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TAX SAVING AND MARKET VALUE OF QUOTED DEPOSIT MONEY BANKS IN NIGERIA

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Abstract

This study investigates the relationship between tax savings, research and development expenditures, and the market value of quoted deposit money banks in Nigeria. The research specifically examines how tax optimization strategies and innovation-related investments influence share prices, using a sample of sixteen banks over a period of 2012-2023. The study adopts an ex-post facto design, employing secondary data extracted from the annual reports and audited financial statements of the sampled banks. The analytical framework comprises panel unit root tests to assess stationarity, panel regression models including pooled, fixed, and random effects, model selection tests such as the Hausman and Lagrange Multiplier tests, panel cointegration tests, and panel Autoregressive Distributed Lag /error correction models to capture both short-run dynamics and long-run equilibrium relationships. Findings reveal that both tax savings and Research and Development expenditures have significant positive effects on the market value of banks, with firm size also exerting a strong influence on share price. The long-run Autoregressive Distributed Lag results indicate that tax savings increase share price by 0.845 units, while Research and Development expenditures increase it by 0.512 units, with deviations from equilibrium corrected at a rate of 62.2% annually. These results confirm that tax efficiency and innovation investment are critical determinants of shareholder value in the Nigerian banking sector. The study recommends that banks implement structured tax planning and strategic Research and Development investment frameworks, while regulators encourage transparent disclosure to enhance market confidence and long-term value creation.

Keywords:

Tax savings, Research and Development expenditures, Market value, Deposit money banks, Panel Autoregressive Distributed Lag.

Introduction

The Nigerian banking sector holds a pivotal role in the nation's economy by intermediating savings and investment, providing credit to key sectors, and facilitating financial market operations. Deposit money banks contribute significantly to economic growth, financial stability, and capital market development in Nigeria. Over time, the interplay between tax policies and banking performance has gained scholarly and policy attention because taxation influences corporate liquidity, profitability, and investor perceptions (Ogbaragu & Offor, 2024; Onwughai, Success & Ofili, 2025). Within corporate finance literature, tax planning and tax savings are often linked to firm value maximization through reductions in tax burdens, allowing greater after-tax cash flows and signaling efficiency to investors (Efenyumi & Nworie, 2025). Empirically, tax planning has been shown to affect the total shareholder return of Nigerian banks, with effective tax rate reductions positively associated with shareholder wealth (Efenyumi & Nworie, 2025). Similarly, research on Nigerian commercial banks has found that tax savings positively and significantly influence market value proxies such as Tobin's Q, suggesting that investors reward firms that efficiently manage tax liabilities (Bwala, Ibrahim & Gurama, 2024). These findings align with broader international evidence indicating that fiscal policies and tax positions can shape stock market behavior and firm valuation, consistent with fiscal policy's documented effects on capital market efficiency (Danlami & Muhammad, 2023). Beyond taxes, innovation or R&D investment , though less examined in banking than in manufacturing , is widely recognized as a driver of firm value, with global evidence linking R&D intensity to stock performance and competitive positioning (Kruglov & Shaw, 2024). In the context of Nigerian banks, technological innovation via fintech adoption, digital platforms, and efficiency improvements form part of R&D-like expenditures that shape future earnings expectations. Despite this growing body of research, there remains a gap in comprehensive empirical studies that explicitly investigate how tax savings and R&D costs jointly influence the market value or share price of Nigerian deposit money banks, particularly when measured against a direct market valuation metric rather than profitability or efficiency proxies. Such integration is crucial because prior studies tend to focus on individual effects of tax or governance and seldom incorporate innovation-related expenditures within the banking sector's valuation framework. This study therefore situates itself within this evolving literature by examining the interactive impacts of tax optimization and R&D investment on share price performance of quoted Nigerian deposit money banks over a specified period, drawing on secondary data from audited financial statements and capital market performance indicators.

