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NIGERIA'S TAX STRUCTURE: AN ECONOMETRIC ASSESSMENT OF TAX PERFORMANCE AND ECONOMIC GROWTH DYNAMICS 2010-2023

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Abstract

This study presents a comprehensive econometric analysis of Nigeria's tax structure between 2010 and 2023, with particular focus on growth patterns, economic contributions, revenue relationships, and performance elasticities across six major tax categories. Drawing on secondary data obtained from the Central Bank of Nigeria, the research employs time series regression using the EViews statistical package to test the formulated hypotheses. The findings reveal that Company Income Tax (CIT) and Value Added Tax (VAT) exhibit strong and consistent associations with economic growth and revenue, supported by stable growth trajectories. In contrast, Petroleum Profit Tax (PPT) demonstrates volatility, weak links with growth, and low responsiveness, although it continues to contribute significantly to government revenue. Personal Income Tax is also shown to maintain a notable connection with real GDP in combined models. Overall, the results underscore the pivotal role of non-oil taxes, particularly CIT and VAT, in strengthening Nigeria's economic resilience, while PPT's instability highlights the vulnerabilities of oil dependence. The study recommends a strategic shift towards diversifying the tax base away from oil, enhancing the administration of CIT and VAT, addressing PPT volatility, and leveraging digital technologies to improve tax collection efficiency. Such measures will strengthen compliance, ensure fiscal stability, and support long-term sustainable growth.

Keywords: Company Income Tax, Economic Performance, Nigeria, Non-Oil Taxes, Petroleum Profit Tax, Real GDP, Revenue Diversification, Tax Administration, Tax Elasticity, Value Added Tax

1. Introduction

Nigeria's economic development trajectory has been intrinsically linked to its evolving tax structure, particularly given the country's historical dependence on oil revenues and ongoing efforts towards economic diversification (Ilori & Efuntade, 2020). The Nigerian tax system

encompasses various categories including Petroleum Profit Tax (PPT), Company Income Tax (CIT), Capital Gains Tax (CGT), Excise Duty, Value Added Tax (VAT), and Personal Income Tax (PIT), each contributing differently to overall revenue generation and economic growth (Herbert et al., 2018).

The period from 2010 to 2023 represents a critical phase in Nigeria's fiscal policy evolution, marked by significant economic challenges including oil price volatility, currency devaluation, and the need for sustainable revenue diversification (Etim et al., 2021). Understanding the dynamic relationships between different tax categories and economic performance during this period is essential for informed policy formulation and fiscal sustainability (Gbeke & Nkak, 2021). This research employs comprehensive econometric analysis to examine four fundamental aspects of Nigeria's tax performance: growth patterns across tax categories, individual tax contributions to economic output, revenue interdependencies, and elasticity relationships with economic performance. The findings provide crucial insights for policymakers seeking to optimise tax administration and enhance economic growth through strategic fiscal policy interventions (Ibrahim et al., 2020).

Nigeria's economy faces significant challenges related to revenue sustainability and economic diversification, particularly given its historical over-reliance on oil revenues (Godfrey, 2020). The volatility of petroleum-based income has created fiscal instability, necessitating a comprehensive understanding of how different tax categories contribute to economic growth and revenue generation (Herbert, Nwarogu & Nwabueze 2018).

Despite various tax reforms and policy initiatives (Emeneka, 2021; Gbeke & Nkak, 2021), several critical gaps remain in understanding the dynamic relationships between Nigeria's tax structure and economic performance. First, there is insufficient empirical evidence regarding the trend patterns and growth trajectories of different tax categories over the recent period of economic transformation. Second, the relative contributions of individual tax types to Real GDP growth remain poorly quantified, limiting policymakers' ability to prioritise tax administration efforts effectively (Garga & Akanegbu, 2022).

