borrowing and Exchange Rate would not have a statistically significant influence. These results indicate that emphasis given to improving the effectiveness and collection of VAT as well as improving its coverage should be a viable policy option that will ensure that the state improves its revenue base.

Discussion of Findings

The regression results indicate that value-added tax (VAT) is significantly and positively influencing the Internally Generated Revenue (IGR) of Osun State. This means that the growth of VAT revenues correlates with the growth of IGR of the state. This strong relationship reiterates that VAT is a stable and critical source of revenue to the government as a state. This observation is congruous with the study by Yusuf (2018), who identified that in Nigeria, VAT and homegrown investments also had strong positive correlations with economic growth, as well as Kwanti & Dauda (2022), who concluded that VAT is also an important fiscal instrument in the growth of

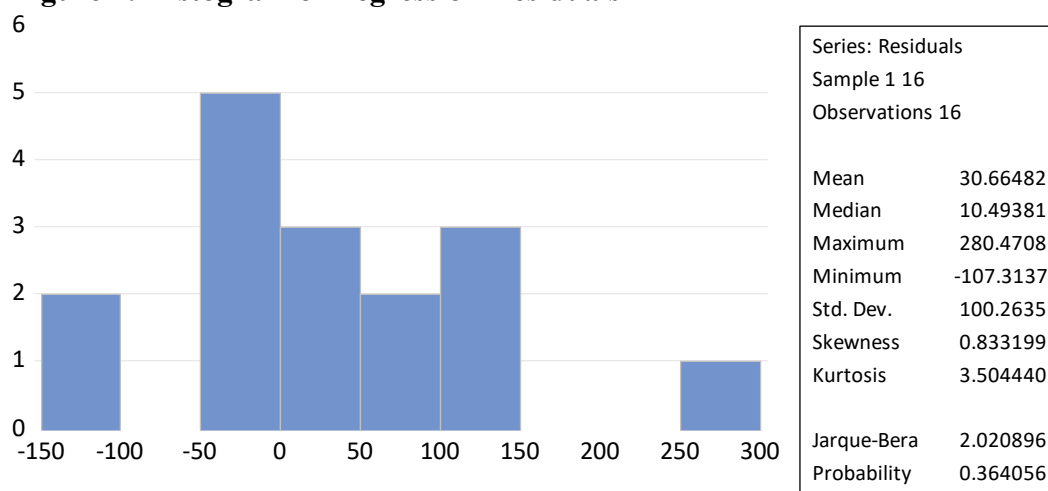
state income. On the same note, El-Yaqub & Musa (2024) determined that VAT was effective in enhancing fiscal capacity in the subnational governments. The uniformity among the previous papers and the current results supports the significance of effective VAT administration that enhances state revenue increase.

The results, on the other hand, show that Total Public Borrowing (TPB) has negative but statistically insignificant effects on IGR. This implies that borrowing by the Osun State Government does not necessarily or not have a predictable effect on Osun State internally generated funds. Whereas descriptive statistics indicate that borrowing may increase with a decline in tax collection, the statistical results obtained in the research do not offer a significant relationship determining cause and effect. This is similar to the conclusion that Olusegun (2023) made, stating that borrowing did not have a statistically significant positive impact on generating revenues at the state level in Nigeria. Similarly, Obadiaru et al. (2024) discovered that the overuse of debt in supporting recurrent and capital spending had fiscal constraints without an income rise to support it in the long term.

The results of the regression analysis are also supported by the high positive relationship recorded between VAT and IGR during the correlation examinations that pointed towards a direct significant relationship between the variables. Conversely, the low and insignificant relationship between TPB and IGR depicts the regression result that the public borrowing is not a major force on internally generated funds.

All the findings point to the fact that VAT is a credible, evidence-based and policy-relevant tool in enhancing revenue generation in Osun State. Effective VAT collection and management would thus be an effective budgetary policy that is likely to last long compared to excessive borrowing that may do little to increase revenues. Based on these findings, the Osun State fiscal policy should focus primarily on the need to improve tax collection administration, particularly, VAT, in addition to ensuring that the fiscal policy does not result in long-term challenges to debt sustainability arising due to excessive borrowing.

