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Asymmetric Effects of Non-Oil Tax Revenue on Economic Growth in Nigeria

[1]Agbo Cyril Uchenna, [2]Kalu Uma, [3]Ogbuagu Anuli Regina & [4]Eze Ikechukwu Okereke

[1,2,3&4]Department of Economics and Development Studies, Alex Ekwueme Federal University Ndufu Alike, Ebonyi State, Nigeria

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Abstract

This study investigates the asymmetric effects of non-oil tax revenue on economic growth in Nigeria, utilizing quarterly data from 2011 to 2023. The analysis employs the Nonlinear Autoregressive Distributed Lag (NARDL) model, with Gross Domestic Product per capita as the dependent variable and Company Income Tax (CIT), Capital Gains Tax (CGT), Education Tax (EDT), and Value Added Tax (VAT) as independent variables. Control variables include Gross Fixed Capital Formation, Government Expenditure on Education, and Trade Openness. The Augmented Dickey-Fuller (ADF) test confirms that the variables are integrated at different levels, justifying the use of the NARDL framework. The short-run results reveal significant asymmetries where CIT positively impacts economic growth with coefficients of 0.039 and 0.063 for current and lagged terms, respectively, while a negative shock from CIT has a detrimental effect with a coefficient of -0.076. In the long run, the coefficient for CIT is -0.156, suggesting that while CIT stimulate growth initially, it has detrimental long-term effects, reinforcing the need for careful tax policy considerations. The Wald test results indicate significant asymmetry, allowing for the rejection of the null hypothesis. In contrast, CGT shows that both positive and negative changes significantly decrease GDP per capita in the short run, with long-run analysis indicating a statistically significant negative effect from positive changes in CGT. EDT demonstrates a strong positive effect in the short run (coefficient of 0.758), while the long-run analysis shows that both positive and negative changes significantly enhance GDP per capita. VAT exhibits positive coefficients, suggesting a stimulating effect on the economy, with a long-run coefficient of 1.171 indicating its potential for enhancing economic growth. The NARDL long-run Wald test results further confirm significant asymmetry in the effects of the independent variables on GDP per capita, highlighting the necessity for policymakers to consider the implications of tax structures and their potential long-term effects on economic performance. The study recommends among others, the restructuring of CIT to balance short-term benefits with long-term economic sustainability. This will include providing incentives for reinvestment and ensuring that tax rates do not deter private sector investment.

Keywords: *Non-Oil Tax Revenue, Wald Test, Asymmetric effect, Economic Growth*

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Background to the Study

In recent years, the need to diversify Nigeria's revenue base has gained considerable attention due to persistent economic challenges driven by volatility in global oil prices. For decades, Nigeria has heavily depended on oil and gas revenue, a trend that has rendered the economy highly vulnerable to external shocks and fiscal instability. As global energy markets fluctuate, the limitations of oil-dependent growth strategies have become increasingly apparent, prompting a renewed emphasis on mobilizing domestic revenue through non-oil taxation. According to Otekunrin et al. (2023), sustainable economic development in Nigeria hinges on the effective mobilization of non-oil tax revenues to fund critical infrastructural projects and social investments.

Historically, Nigeria's economy thrived on non-oil revenue sources. In the 1960s, the country's foreign exchange earnings were predominantly generated through the export of agricultural commodities such as cocoa, palm oil, rubber, and groundnuts (Omesi et al., 2020). However, the discovery of crude oil in Oloibiri in 1956, and its subsequent exploitation in the 1970s led to the structural reorientation of Nigeria's economy. Successive governments shifted their focus to oil exports, resulting in the neglect of non-oil sectors and a significant decline in agricultural productivity (Ndu & Uguru, 2022). This mono-product dependence has weakened public sector financing capacity, constrained long-term growth, and undermined macroeconomic stability.

In response, Nigeria's Economic Recovery and Growth Plan (ERGP), introduced in 2017, prioritized revenue diversification through increased taxation of non-oil activities such as Company Income Tax (CIT), Capital Gains Tax (CGT), Education Tax (EDT), and Value Added Tax (VAT). These efforts aimed to enhance the tax-to-GDP ratio, broaden the tax base, and reduce fiscal vulnerability by integrating more of the informal sector into the formal tax system (Federal Ministry of Budget and National Planning, 2017). While some progress has been made, significant challenges remain. Tax revenues exhibit marked variability across different instruments, driven by shifts in policy, enforcement inconsistencies, global economic conditions, and internal restructuring. For instance, Company Income Tax reached ₦1207.52 billion in Q3 2023, and Education Tax rose to ₦575.9 billion in the same quarter (FIRS, 2024), suggesting improved tax administration or economic activity. However, fluctuations in Capital Gains Tax and uneven VAT performance reflect deeper structural and compliance issues.

The broader macroeconomic context presents additional complexity. While Nigeria's Human Development Index (HDI) has improved marginally—rising from 0.492 in 2011 to 0.548 in 2022 (OECD, 2024)—the informal sector, which accounted for 58.2% of GDP in 2023 (IMF, 2024), remains largely outside the tax net. Less than 10% of its activities are captured, representing a substantial loss in potential revenue (FIRS, 2023). Moreover, weak infrastructure—only 30% of GDP compared to the global benchmark of 70%—and chronic power shortages costing the economy over $29 billion annually (World Bank, 2024) constrain productivity and tax collection efforts. These challenges hinder the development of a robust, broad-based non-oil tax system that can drive inclusive and sustainable growth.

