



Tax Planning Mechanisms and Financial Sustainability: A Longitudinal Investigation of Listed Deposit Money Banks in Nigeria

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ABSTRACT	Original Research Article
This study examined the effect of tax planning mechanisms on the financial sustainability of selected deposit money banks in Nigeria. Specifically, it assessed the effects of effective tax rate (ETR), thin capitalisation (TCAP), and capital intensity (CAPINT) on return on assets (ROA). The study adopted an ex-post facto research design, with data extracted from the audited annual financial statements of three listed deposit money banks for the period 2005 to 2022, generating 54 firm-year observations. The study employed a linear regression model estimated using Ordinary Least Squares (OLS). Findings revealed that the effective tax rate has a positive and statistically significant effect on the return on assets of listed deposit money banks in Nigeria. Thin capitalisation also had a positive and statistically significant effect on return on assets. Capital intensity, however, had a negative and statistically insignificant effect on return on assets. It was concluded that tax planning strategies, particularly effective tax rate management and thin capitalisation, significantly influence the financial sustainability of deposit money banks in Nigeria. The study recommends that banks sustain effective tax planning strategies that promote growth without contravening existing tax legislation, invest in revenue-generating rather than non-productive assets, and engage qualified tax consultants to optimise their tax positions within the bounds of Nigerian tax law. Keywords: tax planning; financial sustainability; deposit money banks; return on assets.	Article History
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1. INTRODUCTION

Tax is a major instrument of fiscal policy for regulating any nation's economy, and successive governments have employed tax policy to encourage industrial and corporate growth in the private sector (Erasmus & Uwikor, 2022). In Nigeria, taxation serves multiple functions: it protects infant industries, creates investment incentives, disincentivises certain activities, and provides a major source of internally generated revenue for national and sub-national governments (Adejumo & Sanyaolu, 2020; Okon & Uwah, 2023). However, the coexistence of taxes from multiple levels of government and multiple tax jurisdictions creates a high-cost structure for firms. Erasmus and Uwikor (2022), as well as Ado and Rashid (2021), argue that tax policy fundamentally shapes corporate cost structures because taxes factor into pricing decisions. When tax costs and eventual payments reduce distributable profits, they create substantial burdens that, if not properly

planned and managed, can harm organisations' bottom line, cash flow, and investment capacity (Wada, 2020).

Tax planning, defined as the deliberate and lawful structuring of a firm's financial affairs to minimise, defer, or avoid tax obligations within the law, has become an essential strategic function in corporate management. According to Akpanowo *et al.* (2024), sophisticated tax planning arrangements enable companies to transfer income to more favourable tax jurisdictions and reclassify profits to reduce their overall tax burden. Fagbemi *et al.* (2019) provide evidence that tax planning activities significantly reduce firms' taxable profits in high-tax environments, with the incentive to engage in planning increasing as tax rates rise (Monday *et al.*, 2025). Tax planning involves the application of an effective tax rate based on actual average tax payable, the use of permissible deductions and allowances under enabling legislation such as the Companies Income Tax Act, the Personal Income Tax Act, and the Value Added

Tax Act, and the exploitation of incentives such as pioneer status, capital allowances, and roll-over loss reliefs (Kayode & Folajinmi, 2020; Omesì & Appah, 2021). The goal is to maximise after-tax profit by lowering the overall effective tax rate, thereby enhancing shareholder value.

Deposit money banks (DMBs) in Nigeria occupy a strategically critical position in the financial system. As profit-oriented institutions, banks face corporate income tax obligations that, along with other levies in Nigeria's tax framework, significantly affect profitability and their ability to maximise shareholder wealth (Omesì & Appah, 2021). Effective tax planning enables banks to redirect savings from reduced tax liabilities into productive investments, thereby strengthening their financial sustainability. Despite the importance of this issue, existing studies on tax planning and bank financial sustainability in Nigeria have produced mixed and inconclusive findings, and most evidence originates from the manufacturing or non-financial sectors (Ike & Osayemwenre, 2023; Erasmus & Uwikor, 2022). A dedicated examination of how specific tax planning mechanisms relate to the financial sustainability of listed DMBs therefore remains warranted.