Figure 1: Histogram of Regression Residuals



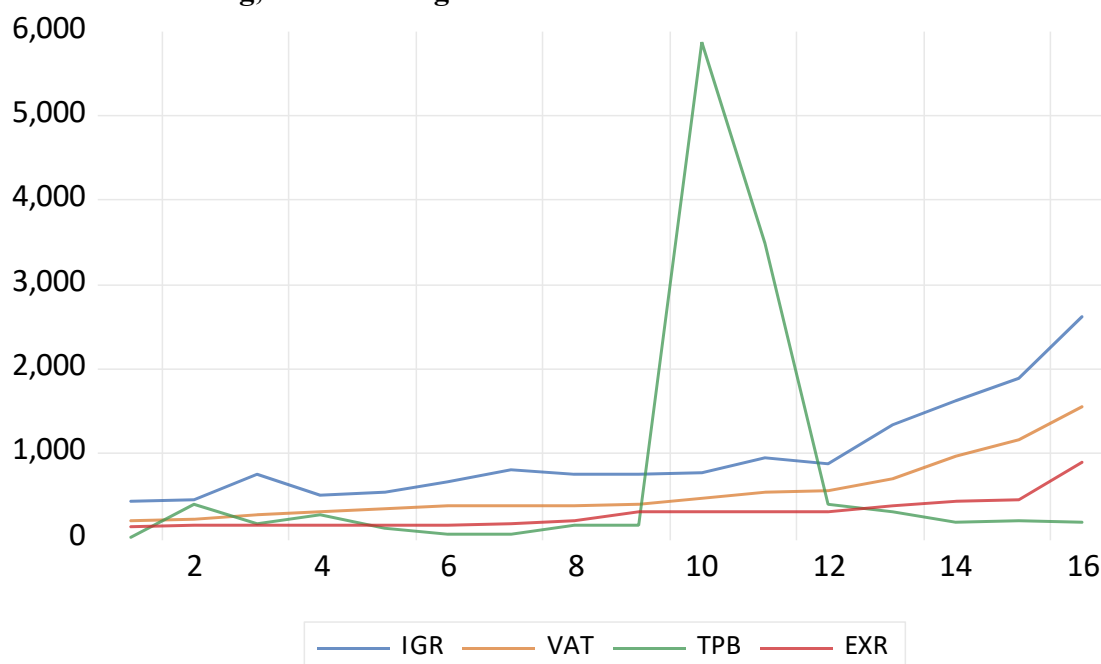
Source: Author's Computation (2025)

It is a histogram that gives the distribution of the residuals of the multiple regression model that determines the influence of Value Added Tax, Total Public Borrowing, and Exchange Rate on the Internally Generated revenue of Osun State. The residual is a measure of the difference between the predicted and actual amounts of an internally generated revenue.

As the descriptive statistics reveal, the mean residual is 30.66 with a median value of 10.49, which is about the origin, owing to the fact that the model does not generally overpredict or underpredict internally generated revenue. The standard deviation of 100.26 indicates a medium value of the dispersion of the residuals around the mean. The skewness figure of 0.83 shows that it is somewhat positively skewed, i.e., the majority of the residuals are located on the left side with some large positive errors. The correlation of the value of kurtosis is 3.50, which is almost the normal distribution set at 3, thereby suggesting that there is a fairly normal peak in the residuals.

The Jarque-Bera statistic 2.02 at 0.3641 is not statistically significant at the standard levels, and this indicates that the warning about rejecting the null hypothesis of normally distributed residuals is true. This implies that the regression model was normal, and this improves the confidence of the estimated coefficients.

Figure 2: Time Series Trend of Internally Generated Revenue, Value Added Tax, Total Public Borrowing, and Exchange Rate



Source: Author's Computation (2025).

This figure shows the time series of Internally Generated Revenue, Value Added Tax, Total Public Borrowing and Exchange Rate over the 16 years that the study covers (2008-2023) in Osun State. Internally Generated Revenue exhibits the trend of a gradual increase and accelerated enhancement at the end of the period, in line with the intent to enhance mobilisation of revenue on a state level. VAT similarly has an upward trend whose level is rather small, which implies that the increase in VAT has played a very important role in the overall growth in the Internally Generated Revenue.