Despite numerous policy interventions and reform initiatives, Nigeria's non-oil tax revenue remains significantly underutilized. The country's tax-to-GDP ratio stands at a meager 6%, a stark contrast to peer economies such as South Africa (26%) and Ghana (13%) (IMF, 2023). This underperformance reflects deep-rooted systemic inefficiencies, a narrow tax base, and widespread non-compliance. These structural weaknesses are particularly concerning given that oil revenue accounts for approximately 82% of total government income (George et al., 2022). Such overreliance on volatile oil revenues exacerbates fiscal instability, undermines long-term economic planning, and constrains investment in critical sectors such as human capital development and infrastructure. In light of the persistent underperformance of non-oil tax instruments and their untapped potential to support sustainable growth, this study investigates the asymmetric effects of non-oil tax revenue on economic growth in Nigeria. Specifically, it focuses on four pivotal tax instruments—Company Income Tax (CIT), Capital Gains Tax (CGT), Education Tax (EDT), and Value Added Tax (VAT)—and evaluates their distinct impacts on GDP per capita within a Nonlinear Autoregressive Distributed Lag (NARDL) framework.

Research Objectives

The main objective of this study is to examine the asymmetric effects of non-oil tax revenue on economic growth in Nigeria, using GDP per capita as a proxy. Specifically, the study seeks to:

a. Evaluate the asymmetric effect of Company Income Tax (CIT) on GDP per capita.
b. Determine how changes in Capital Gains Tax (CGT) affect GDP per capita.
c. Examine how changes in Education Tax (EDT) affect GDP per capita.
d. Investigate the differential effects of Value Added Tax (VAT) on GDP per capita.

Research Hypotheses

H_{01}: Changes in CIT do not have a significant asymmetric effect on Nigeria's GDP per capita.
H_{02}: CGT does not exhibit a significant asymmetric impact on GDP per capita in Nigeria.
H_{03}: Changes in EDT have no significant asymmetric effect on GDP per capita in Nigeria.
H_{04}: Changes in VAT do not have a significant asymmetric impact on GDP per capita in Nigeria.

Scope of the Study

The study covers the period from 2011 to 2023, using quarterly data to analyze the asymmetric effects of CIT, CGT, EDT, and VAT on GDP per capita in Nigeria. This timeframe provides 52 observations, allowing for robust analysis of the nonlinear and dynamic relationships between tax revenue and economic performance.

Review of Related Literature

Contextual Overview of Non-Oil Tax Revenue in Nigeria

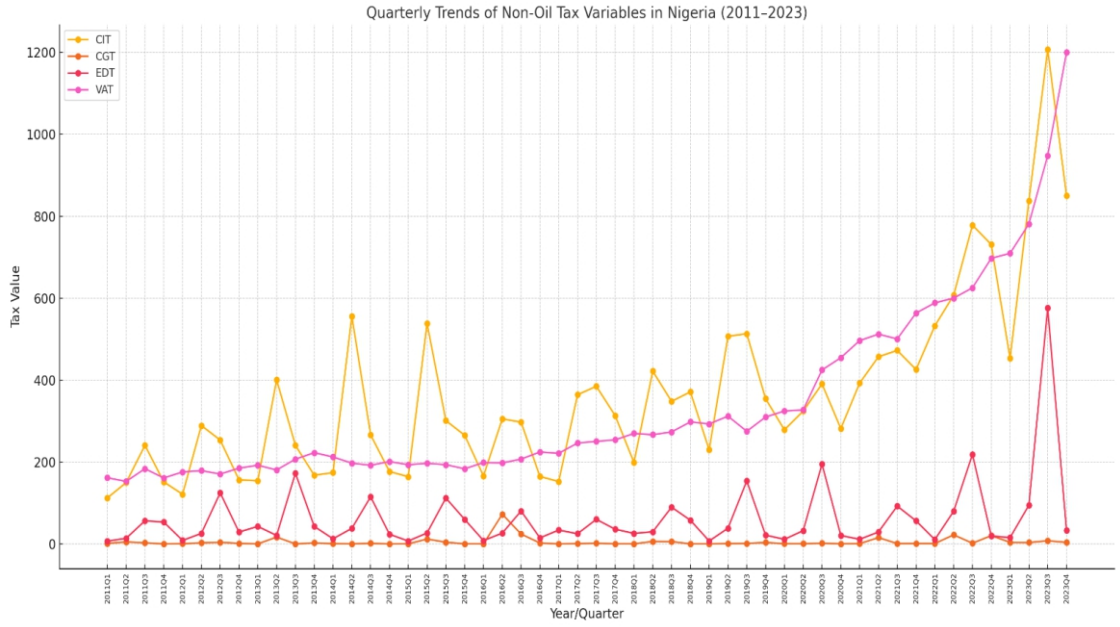
Non-oil tax revenue comprises direct and indirect taxes outside the oil sector, including CIT, CGT, EDT, and VAT (Yahaya & Yusuf, 2019; Adeusi et al., 2020). These sources have grown in prominence as Nigeria seeks to insulate its economy from oil price shocks and broaden its fiscal base (Ndu & Uguru, 2022). However, the low tax-to-GDP ratio (6%) relative to peers like South Africa (26%) and Ghana (13%) (IMF, 2023) reflects systemic inefficiencies, weak compliance, and underutilization of non-oil taxes, undermining sustainable growth.