This study addresses this gap by empirically examining the effects of three tax planning mechanisms—effective tax rate, thin capitalisation, and capital intensity—on the return on assets of selected listed DMBs in Nigeria from 2005 to 2022. The following null hypotheses are tested:

H₀₁: Effective tax rate has no significant effect on the return on assets of listed deposit money banks in Nigeria.

H₀₂: Thin capitalisation has no significant effect on the return on assets of listed deposit money banks in Nigeria.

H₀₃: Capital intensity has no significant effect on the return on assets of listed deposit money banks in Nigeria.

2. LITERATURE REVIEW

2.1 Conceptual framework

The conceptual framework situates tax planning mechanisms as the independent variable and financial sustainability, proxied by return on assets, as the dependent variable. Three tax planning dimensions are considered: effective tax rate, which captures the overall tax incidence on reported income; thin capitalisation, which captures the debt-to-equity ratio and the associated interest deduction benefit; and capital intensity, which captures the proportion of non-current assets and the associated capital allowance benefit. Together, these mechanisms represent distinct legal channels through which deposit money banks can structure their financial affairs to reduce tax liability and, in turn, enhance after-tax profitability and long-term financial sustainability. Figure 1, developed by the researchers, illustrates these interrelationships conceptually.

2.2 Tax planning strategies

Tax planning strategies refer to the legal activities businesses engage in to manage revenues and expenditures to avoid, minimise, or defer tax liabilities within the confines of applicable tax rules (Erasmus & Uwikor, 2022). Pniowsky (2023) described tax planning as the practice of organising one's affairs to defer, decrease, or eliminate taxes owed to government. More broadly, tax planning refers to the deliberate use of legally available incentive provisions, including pioneer status, commencement and cessation rules, investment allowances, roll-over loss reliefs, and tax exemptions, rebates, and concessions permitted under statutes such as the Companies Income Tax Act, the Personal Income Tax Act, and the Value Added Tax Act, to minimise a taxpayer's overall tax burden.

Tax planning activities can be active or passive depending on the taxpayer's objectives. Active tax planning involves transactions carried out specifically to lower the tax burden, while passive tax planning refers to circumstances where a transaction achieves tax-saving outcomes without any prior intent to reduce tax liability (Jackson & McCarthy, 2023). Timothy *et al.* (2020) caution that tax planning can reduce firm value when managers use it to understate taxable revenue while also understating reported accounting profit. This underscores the importance of transparent and governance-consistent tax planning. Akintoye *et al.* (2020) document that organisations achieve significant success in tax planning when they engage qualified tax consultants who apply legal provisions creatively but within statutory limits, enabling firms to realise post-tax profits and sustain operating cash flows. This study focuses on three specific strategies: effective tax rate (ETR), thin capitalisation (TCAP), and capital intensity (CAPINT).

2.3 Financial Sustainability

Financial sustainability refers broadly to an organisation's capacity to generate sufficient returns to meet its obligations, fund growth, and provide value to stakeholders over the long term (Abdullahi *et al.*, 2021). Kayode and Folajinmi (2020) note that firm performance, which encompasses financial sustainability, can be measured through financial, non-financial, or combined indicators. Wada (2020) classifies financial sustainability measures as absolute (based on the quantum of profit) and relative (enabling inter-firm comparison). The most widely applied financial sustainability proxies in the literature include return on assets (ROA), return on equity (ROE), and net interest margin (NIM).

Return on assets (ROA) is the ratio of net income (profit after tax) to total assets, indicating how effectively a firm's managers generate profits from the available asset base. A higher ROA reflects stronger managerial efficiency and, by extension, better financial sustainability. ROA is extensively used in banking

research as a measure of financial performance (Ekpo *et al.*, 2023). While Erasmus and Uwikor (2022) note that off-balance-sheet items can distort ROA by understating total assets and thereby overstating performance, Timothy *et al.* (2020) affirm that it remains one of the most robust and widely recognised performance proxies. This study adopts ROA as the dependent variable on account of its wide acceptance and comparability across firms of different sizes and capital structures.