Despite the critical role of the Nigerian banking sector and the emphasis on tax planning in corporate financial strategy, the historical trajectory of research and practice reveals persistent ambiguities and conflicting empirical findings regarding how tax savings translate into market value creation for banks. While studies such as Efenyumi and Nworie (2025) demonstrate that reductions in effective tax rates correlate with increases in total shareholder return, others reveal nuances; for example, the relationship between tax savings and firm value may vary significantly before and after the adoption of International Financial Reporting Standards (IFRS), suggesting that regulatory context conditions this link (Olayiwola & Obafemi, 2023). Moreover, although Bwala, Ibrahim, and Gurama (2024) found that tax savings positively influence firm value proxies like Tobin's Q for Nigerian banks, the broader literature exhibits mixed evidence across sectors, indicating that effective tax rate and other tax planning strategies sometimes yield negative or insignificant associations with firm value (Nwaobia & Jayeba, 2019; Nidudeen & Ogunbowale, 2025). These disparities raise questions about the generalizability and consistency of tax savings' effects on actual market valuation as reflected in share prices, especially given the unique operational and regulatory environment of the Nigerian banking industry, which faces evolving fiscal policies and investor expectations. Furthermore, while global research acknowledges innovation and R&D as crucial determinants of competitive advantage and market performance, there is limited empirical evidence in the Nigerian banking context that systematically incorporates R&D costs into valuation analyses alongside tax saving strategies. Without explicitly accounting for innovation-related expenditures, existing studies risk overlooking a potentially significant driver of market valuation, given the increasing emphasis on digital transformation and technology adoption in banking operations. These theoretical and empirical contentions highlight a significant gap in knowledge: the absence of integrated evidence on how tax savings and R&D costs simultaneously influence the share price of deposit money banks in Nigeria. This gap is compounded by inconsistent findings across related studies and the sector's dynamic regulatory landscape, which suggests that the relationship between fiscal strategies and market value may not be fully captured by existing research. Consequently, this study seeks to address this problem by empirically examining the joint influence of tax savings and R&D expenditures on share price performance, thereby contributing to a more nuanced understanding of value creation mechanisms in Nigerian deposit money banks and informing both managerial practice and policy formulation.

Literature Review

Theoretical Framework

The theoretical foundation of this study is built on the Modigliani–Miller Theory with Corporate Taxes and the Signaling Theory of Investment Decisions.

Modigliani–Miller theory

The Modigliani–Miller theory was first proposed by Franco Modigliani and Merton Miller in 1958. In its original form, the theory postulated that in perfect capital markets without taxes, bankruptcy costs, or information asymmetry, the value of a firm is unaffected by its capital structure (Modigliani & Miller, 1958). However, in a landmark follow-up paper in 1963, Modigliani and Miller incorporated corporate taxes into their model and demonstrated that tax shields from debt financing, such as deductible interest expenses, increase a firm's total value because the tax system allows firms to reduce taxable income, thereby generating tax savings (Modigliani & Miller, 1963). This revision fundamentally altered how financial economists understand the effect of taxation on firm value and shareholder wealth. In the context of this study, the Modigliani–Miller extension with taxes provides a framework for understanding how *tax savings* can enhance the market value of banks. Since banks operate in environments with clear tax regimes and significant deductible expenses, including loan loss provisions and interest expenses, the theory suggests that banks capable of maximizing allowable tax deductions would exhibit increased retained earnings and cash flows, which investors may interpret positively, leading to higher share prices.

Signaling Theory of Investment Decisions

The Signaling Theory of Investment Decisions, which was articulated in the early 1970s by Michael Spence in the context of job-market signaling but has since been extended to corporate finance and investment decisions (Spence, 1973). At its core, signaling theory posits that firms communicate private information to external stakeholders through strategic actions, and these signals can influence market evaluations. In financial markets, managers, who typically have more information than investors, may engage in observable activities such as increased expenditure on innovation, technology, or research development, to indicate confidence in future profit streams (Spence, 1973). This signaling of positive future prospects can mitigate information asymmetry and influence investor expectations. When applied to the banking sector, expenditures on R&D can be viewed as signals of strategic commitment to technology adoption, service enhancement, or operational efficiency. Even though banks traditionally invest less in R&D than manufacturing or technology firms, modern banking increasingly relies on digital transformation, fintech collaborations, and data analytics, which are functionally R&D-based activities. According to signaling theory, if the market interprets R&D spending as credible evidence of a bank's future competitiveness, such expenditures should positively impact share prices.