Company Income Tax, Capital Gains Tax, Education Tax, and Value Added Tax

1. CIT contributes substantially to public revenues and corporate accountability. Yet, its impact on business performance and growth remains contested (Adeyemo & Oyedokun, 2023).
2. CGT influences investment dynamics by taxing returns from capital assets. Higher rates can deter innovation (Edwards & Todtenhaupt, 2020).
3. EDT is earmarked for educational development through TETFund, supporting human capital formation (Taiwo & Oyedokun, 2022).
4. VAT, as a consumption-based tax, affects spending, equity, and income distribution (Nwakanma & Udeorah, 2022).

Together, these instruments offer a multidimensional view of fiscal policy's role in economic growth.

Figure 1: Graphical Analysis of Tax Revenue Dynamics



Source: Researcher's Compilation (2025)

This figure presents the quarterly distribution of tax revenues, revealing structural volatility and behavioural responses over time. Spikes in CIT and CGT during 2014 and 2023, respectively, suggest increased profitability or compliance, while VAT demonstrates a steady upward trajectory, consistent with rising consumption. EDT appears relatively stable, underscoring consistent educational investment.

Theoretical Underpinnings

Taxation is central to macroeconomic management, particularly in developing economies striving to diversify revenue away from volatile oil earnings. This study is grounded in two complementary theoretical perspectives: The Benefit Theory of Taxation and the

Endogenous Growth Theory, which together provide a robust framework for understanding the developmental implications of non-oil tax revenue.

Benefit Theory of Taxation

The Benefit Theory, as articulated by early thinkers like Hobbes and Locke (cited in Bukie et al., 2013), posits a reciprocal relationship between taxpayers and the state, where taxes paid are expected to yield public benefits in the form of infrastructure, services, and economic stability. The theory underscores the legitimacy of taxation when public revenues are transparently and productively reinvested. Within the Nigerian context, where non-oil tax components such as Company Income Tax (CIT), Capital Gains Tax (CGT), Education Tax (EDT), and Value Added Tax (VAT) are increasingly crucial, this theory supports the argument that efficient utilization of such revenue streams can stimulate inclusive growth and development.

Endogenous Growth Theory

Endogenous Growth Theory, developed by Lucas (1988) and Romer (1990), emphasizes that growth is driven by internal factors such as innovation, investment in human capital, and supportive policy environments. Tax revenue—particularly non-oil revenue—can play a catalytic role by financing public goods that promote productivity and economic transformation. The theory, therefore, supports an empirical investigation into how distinct tax instruments affect GDP per capita, as a welfare-sensitive proxy for economic growth.

Empirical Review

Yusuf et al. (2024), using quarterly data from 2011 to 2022 and the ARDL-ECM framework, found mixed short-run and long-run effects of various taxes on real GDP. In contrast, Maidugu (2024) reported a positive long-run but negative short-run relationship between CIT, EDT, VAT, and growth using Johansen co-integration. Onyekwelu et al. (2024) found divergent effects: while CIT and VAT were positive and significant, other tax types like CEDR, (custom and excise duties tax revenue) and PITR (petroleum income tax revenue) were less impactful. Meanwhile, Okoye et al. (2023) and Ndu & Uguru (2022) confirmed statistically significant positive contributions of all non-oil tax variables to GDP, supporting the fiscal growth hypothesis. Yet, others, such as Otekunrin et al. (2023) and Ilori & Akinwunmi (2020), highlighted inconsistent or negative effects of non-oil taxes on economic performance. These contradictions stem from methodological choices, omitted variable bias, or failure to capture structural breaks and behavioral nonlinearities.

Literature Gaps and Justification for Methodological Approach

Despite increasing attention to non-oil tax revenue, the literature exhibits critical shortcomings that this paper seeks to address:

1. Linearity Assumption: Most studies adopt linear frameworks (OLS, ARDL, ECM), which presume constant marginal effects of taxes across time and levels. This is unrealistic, given the threshold effects and diminishing returns often observed in fiscal policy. To address this, this paper adopts the Nonlinear Autoregressive Distributed Lag (NARDL) model, which accommodates asymmetric and nonlinear relationships.