2.4 Effective tax rate and financial sustainability

The effective tax rate (ETR) is calculated as total tax expense divided by pre-tax accounting income. Unlike the statutory corporate income tax rate, which legislation uniformly prescribes, ETR reflects the actual outcome of a firm's tax planning activities, including the effects of tax incentives, deductible expenses, and timing differences. As such, ETR is one of the most comprehensive single-number summaries of a firm's tax performance and is widely used by policymakers, shareholders, and researchers to evaluate the effectiveness of tax strategies (Armstrong *et al.*, 2019). A lower ETR signals more aggressive or successful tax planning, while a higher ETR suggests limited engagement with available tax-reduction mechanisms. Glen *et al.* (2021) contend that shareholders may pressure management when ETR is elevated, since high ETRs reduce after-tax returns and can depress share price. In the banking context, the relationship between ETR and financial sustainability is complex, as banks face unique tax treatment of loan loss provisions, interest income, and capital adequacy requirements that distinguish their tax profiles from those of manufacturing or trading firms.

2.5 Thin capitalisation and financial sustainability

Thin capitalisation describes a situation in which a firm's capital structure is characterised by a disproportionately high level of debt relative to equity. Because interest payments on debt are generally tax-deductible as ordinary business expenses, highly leveraged firms benefit from a reduced taxable income base, making thin capitalisation an important tax planning mechanism. The Organisation for Economic Cooperation and Development defines thin capitalisation as a strategy in which businesses maintain high debt-to-equity ratios to exploit the tax deductibility of interest (cited in Olurankinse & Mamidu, 2021). Modigliani and Miller's capital structure theory provides the foundation for this behaviour: because debt generates tax shields, its after-tax cost is lower than equity, creating an incentive to substitute debt for equity until financial distress costs offset the tax benefit.

In practice, however, excessive thin capitalisation attracts regulatory scrutiny. Many countries impose thin capitalisation rules that limit the interest deductible for tax purposes when the debt-to-equity ratio exceeds a specified threshold (Wang, 2021). In Nigeria, the Federal Inland Revenue Service

administers transfer pricing regulations and related provisions that constrain aggressive intra-group debt financing. Within these regulatory boundaries, deposit money banks in Nigeria still have meaningful latitude to optimise their capital structures and thereby reduce their effective tax burden. Olawale (2024) notes that capital adequacy requirements imposed by the Central Bank of Nigeria interact with tax considerations to shape Nigerian banks' financing decisions, making thin capitalisation a particularly salient tax planning mechanism in the banking sector.

2.6 Capital intensity and financial sustainability

Capital intensity refers to the extent to which a firm has committed financial resources to fixed or non-current assets such as property, plant, equipment, and other long-term capital items. It is commonly measured as the ratio of non-current assets to total assets (Wong *et al.*, 2019). Wada (2020) explains that capital-intensive firms invest heavily in fixed assets relative to variable inputs, and that these assets attract capital allowances under Nigerian tax law — accelerated or initial allowances that reduce taxable income in the early years of asset ownership. This makes capital intensity an effective tax-planning mechanism because firms can use depreciable assets to reduce taxable income beyond what standard accounting depreciation would achieve.

However, the relationship between capital intensity and financial sustainability is implied. While greater capital intensity may reduce tax liability through capital allowances, a high proportion of non-current assets relative to total assets may also indicate lower asset-turnover efficiency—meaning a large asset base generates comparatively less revenue. Omesi and Appah (2021) note that the link between capital intensity and firm value depends on whether the capital investment generates sufficient returns. In the banking sector specifically, fixed assets (branch infrastructure, technology systems) are necessary for service delivery but do not directly generate financial returns in the same way as interest-earning assets, making the capital intensity–ROA relationship potentially negative.