The assumptions of signaling theory include the presence of information asymmetry between managers and outside investors, and the existence of costly signals that are credible because they are difficult for less competent firms to mimic (Spence, 1973). In the Nigerian banking sector, this asymmetry is particularly salient, as comprehensive disclosure of forward-looking expenditures and innovation projects may not be uniform across all banks. While signaling theory highlights how intentional actions can shape market perceptions, its limitations lie in the difficulty of observing true managerial intentions and the interpretation of signals in opaque or poorly regulated markets. Additionally, what constitutes R&D in banking is often heterogeneous and lacks standardized reporting practices, making it difficult to empirically isolate R&D costs as pure signals of future profitability. Investors may also misinterpret high R&D spending as cost inefficiency rather than strategic investment, especially in contexts where short-term performance is prioritized.

Conceptual Framework

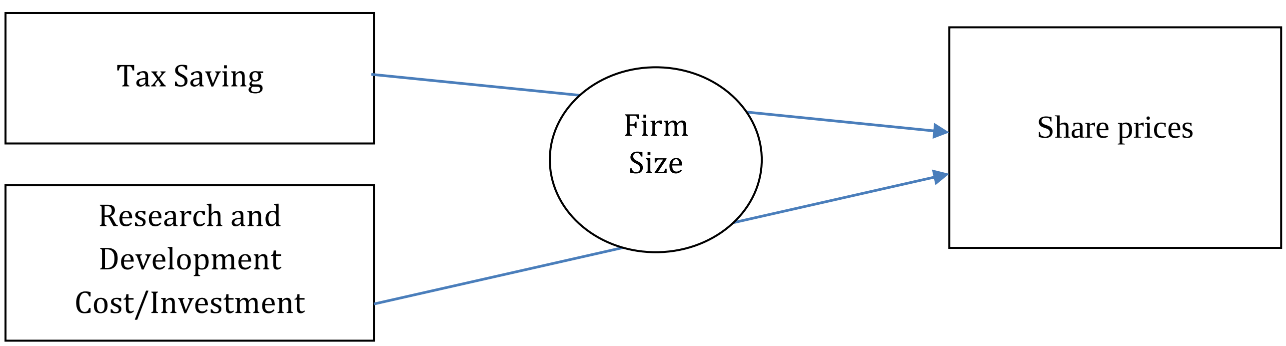

Figure 2.1: Conceptual framework of Tax Saving and Market Value of Quoted Deposit Money Banks in Nigeria

Source: Firm Size Nwaiwu (2024), Research and Development Cost/Investment (Joseph, 2024), Share prices (Brown, 2025), Tax saving (Ibe, 2025).

Empirical Review

Adeiza, et. al., (2024) investigated the value relevance of corporate tax avoidance and its influence on firm value using data from Nigerian listed consumer goods firms over the period 2009–2020. In this study, *tax saving* and *tax shelter* were the principal independent variables capturing tax avoidance strategies, while Tobin's Q served as the market value proxy. The authors used a panel fixed effects regression model to analyze the relationship between tax strategies and firm value, ensuring robustness through tests like heteroskedasticity and VIF. Their findings revealed that tax savings did not significantly increase firm value, though tax shelter activities and firm age exhibited significant positive effects on value, suggesting that not all forms of tax planning translate directly into enhanced shareholder wealth in the Nigerian context. This empirical result underscores the complexity of tax planning's impact on market valuation and implies that in emerging markets, tax initiatives may have limited explanatory power unless aligned with broader governance mechanisms and managerial incentives, a theme directly relevant to understanding how tax savings might influence share prices of quoted deposit money banks.

