

Tax revenue reformation and macro-economic performance in Nigeria

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ABSTRACT

The overall health and well-being of a nation are reflected in its macroeconomic performance, which is typically measured by gross domestic product, interest rates, inflation, and the unemployment rate. Over the years, Nigeria's macroeconomic performance has been affected by various factors, including taxation, exchange rate fluctuations, corruption, price changes, and insecurity. The specific objectives of this study are to examine the effect of tax revenue reformation on economic growth in Nigeria, investigate the impact of tax revenue on unemployment rate, assess the influence of tax revenue reformation on the inflation rate, and analyze the causal relationship between tax revenue reformation and economic growth in Nigeria. The error correction model technique was utilized to examine the effect of tax revenue reformation on macroeconomic performance in Nigeria. This study covers the time period from 2000 to 2024. The study highlights that total tax revenue, petroleum profit tax and value-added tax has a negative long-run association with gross domestic product while company income tax has a positive long-run relationship with gross domestic product. Second, total tax revenue has a negative long-run association with unemployment, while, petroleum profit tax, value added tax and company income tax has a positive long-run connection with unemployment. There exists a unidirectional causality between total tax revenue and economic growth. The study recommends that total tax revenue, petroleum profit tax, and value-added tax should be utilized effectively by the government in order to foster significant economic growth in the long-run.

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1. INTRODUCTION

The overall health and well-being of a nation are reflected in its macroeconomic performance, which is typically measured by gross domestic product, interest rates, inflation, and the unemployment rate. This performance indicates whether a country is experiencing growth or recession (Akinola & Kuye, 2025). Key macroeconomic indicators, such as economic growth, unemployment, and inflation rates, reveal the health and progress of the economy (Akinola & Adekile, 2024). Macroeconomic performance has a significant influence on the overall living standards of individuals (Temilade, Gbenga, & Babatunde, 2024). Over the years, Nigeria's macroeconomic performance has been affected by various factors, including taxation, exchange rate fluctuations, corruption, price changes, and insecurity. Taxation, as a primary means of revenue generation, is usually imposed by the government to protect emerging industries, provide infrastructure, and promote economic performance globally (Ejeh et al., 2025; Boadway & Flatters, 2023; Accordino, 2020). However, taxation remains vital for improving Nigeria's macroeconomic performance because it is essential for generating revenue, redistributing wealth, and regulating the economy. Additionally, tax revenue plays a significant role in supporting sustainable economic growth, reducing inflation, creating jobs through proper resource allocation and income distribution, and stabilizing the economy (Garg, Narwal, & Kumar, 2022). Governments worldwide use taxation to combat poverty, inequality, unemployment, and inflation (Cebreiro-Gómez et al., 2022; Chen et al., 2020). Tax revenue is one of the most important fiscal strategies for any government aiming for sustainability in both economic growth and development, and it should be enhanced to reach these objectives. Countries that generate sufficient tax revenues tend to have the resilience needed to undertake various capital projects (Mardan & Stimmelmayer, 2020). A well-designed tax system increases both revenue collection and expenditures, helping countries achieve strong and effective macroeconomic goals (Ajeigbe, Ganda, & Enowkenwa, 2023). Tax revenue is a major driver that fuels government activities (Monica & Kazeem, 2022). Therefore, reforming tax revenue is a key tool that influences macroeconomic performance by providing social welfare and infrastructure (Akram et al., 2023).

On the other hand, raising enough tax revenue to boost macroeconomic performance has been challenging in developing countries. Low tax revenue collection in these nations indicates tax inefficiency, which can result from flaws in tax policy design, corruption, and insufficient government efforts in tax collection (Teera & Hudson 2004; Garg, Narwal, &

Kumar, 2024f). Moreover, an excessive tax burden can hinder key macroeconomic objectives like full employment, price stability, and sustainable economic growth. Therefore, many Sub-Saharan Africa (SSA) countries need to increase tax revenue and ease the tax burden, as current levels are not enough to fund the Sustainable Development Goals (SDGs) (Gupta, Jalles & Liu, 2021).

According to economic theory, taxation has its pros and cons. The Keynesian economist argued that the government can stimulate economic growth during a recession through an effective tax revenue system, which allows the government to invest in essential services and infrastructure, creating a ripple effect that sustains economic stability (Keynes, 1936). Similarly, the optimal tax theory proposed that tax policies can reduce market distortions and maximize societal welfare (Ramsey, 1927). Controversially, supply-side economics used the Laffer curve to explain how high tax rates discourage economic activity and reduce tax revenue, while lowering tax rates can encourage economic growth, ultimately expanding the tax base and potentially increasing total revenue (Laffer, 1974; Wanniski, 1978). Personal income tax revenue acts as a key and direct constraint on individuals' economic freedom, which hampers economic performance because higher tax rates decrease the ability of individuals and firms to pursue their goals in the marketplace (Miller et al., 2022). In Nigeria, taxation serves several key functions. First, it enables the government to assert its authority and manage public assets. Second, high taxes are levied to regulate industry participation and prevent rapid resource depletion, ensuring resources remain available for future generations. The third purpose is to use taxation to redistribute wealth between wealthy, industrialized economies, often represented by multinational corporations with the technology, skills, and capital for industrial growth, and poorer, developing economies that supply petroleum resources (Adefolake & Omodero, 2022). Despite ongoing government efforts to increase tax revenue, Nigeria's economy faces challenges such as hyperinflation, unpredictability, corruption, poor infrastructure, high unemployment, insecurity, and fluctuating prices—issues that stem from ineffective use of tax revenues and limit the real benefits governments can provide (Obadiaru, Okon, & Ayeni, 2024).

