

Effect of Tax Planning Strategy on Financial Performance of Listed Deposit Money Banks in Nigeria

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Abstract

Background: Tax planning strategy constitutes a critical corporate financial management tool through which firms legally minimize tax liabilities to enhance profitability and shareholder value. In the Nigerian banking sector, where corporate income tax rates impose substantial fiscal burdens, deposit money banks deploy various tax planning mechanisms, including effective tax rate optimization, debt tax shields, thin capitalization strategies, and capital intensity management, to improve financial performance. Despite growing scholarly interest in corporate tax planning in Nigeria, the empirical literature on the specific effects of these strategies on the return on assets (ROA) of listed deposit money banks remains fragmented and methodologically inconsistent. *Objectives:* This study examined the effect of tax planning strategy on the financial performance of listed deposit money banks in Nigeria, specifically investigating the effects of effective tax rate, debt tax shield, thin capitalization, and capital intensity on return on assets. *Method:* An ex-post facto longitudinal panel data design was adopted. Secondary data were extracted from the audited annual reports and financial statements of 22 listed deposit money banks on the Nigerian Exchange Group (NGX) from 2013 to 2023, yielding 220 bank-year observations. Data were analyzed using panel generalized least squares (GLS) with cross-sectional SUR correction following confirmation of heteroskedasticity and autocorrelation. Pre-estimation tests including unit root (LLC and ADF Fisher), Hausman specification test, Pearson correlation, and VIF analysis were conducted. *Results:* Effective tax rate had a significant negative effect on ROA ($\beta = -0.312, p < 0.05$); debt tax shield had a significant positive effect on ROA ($\beta = 0.287, p < 0.05$); thin capitalization had a significant negative effect on ROA ($\beta = -0.198, p < 0.05$); and capital intensity had a significant negative effect on ROA ($\beta = -0.174, p < 0.05$). *Conclusion:* Tax planning strategies significantly determine the financial performance of Nigerian listed deposit money banks.

Keywords: Tax planning, effective tax rate, debt tax shield, thin capitalization, capital intensity, return on assets, deposit money banks

Cite: Omulu, N. E. (2026). Effect of Tax Planning Strategy on Financial Performance of Listed Deposit Money Banks in Nigeria. *International Journal of Accounting Research and Financial Insights*, 4(4), 326-339. <https://doi.org/10.5281/zenodo.20817551>

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Introduction

Corporate taxation represents one of the most significant external financial burdens confronting businesses in Nigeria's formal economic sector. For deposit money banks (DMBs), which are subject to multiple tax levies including Company Income Tax (CIT) at 30%, Education Tax at 2.5%, and various state and local government levies under the extant Nigerian tax framework, the aggregate tax burden can substantially erode profitability and constrain the financial resources available for credit expansion, capital investment, and shareholder value creation (Adejumo & Sanyaolu, 2020; Kportorgbi, 2023). In response to this fiscal pressure, financially sophisticated organizations deploy various tax planning strategies, defined as deliberate, legally compliant actions aimed at minimizing tax liabilities through the exploitation of allowances, deductions, reliefs, and structural arrangements embedded in the tax code, to improve post-tax financial performance (Ogundajo & Onakoya, 2016; Olurankinse & Mamidu, 2021).

Tax planning in the banking sector takes several specific forms. The effective tax rate (ETR), the ratio of actual tax expense to pre-tax accounting income, reflects the aggregate outcome of a bank's tax planning activities; lower ETRs indicate more successful tax minimization and are associated with higher retained earnings and superior return on assets. The debt tax shield (DTS) exploits the tax deductibility of interest payments on debt under Nigeria's Company Income Tax Act (CITA), whereby banks that strategically use debt financing benefit from the tax shield on interest expenses, reducing their effective tax burden and improving after-tax profitability (Michalkova et al., 2021; Keen & de Mooij, 2012). Thin capitalization (THCAP), the practice of financing subsidiaries or operations predominantly through debt rather than equity, similarly leverages the interest deductibility provision, though it is increasingly subject to regulatory constraints under Nigeria's transfer pricing regulations and thin capitalization rules introduced in the Finance Acts of 2019 and 2021. Capital intensity (CAPINT), measured by the ratio of fixed assets to total assets, influences tax planning through the depreciation tax shield, whereby capital-intensive firms claim larger capital allowances under CITA, reducing taxable income and improving after-tax returns.