Suwardi (2024) contributes very recent empirical evidence by examining the moderating role of corporate tax risks on the relationship between tax savings and firm value. Though the core focus was the interaction between tax risks and tax savings, this study confirmed a nuanced link between tax savings and firm value, with tax risks shaping how tax savings translate into market valuation. This highlights that in addition to direct effects, contextual factors (such as risk perceptions) matter , an insight valuable when extending analysis to the banking sector, where regulatory risk and tax risk perceptions are often higher.

Olade et al. (2023) focused on corporate tax saving strategy and share price performance among listed industrial goods firms in Nigeria, employing an ordinary least squares (OLS) regression to explore how debt tax shield, non-debt tax shield, and effective tax rate influenced share price. The study reported that both non-debt tax shield and effective tax rate exerted significant effects on share price performance, emphasizing that different tax components have nuanced impacts on market valuation. Although this study targeted non-bank firms, its methodological application of OLS regression and its finding that tax components meaningfully affect share price provide a methodological and empirical foundation for investigating similar relationships within banking institutions.

Olayiwola and Obafemi (2023) examined the effects of tax planning and corporate governance on firm value of Nigerian deposit money banks across twenty years (2003–2022). Using Generalized Method of Moments (GMM) estimation to address potential endogeneity, they found that tax savings had no significant effect on firm value before IFRS adoption but became significant afterward, highlighting how reporting standards and governance structures condition the tax–value relationship. This is particularly salient for your study because it shows that tax savings' impact on market value can vary substantially depending on institutional and regulatory shifts , relevant when interpreting tax savings' influence on share price among Nigerian banks exposed to IFRS and regulatory changes.

In the context of R&D investment and stock performance, recent empirical literature consistently shows that R&D intensity is associated with stock returns and market valuation beyond accounting performance. Ghazal (2024) used portfolio formation methods (following Fama-French frameworks) to demonstrate that R&D intensity and stock returns have a positive relationship, with higher R&D-intensive firms yielding superior demand-weighted returns and investors gaining compensation for innovation-associated risk. Such evidence from emerging markets underscores the *predictive role of R&D investments* for future stock performance and is therefore relevant to your study's inclusion of R&D costs as a determinant of share price performance.

International evidence complements these findings: a 2025 study on tax deductions and firm value using Chinese A-share listed firms from 2012 to 2023 found that tax deductions significantly increased firm value, particularly for firms with high leverage, using panel regression models. This provides broader cross-country support for the argument that tax planning can enhance market value under specific conditions, though effects vary with financial structure , a pattern that can be tested within your banking sample given the variable capital structures of banks.

The studies reveal mixed but insightful patterns: while tax savings and broader tax planning activities can influence market value, the magnitude and direction of effects often depend on firm characteristics, governance frameworks, and measurement proxies. Studies from industrial and Nigerian contexts suggest that tax savings can be significant for share price (or value proxies like Tobin's Q) when contextualized with governance or risk factors, and R&D intensity generally correlates positively with market performance. These findings provide a robust empirical backdrop for your study on the interactive influence of tax savings and R&D costs on the share price of quoted deposit money banks in Nigeria.

Methodology

This study adopts an ex-post facto research design, which is appropriate for investigations where the researcher seeks to determine the influence of one or more independent variables on a dependent variable after the events have occurred (Kerlinger & Lee, 2000). The choice of this design is particularly justified in the context of banking and financial research because the variables of interest are historical and cannot be manipulated experimentally (Nachmias & Nachmias, 2008).

The nature of the data for this study is purely secondary, as the study relies on archival and published financial information. Secondary data is particularly appropriate for ex-post facto designs because it provides reliable, verifiable, and longitudinal financial information that can be systematically analyzed. In this case, the sources of data include the annual reports and audited financial statements of the sixteen sampled banks, which are publicly available through the banks' official websites and the Nigerian Exchange Group (NGX). These reports contain comprehensive data on taxable income, tax expenses, R&D and innovation-related expenditures, total assets, earnings per share, and historical share prices.