The four specific objectives of this study are to examine the effect of tax revenue reformation on economic growth in Nigeria, investigate the impact of tax revenue on unemployment rate, assess the influence of tax reformation on the inflation rate, and analyze the causal relationship between tax revenue reformation and economic growth in Nigeria. This study

contributes to existing literature in several ways. First, it breaks down macroeconomic performance into three variables—economic growth, inflation rate, and unemployment rate—to reflect the effects of tax revenue reformation on these areas. Second, it specifies tax revenue reformation to include total tax revenue (TTR), petroleum profit tax (PPT), company income tax (CIT), and value added tax (VAT). Previous studies either used total tax revenue or focused only on PPT, CIT, or VAT. Third, methodologically, the study employs the Error correction model to analyze both short-term dynamics and long-term equilibrium effects of tax revenue on macroeconomic performance in Nigeria, as well as to examine the causal relationship. This research is novel because it broadens the scope by extending the population from 2000 to 2024, whereas prior studies typically concluded in 2023.

2. LITERATURE REVIEW

2.1 Laffer Curve Theory

The Laffer curve theory was propounded by Professor Arthur in 1974. The theory explains the theoretical relationship between tax rates and government revenue derived from taxation. The theory assumes that a tax rate that optimizes government income does exist, that overly high taxes reduce taxable revenue by discouraging investment and economic activity, and taxes that are too low create revenue gaps that prevent public services from being funded. The Laffer curve demonstrates the idea that changes in tax rates can affect tax revenue in two distinct ways: the Arithmetic Effect and the Economic Effect (Laffer, 2004). The Arithmetic Effect states that a decrease in the tax rate would lead to a reduction in tax revenue (per unit of the tax base) proportionate to the reduction in the tax rate, and vice versa. In contrast, the Economic Effect acknowledges that a lower tax rate can positively influence work, output, employment, and consequently, the tax base by incentivizing economic activity. Essentially, the Arithmetic Effect and the Economic Effect are opposing forces. Thus, when both effects are combined, the overall impact of a tax rate change on total tax revenue collection becomes less straightforward. As depicted in the Laffer curve below in figure 1, the left side shows that there are no tax rates that yield zero government revenue, which would lead to the absence of government. Initially, as tax rates increase from zero, tax revenue rises. However, as tax rates continue to climb, tax revenue can ultimately decline, leading to the curve's downward slope. This increased tax burden can significantly impede the economic growth of a nation. Heavier taxes tend to reduce consumer spending, which lowers demand. Over the long term, this demand reduction can offset any rapid increase in tax revenue due to higher tax rates. This segment of the Laffer Curve is known as the Prohibitive Range, where the curve slopes downward. A tax increase beyond this range will lead to a decrease in government revenue (Laffer, 2004).

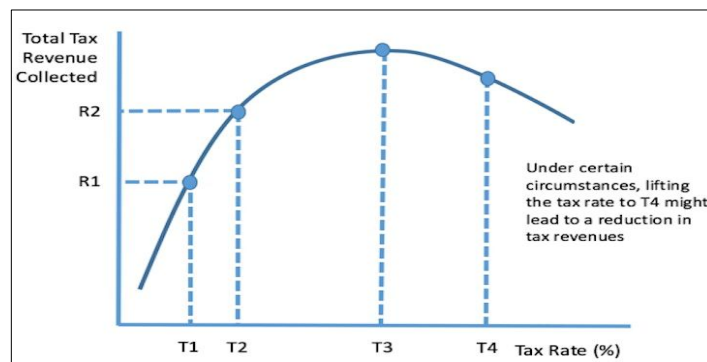


Figure 1: Laffer Curve

2.2 Ability to pay theory

The theory was propounded by Adam Smith in 1776. This principle states that those people who possess income or wealth should contribute to their country in proportion to their ability to pay. The basic point of the ability to pay principle is that the burden of taxation should be shared amongst the members of the society to conform to the principle of justice and equity which will be satisfied if the tax burden is determined according to the relative ability of the taxpayers. The burden of taxation should be so distributed that the direct real burden on all tax payers is equal. The ability to pay principle explains the fairness or justice in the distribution of tax burden. Thus, the theory is based on the equity principle of taxation since income is the most acceptable measure of ability to pay (Ayeni et al., 2017; Peter & Adesina, 2015). This theory is the basis for progressive tax systems (e.g., income tax), where tax rates increase as income increases.

2.3 Benefit Received Theory

The benefit received theory was introduced by Knut Wicksell in 1896 and Erik Lindahl in 1919. The theory states that taxes should be paid in accordance with the benefits each individual receives from expenditure programs financed by tax revenues collected by the government. According to this principle, people receiving equal benefits should pay equal amounts of taxes, and those who receive greater benefits should pay higher taxes. These benefits include various aspects such as infrastructure, security and defense, and job opportunities, among others. Therefore, the government and taxpayers engage in a reciprocal relationship, where the state provides public goods and services along with other benefits to society's members, who in turn compensate the government for these goods and services based on the level of benefit they receive (Ayeni et al., 2017).