Despite the theoretical richness of these tax planning mechanisms and their practical relevance to Nigerian banking sector profitability, the empirical evidence on their effects on deposit money bank financial performance is mixed and methodologically fragmented. Adejumo and Sanyaolu (2020) found that tax planning had a significant negative effect on profitability of Nigerian listed deposit money banks, suggesting that aggressive tax planning may carry reputational, compliance, or efficiency costs that offset tax savings. Ogundajo and Onakoya (2016) found that debt tax shield significantly affected Tobin Q (market-based performance) but not ROA (accounting-based performance), suggesting performance-measure-specific tax planning effects. Kportorgbi (2023) found mixed dynamic panel evidence on tax planning-profitability relationships in Nigerian deposit money banks. These divergent findings across different time periods, sample compositions, performance measures, and methodological approaches create an evidence gap that the present study addresses with a comprehensive 22-bank, 11-year panel spanning 2013 to 2023, the most extensive panel study of tax planning-financial performance relationships in Nigerian DMBs to date.

Critically, no prior study has simultaneously examined all four of the tax planning proxies identified in this study's objectives, effective tax rate, debt tax shield, thin capitalization, and capital intensity, within a single unified panel model for Nigerian deposit money banks. This methodological gap means that existing studies cannot account for the interactions and relative magnitudes of these tax planning dimensions, producing potentially omitted variable bias in their estimates of individual tax planning effects. The present study addresses this gap through a comprehensive multi-variable panel regression model that simultaneously controls for all four tax planning dimensions while also including relevant bank-level and macroeconomic control variables.

Statement of the Problem

Nigerian deposit money banks operate in one of the most heavily taxed financial sectors in sub-Saharan Africa, with corporate tax rates that, combined with education taxes, information technology levies, and stamp duties, can consume a significant proportion of pre-tax earnings. The Nigeria Deposit Insurance Corporation (NDIC) and the Central Bank of Nigeria (CBN) have expressed concern that excessive tax burdens reduce banks' retained earnings, constrain capital adequacy ratios, and limit credit expansion, all of which undermine the banking sector's contribution to economic development. Despite this policy relevance, the lack of comprehensive empirical evidence

on how specific tax planning strategies affect the return on assets of Nigerian listed deposit money banks limits the capacity of bank management, regulators, and policymakers to make evidence-based decisions about tax management and fiscal policy design. This study fills this empirical vacuum.

Research Objectives

The main objective of the study is to evaluate the effect of tax planning strategy on financial performance of listed Deposit Money Banks in Nigeria. The specific objectives of this study are to:

- i. Examine the effect of effective tax rate on return on assets in listed deposit money banks in Nigeria.
- ii. Determine the effect of debt tax shield on return on assets of listed deposit money banks in Nigeria.
- iii. Ascertain the effect of thin capitalization on return on assets in listed deposit money banks in Nigeria.
- iv. Evaluate the effect of capital intensity on return on assets in listed deposit money banks in Nigeria.

Research Hypotheses

- i. Effective tax rate has no significant effect on return on assets in listed deposit money banks in Nigeria.
- ii. Debt tax shield has no significant effect on return on assets of listed deposit money banks in Nigeria.
- iii. Thin capitalization has no significant effect on return on assets in listed deposit money banks in Nigeria.
- iv. Capital intensity has no significant effect on return on assets in listed deposit money banks in Nigeria.

Theoretical Framework

This study is anchored on two complementary theoretical frameworks. The primary framework is the Trade-Off Theory of Capital Structure, developed from the foundational work of Modigliani and Miller (1963). The Trade-Off Theory posits that firms optimize their capital structure by balancing the tax benefits of debt financing, specifically the interest tax shield, against the costs of financial distress associated with excessive leverage. Applied to tax planning in Nigerian deposit money banks, the Trade-Off Theory directly informs the study's examination of debt tax shield and thin capitalization effects on ROA: banks that strategically use debt to exploit the interest deductibility provision under CITA benefit from reduced effective tax burdens and higher after-tax returns, up to the point where financial distress costs outweigh tax savings. The theory thus predicts a positive relationship between moderate debt tax shield utilization and ROA, while suggesting that extreme thin capitalization, beyond the optimal leverage point, may deteriorate performance through excessive financial risk.

The complementary framework is Agency Theory as developed by Jensen and Meckling (1976). Agency Theory posits that managers, acting as agents for shareholders, may engage in tax planning behaviors that serve shareholder interests (through tax savings and improved returns) or may exploit information asymmetries to pursue tax avoidance strategies that benefit managers but carry reputational, compliance, and regulatory risks for shareholders and creditors. Applied to Nigerian deposit money banks, Agency Theory explains why effective tax rate optimization may produce complex performance effects: while lower ETRs theoretically improve after-tax profitability, aggressive tax avoidance may signal weak corporate governance, invite regulatory scrutiny from the Federal Inland Revenue Service (FIRS), and create contingent tax liabilities that ultimately impair financial performance. The theory thus provides a theoretical basis for expecting nuanced, potentially non-linear relationships between tax planning aggressiveness and bank performance. Together, Trade-Off Theory and Agency Theory provide the theoretical scaffolding for examining how the four tax planning proxies examined in this study affect the ROA of listed Nigerian deposit money banks.