2. Symmetric Shock Assumption: Prior research generally assumes that tax increases and decreases have equal impacts—a symmetry rarely observed in real-world tax behavior. This study accounts for positive and negative shocks separately, allowing for distinct policy implications.
3. Omitted Variable Bias: Many studies ignore key macroeconomic variables that moderate tax-growth dynamics. We include gross fixed capital formation (GFCF), government education expenditure (HUC), and trade openness (TOP) to enhance the explanatory power and policy relevance.
4. Limited Tax Scope: Existing literature often focuses on a narrow subset of tax instruments. This paper evaluates CIT, CGT, EDT, and VAT together, providing a more integrated perspective.
5. Data Frequency and Period Issues: The use of inconsistent data frequencies hinders generalizability. By employing quarterly data from 2011–2023, this research ensures temporal consistency and captures post-COVID fiscal shifts.
6. Weak Diagnostics and Model Specification: Some studies lack robust pre-estimation diagnostics, leading to spurious results. Our analysis includes unit root, co-integration, and stability tests to validate the NARDL model's assumptions.

Contribution to Knowledge

By integrating a development-sensitive growth measure (GDP per capita), incorporating behavioral dynamics through asymmetric modeling, and including broader tax instruments and comprehensive controls, this paper provides a more refined and policy-relevant understanding of how non-oil tax revenue impacts economic growth in Nigeria. It thus fills a critical void in the fiscal policy literature and offers empirical evidence that can inform sustainable tax reform, macroeconomic planning, and development strategies in resource-dependent economies.

Methodology

Theoretical Framework

The study is anchored on the Endogenous Growth Theory, pioneered by Romer (1986, 1990) and Lucas (1988), which posits that long-run economic growth is endogenously determined by factors such as human capital, innovation, and public policy. According to the theory, taxation, though traditionally perceived as distortionary, can be growth enhancing when tax revenues are directed toward productivity-inducing expenditures like education and infrastructure. This paper extends the traditional endogenous growth model by embedding tax variables and fiscal policy tools into the total factor productivity (TFP) function, thus recognizing their role in resource allocation and economic efficiency:

$$Y = AK^{\alpha}H^{\beta} \qquad 1$$

Where:
Y: Economic growth (proxied by GDP per capita)
A: Total Factor Productivity (TFP)
K: Physical capital

H: Human capital

TFP is assumed to be a function of fiscal variables:

$$A = F(CIT, CGT, EDT, VAT, GFCF, HUC, TOP) \quad 2$$

Substituting into (1) yields:

$$Y=A\,(CIT, CGT, EDT, VAT, GFCF, HUC, TOP).\, K^{\alpha}.\, H^{\beta} \quad 3$$

This extension allows for analyzing how different tax instruments and policy variables affect growth via their influence on productivity.

Model Specification

Drawing on the structure of Maidugu (2024), this study specifies the functional relationship as:

$$GDPCC = F(CIT, CGT, EDT, VAT, GFCF, HUC, TOP) \quad 4$$

Where;
GDPPC = Gross domestic product per capita
CIT = Company Income Tax
CGT = Capital Gains Tax
EDT = Education Tax
VAT = Value Added Tax
GFCF = Gross Fixed Capital Formation
HUC = Government expenditure on education
TOP = Trade openness

The linear regression model therefore is specified as follows:

$$GDPCC_t = \beta_0 + \beta_1 CIT_t + \beta_2 CGT_t + \beta_3 EDT_t + \beta_4 VAT_t + \beta_5 GFCF_t + \beta_6 HUC_t + \beta_6 TOP_t + \mu_t \quad 5$$

The extended log-linear form of the model can be given as:

$$LGDPCC_t = \beta_0 + \beta_1 LCIT_t + \beta_2 LCGT_t + \beta_3 LEDT_t + \beta_4 LVAT_t + \beta_5 LGFCF_t + \beta_6 LHUC_t + \beta_6 TOP_t + \mu_t \quad 6$$

Where;
Y = GDP per capita (proxy for economic growth)
A (·) = Total factor productivity, which is a function of fiscal policy instruments and tax components
L = Log transformation

β = Beta representing the parameters
t = Trend factor
β_0 = Constant term
$\beta_1 - \beta_2$ = Parameters of the independent variables

Estimation Technique: Nonlinear ARDL (NARDL)
To capture asymmetric relationships, the NARDL framework by Shin et al. (2014) is employed. The model distinguishes between the effects of positive and negative shocks in tax components:

Decomposition:

$$X_t = X_t^+ + X_t^-$$

Model form:

$$GDPPC_t = \beta_0 + \beta_1^+ X_t^+ + \beta_1^+ X_t^- + \epsilon_t$$

To capture the effects of asymmetry, NARDL decomposes X into two parts:
Partial sum of positive change in X, denoted by X^+
Partial sum of negative change in X, denoted by X^-
Both X^+ and X^- are included as separate regressors in the NARDL model

This allows separate estimation of the impacts of tax increases versus decreases, reflecting real-world policy dynamics.

Sources of Data

i. Tax Revenue Data (CIT, CGT, EDT, VAT): Sourced from Federal Inland Revenue Service (FIRS) Tax Statistics Reports (various years).
ii. GDP per Capita and Trade Openness (TOP): Retrieved from the World Bank Dataset).
iii. Gross Fixed Capital Formation (GFCF) and Government Education Expenditure (HUC): Extracted from the Central Bank of Nigeria (CBN) Statistical Bulletin (2023 Edition).