Sharp volatility is also characteristic of Total Public Borrowing, as evidenced by a sharp increase in borrowing in the 10th year of observation, when the level of borrowing increased sharply only to fall back to the comparatively lower levels. This means that the borrowing was

mainly influenced by certain fiscal strains as opposed to chronic dependency. Exchange Rate shows a clear trend upwards over the period and is in line with the ever-decreasing value of the Nigerian naira, especially during the latter part of the series.

Generally, the trends show that growth in internally Generated Revenue and value-added tax has been relatively steady, but the total borrowing by the government has been so uncalculated, and the Exchange Rate has been soaring. The trend confirms the fact that Value Added Tax is a major contributor to internally generated revenue, whose role is quite predictable, but borrowing is a less predictable one.

Conclusion and Recommendations

Conclusion

The results of the research show that a Value Added Tax contributes significantly and is a reliable source of internally generated revenue in Osun State. The fiscal capacity of the state, which is dependent on Value Added Tax, can be greatly enhanced by enhancing collection, increasing its coverage and enhancing compliance mechanisms. Although Total Public Borrowing can sometimes be a helpful tool to fill temporary fiscal gaps, the use of this approach to provoke revenue collection does not reveal any significant effect, and continuous dependence on this method can lead to the non-realisation of long-term fiscal sustainability. Fluctuations in the exchange rates were argued to have a positive yet statistically not significant relationship with internally generated revenue, which in turn implies that the currency movements do not automatically offer a consistent or steady foundation on which the state could improve its revenue standing. In general, policy measures ought to be directed at strengthening the administration of Value Added Tax, besides embracing judicious borrowing behaviour and keeping a close eye on external economic conditions, including the changes in the exchange rates, in order to reduce the fiscal fragility.

Recommendations

1. The state government should increase the effectiveness of value-added tax collection by strengthening enforcement procedures, decreasing leakage, and broadening the tax base to assure steady and predictable growth of internally produced revenue and minimise the internally generated revenue curve.
2. Osun State should focus on sustainable revenue-raising strategies in an effort to reduce the fiscal risks associated with excessive borrowing, as evidenced by the negative and negligible effects of total public borrowing on domestically generated income.
3. Although there is not much of a direct impact of exchange rate fluctuations on revenue generation, state policies that support local production and economic stability can help protect state revenues from the effects of inflation and currency depreciation.