2.4 Empirical Review

Otegunrin, Fakile, Eluyela, Onabote, John & Ifeanyichukwu (2023) investigated the impact of oil and non-oil tax revenue on economic growth in Nigeria. The Error correction model was employed, and the study revealed that the petroleum tax has a positive and significant effect on economic growth in Nigeria. Using the Vector Error Correction model, Adefolake & Omodero (2022) analyzed the effect of tax revenue on Nigeria's economic growth. Data for the study span from 2000 to 2021. The findings highlight that the petroleum profit tax and value-added tax have positive and significant influence on gross domestic product, while company income tax has a negative & significant influence on economic growth. Obadiaru, Okon & Ayeni (2024) assessed the effect of tax revenue on economic growth in Nigeria for the period 1991 to 2021. The Auto-regressive distributed lag model technique was employed for the study. The results suggest that tax revenue has a positive and significant influence on Nigeria's economy. Ejeh et al., (2025) investigated the effect of tax revenue on government budget implementation in Nigeria from 1999-2023. The Ordinary Least Square method was employed for the study. The findings suggest that company income tax, petroleum profit tax, and value added tax have a significant effect on government budget implementation in Nigeria. This confirms the findings of Adefolake & Omodero (2022) that petroleum profit tax and value added tax fosters economic performance.

Employing the descriptive and inferential statistical technique, correlational and regression statistics, Etim et al., (2021) assessed the effects of direct and indirect taxation on the growth of the Nigerian economy. The findings revealed that indirect taxes hamper economic growth in Nigeria. Mukolu & Ogodor's (2021) investigated the effect of value-added tax on the Nigerian economic growth, from 1994 to 2018, utilizing an Augmented Dickey Fuller analysis technique. The findings highlight that value-added tax positively and significantly influences economic growth. It also showed that VAT has, to a great extent, given rise to the total revenue of the nation and has helped in tax evasion by taxpayers. These findings aligns with the result of Adefolake & omodero (2022); Ejeh et al., 2025 that value added tax stimulate economic growth. Using the vector autoregressive model from 1974 to 2018, Asimakopoulos (2025) examined the macroeconomic impact of tax on the Greek economy. The study reported that government expenditure and taxes have an inverse relationship with economic growth. Contrary to the findings of Asimakopoulos (2025), Odumu (2025) utilized a mixed-method technique to examine the Nigeria tax reform bill. The findings demonstrate that an inclusive fiscal strategy is important in achieving economic growth. This implies that tax reform stimulates economic growth. Zhao, Ma, & Guan (2025) employed cross-sectional data to investigate the effect of unified tax incentive policies, tax burden fairness on corporate investment efficiency. The result shows that a unified tax incentives policy helps firms to seize investment opportunities, which spurs economic performance. Arnemann, Buhlamaann, Ruf & Voget (2025) examined the effect of taxes on CEO performance. The result revealed that a high tax rate depresses a firm's returns on assets, which hinders economic growth. These findings contradict the result of Zhao et al. (2025) that taxes enhance corporate investment.

Employing the Autoregressive distributed lag model for data that span from 2017-2024, Garg, Mittal & Garg (2025) examined the implications of goods and services tax revenue on the Indian economy. The findings highlight that goods and services tax positively influence economic growth in India. Utilizing the quantile regression for twelve Latin American countries for the period 2000-2021, Claveria (2025) investigated the effect of taxes and transfers on economic development. The findings demonstrate that tax revenue and transfers have a positive and significant influence on economic growth. Kubaje, Andoh, Eklemet & Wassan (2025) analyzed the impacts of foreign-direct investment and tax revenue in 43 Sub-Saharan African (SSA) Countries. Data for the study span from 2001-2022. The fixed effect technique was used to analyze the data. The findings suggest that tax revenue has an insignificant impact on economic growth in SSA.

Using the Generalized Methods of Moments technique, Ajeigbe, Ganda & Enowkenwa (2022) evaluated the impact of sustainable tax revenue and expenditures on sustainable development goals in Africa. Data for the study cover the years 2010-2020. The study indicates that various types of taxes and other revenue sources are positively linked to economic growth but negatively affect unemployment. Similarly, Anjarwi (2025) employed structural equation modeling, covering 2013 to 2019, to explore the moderating role of fiscal freedom on the relationship between the tax burden and poverty in lower-middle-income countries. The findings show that high tax rates and taxes on goods and services deepen poverty in these countries. Hamaguchi (2024) employed the R&D- based growth model to investigate the effect of a policy mix of a uniform tax on economic welfare; the result revealed that a high tax on exporters improves economic welfare. Employing the threshold Vector Autoregressive Technique, Orisadare and Fasoye (2022) assessed the impact of value-added tax on economic growth in Nigeria. The result highlights that value-added tax above the 10% threshold harms the economy, while value-added tax below 7.59% enhances people's well-being and stimulates economic growth.

3. METHODOLOGY

The *ex post facto* research design was utilized for this research. The error correction model technique was utilized to examine the effect of tax revenue reformation on macroeconomic performance in Nigeria. This study covers the time period from 2000 to 2024. Secondary data was employed for this research, which was sourced from the Central Bank Statistical Bulletin (CBN), Federal Inland Revenue Service (FIRS), and the World Development Indicators (WDI). Macroeconomic performance is the outcome variable and it was measured in this study by using gross domestic product growth (GDPG), unemployment (UNE), and inflation (INF). Tax revenue is the regressor, and it was measured in this research by utilizing total tax revenue (TTR), petroleum profit tax (PPT), Company income tax (CIT), and value-added tax (VAT).