Empirical Results and Discussion
Table 1: AIC as a Model Selection Criterion

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-207.7575	NA	7.73e-07	8.630298	8.936222	8.746796
		449.4046		0.229211	2.982524	1.277689
1	66.26972	*	1.79e-10*	*	*	*
2	124.6646	77.08120	2.72e-10	0.453417	5.654120	2.433874

Source: E-views output

The optimal lag length for the NARDL model was determined using the Akaike Information Criterion (AIC). Among the competing lag structures, the first lag (Lag 1) presented the lowest AIC value of 0.2292, thus satisfying the minimum information criterion requirement. Other selection metrics—log-likelihood, LR, and FPE—also reinforced Lag 1 as the most suitable choice. Hence, Lag 1 was adopted for further analysis to ensure both model efficiency and parsimony.

Stationarity Test Results

Table 2: Unit Root Test Results (ADF Test) at 5% Significance Level

Variable	Null Hypothesis (Variable has a unit root)	ADF Statistic	Critical Value (5%)	p-value	Stationarity Decision	The level test	The First difference test
LGDPCC	H_0:D(LGDPCC) has a unit root	-7.034116	-2.921175	0.0000	**Reject** H_0: **Stationary**	P-Value = 0.8392. 5% Sig. level = 0.05	I(1) Stationary after first difference
LCIT	H_0:LCIT has a unit root	-3.521450	-2.919952	0.0113	**Reject** H_0: **Stationary**	I(0) Stationary at level	
LCGT	H_0:LCGT has a unit root	-5.834021	-2.921175	0.0000	**Reject** H_0: **Stationary**	I(0) Stationary at level	
LEDT	H_0:LEDT has a unit root	-12.16974	-2.921175	0.0000	**Reject** H_0: **Stationary**	I(0) Stationary at level	
LVAT	H_0:LEDT has a unit root	-7.470414	-2.921175	0.0000	**Reject** H_0: **Stationary**	P-Value = 1.0000. 5% Sig. level = 0.05	I(1) Stationary after first difference
LGFCF	H_0:LEDT has a unit root	-6.780826	-2.922449	0.0000	**Reject** H_0: **Stationary**	P-Value = 0.9906. 5% Sig. level = 0.05	I(1) Stationary after first difference
LHUC	H_0:LEDT has a unit root	-7.513504	-2.921175	0.0000	**Reject** H_0: **Stationary**	P-Value = 0.94835% Sig. level = 0.05	I(1) Stationary after first difference
TOP	H_0:LEDT has a unit root	-7.299489	-2.921175	0.0000	**Reject** H_0: **Stationary**	P-Value = 0.2196. 5% Sig. level = 0.05	I(1) Stationary after first difference

Source: Compiled by the Researcher

The Augmented Dickey-Fuller (ADF) test was applied to ascertain the stationarity properties of the variables. The results revealed that LCIT, LCGT, and LEDT were stationary at level I(0), while LGDPCC, LGFCF, LHUC, and TOP attained stationarity at first difference I(1). These mixed integration orders validate the use of a Nonlinear ARDL (NARDL) approach, which accommodates both I(0) and I(1) series without the risk of spurious regression, while also allowing for asymmetric modelling of tax shocks.

Bounds Test for Co-integration

Table 3: Presentation of Bounds Test Analysis

F-Bounds Test			Null Hypothesis: No levels relationship	
Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	7.067260	10%	1.83	2.94
k	14	5%	2.06	3.24
		2.5%	2.28	3.5
		1%	2.54	3.86

Source: Obtained from E-Views Results

To confirm the existence of a long-run equilibrium relationship among the variables, the bounds test was employed. The F-statistic value of 7.067260 exceeded the upper critical bound of 3.24 at the 5% significance level. This implies rejection of the null hypothesis of no long-run relationship, affirming the presence of co-integration. Thus, both short- and long-run asymmetric estimations using the NARDL model are justified.

Short-Run NARDL Results

Table 4: Presentation of Short-Run NARDL Analysis

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	4.253596	0.241852	17.58762	0.0000
D(LGDPCC(-1))	-0.155087	0.052529	-2.952421	0.0213
D(LCIT_POS)	0.039311	0.021478	2.830323	0.0099
D(LCIT_POS(-1))	0.062944	0.021545	2.921565	0.0223
D(LCIT_NEG)	-0.076215	0.023197	-3.285594	0.0134
D(LCGT_POS)	-0.002763	0.003342	-2.826654	0.0357
D(LCGT_NEG)	-0.018656	0.003193	-5.842328	0.0006
D(LCGT_NEG(-1))	0.038883	0.003584	10.85002	0.0000
D(LEDT_POS)	0.758244	0.048113	15.75972	0.0000
D(LEDT_POS(-1))	-0.339028	0.030523	-11.10727	0.0000
D(LEDT_NEG)	0.020102	0.025528	0.787470	0.4568
D(LEDT_NEG(-1))	-0.217236	0.046068	-4.715578	0.0022
D(LVAT_POS)	1.251935	0.092538	13.52889	0.0000
D(LVAT_POS(-1))	-0.764986	0.091772	-8.335739	0.0001
D(LVAT_NEG)	1.842779	0.155973	11.81473	0.0000
D(LVAT_NEG(-1))	1.559930	0.175708	8.877959	0.0000
D(LGFCF_POS)	0.572818	0.056173	10.19741	0.0000
D(LGFCF_POS(-1))	0.311934	0.051279	6.083080	0.0005
D(LGFCF_NEG)	-0.121663	0.069062	-1.761637	0.1215
D(LGFCF_NEG(-1))	-1.512608	0.107882	-14.02099	0.0000
D(LHUC_POS)	-0.340509	0.112837	-3.017696	0.0194
D(LHUC_NEG)	-0.574276	0.203636	-2.820114	0.0258
D(LHUC_NEG(-1))	-2.183539	0.246708	-8.850692	0.0000
D(TOP_POS)	0.051301	0.004417	11.61522	0.0000
D(TOP_POS(-1))	0.027895	0.004524	6.165407	0.0005
D(TOP_NEG)	-0.019745	0.001640	-12.04035	0.0000
D(TOP_NEG(-1))	-0.008551	0.001881	-4.546040	0.0026
CointEq(-1)*	-0.776818	0.032345	-17.83330	0.0000