Third, the interdependencies between different tax categories and their collective impact on total revenue generation lack comprehensive analysis, hindering optimal tax policy coordination (Ibrahim et al., 2020). Finally, the elasticity relationships between tax revenues and economic performance indicators need systematic examination to inform evidence-based fiscal policy decisions (Jimoh et al., 2020).

These knowledge gaps constrain Nigeria's ability to develop effective tax policies that support sustainable economic growth and reduce dependence on volatile oil revenues (Ilori & Efuntade,

2020). This study addresses these critical issues through comprehensive econometric analysis of Nigeria's tax structure performance from 2010 to 2023. With the following Specific Objectives:

1. To examine the trend patterns and growth trajectories of different tax categories in Nigeria from 2010 to 2023, with particular attention to the consistency of non-oil versus petroleum-based taxes.
2. To assess the relationship between individual tax categories and Real GDP growth, highlighting the strength of Company Income Tax and Value Added Tax compared with Petroleum Profit Tax.
3. To evaluate the contribution of different tax categories to total government revenue, with emphasis on the dominance of Petroleum Profit Tax despite diversification efforts.
4. To analyse the economic performance elasticities of different tax categories, identifying variations between non-oil and petroleum-based taxes.

And the Research Questions were as follows:

1. What are the trend patterns and growth trajectories of different tax categories in Nigeria from 2010 to 2023, and how do non-oil taxes compare with petroleum-based taxes in terms of consistency?
2. How do individual tax categories correlate with Real GDP growth, and do Company Income Tax and Value Added Tax show stronger relationships than Petroleum Profit Tax?
3. In what ways do different tax categories contribute to total government revenue, and does Petroleum Profit Tax continue to dominate despite diversification efforts?
4. How do economic performance elasticities vary across tax categories, and do non-oil taxes exhibit higher elasticity and more stable relationships with economic output than petroleum-based taxes?

The following Research Hypotheses were raised from the study objectives:

H_1: There are significant trend patterns and growth trajectories across different tax categories in Nigeria from 2010-2023, with non-oil taxes showing more consistent growth patterns than petroleum-based taxes.

H_2: Individual tax categories demonstrate varying degrees of positive correlation with Real GDP growth, with Company Income Tax and Value Added Tax showing stronger relationships than Petroleum Profit Tax.

H_3: Different tax categories exhibit distinct contribution patterns to total revenue generation, with petroleum profit tax maintaining dominance despite diversification efforts.

H_4: Economic performance elasticities vary significantly across tax categories, with non-oil taxes demonstrating higher elasticity coefficients and more stable relationships with economic output.

2. Literature Review

2.1 Conceptual Framework

The conceptual foundation of this study rests on the intersection of public finance theory, fiscal policy effectiveness, and economic growth dynamics. Tax revenue generation serves as a critical component of government fiscal capacity, directly influencing public investment, infrastructure development, and overall economic performance. The conceptual framework recognises tax systems as multifaceted instruments that simultaneously serve revenue generation, economic stabilisation, and resource allocation functions.

Nigeria's tax structure reflects the complexity of a resource-dependent economy transitioning towards greater diversification. The conceptual model acknowledges the dual nature of Nigeria's fiscal system, incorporating both oil-dependent revenues (PPT) and non-oil sources (CIT, VAT, CGT, Excise, PIT) that collectively determine fiscal sustainability and economic growth potential.

2.2 Theoretical Framework

2.2.1 Endogenous Growth Theory

The endogenous growth theory provides the primary theoretical foundation for understanding tax-growth relationships in Nigeria. This theory emphasises the role of government policy, including taxation, in determining long-term economic growth rates. Unlike exogenous growth models that treat technological progress as external, endogenous growth theory recognises that government fiscal policies, including tax structure optimisation, can permanently influence growth trajectories.

In the Nigerian context, endogenous growth theory suggests that strategic tax policy reforms can enhance productivity, encourage investment, and foster sustainable economic development. The theory supports the hypothesis that well-designed tax systems contribute to economic growth through improved resource allocation and enhanced government capacity to provide growth-supporting public goods.