3.1 Model Specification

This study adopts and modifies the model of Ayeni & Omodero (2022) on the effect of tax revenue on economic growth in Nigeria. GDP was utilized in their study as the outcome variable, while PPT, CIT, and VAT were utilized to measure tax revenue. The model was written as:

$$GDP = f(PPT, CIT, VAT) \text{-----1}$$

The model above was modified by delineating the dependent variable of this study (macroeconomic performance) into GDPG, UNE, and INF. Therefore, this study introduced two additional dependent variables to reflect macroeconomic performance, while tax revenue was delineated into TTR, PIT, CIT, and VAT. Thus, the model for this study is specified as follows:

Model 1: To examine the effect of tax revenue reformation on economic growth in Nigeria.
 $GDP = F(TR, PPT, CIT, VAT) \text{-----2}$

Model 2: To investigate the effect of tax revenue reformation on unemployment in Nigeria.
 $UNE = F(TR, PPT, CIT, VAT) \text{-----3}$

Model 3: To assess the effect of tax revenue reformation on inflation in Nigeria.
 $INF = F(TR, PPT, CIT, VAT) \text{-----4}$

The functional equation of the model is written thus:

$$GDP_t = \alpha_0 + \alpha_1 \ln TR_{it} + \alpha_2 \ln PPT_{it} + \alpha_3 \ln CIT_{it} + \alpha_4 \ln VAT_{it} + \lambda_t \text{-----5}$$

$$UNE_t = \alpha_0 + \alpha_1 \ln TR_{it} + \alpha_2 \ln PPT_{it} + \alpha_3 \ln CIT_{it} + \alpha_4 \ln VAT_{it} + \lambda_t \text{-----6}$$

$$INF_t = \alpha_0 + \alpha_1 \ln TR_{it} + \alpha_2 \ln PPT_{it} + \alpha_3 \ln CIT_{it} + \alpha_4 \ln VAT_{it} + \lambda_t \text{-----7}$$

Where: GDP_t denotes Gross Domestic Product at time t UNE represent unemployment at time t, INF_t stands for Inflation rate at time t, $\ln TR_{it}$ means log of total tax revenue, $\ln PPT_{it}$ represent log of petroleum profit tax, $\ln CIT_{it}$ symbolizes the log of company income tax, $\ln VAT_{it}$ means the log of value added tax, $\ln GTE_{it}$ signifies the log of government total expenditure, λ_t denotes error term, α_0 symbolizes intercept of tax revenue, $\alpha_1 - \alpha_4$ stands for the short-run and long-run dynamic parameters of the explanatory variables.

The Error correction model for this study is written as follows:

$$\Delta GDP_t = \alpha_0 + \sum_{i=1}^p \alpha_{1i} \Delta \ln GDP_{t-i} + \sum_{i=1}^q \alpha_{2i} \Delta TTR_{t-1} + \sum_{i=1}^q \alpha_{3i} \Delta PPT_{t-i} + \sum_{i=1}^q \alpha_{4i} \Delta CIT_{t-1} + \sum_{i=1}^q \alpha_{5i} \Delta VAT_{t-i} + \lambda \text{ECT}_{t-1} + \theta_t \text{-----8}$$

$$\Delta UNE_t = \alpha_0 + \sum_{i=1}^p \alpha_{1i} \Delta \ln UNE_{t-i} + \sum_{i=1}^q \alpha_{2i} \Delta TTR_{t-1} + \sum_{i=1}^q \alpha_{3i} \Delta PPT_{t-i} + \sum_{i=1}^q \alpha_{4i} \Delta CIT_{t-1} + \sum_{i=1}^q \alpha_{5i} \Delta VAT_{t-i} + \lambda \text{ECT}_{t-1} + \theta_t \text{-----9}$$

$$\Delta INF_t = \alpha_0 + \sum_{i=1}^p \alpha_{1i} \Delta \ln INF_{t-i} + \sum_{i=1}^q \alpha_{2i} \Delta TTR_{t-1} + \sum_{i=1}^q \alpha_{3i} \Delta PPT_{t-i} + \sum_{i=1}^q \alpha_{4i} \Delta CIT_{t-1} + \sum_{i=1}^q \alpha_{5i} \Delta VAT_{t-i} + \lambda \text{ECT}_{t-1} + \theta_t \text{-----10}$$

λ denotes the speed of adjustment parameter

ECT signifies the residuals for the regression of the long-run equation

θ_t represents the long-run parameter

$\alpha_{1i}, \alpha_{2i}, \alpha_{3i}, \alpha_{4i}, \alpha_{5i}$ are the short-run dynamic coefficient of the model's adjustment long-run equilibrium.

4. RESULTS AND DISCUSSIONS OF FINDINGS

4.1 Summary Statistics

Table 1: Descriptive statistics on tax revenue reformation and economic growth in Nigeria.

Variable(s)	Obs	Mean	Std. Dev.	Minimum Value	Maximum Value
GDP	25	4.986	3.569	-1.794	15.329
UNE	25	4.054	0.691	2.989	5.742
INF	25	11.666	6.246	0.686	23.864
TTR	25	4557.21	4583.74	433.9	21702
PPT	25	59.709	27.960	1.322	97.979
VAT	25	75.005	18.442	38.163	138.242
CIT	25	65.045	36.610	10.601	156.06

Source: Author's Compilation, 2025.

The table above outlines the variables used in this study. The gross domestic product (GDP) averages 4.986% in Nigeria, indicating the typical GDP growth rate, with a standard deviation of 3.569% and minimum and maximum values of -1.794% and 15.329%, respectively. This highlights the importance of GDP as it reflects the economic performance of the nation. The positive standard deviation indicates variability within Nigeria. The unemployment rate (UNE) shows a mean value of 4.054%, a standard deviation of 0.691%, a minimum of 2.989%, and a maximum of 5.742%. The mean inflation rate (INF) is 11.666%, with a minimum of 0.686%, a maximum of 23.864%, and a standard deviation of 6.246%. Total tax revenue (TTR) averages \$4557.21, with a standard deviation of \$4583.74, a minimum of \$433.9, and a maximum of \$21702. This suggests diversity in tax revenue. The average value for petroleum profit tax (PPT) is 59.709, with a minimum of 1.322 and a maximum of 97.979. The mean value for value-added tax (VAT) is 75.005, fluctuating between a minimum of 38.163 and a maximum of 138.242. Company income tax (CIT) has a mean value of 65.045, a standard deviation of 36.610, a minimum of 10.601, and a maximum of 156.06.