References

- Abada, M. F. I., & Winarsih, W. (2024). The effect of e-commerce, tax, supervision, and tax audit on value-added tax revenue (case study on Kudus Regency taxpayers). *Journal of Advanced Multidisciplinary Research*, 5(1), 13–27.
- Acosta-Ormaechea, S., & Morozumi, A. (2021). The value-added tax and growth: Design matters. *International Tax and Public Finance*, 28(5), 1211–1241.
- Adebayo, A. (2020). Taxing emerging digital economy: A vital buffer to an ailing economy. *Journal of Management and Corporate Governance*, 2(1), 1-12
- Akpokhio, M., & Ekperiware, M. C. (2022). Impact of companies income tax, petroleum profits tax and value-added tax in Nigeria. *Journal of Economics, Business Management and Administration*, 3(3), 31–47.
- Alabi, A. W., Atanda, F. A., Akintoye, I. R., & Kajola, S. G. (2024). Internally generated revenue, public debt and budget implementation in Nigeria. *African Journal of Business & Economic Research*, 19(3), 145-171.
- Ali, M. J. (2024). The impact of value-added tax on consumer behavior in Oman. *Research and Development (IJAFMRD)*, 2(1), 1-14.
- Anthony Kwanti, A., & Dauda, H. (2022). Impact of value-added-tax (VAT) on the economic growth of Nigeria (1994–2020). *Journal of Economics*, 1(1), 28811–2695.
- Adewale, A. A. (2025). Capital Expenditure and Inflation: Is Government Spending Worsening Nigeria's Economic Crisis? *Indonesian Journal of Business and Economics*, 8(1), 1116-1137. <https://ijbe.uniku.ac.id/pub/article/view/2>
- Adewale, A. A., & Raji, L. A. (2023). Effect of exchange rate fluctuation on external reserve in Nigeria. *Journal of Perspectives in Management – JPM*, 7, e258848. <https://doi.org/10.51359/2594-8040.2023.258848>
- Asaolu, A. A., Adewale, A. A., & Ozabeme, L. S. (2025). Effect Of Public Debt on Nigeria's Economic Growth. *Nigerian Journal of Management Sciences*, 26(1b), 123-136.
- Bonga, W. G. (2017). Empirical examination of the link between value-added tax and total tax revenues in Zimbabwe. *DRJ's Journal of Economics & Finance*, 2(8), 5–14.
- Chindengwiwe, J. (2022). The influence of value-added tax revenue on private domestic investment in developing countries. *Journal of Global Economy*, 18(4), 289–310.
- Egolum, P. U., & Celestine, U. U. (2021). The effects of value added tax on the economic development in Nigeria. *Journal of Humanities and Social Sciences*, 26(5), 21-23
- El-Yaqub, A., & Musa, I. (2024). Empirical analysis of the impact of tax on economic growth in Nigeria: Evidence from vector error correction model. *International Journal of Humanities and Social Science*, 12, 2321–9467.
- Ihenyen, C. J., & Ogbise, T. A. S. (2022). Effect of tax revenue generation on economic growth in Nigeria. *International Journal of Business and Management Review*, 10(2), 44–53.
- Ikue, N. J., Sodipo, J., Oraemesi, C., Enegesi, L., Yisa, D., Anthony, V., & Nna, C. (2024). The combined effects of retail energy prices, and exchange rates on inflation in Nigeria States. *Bussecon Review of Social Sciences*, 6(1), 14-28.
- Isibor, A. A., & Babajide, A. A. (2018). The effect of public debt on economic growth in Nigeria: An empirical investigation. *International Business Management*, 12 (6),436-441
- Izang, R. L. I. R. L. (2025). Effect of value-added tax on consumer purchase decision of household products in Abuja. *Journal of Taxation and Revenue Management*, 3(1), 56-69.
- Obadiaru, E., Brian-Kufre, O., & Ayeni, A. (2024). The impact of tax revenue on economic growth in Nigeria. *International Journal of Multidisciplinary Research and Growth Evaluation*, 5(1), 566–571. <https://doi.org/10.54660/IJMRGE.2024.5.1.566-571>

- Oladipo, O., & Owolabi, O. (2020). Factors affecting value-added tax revenue generation in Nigeria. *International Journal of Academic Research in Business and Social Sciences*, 10(1), 1–12.
- Olasunkanmi, F. O., & Adejuwon, J. A. (2023). Valued added tax automation and revenue generation in Nigeria. *International Research Journal of Economics and Management Studies (IRJEMS)*, 2(4), 225-236.
- Olusegun, E. A. (2023). Assessing the Effects of Revenue and Budget Risk Factors on Capital Expenditure of Federal Government in Nigeria. [researchgate.net/publication.DOI:10.13140/RG.2.2.26082.95680](https://researchgate.net/publication/DOI:10.13140/RG.2.2.26082.95680).
- Oto, T., & Wayas, S. (2024). Value added tax and economic growth of Nigeria (2003-2022). *FUDMA Journal of Accounting and Finance Research*, 2(1), 15-30. <https://doi.org/10.33003/fujafr-2024.v2i1.74.15-30>.
- Owolabi, O., & Oladipo, O. (2018). The impact of inflation on value-added tax revenue in Nigeria. *International Journal of Academic Research in Business and Social Sciences*, 9(3), 1–10.
- Ozigbo, S. A., Ekane, R. O., & Ujuju, L. E. (2025). Exchange Rate Fluctuations and Economic Growth in Nigeria: An Empirical Analysis. *International Journal of Economics and Financial Issues*, 15(2), 252-259.
- Uche, T. A. (2021). Effects of electronic banking on financial performance of deposit money. *International Journal of Accounting and Finance* 16(3), 71-84.
- Wayas, S., & Oto, T. (2024). Value-added tax and economic growth of Nigeria (2003–2022). *FUDMA Journal of Accounting and Finance Research*, 2(1), 15–30. <https://doi.org/10.33003/fujafr-2024.v2i1.74.15-30>.
- Yusuf, H. A., Abidin, T. S. Z., Bakar, N., & Musa, O. H. (2018). Causality between VAT and economic growth in Nigeria: An ARDL bounds testing approach. *Journal of Emerging Economies & Islamic Research*, 6(1), 55–67.