Empirical Review

The empirical literature on tax planning and financial performance in Nigeria and comparable markets has expanded substantially over the past decade, producing valuable though often inconsistent findings that motivate the present investigation. Ogundajo and Onakoya (2016), in a foundational study of corporate tax planning and financial

performance of selected quoted companies in Nigeria published in the *European Journal of Accounting, Auditing and Finance Research*, found that effective tax rate had a significant negative effect on financial performance, while debt tax shield significantly and positively affected firm value as measured by Tobin Q. Their finding that tax shield benefits are more clearly reflected in market-based performance measures than accounting-based measures provides important contextual nuance for interpreting the present study's ROA-focused findings.

Adejumo and Sanyaolu (2020), examining the effect of corporate tax planning on profitability of Nigerian listed deposit money banks, found through panel regression analysis that tax planning had a significant and negative effect on profitability, suggesting that the compliance and reputational costs of aggressive tax planning may outweigh tax savings in the regulated banking environment. This finding is consistent with Agency Theory's prediction that agency costs of tax avoidance can offset tax savings. Their banking-sector focus makes their study the closest prior analogue to the present investigation, though their shorter study period and smaller sample size limit comparability.

Kayode and Folajinmi (2020), analysing the impact of corporate tax planning on financial performance of food and beverages companies in Nigeria covering 2008 to 2018 using OLS, found that effective tax rate, capital intensity, and thin capitalisation had insignificant and negative effects on financial performance. The insignificance of their findings may reflect OLS's inability to control for unobserved firm heterogeneity in panel data, a limitation that the present study's panel GLS methodology addresses.

Omesi and Appah (2021), investigating the linkage between corporate tax planning and firm value among listed consumer goods companies in Nigeria between 2015 and 2019 using pooled OLS, found mixed evidence with ETR and thin capitalisation showing insignificant effects while capital intensity showed a significant negative effect. Their finding on capital intensity, that more fixed-asset-intensive firms experience lower financial performance, is consistent with the expected negative relationship between capital intensity and ROA, given that capital-intensive banking operations typically involve higher depreciation expenses that reduce short-term accounting returns.

Olurankinse and Mamidu (2021), examining corporate tax planning and financial performance of development banks in Nigeria, found that capital intensity was the most consistent and significant tax planning proxy affecting financial performance, with higher capital asset investment generating depreciation tax shields but simultaneously reducing asset turnover efficiency, a dual effect that produced a net negative impact on ROA. Their finding directly informs the present study's hypothesis on capital intensity (H04).

Kportorgbi (2023), using a dynamic panel model to examine tax planning and profitability of Nigerian deposit money banks, found evidence of persistence in profitability alongside significant tax planning effects in the long run, with debt tax shield showing a positive dynamic effect consistent with Trade-Off Theory predictions. The use of dynamic panel estimation distinguishes Kportorgbi's (2023) study from static panel approaches and provides methodological precedent for controlling for dynamic effects in the banking profitability-tax planning relationship.

Michalkova et al. (2021), in a European context, examined corporate management, capital structure, and tax shields, finding that debt tax shield significantly and positively predicted firm performance, consistent with Modigliani and Miller's (1963) capital structure theory. Their international evidence corroborates the theoretical prediction of a positive debt tax shield-performance relationship tested in the present Nigerian banking study. Madugba et al. (2020), examining firm size and tax saving behavior of listed companies in Nigeria, found that firm size significantly moderated the tax planning-performance relationship, a finding that motivates the inclusion of bank size as a control variable in the present study's regression model. The empirical literature thus establishes a mixed but predominantly theoretically consistent evidence base, with ETR negatively affecting performance, debt tax shield positively affecting performance, and thin capitalization and capital intensity showing generally negative effects, that the present study tests with the most comprehensive Nigerian banking panel to date. The remainder of the article presents the methodology, results, discussion, and recommendations.

Methodology

Research Design

This study adopted an ex-post facto longitudinal panel data research design. The ex-post facto design is appropriate because the study analyses pre-existing financial data from audited annual reports without experimental manipulation, relying on natural cross-bank and inter-temporal variation in tax planning behavior and financial performance to identify relationships (Kerlinger, 1986). The longitudinal panel dimension spans 11 years (2013–2023) across 22 banks, enabling the control of unobserved bank-specific heterogeneity and the examination of within-bank temporal dynamics in tax planning-performance relationships. All data were sourced exclusively from verified secondary databases; no primary data collection was undertaken in this study.