4.2 Correlation matrix

Table 2: Test of Correlation of Residuals

Variables	GDP	UNE	INF	TTR	PPT	VAT	CIT
GDP	1.000						
UNE	-0.555	1.000					
INF	0.329	-0.229	1.000				
TTR	-0.375	-0.166	-0.108	1.000			
PPT	0.084	-0.008	-0.124	0.208	1.000		
VAT	-0.275	-0.581	0.143	0.325	0.286	1.000	
CIT	-0.364	0.150	-0.132	0.577	0.215	0.307	1.000

Source: Researchers' Compilation (2025)

Table 2 indicate that there is no multicollinearity among the explanatory variables employed in the study. That is, the independent variables are not correlated with one another.

4.3 Test for Unit Root

Table 3: Augmented Dickey-Fuller (ADF) Unit Root Test

Variable s	@ Levels		Variable s	@ First Difference		Order of Integration	P-Value
	T-Statistic s	5% Critical Value		T-Statistic s	5% critical level		
GDP	-1.628	-1.761	ΔGDP	-4.917	-1.796	I(1)	0.000
UNE	-3.004	-1.725	ΔUNE	-	-	I(0)	0.004
INF	-2.373	-1.725	ΔINF	-	-	I(0)	0.014
TTR	-0.384	-2.528	ΔTTR	-3.487	-1.729	I(1)	0.001
PPT	-3.569	-1.725	ΔPPT	-	-	I(0)	0.001
VAT	-3.051	-1.725	ΔVAT	-	-	I(0)	0.003
CIT	-2.355	-1.725	ΔCIT	-	-	I(0)	0.014

Source: Authors' Computation, 2025 extracted from STATA 16.

The ADF result above indicate that only gross domestic product and total tax revenue became stationary after first difference I(1) while unemployment rate, inflation rate, petroleum profit tax, value added tax and

company income tax are stationary at level I(0). This makes the error correction model technique appropriate for the estimation.

4.4 ARDL Bound Test

Table 4: Bound Test on the Effect of Tax Revenue Reformation on Economic Growth in Nigeria.

Model 1				
			I(0)	I(1)
F-Statistics	5.269	10%	2.45	3.52
T-Statistics	-2.836	5%	2.86	4.01
		2.5%	3.25	4.49
		1%	3.74	5.06
Is There Long-Run Relationship	Yes	F-Statistics>I(0) & I(1)		

Source: Authors' Computation, 2025 extracted from STATA 16.

Table 5: Bound Test of Cointegration on the Effect of Tax Revenue Reformation on Unemployment in Nigeria.

Model 2				
			I(0)	I(1)
F-Statistics	6.810	10%	2.45	3.52
T-Statistics	2.915	5%	2.86	4.01
		2.5%	3.25	4.49
		1%	3.74	5.06
Is There Long-Run Relationship	Yes	F-Statistics>I(0) & I(1)		

Source: Authors' Work, 2025 extracted from STATA 16.

Table 6: Bound Test of Cointegration on the Effect of Tax Revenue Reformation on Inflation in Nigeria.

Model 3				
			I(0)	I(1)
F-Statistics	7.271	10%	2.45	3.52
T-Statistics	-4.414	5%	2.86	4.01
		2.5%	3.25	4.49
		1%	3.74	5.06
Is There Long-Run Relationship	Yes	F-Statistics>I(0) & I(1)		

Source: Authors' Computation, 2025 extracted from STATA 16.

Table 4, 5 and 6 above reflects the ARDL bound test that was conducted in order to confirm the presence of cointegration among the variables utilized for the study. Since F-Statistics is greater than the critical value for the upper bound I(1) then we conclude that there is cointegration. That is, there is long-run relationship. The null hypothesis of no long-run relationship is rejected and we estimate the long-run model, which is the error correction model (ECM).

4.5 Error Correction Model Result

The error correction model result in Table 7 for model 1 indicate that 53.1% of GDP of the previous period disequilibrium would be corrected in the current period by pulling the GDP back into equilibrium association. This implies that the errors of the previous period would be corrected in the current period. This demonstrate the speed of adjustment at which GDP returns to stability after deviation. The long-run result for model1 indicate that TTR,PPT, and VAT is associated with a 91.4% , 76.5% and 26.6% decline in GDP respectively, on average Ceteris Paribus, hence, TTR,PPT and VAT has a negative long-run connection with GDP. TTR, PPT and VAT hampers economic growth in Nigeria. This is due to mismanagement of funds and corruption, over-reliance on oil revenue, and imposition of high VAT while CIT has a positive long-run association with GDP on average ceteris paribus, 1% change in CIT would lead to 24.2% increase in GDP. These findings contradict the findings of Adefolake & Omodero (2022) that PPT and VAT have a positive and significant influence on economic growth while CIT has a negative and significant association with economic performance.