Source: Obtained from E-Views Results

The short-run NARDL estimation indicated significant asymmetries in the effects of tax variables on GDP per capita. Positive shocks in Company Income Tax (CIT) yielded significant positive impacts (coefficients: 0.039 and 0.063), while negative shocks produced a substantial negative effect (-0.076). Capital Gains Tax (CGT) also showed asymmetric

effects; both positive (-0.003) and negative (-0.019 and 0.039) components affected growth. For Education Tax (EDT), a strong positive influence (0.758) was found, although a significant negative lagged effect (-0.217) was also observed. VAT's impact was unambiguously positive across both positive (1.252) and negative (1.843 and 1.560) components. The error correction term (CointEq(-1)) was significant and negative (-0.777), confirming a rapid convergence to long-run equilibrium at a rate of 77.6% per quarter.

Table 5: Short-Run Wald Test for Asymmetry

Wald Test:

Equation: NARDL

Test Statistic	Value	df	Probability
F-statistic	4.560943	(14, 7)	0.0255
Chi-square	63.85320	14	0.0000

Null Hypothesis: C(3) = C(4) = C(5) = C(6) = C(7) = C(8)
= C(9) = C(10) = C(11) = C(12) = C(13) = C(14) =
C(15) = C(16) = 0

Null Hypothesis Summary:

Normalized Restriction (= 0)	Value	Std. Err.
C(3)	0.039311	0.069920
C(4)	-0.066589	0.083090
C(5)	-0.062944	0.073937
C(6)	-0.076215	0.085688
C(7)	0.198622	0.095293
C(8)	-0.002763	0.010232
C(9)	-0.039321	0.013117
C(10)	-0.018656	0.010565
C(11)	-0.016130	0.011447
C(12)	-0.038883	0.013497
C(13)	0.758244	0.167828
C(14)	0.309825	0.149804
C(15)	0.339028	0.101440
C(16)	0.020102	0.083955

Restrictions are linear in coefficients.

The Wald test for short-run asymmetry yielded an F-statistic of 4.561 (p-value = 0.0255) and a Chi-square value of 63.853 (p-value = 0.0000). These results reject the null hypothesis of symmetry, confirming the presence of statistically significant asymmetric responses of GDP per capita to changes in the tax components.

Table 6: Long-Run NARDL Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LCIT_POS	-0.156412	0.246680	-3.634068	0.0462
LCIT_NEG	0.212210	0.223607	0.949032	0.3742
LCGT_POS	-0.072959	0.043574	-2.674364	0.0380
LCGT_NEG	-0.127716	0.067958	-1.879319	0.1023
LEDT_POS	2.439412	1.176258	2.073875	0.0468
LEDT_NEG	1.485241	0.475566	3.123104	0.0168
LVAT_POS	1.170723	0.739565	2.582989	0.0274
LVAT_NEG	2.015360	1.906548	1.057073	0.3256
LGFCF_POS	0.879817	0.456200	1.928580	0.0951
LGFCF_NEG	3.817246	2.044603	1.866986	0.1041
LHUC_POS	-1.557776	1.614406	-0.964922	0.3667
LHUC_NEG	2.530069	2.122133	1.192229	0.2720
TOP_POS	0.052082	0.051822	1.005013	0.3484
TOP_NEG	-0.022654	0.011310	-2.003026	0.0852

In the long run, Company Income Tax (CIT) exhibited a negative impact (-0.156), implying that persistent increases hinder economic performance. Education Tax (EDT) showed a positive and significant coefficient (2.439), affirming its developmental role in enhancing human capital. Capital Gains Tax (CGT) presented a negative long-run coefficient (-0.073), consistent with its disincentive effect on capital formation. VAT maintained its positive impact (1.171), suggesting that consumption-based taxation promotes economic expansion over time.