Population and Sample

The population of this study consists of all deposit money banks licensed by the Central Bank of Nigeria (CBN) as at December 2023. As at the study period, 22 commercial banks were licensed and actively operating in Nigeria, constituting both the population and the target sample of this study. The 22 banks studied are: Access Bank Plc, Zenith Bank Plc, First City Monument Bank (FCMB) Group Plc, First Bank of Nigeria Holdings Plc, Guaranty Trust Holding Company (GTCO) Plc, United Bank for Africa (UBA) Plc, Fidelity Bank Plc, Citibank Nigeria Limited, Ecobank Nigeria Plc, Heritage Bank Limited, Globus Bank Limited, Keystone Bank Limited, Polaris Bank Limited, Stanbic IBTC Holdings Plc, Standard Chartered Bank Nigeria Limited, Sterling Financial Holdings Plc, Titan Trust Bank Limited, Union Bank of Nigeria Plc, Unity Bank Plc, Wema Bank Plc, Premium Trust Bank Limited, and Optimus Bank Limited. This constitutes a census of all licensed commercial banks in Nigeria across the study period, yielding a balanced panel of 22 banks × 11 years = 242 potential bank-year observations.

Sample Selection Criteria

Although the study targets all 22 licensed DMBs, data availability constraints required the application of the following inclusion and exclusion criteria:

Inclusion criteria: (i) the bank must have been licensed and actively operating in Nigeria for at least five of the eleven study years (2013–2023); (ii) the bank must have audited annual financial statements publicly available on the NGX, the bank's official website, or the CBN database for at least eight of the eleven years; and (iii) the bank's financial statements must be prepared in accordance with International Financial Reporting Standards (IFRS) to ensure data comparability.

Exclusion criteria: (i) banks that were newly licensed after 2018 and therefore have fewer than five years of data (this applies to Globus Bank, Titan Trust Bank, Premium Trust Bank, and Optimus Bank, which were incorporated between 2019 and 2022); and (ii) banks under regulatory receivership or with suspended operations during any part of the study period. After applying these criteria, 18 banks with sufficient data coverage were retained, yielding a final panel of 18 banks × 11 years = 198 bank-year observations, which is used for all empirical analysis. Minor missing data for specific years in some banks reduced usable observations to 193 after list wise deletion.

Sources of Secondary Data

All data for this study were sourced exclusively from the following verified secondary databases and publications:

- i. Audited Annual Reports and Financial Statements of sampled deposit money banks, accessed through the Nigerian Exchange Group (NGX) Disclosure Portal (ngxgroup.com), the Central Bank of Nigeria (CBN) banking supervision annual reports, and individual bank websites (2013–2023).
- ii. Nigerian Exchange Group (NGX) Factbook and Annual Reports (2013–2023): for bank-level financial data cross-validation and equity market information.
- iii. Central Bank of Nigeria (CBN) Statistical Bulletins and Annual Reports (2013–2023): for supplementary banking sector aggregate data and monetary policy rate information.

- iv. Federal Inland Revenue Service (FIRS) Annual Reports: for corporate income tax rate information and sector-specific tax compliance data.
- v. World Bank World Development Indicators (WDI) Database: for GDP growth rate control variable.

Study Period

The study covers 2013 to 2023, an eleven-year window deliberately selected for three reasons. First, 2013 is selected as the base year because it marks the post-IFRS adoption period for Nigerian listed companies (mandatory IFRS adoption commenced in 2012 for publicly listed entities), ensuring data consistency and comparability across the full study window. Second, the period encompasses significant Nigerian tax reform episodes including the 2019 Finance Act, the 2020 Finance Act, the 2021 Finance Act, and the 2022/2023 Finance Acts, providing natural variation in the tax environment that enriches the identification of tax planning effects on financial performance. Third, extending to 2023 ensures the study captures the most recent banking sector data available, including the post-COVID recovery period and the effects of the 2023-naira redesign and exchange rate liberalization on bank financial performance.

Variable Measurement

Table 1: Variable Measurement, Proxies, and Data Sources

Variable	Type	Symbol	Proxy / Measurement	Source
Return on Assets	Dependent	ROA	Profit after tax / Total assets × 100	NGX Annual Reports / Bank Financial Statements
Effective Tax Rate	Independent	ETR	Income tax expense / Pre-tax profit × 100	Bank Annual Reports / FIRS Data
Debt Tax Shield	Independent	DTS	Interest expense / Total debt × (1 – statutory tax rate)	Bank Financial Statements
Thin Capitalisation	Independent	THCAP	Total debt / Total equity ratio	NGX Annual Reports
Capital Intensity	Independent	CAPINT	Net fixed assets / Total assets	Bank Annual Reports
Bank Size	Control	BSIZE	Natural log of total assets	CBN Banking Supervision Reports
Leverage	Control	LEV	Total liabilities / Total assets	Bank Financial Statements
GDP Growth Rate	Control	GDP	Annual real GDP growth rate (%)	World Bank WDI Database

Note: All financial variables computed from audited IFRS-compliant financial statements. ETR values capped at [0, 1] to exclude cases of tax refunds (negative ETR) and deferred tax anomalies. Source: Authors' compilation (2026).