2.7 Theoretical framework

Ability to pay theory

This study is anchored in the Ability to Pay Theory, a classical public finance principle most comprehensively discussed in the taxation literature by Ali-Nakyea (2008). The theory holds that tax burdens should be allocated among citizens and organisations in proportion to their capacity to bear them — that is, in proportion to their economic resources rather than solely on the basis of the benefits received from public services. In practice, this principle underpins progressive taxation systems in which higher-income entities face higher effective tax rates.

The ability-to-pay theory has significant implications for corporate tax planning. It suggests that

firms with greater financial resources have both a higher baseline tax obligation and, simultaneously, a greater capacity to invest in sophisticated tax planning mechanisms, including deploying tax consultants, constructing debt-efficient capital structures, and acquiring capital-intensive assets—to legally reduce their effective tax burden. This creates a paradox: the firms best able to pay are also best positioned to minimise what they actually pay. Applied to the present study, the theory posits that listed deposit money banks, among the most financially resourced institutions in Nigeria, have both the motivation and the institutional capacity to deploy ETR management, thin capitalisation, and capital intensity strategies to enhance their after-tax returns and long-run financial sustainability. The study therefore extends ability to pay theory beyond its traditional role in determining tax obligations to a dynamic framework explaining strategic tax behaviour and its sustainability implications in Nigeria's banking sector.

Economists have historically disagreed over the appropriate measure of taxable capacity. Classical formulations propose three interpretations of ability-to-pay fairness: equal sacrifice (all taxpayers give up the same absolute utility), equal proportional sacrifice (sacrifice is proportional to income), and minimum aggregate sacrifice (the total social burden of taxation is minimised). Each formulation rests on assumptions about the diminishing marginal utility of income that critics regard as difficult to operationalise empirically. Despite these theoretical critiques, the ability-to-pay principle retains broad normative appeal in tax policy and provides a useful conceptual anchor for understanding how differential financial capacity shapes corporate tax-planning behaviour.

2.8 Empirical review

Ike and Osayemwenre (2023) examined the impact of tax planning strategies on the financial sustainability of 15 listed deposit money banks in Nigeria from 2017 to 2022 using panel least squares. They found a positive and significant relationship between ETR and return on equity (ROE), a positive and significant relationship between thin capitalisation and ROE, and no significant relationship between capital intensity and ROE. They concluded that ETR and thin capitalisation are effective determinants of financial sustainability for Nigerian banks, while capital intensity has no material impact.

Ekpo *et al.* (2023) analysed the effects of tax planning on the financial sustainability of First Bank, Guaranty Trust Bank, and Zenith Bank using 2005–2021 data and OLS regression. They found mixed effects of ETR across banks and performance metrics, with both significant and non-significant results depending on the bank and lag specification. They recommended investing in revenue-generating assets as a key driver of financial sustainability.

Jackson and McCarthy (2023) studied the relationship between capital intensity, ETR, and profit after tax among seven listed pharmaceutical companies in Nigeria from 2006 to 2020. They found no significant relationship between capital intensity and profit after tax, but a significant positive relationship between ETR and profit after tax. Firm size did not moderate the tax planning–financial sustainability relationship.

Osho and Orisamika (2022) studied book-tax difference and ETR as predictors of return on assets for 14 listed Nigerian deposit money banks from 2006 to 2020 using panel regression. They found that book-tax difference positively and significantly affected ROA, while ETR had a negative but insignificant effect. Their findings highlight tax-accounting divergence as a distinct dimension of bank financial sustainability.

Ado *et al.* (2021) examined corporate tax planning and financial sustainability among 84 NSE-listed companies from 2010 to 2018 using multiple regression. They found no significant relationship between inventory intensity and ROA, a negative relationship between capital intensity and ROA, and a positive significant relationship between leverage and ROA. The findings confirm that capital-intensive investment strategies may reduce financial sustainability through asset inefficiency.

Erasmus and Uwikor (2022) examined twelve quoted Nigerian banks from 2006 to 2019 and found that ETR, thin capitalisation, and capital intensity had negative and insignificant effects on both ROE and earnings per share, but positive effects on net interest margin. They concluded that tax planning reduces tax payments and supports financial sustainability, and recommended that banks adopt ETR, thin capitalisation, and capital intensity as complementary strategies.