Table 7: Long-Run Wald Test for Asymmetry

Wald Test:

Equation: NARDL

Test Statistic	Value	df	Probability
F-statistic	2.116504	(8, 7)	0.1696
Chi-square	16.93203	8	0.0308

Null Hypothesis: C(1) = C(2) = C(3) = C(4) = C(5) = C(6)
= C(7) = C(8) = 0

Null Hypothesis Summary:

Normalized Restriction (= 0)	Value	Std. Err.
C(1)	0.268094	0.212159
C(2)	0.155087	0.172510
C(3)	0.039311	0.069920
C(4)	-0.066589	0.083090
C(5)	-0.062944	0.073937
C(6)	-0.076215	0.085688
C(7)	0.198622	0.095293
C(8)	-0.002763	0.010232

The Wald test for long-run asymmetry revealed a Chi-square statistic of 16.932 (p-value = 0.0308), indicating that at least one coefficient significantly influences the model. However, the F-statistic (2.117; p = 0.1696) suggests weaker evidence of joint significance. Overall, the test underscores important asymmetric effects in the long run, though less uniformly robust than in the short run.

Model Fit and Stability Diagnostics

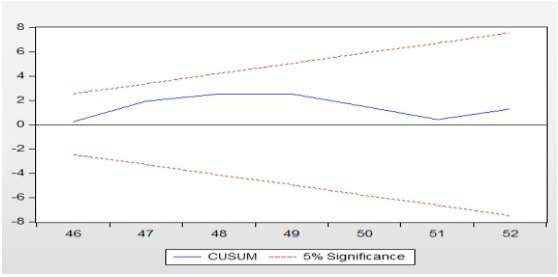
Table 8: Model Fit and Stability Assessment

R-squared	0.967199	Mean dependent var	-0.008474
Adjusted R-squared	0.925025	S.D. dependent var	0.068802
S.E. of regression	0.018839	Akaike info criterion	-4.810227
Sum squared resid	0.007453	Schwarz criterion	-3.729187
Log likelihood	145.8506	Hannan-Quinn criter.	-4.400082
F-statistic	22.93399	Durbin-Watson stat	2.283687
Prob(F-statistic)	0.000000		

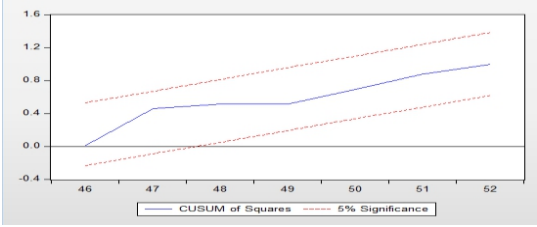
Normality test	Jarque-Bera value=0.155899	Prob. Value	0.925011
Serial correlation test	F-statistic value= 2.734505	Prob. Value	0.1784
CUSUM			CUSUM remains within the 5% significance threshold
CUSUMSQ			CUSUMSQ remains within the 5% significance threshold

Source: Compiled by the Researcher

CUSUM



CUSUMSQ



The model demonstrated excellent explanatory power with an R-squared of 0.967 and an adjusted R-squared of 0.925. The F-statistic of 22.934 ($p < 0.01$) affirms overall model significance. The Durbin-Watson statistic of 2.284 indicates no serial correlation, while the Jarque-Bera normality test ($p = 0.925$) confirms normal distribution of residuals. CUSUM and CUSUMSQ plots remained within the 5% bounds, indicating model stability over time.

Hypotheses Testing

H_{01} (CIT): Rejected. CIT has significant short-run positive and negative effects, and a long-run negative effect.

H_{02} (CGT): Rejected. CGT exerts a negative impact in both short and long-run, with asymmetric dynamics.

H_{03} (EDT): Rejected. EDT significantly enhances GDP per capita in both time horizons.

H_{04} (VAT): Rejected. VAT shows strong positive and asymmetric effects in both the short and long run.

Discussion of Results

The findings affirm the asymmetric nature of the relationship between non-oil tax revenue and economic growth in Nigeria. CIT increases stimulate short-term growth but have detrimental long-run consequences, suggesting over-reliance affect investment. CGT discourages capital accumulation and should be carefully structured to avoid growth retardation. Conversely, EDT emerges as a growth-promoting tool, underlining the value of education investment. VAT proves to be the most consistent positive contributor, reinforcing its role as a robust tax instrument for developmental finance. Overall, the results align with the tenets of endogenous growth theory and emphasize the importance of nuanced, evidence-based fiscal policy to optimize tax structures for inclusive and sustainable economic growth.

Summary of Findings and Policy Recommendations

This study investigated the asymmetric effects of non-oil tax revenue components—Company Income Tax (CIT), Capital Gains Tax (CGT), Education Tax (EDT), and Value Added Tax (VAT)—on economic growth in Nigeria, using GDP per capita as a proxy. The empirical analysis, conducted using the Nonlinear Autoregressive Distributed Lag (NARDL) framework, uncovered distinct short-run and long-run dynamics across the tax instruments.

The findings revealed that CIT has a significant positive impact in the short run but exerts a negative influence in the long run, suggesting that while initial increases in CIT boost growth, over time they discourage investment. CGT showed consistently negative effects, with both positive and negative changes reducing GDP per capita. EDT demonstrated strong positive impacts in both the short and long term, reinforcing the importance of education funding in driving sustainable growth. VAT exhibited a positive and significant effect on economic growth across time horizons, with the Wald test confirming the presence of asymmetries for all tax variables.