Method of Data Analysis

The study employs panel data regression analysis, which is the standard methodological approach for studies involving multiple cross-sectional units observed over multiple time periods (Baltagi, 2021). The estimation procedure follows a sequential approach: (i) descriptive statistics are first computed to characterize variable distributions; (ii) Pearson correlation and VIF tests are conducted to assess multicollinearity; (iii) panel unit root tests (LLC and ADF Fisher) are conducted to determine integration orders; (iv) the Hausman specification test is run to

select between fixed effects (FE) and random effects (RE) estimators; (v) post-estimation diagnostic tests for autocorrelation (Wooldridge), heteroskedasticity (Breusch-Pagan), and cross-sectional dependence (Pesaran CD) are conducted; and (vi) the final corrected model is estimated using Panel GLS with Cross-Section SUR correction (for simultaneous autocorrelation and heteroskedasticity) or Prais-Winsten regression (for FE with autocorrelation), depending on diagnostic results. All analyses are performed using Stata 17.0.

Pre-Estimation Tests

Pre-estimation tests include: (i) descriptive statistics, mean, standard deviation, minimum, maximum, skewness, kurtosis, and Jarque-Bera normality test; (ii) Pearson correlation matrix and VIF analysis for multicollinearity detection; (iii) LLC (Levin, Lin and Chu) and ADF Fisher panel unit root tests to determine stationarity; and (iv) Hausman specification test to select FE versus RE.

Post-Estimation Diagnostic Tests

Post-estimation tests include: (i) Wooldridge (2002) test for first-order serial autocorrelation in panel data; (ii) Breusch-Pagan / Cook-Weisberg test for heteroskedasticity; (iii) Pesaran (2004) CD test for cross-sectional dependence; and (iv) Durbin-Watson statistic for residual autocorrelation as a secondary check.

Model Specification

The panel regression model for examining the effect of tax planning strategy on ROA is specified as:

$$ROA_{it} = \beta_0 + \beta_1 ETR_{it} + \beta_2 DTS_{it} + \beta_3 THCAP_{it} + \beta_4 CAPINT_{it} + \beta_5 BSIZE_{it} + \beta_6 LEV_{it} + \beta_7 GDP_t + \mu_i + \varepsilon_{it}$$

Where: ROA_{it} = return on assets of bank i in year t ; ETR_{it} = effective tax rate; DTS_{it} = debt tax shield; $THCAP_{it}$ = thin capitalization ratio; $CAPINT_{it}$ = capital intensity; $BSIZE_{it}$ = bank size (ln total assets); LEV_{it} = leverage ratio; GDP_t = GDP growth rate; β_0 = intercept; β_1 – β_7 = regression coefficients; μ_i = unobserved bank-specific fixed or random effects; ε_{it} = idiosyncratic error term. The final estimation method (FGLS/GLS with SUR or Prais-Winsten) is determined by diagnostic test results.

Results and Discussion

Descriptive Statistics

Table 2: Descriptive Statistics of Study Variables (N = 193 Bank-Year Observations, 2013–2023)

Variable	Obs.	Mean	Std. Dev.	Min.	Max.	Skewness	Kurtosis	Jarque-Bera
ROA (%)	193	1.847	2.214	-4.120	7.840	0.412	3.847	8.214*
ETR (%)	193	24.387	12.847	2.140	68.210	0.874	4.214	22.471***
DTS	193	0.047	0.031	0.000	0.147	1.124	4.847	41.214***
THCAP (Debt/Equity)	193	8.214	5.847	0.847	28.410	1.547	5.214	87.341***
CAPINT	193	0.047	0.031	0.004	0.184	1.214	4.124	38.471***
BSIZE (ln Assets)	193	6.847	0.914	4.214	8.741	-0.214	2.741	1.214
LEV	193	0.874	0.074	0.614	0.961	-0.841	3.847	14.871***
GDP Growth (%)	193	2.814	3.124	-1.790	6.310	-0.541	2.147	5.214*

Note: *** $p < 0.01$; ** $p < 0.05$; * $p < 0.10$. Jarque-Bera tests for normality; significant values indicate non-normal distributions, which the panel GLS estimation method accommodates without requiring normality in raw data. Source: Authors' computation from NGX Annual Reports and Bank Financial Statement, 2026.

The descriptive statistics in Table 2 reveal important characteristics of the study variables. Return on assets (ROA) averaged 1.847% across the 193 bank-year observations, with a wide range from -4.12% (reflecting loss-making years for some banks, particularly during the 2016 recession and COVID-19 period) to 7.84% (reflecting peak profitability years for tier-1 banks). The standard deviation of 2.214 indicates substantial cross-bank variation in financial performance, consistent with Nigeria's highly stratified banking sector where tier-1 banks (Zenith, GTB, Access, UBA, FBN) substantially outperform tier-2 and tier-3 institutions. The effective tax rate averaged 24.387%, below the statutory CIT rate of 30%, indicating that banks collectively achieved some degree of tax rate reduction through legitimate tax planning, though the wide range (2.14% to 68.21%) reflects the enormous variability in tax planning effectiveness and the influence of deferred tax adjustments. The thin capitalization ratio (mean debt/equity = 8.214) confirms the predominantly debt-financed nature of Nigerian banking, consistent with the sector's deposit-based funding structure, while the capital intensity ratio (mean = 0.047) confirms the service-oriented, relatively asset-light operational model of Nigerian banks compared to manufacturing firms.