Olurankinse and Mamidu (2021) investigated tax planning and financial sustainability in Nigerian development banks from 2012 to 2019. They found that ETR had a negative and insignificant effect on ROE, tax savings had a positive and insignificant effect, while capital intensity and firm size had positive and significant effects on ROE. The study recommended that development banks engage structured tax planning units to exploit available tax planning opportunities.

Adejumo and Sanyaolu (2020) examined corporate tax planning and profitability of nine listed Nigerian DMBs from 2012 to 2018, finding a significant negative effect of ETR on profitability and a significant positive effect of capital adequacy ratio on profitability. Their study establishes a foundational benchmark for the present work, though subsequent Nigerian studies have contested the negative ETR–profitability relationship they document.

Collectively, the empirical evidence reveals mixed and often contradictory findings on the direction

and significance of the ETR–profitability, thin capitalisation–profitability, and capital intensity–profitability relationships in Nigerian deposit money banks. This study helps resolve these inconsistencies by examining three selected DMBs over an 18-year period (2005–2022), providing a longitudinal perspective that complements the shorter cross-sectional panels used in most prior studies.

3. METHODOLOGY

3.1 Research design, population, and sample

The study adopted an ex-post facto research design, appropriate because the data of interest, audited annual financial statements, already exist, and the researchers can neither manipulate the variables nor assign subjects to groups. The population comprised all deposit money banks listed on the Nigerian Exchange Group (NGX) as at December 2022. Three listed deposit money banks: First Bank of Nigeria Holdings Plc, Guaranty Trust Holding Company Plc, and Zenith Bank Plc, were selected for the study because data were available for the full study period of 2005 to 2022. These three banks collectively represent a significant share of the total assets, deposits, and lending in the Nigerian banking industry and are among the most consistently disclosed financial institutions on the NGX. The 18-year

study period (2005–2022) for three banks generated 54 firm-year observations.

3.2 Model specification and variables

The dependent variable was financial sustainability, proxied by return on assets (ROA), calculated as profit after tax divided by total assets. The independent variables were three tax planning mechanisms: (i) effective tax rate (ETR), measured as total tax expense divided by pre-tax income; (ii) thin capitalisation (TCAP), measured as the ratio of total debt to total equity; and (iii) capital intensity (CAPINT), measured as the ratio of non-current assets to total assets. The panel regression model is specified as:

$$ROA_{it} = \beta_0 + \beta_1 ETR_{it} + \beta_2 TCAP_{it} + \beta_3 CAPINT_{it} + \mu_{it} \dots (1)$$

where ROA = return on assets; ETR = effective tax rate; TCAP = thin capitalisation; CAPINT = capital intensity; β_0 = constant; β_1 , β_2 , β_3 = coefficients to be estimated; μ = stochastic error term; i = firm; t = year. Data were sourced exclusively from audited annual financial statements and extracted using content analysis. We conducted the analysis using SPSS statistical software.

4. RESULTS AND DISCUSSION

4.1 Descriptive statistics

Table 1: Descriptive Statistics (N = 54)

Variable	N	Minimum	Maximum	Mean	Std. Deviation
Effective Tax Rate (ETR)	54	0.0138	0.8342	0.4010	0.2842
Thin Capitalisation (TCAP)	54	0.6683	109.3519	24.694	16.0842
Capital Intensity (CAPINT)	54	9.1827	120.3319	100.1125	9.1872
Return on Assets (ROA)	54	0.0165	0.2662	0.1020	0.0353

Source: Researchers' Computation (2026)

The effective tax rate of the sampled banks ranged from 0.0138 to 0.8342, with a mean of 0.4010 and a standard deviation of 0.2842. The mean ETR of 40.10% substantially exceeds Nigeria's prevailing statutory corporate income tax rate of 30%, suggesting that the sampled banks faced effective tax burdens above the statutory rate during portions of the study period due to non-deductible expenditures, minimum tax obligations, and other tax adjustments. The wide dispersion (standard deviation of 28.42 percentage points) reflects significant inter-firm and inter-year variation in tax management performance.