These results highlight the nuanced and nonlinear relationship between tax policy and economic performance, underscoring the need for a more strategic and flexible fiscal approach.

Based on the findings, the following policy recommendations are proposed:

1. Reform of Company Income Tax (CIT): Tax authorities should restructure CIT to balance its short-run stimulative effects with its long-run economic implications. Policies should focus on offering tax incentives for reinvestment and simplifying compliance to avoid deterring private sector investment.
2. Rethink Capital Gains Tax (CGT): Given its adverse impact, CGT should be reviewed and possibly redesigned to avoid discouraging capital formation. A tiered structure or exemptions for long-term or productive investments enhance its efficiency.
3. Strengthen Education Tax (EDT) Deployment: The positive results of EDT call for a more transparent and performance-based allocation of funds to the education sector. Monitoring mechanisms should ensure that tax revenues translate into measurable improvements in human capital.
4. Enhance VAT Efficiency: VAT should be further optimized to improve compliance and minimize regressivity. Expanding the VAT net, simplifying the system, and earmarking revenues for infrastructure and social services reinforce its growth-promoting role.

References

Adeusi, A. S., Uniamikogbo, E., Erah, O. D., & Aggreh, M. (2020). Non-oil revenue and economic growth in Nigeria, *Research Journal of Finance and Accounting*, 11(8), 95-106.

Adeyemo, A. K., & Oyedokun, G. E. (2023). Effects of company income tax and capital gains tax on the financial performance of small and medium sized businesses in Nigeria, *Multidisciplinary Journal of Social Sciences*, 3(1), 73-94.

Bukie, H. O., Adejumo, T., & Edame, G. E. (2013). The effect of tax revenue on economic growth in Nigeria, *International Journal of Humanities and Social Invention*, 2(6), 16-26.

Edwards, A., & Todtenhaupt, M. (2020). Capital gains taxation and funding for start-ups, *Journal of Financial Economics*, 138(2), 549-571.

Federal Inland Revenue Service (FIRS), 2023. *Statistical report.*

Federal Inland Revenue Service (FIRS). (2024). *Quarterly tax revenue reports*, Abuja: FIRS.

Federal Ministry of Budget and National Planning (2017). *Economic recovery and growth plan* (ERGP) 2017–2020. Abuja, Nigeria.

George, W. C., Monday, O., & Chukwu, G. J. (2022). Evaluating the impact of non-oil tax revenue on Nigerian economic performance, *International Journal of Multidisciplinary Research and Growth Evaluation*, 3(1), 310-316.

Ilori, F., & Akinwunmi, A. (2020). Comprehensive analysis of the effect of oil and non-oil revenues on economic development in Nigeria, *International Journal of Accounting Research*, 5(3), 93-106.

International Monetary Fund (IMF), *2023. statistical report.*

Ndu, C., & Uguru, L. C. (2022). Non-oil tax revenue and economic growth in Nigeria, *Journal of Taxation and Economic Development*, 21(2), 12-25.

Nwakanma, P. C., & Udeorah, S. C. (2022). Asymmetric impact of value added tax on economic growth in Nigeria, *Journal of Fiscal Studies and Taxation, 9*(1), 34–48.

Okoye, N. J., Nwosu, N. L., Amobi, C. S., & Udoye, O. N. (2023). Examining the effect of non-oil tax revenue on gross domestic products in Nigeria, *African Banking and Finance Review Journal*, 3(3), 20–34.

Omesi, I., Ngoke, O. S. & Ordu, P. A. (2020). Non-oil revenue and economic development of Nigeria. *International Journal of Innovative Development and Policy Studies, 8* (1), 91-99.

Onyekwelu, W. I., Anzaku, E. D., & Eggon, H. A. (2024). Empirical analysis of impact of non-oil tax revenue on economic growth in Nigeria, *Polac Management Review* (PMR)/4(1), 2814-0842.

Organisation for Economic Co-operation and Development (OECD). (2024). *Human development and economic growth reports: Nigeria*, Paris: OECD.

Otekunrin, A. O., Fakile, S. A., Eluyela, D. F., Onabote, A. A., John, O. N., & Ifeanyichukwu, S. (2023). Impact of Oil and Non-oil Tax Revenue on Economic Growth in Nigeria, *International Journal of Energy Economics and Policy*, 13(2), 545–552.

Romer, P. M. (1990). Endogenous technological change, *Journal of Political Economy*, 98(5, Part 2), S71-S102.

Taiwo, A. O., & Oyedokun, G. E. (2022). Corporate taxes and financial performance of small and Medium Enterprises in Nigeria, *Journal of Accounting and Taxation*, 2(3), 107-118.

World Bank (2024). *Statistical report.*

World Bank. (2023). *World development indicators*, Washington, DC: World Bank Publications.

Yahaya, K. A. & Yusuf, K. (2019). Impact of non-oil tax revenue on economic growth in Nigeria, *The Journal of Accounting and Management*, 9(2):14-23

Yusuf, Y. S., Aigbedion, I. M., & Ologunla, S. E. (2024). Impact of non-oil taxation on economic growth in Nigeria, *International Journal of Operational Research in Management*, Social Sciences & Education | IJORMSSE, 10(1), 2536-6521