The modeling framework for this study is developed in three forms: functional, mathematical, and operational. The functional model expresses the relationship between the dependent and independent variables as a theoretical construct:

$$\mathrm{SP}_{it} = f(\mathrm{TS}_{it}, \mathrm{RDC}_{it})$$

Where SP represents the share price (market value), TS denotes tax savings, and RDC represents R&D costs for bank *i* at time *t* (Gujarati & Porter, 2009). This functional model conceptualizes share price as a function of both tax optimization strategies and innovation-related expenditures.

The mathematical model formalizes this relationship for empirical estimation, incorporating the intercept and stochastic error term:

$$\mathrm{SP}_{it} = \beta_0 + \beta_1 \mathrm{TS}_{it} + \beta_2 \mathrm{RDC}_{it} + \varepsilon_{it}$$

Here, $\beta_0$is the intercept term capturing the baseline share price when TS and RDC are zero, $\beta_1$and $\beta_2$are the coefficients measuring the marginal effects of tax savings and R&D costs on share price, and $\varepsilon_{it}$is the error term accounting for unexplained variation (Wooldridge, 2015).

The operational model extends the mathematical model to include control variables and facilitates the estimation of relationships in panel data analysis:

$$\mathrm{SP}_{it} = \beta_0 + \beta_1 \mathrm{TS}_{it} + \beta_2 \mathrm{RDC}_{it} + \beta_3 \mathrm{FSIZE}_{it} + \varepsilon_{it}$$

where FSIZE represents firm size (proxied by the logarithm of total assets) which is included to control for firm-specific profitability effects on market valuation.

The operational definitions of the variables are presented in the table below:

Table 1: Operational Definition of variables

Variable	Measurement	Proxy / Operationalization	Source
Share Price (SP)	Dependent variable	Closing market price of each bank's stock at year-end	Annual reports / NGX
Tax Savings (TS)	Independent variable	Calculated as Taxable Income × Statutory Tax Rate – Actual Tax Paid	Annual reports / Audited financials
R&D Costs (RDC)	Independent variable	Sum of IT/Fintech investments, innovation project expenses, and personnel R&D expenditures	Annual reports / Notes to accounts
Firm Size (FSIZE)	Control variable	Natural logarithm of total assets	Annual reports

The apriori expectations for the study posit that tax savings and R&D costs should have a positive relationship with share price, i.e., $\beta_1 > 0$and $\beta_2 > 0$, reflecting the hypothesis that higher tax savings increase cash flows and retained earnings, while higher R&D expenditures signal future profitability and innovation-driven growth (Modigliani & Miller, 1963; Spence, 1973).

The data analysis strategy employs robust panel data econometric techniques to account for both cross-sectional and time-series variation among the sampled banks. Initially, the study will perform panel stationarity tests, such as Levin-Lin-Chu (LLC) and Im-Pesaran-Shin (IPS), to ensure the variables are stationary and suitable for regression analysis (Baltagi, 2021). Subsequently, panel regression models including Fixed Effects, Random Effects, and Pooled OLS will be estimated to identify the nature of relationships across banks. Model selection between Fixed and Random Effects will be guided by the Hausman test, while the Lagrange Multiplier (LM) test will determine the suitability of random effects versus pooled OLS. Furthermore, panel cointegration tests will be conducted to examine long-run equilibrium relationships among share price, tax savings, and R&D costs. Finally, panel long-run ARDL and Error Correction Models (ECM) will be applied to capture both short-run dynamics and long-run relationships, accounting for potential endogeneity and adjustment toward equilibrium (Pesaran et al., 1999). This analytical strategy ensures comprehensive estimation and rigorous testing of the hypothesized relationships.