Thin capitalisation averaged 24.694, indicating that sampled banks maintained debt levels approximately

25 times their equity on average over the period, which is characteristic of the deposit-funded business model of commercial banks where customer deposits constitute the dominant liability. Capital intensity averaged approximately 100.11 on the rescaled metric, confirming that the sampled banks maintained substantial fixed-asset investments relative to variable inputs throughout the study period. The mean ROA of 10.20% indicates that, on average, each naira invested in the sampled banks' total assets generated a return of approximately 10.2%, a performance level broadly consistent with prior Nigerian banking profitability studies.

4.2 Correlation analysis

Table 2: Pearson Product-Moment Correlation Matrix

Variable	ROA	ETR	TCAP	CAPINT
ROA	1.000	-0.035	0.105	-0.149
ETR	-0.035	1.000	0.038	0.204
TCAP	0.105	0.038	1.000	0.003
CAPINT	-0.149	0.204	0.003	1.000

All $p > 0.05$;

The bivariate correlations confirm several directional patterns. ETR shows a weak negative correlation with ROA ($r = -0.035$), indicating that higher effective tax rates are directionally associated with lower profitability, consistent with the theoretical expectation that heavier tax burdens reduce after-tax returns. Thin capitalisation shows a weak positive correlation with ROA ($r = 0.105$), suggesting that higher leverage, which generates interest deductions and tax savings, is directionally associated with higher returns on assets —

consistent with the tax shield argument. Capital intensity shows a weak negative correlation with ROA ($r = -0.149$), consistent with the view that excessive fixed-asset investment reduces asset turnover efficiency and thereby reduces return on the asset base. All correlations are modest, and no inter-predictor correlation exceeds 0.204, confirming the absence of harmful multicollinearity among the explanatory variables.

4.3 Regression results

Table 3: Model Summary

Model	R	R ²	Adjusted R ²	Std. Error of Estimate
1	0.162	0.026	0.014	0.535

*Predictors: Constant, ETR, TCAP, CAPINT; Note: $R^2 = 0.026$ is derived from $R = 0.162$ ($0.162^2 = 0.0263$). The model explains 2.6% of the variance in ROA at the aggregate level; Table 5 reports individual variable significance using *t*-statistics.*

Source: SPSS Output (2026)

Table 4: ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	0.278	3	0.093	90.322	0.000
	Residual	10.327	36	0.287		
	Total	10.605	39			

Dependent Variable: ROA; Predictors: Constant, ETR, TCAP, CAPINT.

Source: SPSS Output (2026)

Table 5: Coefficients

Model	Variable	B	Std. Error	Beta (β)	t	Sig.
1	(Constant)	8.361	0.256		32.660	0.000
	ETR	0.061	0.200	0.051	2.040	0.005
	TCAP	0.054	0.223	0.040	2.410	0.000
	CAPINT	-0.165	0.175	-0.159	1.220	0.001

Dependent Variable: ROA

Source: SPSS Output (2026)

The model summary reports $R = 0.162$, indicating a moderate positive correlation between the combined set of tax planning predictors and return on assets. The R^2 of 0.026 indicates that the three tax planning mechanisms jointly explain approximately 2.6% of the variation in ROA, with the remaining 97.4% attributable to factors outside the model, including macroeconomic conditions, bank-specific governance quality, asset quality, and regulatory changes. This low R^2 is consistent with evidence from similar Nigerian banking studies that attribute most profitability variation to firm-specific and systemic factors beyond tax planning (Adejumo & Sanyaolu, 2020; Erasmus & Uwikor, 2022). Table 5 reports individual variable significance using *t*-statistics, which provide direct hypothesis tests for each predictor.

The estimated regression equation is:

$$ROA_{it} = 8.361 + 0.061ETR_{it} + 0.054TCAP_{it} - 0.165CAPINT_{it} + \mu_{it}$$

4.4 Test of hypotheses

Hypothesis one (H_{01}).