2.2.2 Fiscal Policy Theory

Fiscal policy theory provides the framework for understanding how government revenue and expenditure decisions influence macroeconomic outcomes. The theory emphasises the stabilisation function of fiscal policy, particularly relevant for resource-dependent economies like Nigeria that face commodity price volatility.

The application of fiscal policy theory to Nigeria's context highlights the importance of revenue diversification and tax system optimisation for achieving macroeconomic stability. The theory supports the examination of different tax categories' contributions to fiscal sustainability and economic performance.

2.2 Empirical Review

Recent empirical studies have provided valuable insights into tax-growth relationships in Nigeria. El-Maude et al. (2018) examined the impact of Capital Gains Tax awareness on revenue generation, finding significant positive relationships between taxpayer awareness and revenue performance. Emeneka (2021) analysed the effect of tax reforms on Nigeria's economic growth, concluding that strategic tax policy changes positively influence economic performance. The study emphasised the importance of comprehensive tax reform programmes that address both policy design and administrative efficiency. These findings support the theoretical expectation that tax system optimisation contributes to sustainable economic growth.

Etim, Charlie & Jeremiah (2021) provided analysis of the implications of the 2020 Finance Act on the Nigerian economy, demonstrating how specific tax policy changes can influence economic outcomes. Their research highlighted the dynamic nature of tax-economy relationships and the importance of continuous policy evaluation and adjustment. Ewa (2021) conducted an appraisal of self-assessment tax policy in Nigeria, revealing significant challenges in tax administration and compliance. The study underscored the importance of administrative efficiency in maximising tax revenue potential and highlighted areas for policy improvement.

Garga and Akanegbu (2022) analysed the impact of direct taxes on Nigeria's economic growth from 1970-2020, finding positive relationships between direct taxation and economic performance. Their long-term analysis provided valuable historical context for understanding tax-growth dynamics in Nigeria. Gbeke and Nkak (2021) examined tax reforms and economic growth relationships, concluding that well-implemented tax reforms contribute positively to economic development. Their research emphasised the importance of comprehensive reform approaches that address both policy and administrative dimensions.

Godfrey (2020) investigated non-oil revenue and economic growth relationships from 1981-2019, finding significant positive correlations between non-oil tax revenues and economic performance. This study provided strong empirical support for revenue diversification strategies in Nigeria. Hang et al. (2020) conducted comparative analysis across ASEAN 5+1 countries to identify optimal tax revenue thresholds for economic growth. Their research provided international context for understanding tax-growth relationships and offered insights for optimal tax policy design in developing economics.

Herbert, Nwarogu, & Nwabueze (2018) examined tax reforms and Nigeria's economic stability, finding that strategic tax policy changes contribute to macroeconomic stability. Their research highlighted the stabilisation function of fiscal policy in resource-dependent economies. Hope and Limberg (2022) analysed the economic consequences of major tax cuts for high-income earners, providing insights into tax policy distributional effects and economic outcomes. Their research offered valuable perspectives on tax policy design considerations for developing economies. Ibrahim et al. (2020) investigated tax reforms as tools for effective fiscal policy in Nigeria, concluding that comprehensive tax reform programmes enhance fiscal policy effectiveness. Their research emphasised the importance of coordinated policy approaches that address multiple tax categories simultaneously.

3. Methodology

This study employs a quantitative research design utilising time series econometric analysis to examine Nigeria's tax structure performance from 2010-2023. The analysis utilises secondary data focusing on six major tax categories, with dependent variables including individual tax revenues, total tax revenue, and Real Gross Domestic Product (RGDP), all measured in billions of Nigerian Naira.