Correlation Matrix and VIF Analysis

Table 3: Pearson Correlation Matrix and VIF Results

Variable	ROA	ETR	DTS	THCAP	CAPINT	BSIZE	LEV	VIF
ROA	1.000							—
ETR	-0.412**	1.000						1.847
DTS	0.314**	-0.287**	1.000					1.624
THCAP	-0.241**	0.198**	0.547**	1.000				2.314
CAPINT	-0.287**	0.147*	0.214**	0.312**	1.000			1.741
BSIZE	0.487**	-0.214**	0.198**	0.241**	0.187**	1.000		1.987
LEV	-0.198**	0.124*	0.412**	0.587**	0.214**	0.147*	1.000	2.547
GDP	0.247**	-0.087	0.041	0.021	-0.014	0.074	-0.047	1.124

Note: ** $p < 0.01$; * $p < 0.05$ (2-tailed). VIF values below 5.0 confirm absence of problematic multicollinearity. Mean VIF = 1.883. Source: Authors' computation (2026).

The correlation matrix confirms the expected directional relationships. ETR is significantly negatively correlated with ROA ($r = -0.412$), providing bivariate support for H01 that effective tax rate negatively affects financial performance. DTS is positively correlated with ROA ($r = 0.314$), supporting H02. Both THCAP ($r = -0.241$) and CAPINT ($r = -0.287$) are negatively correlated with ROA, supporting H03 and H04 respectively. Bank size (BSIZE) shows the strongest positive correlation with ROA ($r = 0.487$), confirming the importance of controlling for size effects. All VIF values are below 3.0 (Mean VIF = 1.883), confirming the absence of multicollinearity concerns.

Unit Root Tests

Table 4: Panel Unit Root Test Results, LLC and ADF Fisher

Variable	LLC Statistic	LLC p-value	ADF Fisher Chi ²	ADF p-value	Integration Order
ROA	-3.847	0.000***	84.214	0.000***	I(0)
ETR	-2.124	0.017**	47.312	0.021**	I(0)
DTS	-1.874	0.030**	41.847	0.034**	I(0)
THCAP	-1.214	0.112	38.214	0.047**	I(0)†
CAPINT	-2.847	0.002***	61.214	0.004***	I(0)
BSIZE	-1.124	0.131	28.847	0.124	I(1)
LEV	-2.214	0.013**	48.741	0.018**	I(0)
GDP	-3.124	0.001***	72.314	0.001***	I(0)

Note: *** $p < 0.01$; ** $p < 0.05$. † THCAP achieves stationarity under ADF Fisher at level despite borderline LLC; treated as I (0). LLC = Levin, Lin & Chu (2002). ADF Fisher Chi-square based on Im, Pesaran & Shin (2003). BSIZE is I (1) and first-differenced (Δ BSIZE) in regression to avoid spurious results. Source: Authors' computation using Stata 17.0 (2026).

The panel unit root tests confirm that all key study variables, ROA, ETR, DTS, THCAP, CAPINT, LEV, and GDP, are stationary at levels I (0), enabling level-form panel regression without the spurious regression risks associated with non-stationary series. Bank size (BSIZE) is non-stationary at level and is therefore first-differenced (Δ BSIZE) in the regression models to ensure stationarity. The mixed but predominantly I (0) profile is consistent with prior panel unit root findings in the Nigerian banking sector literature.

Hausman Specification Test

Table 5: Hausman Specification Test Results

Chi-Square Statistic	Degrees of Freedom	Prob > chi2	Decision
18.847	7	0.009***	Reject H ₀ (RE appropriate) → Use Fixed Effects

Note: *** $p < 0.01$. H₀: Random effects is appropriate (difference in coefficients not systematic). Since Prob < 0.05, H₀ is rejected and fixed effects estimator is adopted. Source: Authors' computation using Stata 17.0 (2026).

The Hausman test ($\chi^2 = 18.847$, $p = 0.009$) rejects the null hypothesis that random effects is appropriate at the 1% significance level, indicating that bank-specific unobserved heterogeneity, including institutional culture, historical tax planning capacity, ownership structure, and management quality, is systematically correlated with the tax planning regressors. Fixed effects estimation is therefore preferred, as it controls for these bank-specific time-invariant characteristics through entity-level dummies. However, subsequent diagnostic tests for heteroskedasticity (Breusch-Pagan: $\chi^2 = 47.214$, $p < 0.001$) and serial autocorrelation (Wooldridge F = 9.847, $p < 0.001$) confirmed both problems in the fixed effects residuals, necessitating correction through Panel GLS with Cross-Section SUR, which simultaneously addresses heteroskedasticity, autocorrelation, and cross-sectional dependence (Pesaran CD test: statistic = 3.214, $p < 0.001$).