The D1 short-run findings for TTR for model 1 reveals that the magnitude and direction of the instantaneous short-run impact of TTR on GDP. Thus a unit change in TTR would immediately lead to 67.6% increase in GDP in the short-run. The LD result for TTR shows the impact after a period delay in the short-run. A unit change in TTR first difference from the previous period would lead to 82.9% increment in GDP current first difference. The L2D result indicate the short-run effect of TTR after a two-period delay. Hence, a unit change in TTR after a two-period delay would lead to 43.1% increase in GDP. The D1 & LD short-run result for PPT in model1 shows that a percentage change in PPT would instantaneously lead to 38.4% increase in GDP in the short-run, and a unit change in PPT after a one-period delay in the short-run would lead to 16.9% increase in GDP respectively. The D1 & LD short-run result for VAT shows that a percentage change in VAT would immediately lead to 85.7% increase in GDP in the short-run, and a unit change in VAT after a one-period delay in the short-run would lead to 16.9% increase in GDP respectively. The D1 result for CIT shows that a unit change in CIT would instantly lead to 0.002 decline in GDP

in the short-run. Hence, in the short run, TTR, PPT and VAT has a positive connection with GDP, while CIT has a negative relationship with GDP. In model 2, the error correction model result in Table 7 demonstrates that 15.5% of UNE of the previous period imbalance would be corrected in the current period by pulling the UNE back to equilibrium. Therefore, deviation from the long-run equilibrium would be corrected over-time. However, the lack of statistical significance in the error correction model coefficient implies that the adjustment is weak and the model isn't strongly pulling UNE back to equilibrium. The long-run findings suggests that TTR is associated with a 61.5% decrease in UNE on average ceteris paribus, while, PPT, VAT and CIT has a positive long-run association with UNE on average Ceteris Paribus. TTR has a negative and insignificant association with UNE, while a percentage change in PPT, VAT and CIT would lead to a 10.3%, 2.1%, and 9% increase in UNE. These indicate that TTR reduces UNE in the long-run while PPT, VAT and CIT spurs unemployment in the long-run. These result aligns with economic theory that the use of progressive tax reduces unemployment (Keynes, 1936). This however supports the findings of Ajeigbe et al., (2022) that taxation has an inverse relationship with unemployment. This implies that tax revenue reduces unemployment.

The D1 short-run findings for TTR model 2 highlight that the magnitude and direction of the incontinently short-run effect of TTR on UNE. A percentage change in TTR would immediately lead to 11.7% increase in UNE in the short-run. The D1 & LD short-run result for PPT in model 2 suggests that a unit change in PPT would immediately lead to 6% decrease in UNE in the short-run, and a unit change in PPT after a one-period delay in the short-run would lead to 8% decline in UNE respectively. The D1 & LD short-run result for VAT shows that a percentage change in VAT would instantly lead to 6% decline in UNE in the short-run, and a 1% change in VAT after a one-period delay in the short-run would lead to 1% increase in UNE respectively. The D1 result for CIT shows that a unit change in CIT would instantly lead to 2% decline in UNE in the short-run. Accordingly, TTR, PPT and CIT has a negative connection with UNE in D1 and LD, while VAT has a negative relationship with UNE in D1 and a positive relationship with UNE in LD. In model 3, the error correction model result in Table 7 demonstrates that 53.44% of INF of the previous period disequilibrium would be corrected in the current period by pulling the INF back to equilibrium. Therefore, deviation from the long-run equilibrium would be corrected over-time. However, the lack of statistical significance in the error correction model coefficient implies that the adjustment is weak and the model isn't strongly pulling INF back to equilibrium. The long-run findings suggests that TTR is associated with a 4.2% increase in INF on average ceteris paribus, PPT is associated with a 32.5% increase in INF on average ceteris paribus, VAT is associated with a 1.24% increase in INF on average ceteris paribus, and CIT is associated with a 53.3% increase in INF on the average ceteris paribus. Consequently, TTR, PPT, VAT and CIT has a positive long-run association with INF on average Ceteris Paribus. These findings highlight that TTR, PPT, VAT and CIT enhance INF in the long-run. These findings, aligns with the optimal taxation theory that there is a positive correlation between taxation and inflation rates (Mirrlees, 1971; Ramsey 1927).

The D1 short-run findings for TTR model 3 highlight that the magnitude and direction of the immediate short-run impact of TTR on INF. A percentage change in TTR would immediately lead to 2.62% increase in INF in the short-run. TTR has a positive significant effect on INF in the short-run. The D1 & LD short-run result for VAT shows that a percentage change in VAT would instantly lead to 1.66% decline in INF in the short-run, and a 1% change in VAT after a one-period delay in the short-run would lead to 1.38% increase in INF respectively. The D1 result for CIT shows that a unit change in CIT would instantly lead to 57.3% increase in INF in the short-run. Accordingly, TTR and CIT has a positive connection with INF in D1 and LD, while VAT has a negative relationship with INF in D1 and LD. The result from model 1 shows that the ECT coefficient for TTR is statistically significant and negative, it implies that the GDP causes TTR in the long-run. Therefore, it indicates that long-run causal link exist between TTR and GDP in at least one direction. That is there is unidirectional causality between TTR and GDP.