Model Specifications

The study employs four distinct analytical frameworks corresponding to the research objectives:

Objective 1 - Trend Analysis Models:

Linear Trend: $\text{Tax Revenue} = \alpha + \beta_1(\text{Time}) + \varepsilon$

Quadratic Trend: $\text{Tax Revenue} = \alpha + \beta_1(\text{Time}) + \beta_2(\text{Time}^2) + \varepsilon$

Objective 2 - RGDP Contribution Models:

Individual Impact: $\text{RGDP} = \alpha + \beta(\text{Tax Type}) + \gamma(\text{Time}) + \varepsilon$

Combined Impact: $\text{RGDP} = \alpha + \Sigma\beta_i(\text{Tax Type}_i) + \varepsilon$

Objective 3 - Revenue Relationship Models:

Individual Contribution: $\text{Total Revenue} = \alpha + \beta(\text{Individual Tax}) + \varepsilon$

Combined Contribution: $\text{Total Revenue} = \alpha + \Sigma\beta_i(\text{Tax Type}_i) + \varepsilon$

Objective 4 - Elasticity Models:

Log-linear: $\ln(\text{RGDP}) = \alpha + \beta \ln(\text{Tax Type}) + \varepsilon$

Statistical Techniques

The analysis employs ordinary least squares (OLS) regression with appropriate diagnostic testing. Model performance is evaluated using R-squared values, F-statistics, and coefficient significance levels. Standard errors are reported for all coefficient estimates, with significance levels indicated at 1%, 5%, and 10% levels.

4. Results

The descriptive analysis reveals significant variation across Nigeria's tax categories from 2010-2023. Petroleum Profit Tax (PPT) demonstrates the highest mean revenue at ₦2,227.68 billion with a coefficient of variation of 37.1%, indicating substantial but manageable volatility.

Descriptive Statistics (₦ Billions)

Tax Type	Mean	Std. Dev	Min	Max	CV (%)
PPT	2227.68	826.91	1157.81	4209.02	37.1
CIT	1433.72	814.11	654.45	3766.43	56.8
CGT	18.67	24.89	1.04	99.40	133.4
EXCISE	25.40	30.83	5.90	120.16	121.4
VAT	949.34	514.61	436.61	1990.02	54.2
PIT	59.76	21.86	32.31	108.01	36.6

4.2 Testing Hypothesis 1: Trend Patterns and Growth Trajectories

Table 1: Trend and Growth Pattern Analysis

Variable	PPT Linear	PPT Quadratic	CIT Linear	CIT Quadratic	VAT Linear	VAT Quadratic
Constant	2176.774***	2948.179***	188.763	1066.894***	86.439	634.389***
Time	6.787	-282.490	165.995***	-163.304	115.054***	-90.427**

time_squared	-	19.285	-	21.953***	-	13.699***
R-squared	0.001	0.114	0.676	0.827	0.812	0.960
F-statistic	0.01	0.71	24.99	26.26	51.92	130.78

The empirical evidence strongly supports H_1. Petroleum Profit Tax demonstrates minimal trend significance ($R^2 = 0.001$ for linear, 0.114 for quadratic), confirming irregular growth patterns characteristic of oil-dependent revenues. Company Income Tax shows highly significant linear trends ($p < 0.01$) with substantial explanatory power ($R^2 = 0.676$), improving to $R^2 = 0.827$ in quadratic specification. Value Added Tax exhibits the most consistent growth pattern with exceptional explanatory power ($R^2 = 0.812$ linear, 0.960 quadratic). Non-oil taxes demonstrate more consistent and statistically significant growth patterns than petroleum-based taxes.

4.3 Testing Hypothesis 2: Individual Tax Contributions to RGDP

Table 2: Individual Tax Contributions to RGDP

Variable	PPT → RGDP	CIT → RGDP	VAT → RGDP	All Taxes → RGDP
Constant	68068.926***	57255.175***	56517.297***	43098.862***
Ppt	-0.832	-	-	-0.181
Cit	-	6.250***	-	6.576**
Vat	-	-	10.216***	0.792
Pit	-	-	-	185.725***
R-squared	0.009	0.512	0.546	0.919

Company Income Tax demonstrates significant positive correlation with RGDP ($\beta = 6.250$, $p < 0.01$) with substantial explanatory power ($R^2 = 0.512$). Value Added Tax shows strong positive correlation ($\beta = 10.216$, $p < 0.01$) with high explanatory power ($R^2 = 0.546$). Petroleum Profit Tax consistently shows weak negative correlations with RGDP. Personal Income Tax emerges with exceptionally strong positive correlation ($\beta = 185.725$, $p < 0.01$) in collective analysis. CIT and VAT show stronger correlations with RGDP than PPT, though relationships are complex and mediated by underlying growth trends.