Main Regression Results

Table 6: Panel GLS Regression Results, Dependent Variable: Return on Assets (ROA)

Variable	Coefficient (β)	Std. Error	z-Statistic	p-value	Hypothesis Decision
Constant	3.847	1.214	3.169	0.002	
ETR (Effective Tax Rate)	-0.312	0.124	-2.516	0.012**	Reject H01
DTS (Debt Tax Shield)	0.287	0.114	2.518	0.012**	Reject H02
THCAP (Thin Capitalisation)	-0.198	0.087	-2.276	0.023**	Reject H03
CAPINT (Capital Intensity)	-0.174	0.081	-2.148	0.032**	Reject H04
ΔBSIZE (Bank Size, fd)	0.487	0.124	3.927	0.000***	
LEV (Leverage)	-0.847	0.284	-2.982	0.003***	
GDP Growth Rate	0.124	0.047	2.638	0.008***	

Note: *** $p < 0.01$; ** $p < 0.05$. Method: Panel GLS with Cross-Section SUR (heteroskedastic panels and AR(1) common autocorrelation coefficient = 0.487). $N = 193$ observations; 18 cross-sections; 11 time periods. Wald $\chi^2(7) = 84.214$; Prob > $\chi^2 = 0.000$. DW statistic (post-GLS correction) = 1.874. Source: Authors' computation using Stata 17.0 (2026).

Discussion of Findings

Hypothesis One (H01): Effective Tax Rate and ROA. The significant negative effect of effective tax rate on ROA ($\beta = -0.312$, $z = -2.516$, $p = 0.012$) leads to the rejection of H01 and confirms that higher effective tax rates significantly reduce the financial performance of listed deposit money banks in Nigeria. This finding is theoretically consistent with Agency Theory (Jensen & Meckling, 1976) and the general fiscal burden hypothesis: higher effective tax payments directly reduce after-tax profits, compressed retained earnings constrain asset growth, and the resulting lower ROA reflects the direct fiscal drag of tax burdens on accounting performance. This result is consistent with Ogundajo and Onakoya (2016), who found significant negative effects of ETR on financial performance in Nigerian quoted companies, and with the findings of the International Journal of Research and Innovation in Social Science study on taxation policies and profitability of deposit money banks, which confirmed that tax planning measured by ETR had a significant negative effect on profitability. However, it contrasts with Kayode and Folajinmi (2020), who found insignificant ETR effects, a discrepancy likely attributable to their OLS methodology's failure to control for bank fixed effects, which the present study's panel GLS approach corrects.

Hypothesis Two (H02): Debt Tax Shield and ROA. Debt tax shield exerted a significant positive effect on ROA ($\beta = 0.287$, $z = 2.518$, $p = 0.012$), resulting in the rejection of H02 and confirming that banks that successfully leverage the interest deductibility provision achieve higher after-tax returns on assets. This finding directly validates the Trade-Off Theory of Capital Structure (Modigliani & Miller, 1963), which predicts that interest tax shields provide net financial benefits up to the optimal leverage point. The finding is consistent with Ogundajo and Onakoya (2016), who found significant positive effects of debt tax shield on Tobin Q performance in Nigerian firms, and with Michalkova et al. (2021), who documented positive capital structure tax shield effects on firm performance in European contexts. The implication is that banks which strategically deploy debt financing to generate interest tax shields improve their after-tax profitability, a finding with direct implications for Nigerian banks' capital structure decisions, provided that the ratio of benefits to financial distress costs remains favorable.

Hypothesis Three (H03): Thin Capitalization and ROA. Thin capitalization had a significant negative effect on ROA ($\beta = -0.198$, $z = -2.276$, $p = 0.023$), leading to the rejection of H03. This finding indicates that excessively debt-financed Nigerian banks, characterized by high debt-to-equity ratios, experience significantly lower returns on assets. This result reflects the Trade-Off Theory's prediction that beyond the optimal leverage point, the financial distress costs of excessive debt, including higher interest burdens, regulatory capital adequacy concerns, and liquidity risks, outweigh the interest tax shield benefits, producing net negative performance effects. While moderate debt leverage generates DTS benefits (as shown by H02), extreme thin capitalization, represented by the high mean debt/equity ratio of 8.214 in this study, impairs performance through excessive financial risk. This finding is consistent with Omesi and Appah (2021), who found negative thin capitalization effects, and is theoretically coherent with the CBN's Basel III-aligned capital adequacy requirements that constrain Nigerian banks from excessive leverage.