4.6 Post-Estimation Test/Diagnostic Test

The post-estimation test result (diagnostic test) for model 1, model 2 and model 3 as revealed in Table 7 above shows a Durbin-Watson statistics of 2.323, 2.607 and 2.254 respectively, which is slightly above 2, consequently, there is no auto-correlation. The Breusch Godfrey LM test for model 1, model 2 and model 3 indicate a p-value of 0.176, 0.009, and 0.323 respectively, since the p-value is greater than 0.05 ($P > 0.05$), then, there is no significant auto-correlation. We therefore accept the null hypothesis that there is no auto-correlation and reject the alternative hypothesis which states that there is no autocorrelation. The IM-test for heteroscedasticity demonstrates that there is no heteroscedasticity since the p-value for model 1, model 2 and model 3 is greater than 0.005. It therefore demonstrates normality in the model, hence, the ordinary least square

assumption exist in the model. Accordingly, we accept the null hypothesis because there is no heteroscedasticity i.e. constant variance. The model is correctly specified. The skewness p-value for model 1, model 2 and model 3 which is 0.554, 0.538 and 0.678 respectively, suggests that the distribution is normally skewed. We accept the null hypothesis and reject the alternative hypothesis. The data is symmetrically distributed. The Kurtosis p-value for model 1, model 2 and model 3 indicate that the model follows the expected kurtosis of normal distribution, since the p-value is 0.308, 0.984 and 0.273 respectively.

Table 7: ECM result on the effect of tax revenue reformation on macroeconomic performance.

MODEL 1				MODEL2				MODEL3			
D.lnGDP	Coef./P-values	Std.Error	T-Statistics	D.lnUNE	Coef./P-values	Std.Error	T-Statistics	D.lnINF	Coef./P-values	Std.Error	T-Statistics
ADJ. lnGDP L1.	-0.531 (0.082)	0.254	-2.09	ADJ. lnUNE L1.	-0.155 (0.708)	0.395	-0.39	ADJ. lnINF L1.	-0.5344 (0.319)	0.503	-1.06
LR lnTTR	-0.914 (0.436)	1.095	-0.84	LR lnTTR	-0.615 (0.725)	1.666	-0.37	LR lnTTR	0.042 (0.971)	1.127	0.04
lnPPT	-0.736 (0.130)	0.437	-1.75	lnPPT	-0.103 (0.728)	0.028	0.36	lnPPT	0.325 (0.570)	0.549	0.59
lnVAT	-2.660 (0.499)	3.703	-0.72	lnVAT	0.021 (0.829)	0.093	0.23	lnVAT	1.243 (0.816)	5.159	0.24
lnCIT	0.242 (0.754)	0.739	0.33	lnCIT	0.009 (0.744)	0.027	0.34	lnCIT	0.533 (0.616)	1.022	0.52
SR lnTTR D1.	0.676 (0.187)	0.454	1.49	SR lnUNE LD.	0.213 (0.731)	0.592	0.36	SR lnINF LD.	-0.245 (0.579)	0.424	-0.58
LD.	0.829 (0.114)	0.449	1.85	L2D.	-0.627 (0.246)	0.488	-1.29	L2D.	0.014 (0.969)	0.359	0.969
L2D.	0.256 (0.539)	0.393	0.65	L3D.	1.683 (0.054)	0.702	2.40	L3D.	-0.119 (0.644)	0.247	0.644
L3D.	0.431 (0.289)	0.370	1.16								
lnPPT D1.	0.384 (0.016)	0.115	3.34	lnTTR D1.	-0.117 (0.177)	0.076	-1.53	lnTTR D1.	2.619 (0.005)	0.684	3.83
LD.	0.169 (0.093)	0.084	2.00								
lnVAT D1.	0.857 (0.523)	0.115	3.34	lnPPT D1.	-0.006 (0.357)	0.001	-1.00	lnVAT D1.	-1.659 (0.478)	2.230	-0.74
LD.	0.169 (0.093)	0.084	2.00	LD.	-0.008 (0.265)	0.001	-1.23	LD.	-1.384 (0.505)	1.982	-0.70
lnCIT D1.	-0.002 (0.993)	0.263	-0.01	lnVAT D1.	-0.006	0.006	-0.98	lnCIT D1.	0.573 (0.094)	0.301	1.90
				LD.	0.001	0.004	0.15				
				lnCIT D1.	-0.002 (0.787)	0.000	-0.28				
_Cons	11.546 (0.234)	8.735	1.32	_Cons	0.562 (0.650)	1.181	0.48	_Cons	-4.154 (0.800)	15.864	-0.26
Post Estimation Test: Diagnostic Test											
MODEL 1				MODEL 2				MODEL 3			
Source	Chi2	P>Chi2		Source	Chi2	P>Chi2		Source	Chi2	P>Chi2	
Durbin Watson	2.323			Durbin Watson	2.607			Durbin Watson	2.254		
Breusch Godfrey LM test for Autocorrelation	1.833	0.176		Breusch Godfrey LM test for Autocorrelation	6.800	0.009		Breusch Godfrey LM test for Autocorrelation	0.901	0.323	
Im-Test Heteroscedasticity	21.00	0.397		Im-Test Heteroscedasticity	21.00	0.397		Im-Test Heteroscedasticity	21.00	0.397	
Skewness	12.65	0.554		Skewness	12.86	0.538		Skewness	9.29	0.678	
Kurtosis	1.04	0.308		Kurtosis	0.000	0.984		Kurtosis	1.20	0.273	