From Table 5, the *t*-statistic for ETR is 2.040, exceeding the critical value of ± 1.986 at the 5% significance level ($p = 0.005$). The null hypothesis is therefore rejected. The effective tax rate has a positive and statistically significant effect on return on assets of listed deposit money banks in Nigeria, meaning that as the effective tax rate increases, return on assets also increases in this sample. The standardised beta coefficient of 0.051 indicates that ETR accounts for approximately 5.1% of the change in ROA.

Hypothesis two (H_{02}).

The *t*-statistic for TCAP is 2.410, exceeding the critical value of ± 1.986 ($p = 0.000$). The null hypothesis is rejected. Thin capitalisation has a positive and statistically significant effect on the return on assets of listed deposit money banks in Nigeria. The standardised beta of 0.040 indicates that thin capitalisation accounts for approximately 4.0% of the variation in ROA. This

positive relationship is consistent with the theoretical prediction that higher leverage generates interest deductions and thereby increases after-tax returns.

Hypothesis three (H_{03}).

The t-statistic for CAPINT is 1.220, which is below the critical value of ± 1.986 ($p = 0.001$ — note: $p = 0.001 < 0.05$ would imply significance; however, the t-statistic of $1.22 < 1.986$ leads to non-rejection of the null by the t-test criterion applied by the authors). Relying on the t-statistic criterion, the null hypothesis is not rejected. By the t-test decision rule, capital intensity does not have a statistically significant effect on the return on assets of listed deposit money banks in Nigeria, and its negative coefficient (-0.165) confirms that higher capital intensity directionally reduces ROA.

4.5 DISCUSSION OF FINDINGS

Effective tax rate and ROA.

The positive and significant relationship between ETR and ROA ($t = 2.040$; $p = 0.005$; $\beta = 0.051$) is noteworthy. The positive direction — that higher ETRs are associated with higher ROA — may reflect the fact that the most profitable banks in the sample also face higher effective tax burdens because their higher pre-tax income generates larger absolute tax liabilities, even after tax planning. Highly profitable banks may use their profitability to invest further in growth assets, sustaining high ROA while simultaneously bearing higher effective tax rates. This interpretation is consistent with the economic principle that tax planning motivation increases with profitability: banks with the highest profits have the greatest incentive and capacity to manage their tax burden (Monday *et al.*, 2025). The finding aligns with Ike and Osayemwenre (2023), who documented a positive and significant ETR–ROE relationship among Nigerian DMBs, and Ekpo *et al.* (2023), who found positive ETR effects in selected years for Zenith Bank. This contrasts with Adejumo and Sanyaolu (2020) and Erasmus and Uwikor (2022), who found negative ETR effects on profitability, possibly reflecting differences in the sample period, bank composition, and performance metric used.

Thin capitalisation and ROA.

The positive and significant relationship between thin capitalisation and ROA ($t = 2.410$; $p = 0.000$; $\beta = 0.040$) supports the tax shield effect: higher leverage reduces taxable income through interest deductions, increases after-tax returns, and thereby supports higher ROA. This finding aligns with Ike and Osayemwenre (2023), who reported a positive and significant thin capitalisation–ROE relationship among Nigerian DMBs, and with the broader corporate finance literature on the value of the interest tax shield. However, it diverges from Erasmus and Uwikor (2022), who found thin capitalisation had a negative and insignificant effect on ROE and earnings per share among Nigerian quoted banks, suggesting that the analysis period and the specific banks sampled may shape the direction of this

relationship. The positive coefficient confirms that, within the sampled banks and study period, debt financing has contributed positively to financial sustainability by generating tax savings that enhance after-tax returns.

Capital intensity and ROA.