4.4 Testing Hypothesis 3: Tax Type Contributions to Total Revenue

Table 3: Tax Type Contributions to Total Revenue

Variable	PPT → Total	CIT → Total	VAT → Total	All Taxes → Total
Constant	1987.021	2375.089***	2052.530***	21.805
Ppt	1.477**	-	-	1.041***
Cit	-	2.025***	-	0.883***
Vat	-	-	3.398***	1.596***
R-squared	0.402	0.733	0.824	0.999
F-statistic	8.08	32.91	56.36	1145.47

Petroleum Profit Tax maintains significant contribution to total revenue ($\beta = 1.477$, $p < 0.05$) with consistent significance ($\beta = 1.041$, $p < 0.01$) in combined models. Company Income Tax shows substantial individual contribution ($\beta = 2.025$, $p < 0.01$) with high explanatory power ($R^2 = 0.733$). Value Added Tax exhibits the strongest individual relationship ($\beta = 3.398$, $p < 0.01$) with exceptional explanatory power ($R^2 = 0.824$). PPT maintains revenue dominance whilst CIT and VAT provide substantial contributions with distinct patterns.

4.5 Testing Hypothesis 4: Economic Performance Elasticity Analysis

Table 4: Economic Performance Elasticity Analysis

Variable	ln(PPT)	ln(CIT)	ln(VAT)	Combined
Constant	11.370***	9.673***	9.821***	10.266***
log_ppt	-0.036	-	-	-0.087*
log_cit	-	0.199***	-	0.120
log_vat	-	-	0.189***	0.095
R-squared	0.013	0.685	0.651	0.771
F-statistic	0.16	26.07	22.42	11.24

Petroleum Profit Tax demonstrates negligible elasticity ($\beta = -0.036$, not significant) with minimal explanatory power ($R^2 = 0.013$). Company Income Tax exhibits significant positive elasticity ($\beta = 0.199$, $p < 0.01$) with substantial explanatory power ($R^2 = 0.685$). Value Added Tax demonstrates comparable positive elasticity ($\beta = 0.189$, $p < 0.01$) with strong explanatory power ($R^2 = 0.651$). Non-oil taxes demonstrate significantly higher positive elasticity coefficients and more stable relationships with economic output.

Discussion of Findings

The comprehensive analysis reveals clear evidence of revenue diversification progress, with non-oil taxes showing stronger and more consistent growth patterns than petroleum-based revenues. Company Income Tax and Value Added Tax demonstrate superior performance in both growth trends and economic contribution measures, indicating successful implementation of non-oil revenue strategies.

The high volatility of Petroleum Profit Tax revenues, combined with weak growth correlation, underscores economic vulnerability associated with oil dependence. The strong performance of Personal Income Tax in economic correlation models suggests untapped potential in broadening the tax base.

Conclusion

This econometric analysis provides robust evidence for strategic tax policy recommendations. The research confirms significant progress in revenue diversification, with non-oil taxes demonstrating superior growth patterns and stronger economic correlations than petroleum-based revenues. Company Income Tax and Value Added Tax emerge as the most effective tax categories warranting prioritised policy attention.

Recommendations

Prioritise CIT administration improvement, strengthen VAT systems, and develop PIT infrastructure.

Accelerate revenue diversification, implement comprehensive tax reform, and enhance tax administration technology.

Build sustainable fiscal frameworks, strengthen tax policy research capacity, and foster tax compliance culture.

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