Source: Authors' Computation (2025), from STATA 16

4.6.1 Cusum Stability Test

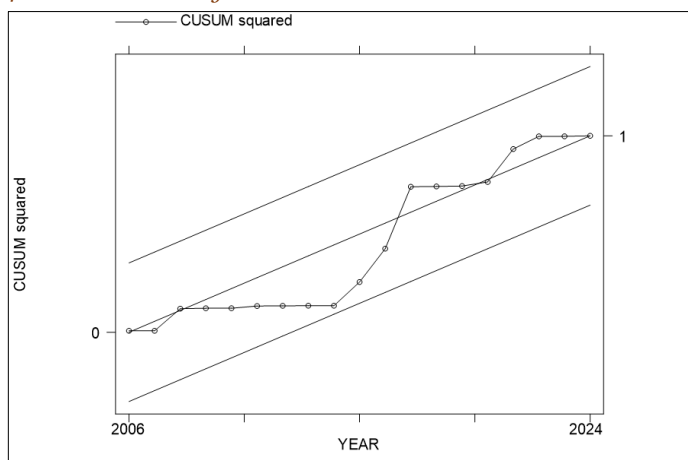


Figure 2: Model 1 Cusum Stability Test

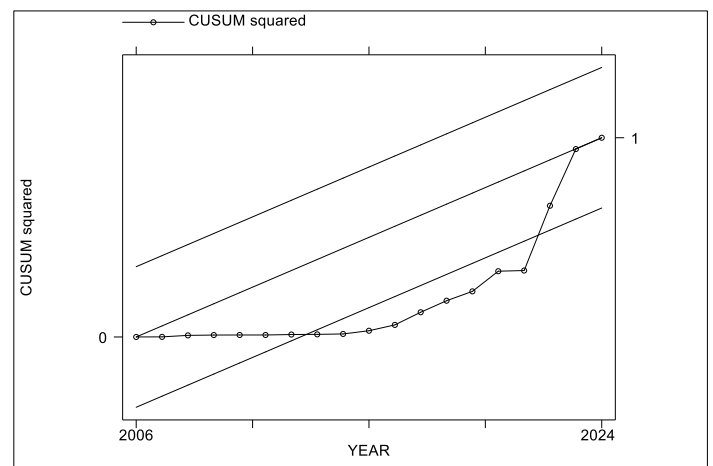


Figure 3: Model 2 Cusum Stability Test

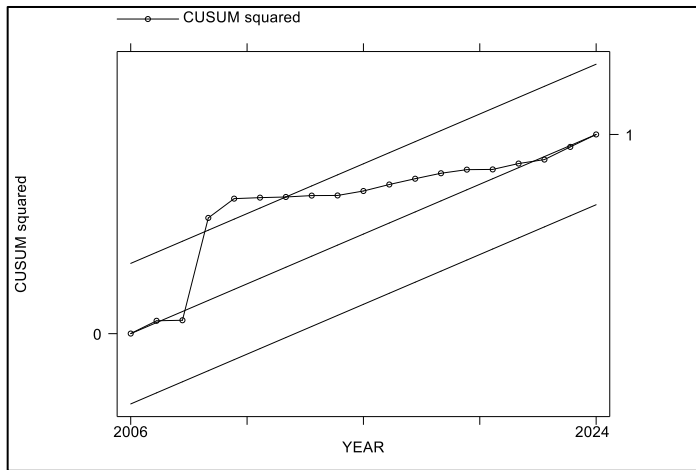


Figure 4: Model 3 Cusum Stability Test

The graph in figure 2 above for model 1 moves with its mean at 5% level of significance. This highlight that the model is stable. However, for model 2 as depicted in figure 3 and model 3 as indicated in figure 4 the model diverges between the blue lines and red lines, the model is therefore considered to be unstable at 5% level of significance. The instability in model 2 and model 3 could be due to structural breaks in Nigeria such as the COVID-19 pandemic, fuel subsidy removal, and a shift in the economic policy.

5. CONCLUSION AND RECOMMENDATIONS

This study examined the effect of tax revenue transformation on macroeconomic performance in Nigeria. The study utilized secondary data which were sourced from the World Development Indicators, Central Bank Statistical Bulletin and Federal Inland Revenue Statistics. The Error Correction model technique was utilized for the study. Data for the Study span from 2000 to 2024. The study highlight that total tax revenue, petroleum profit tax and value-added tax has a negative long-run association with gross domestic product while company income tax has a positive long-run relationship with gross domestic product. Second, the findings demonstrates that total tax revenue has a negative long-run association with unemployment, while, petroleum profit tax, value added tax and company income tax has a positive long-run connection with unemployment. Thirdly, total tax revenue, petroleum profit tax and company income tax has a positive long-run connection with inflation. Lastly, there economic growth granger cause total tax revenue to increase. Hence, there is a unidirectional relationship between total tax revenue and economic growth.

Based on the study findings, the following policy were recommended by the study:

- The total tax revenue, petroleum profit tax and value-added tax should be utilized effectively by the government in order to foster significant economic growth in the long-run.
- Nigeria Government needs to enact policies that would spur sustainable economic growth, since economic growth stimulate total tax revenue.
- It is crucial for policy makers and government to contract the petroleum profit tax, value-added tax and company income tax in order to abridge unemployment and inflation in the nation, since petroleum profit tax, value-added tax and company income tax increases unemployment and inflation.
- Policy makers, government and entrepreneurs should invest more in technological advancement in order to spur industrialization, since company income tax enhances economic growth in the long-run.

Conflict of Interest

The authors declare that they have no conflict of interest regarding the publication of this manuscript.

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Author Contributions

All authors made substantial contributions to the conception and design of the study, data collection, data analysis and interpretation, and manuscript preparation. All authors critically reviewed the manuscript, approved the final version, and agree to be accountable for all aspects of the work.

Informed Consent

Informed consent was obtained from all participants involved in this study prior to data collection.

Use of Generative AI

The authors confirm that generative artificial intelligence (AI) tools were used solely for minor language editing and grammatical refinement. These tools did not contribute to the study design, data collection, data analysis, interpretation of results, or the intellectual content and conclusions of the manuscript. The authors take full responsibility for the accuracy, originality, and integrity of the work.

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