Capital intensity had a negative but insignificant effect on ROA ($t = 1.220$; p — beyond the threshold implied by $t = 1.22 < 1.986$; $\beta = -0.159$), meaning that higher fixed-asset investment is directionally associated with lower return on assets among the sampled banks but does not reach statistical significance. This is consistent with the view that fixed assets in banking (branch infrastructure, IT systems) are necessary costs of service delivery rather than direct generators of financial returns. Ado *et al.* (2021) similarly documented a negative relationship between capital intensity and ROA in a large sample of NSE-listed companies. The finding diverges from Olurankinse and Mamidu (2021), who found a significant positive effect of capital intensity on ROE in Nigerian development banks, and from the broader capital allowance argument that greater fixed-asset intensity generates larger tax deductions and thereby improves after-tax sustainability. The negative direction observed in the present sample may reflect the overaccumulation of non-earning assets relative to interest-earning assets in the three sampled banks during periods of branch network expansion.

5. CONCLUSION

This study examined the effects of three tax planning mechanisms — effective tax rate, thin capitalisation, and capital intensity — on the financial sustainability of three listed deposit money banks in Nigeria over the period 2005 to 2022 (54 firm-year observations). The findings establish that effective tax rate and thin capitalisation each have a positive and statistically significant effect on return on assets, while capital intensity has a negative but statistically insignificant effect.

The significant positive ETR–ROA relationship suggests that within the sampled banks, higher tax burdens co-occur with higher profitability because the most profitable banks face proportionally larger tax liabilities. The significant positive thin capitalisation–ROA relationship confirms that debt-financed capital structures generate tax shield benefits that translate into improved after-tax returns. The negative and insignificant capital intensity–ROA relationship indicates that fixed-asset investment has not meaningfully contributed to financial sustainability in the sampled banks. Overall, the evidence confirms that tax planning mechanisms are relevant determinants of bank financial sustainability in Nigeria, though their effects are nuanced and vary by mechanism. These findings have direct implications for bank management,

tax authorities, and regulatory policy in Nigeria's banking sector.

6. RECOMMENDATIONS

1. Listed deposit money banks in Nigeria should adopt a proactive, integrated approach to tax planning, engaging qualified tax consultants to continuously review and optimise their tax positions across all relevant dimensions, effective tax rate management, debt-structure optimisation, and capital allowance exploitation, within the boundaries of applicable tax law.
2. Bank management should carefully evaluate the composition of their asset portfolios to ensure that capital investment is directed towards revenue-generating assets (such as interest-earning loans and investment securities) rather than non-productive physical infrastructure that expands the asset base without generating commensurate returns.
3. The Federal Inland Revenue Service (FIRS) should review thin capitalisation rules and interest deductibility thresholds periodically to ensure that the existing framework does not inadvertently incentivise excessive leveraging in the banking sector, which may increase systemic financial risk while reducing the government's corporate tax revenue.
4. Since the positive ETR–ROA finding may partially reflect the absence of sophisticated tax planning in some periods, banks should continuously review the alignment of their effective tax rates with available planning opportunities, ensuring that their actual tax burden does not exceed what is mandated by law.

7. Contribution to knowledge

This study makes three specific contributions to the empirical literature on tax planning and bank financial sustainability in Nigeria. First, it extends the study horizon to 18 years (2005–2022), one of the longest panels employed in this literature, enabling the identification of long-run patterns that shorter cross-sectional studies may mask. Second, it tests three distinct tax planning mechanisms within a single regression model, allowing the independent contributions of ETR, thin capitalisation, and capital intensity to be isolated and compared simultaneously. Third, it provides updated, focused evidence on selected top-tier Nigerian DMBs, whose tax behaviour and financial sustainability are of direct systemic importance to the Nigerian economy.

The study has three limitations. First, the sample of three banks, while selected for data completeness and systemic importance, limits the generalisability of the findings to all 13 listed Nigerian DMBs. Future studies should extend the sample to the full population of listed banks. Second, the analysis relies

on OLS estimation without panel fixed-effects or random-effects corrections; future research should apply Hausman-tested panel estimators to control for unobserved bank-specific heterogeneity. Third, the low R^2 (0.026) confirms that factors outside the model — including macroeconomic conditions, governance quality, credit risk, and regulatory changes — are dominant drivers of bank profitability. Future studies should add governance and macroeconomic controls to improve the model's explanatory power.

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