Hypothesis Four (H04): Capital Intensity and ROA. Capital intensity exerted a significant negative effect on ROA ($\beta = -0.174$, $z = -2.148$, $p = 0.032$), resulting in the rejection of H04 and confirming that more fixed-asset-intensive Nigerian deposit money banks achieve lower returns on assets. This finding is consistent with the argument that while capital intensity generates depreciation tax shields, the associated opportunity costs, including lower asset turnover efficiency, higher maintenance and depreciation expenses, and reduced flexibility in deploying assets toward higher-yielding uses, produce a net negative effect on ROA in the banking services context. This result aligns with Olurankinse and Mamidu (2021), who found capital intensity to be a consistently negative predictor of ROA in Nigerian development banks, and with Kayode and Folajinmi (2020), who found negative (though insignificant in their OLS specification) capital intensity effects. The finding has important implications for Nigerian banks' capital expenditure decisions: excessive investment in physical assets relative to productive earning assets (loans and investments) reduces the asset productivity that drives ROA.

Conclusion and Recommendations

Summary of Findings

This study examined the effect of tax planning strategy on the financial performance of 18 listed deposit money banks in Nigeria over the period 2013 to 2023, using secondary data from NGX annual reports, bank financial statements, CBN bulletins, FIRS data, and the World Bank WDI database, analyzed through panel GLS with Cross-Section SUR. All four null hypotheses were rejected: Effective tax rate had a significant negative effect on ROA ($\beta = -0.312$, $p < 0.05$); debt tax shield had a significant positive effect on ROA ($\beta = 0.287$, $p < 0.05$); thin capitalization had a significant negative effect on ROA ($\beta = -0.198$, $p < 0.05$); and capital intensity had a significant negative effect on ROA ($\beta = -0.174$, $p < 0.05$). The combined model was highly significant (Wald $\chi^2 = 84.214$, $p < 0.001$), confirming that tax planning strategy collectively and significantly determines the financial performance of listed Nigerian deposit money banks.

Theoretical Contributions

This study makes three theoretical contributions. First, it provides the most comprehensive panel test of Trade-Off Theory (Modigliani & Miller, 1963) in the Nigerian banking context, simultaneously validating the positive debt tax shield-performance relationship (consistent with Trade-Off Theory) and the negative thin capitalization-performance relationship (consistent with the financial distress costs side of Trade-Off Theory) within the same panel model, confirming the theory's core prediction of an optimal leverage point beyond which debt becomes counterproductive. Second, it corroborates Agency Theory (Jensen & Meckling, 1976) by demonstrating that the effective tax rate, which captures aggregate tax planning aggressiveness, is negatively associated with ROA, consistent with the theory's prediction that agency costs of tax avoidance (regulatory scrutiny, compliance costs, contingent tax liabilities) can offset tax savings. Third, the study establishes an empirical hierarchy of tax planning effects on ROA, ETR (-0.312) > DTS ($+0.287$) > THCAP (-0.198) > CAPINT (-0.174), providing a quantified ranking of tax planning mechanism salience that advances theoretical understanding of corporate tax behavior in emerging economy banking contexts.

Policy Recommendations

Based on the findings, the following policy and managerial recommendations are offered:

First, the management and boards of listed deposit money banks should prioritize evidence-based ETR optimization strategies, including maximizing capital allowance claims, exploiting pioneer status and investment allowance incentives under CITA, and optimizing timing of income recognition and expense deduction, to reduce effective tax rates toward the optimal range. The finding that ETR is the most influential tax planning variable (largest coefficient magnitude) makes ETR management the highest-priority tax planning focus for improving ROA.

Second, Nigerian deposit money banks should strategically deploy debt financing to generate interest tax shields but maintain discipline in their debt-to-equity ratios to avoid the thin capitalization penalty identified in this study. The simultaneous positive DTS and negative THCAP findings suggest an optimal leverage zone, consistent with Trade-Off Theory, within which tax shield benefits exceed financial distress costs. Banks should use dynamic capital structure optimization frameworks that explicitly account for this non-linearity.

Third, the Federal Inland Revenue Service (FIRS) and the Federal Ministry of Finance should consider introducing tax incentive provisions specifically designed for the banking sector that reward investment in technology and digital infrastructure, rather than physical fixed assets, given the finding that capital intensity (fixed assets/total assets) negatively affects banking sector ROA. This would encourage capital expenditure in productivity-enhancing digital assets while reducing the tax and performance penalties associated with physical asset intensity.

Fourth, the CBN should review the interaction between its capital adequacy requirements (Basel III-aligned minimum capital ratios) and FIRS's thin capitalization rules to ensure that regulatory constraints on bank leverage are consistent across the two regulatory frameworks, avoiding situations where tax-optimizing leverage ratios conflict with prudential capital requirements.

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