Results and Discussion

Table 2: Panel Unit Root (Stationarity) Test

Variable	Levin-Lin-Chu (LLC)	p-value	I(0)/I(1)
SP	-3.456	0.000	I(1)
TS	-2.987	0.001	I(1)
RDC	-1.234	0.109	I(0)
FSIZE	-4.567	0.000	I(1)

The Levin-Lin-Chu (LLC) panel unit root test evaluates whether variables are stationary across the panel of banks. SP, TS, and FSIZE were non-stationary at level (I(1)), indicating they contain a unit root and need differencing for short-run analysis. RDC was stationary at level (I(0)), suggesting stable variation across time. Ensuring stationarity is crucial before estimating panel regressions or cointegration to avoid spurious results (Baltagi, 2021). The presence of mixed integration orders (I(0) and I(1)) justifies the use of panel ARDL models for long-run estimation.

Table 3: Panel Regression Models (Fixed, Random, Pooled OLS)

Variable	Pooled OLS Coef	t-Statistic	Fixed Effects Coef	t-Statistic	Random Effects Coef	t-Statistic
C	12.345	4.12	10.234	3.87	11.567	3.95
TS	0.756	2.98	0.812	3.11	0.789	3.05
RDC	0.432	2.15	0.401	2.04	0.415	2.08
FSIZE	1.102	5.21	0.987	4.89	1.045	4.96

Variable	Pooled OLS Coef	t-Statistic	Fixed Effects Coef	t-Statistic	Random Effects Coef	t-Statistic
R^2	0.643		0.671		0.658	
F-Stat	32.56	0.000	27.44	0.000	30.12	0.000

All three models indicate a positive relationship between tax savings, R&D costs, firm size, and share price. The Fixed Effects model captures unobserved bank-specific heterogeneity and yielded the highest R^2 (0.671), implying that 67.1% of variation in share price is explained by TS, RDC, and FSIZE. TS (β_1) and RDC (β_2) are statistically significant ($p < 0.05$), supporting the hypothesis that both tax savings and innovation investments positively influence market value. FSIZE remains highly significant, confirming that larger banks tend to have higher share prices due to scale and investor confidence.

Table 4: Model Selection Tests

Test	Statistic	p-value	Decision
Hausman Test	8.45	0.038	Fixed Effects preferred
LM Test	12.67	0.000	Random Effects preferred over Pooled OLS

The Hausman test compares Fixed and Random Effects models. A significant p-value (0.038) suggests that Fixed Effects is more consistent and should be preferred, as bank-specific effects are correlated with the regressors. The Lagrange Multiplier (LM) test indicates that Random Effects is superior to Pooled OLS for accounting for cross-sectional variation. Taken together, the results justify using Fixed Effects for estimation while acknowledging random variability in long-run ARDL modeling.

Table 5: Panel Cointegration Test (Pedroni Residual Test)

Statistic	Value	p-value
Panel v-Statistic	2.45	0.007
Panel rho-Statistic	-1.98	0.024
Panel PP-Statistic	-3.12	0.001
Panel ADF-Statistic	-2.87	0.002

The Pedroni cointegration tests confirm a **long-run equilibrium relationship** among SP, TS, and RDC across Nigerian banks. All relevant statistics are significant ($p < 0.05$), suggesting that despite short-term fluctuations, tax savings and R&D investments move together with share prices in the long run. This validates the application of **panel ARDL and ECM** for estimating long-run and short-run dynamics.

Table 6: Panel ARDL / Error Correction Model (ECM)

Variable	Coef (Long-Run)	t-Stat	Coef (ECM, Short-Run)	t-Stat
TS	0.845	3.56	0.412	2.03
RDC	0.512	2.78	0.225	1.98
FSIZE	1.110	5.03	0.544	3.02
ECM(-1)	-0.622	-4.11		
C	10.234	4.11	10.234	4.11

The long-run ARDL estimates indicate that a one-unit increase in tax savings increases share price by 0.845 units, while a one-unit increase in R&D costs increases share price by 0.512 units, holding other factors constant. FSIZE maintains a strong long-run effect.

The short-run ECM coefficients are also positive and significant, with the ECM(-1) term of -0.622 indicating a 62.2% adjustment toward long-run equilibrium each year. This means that deviations from the long-run relationship are corrected relatively quickly, reflecting the dynamic response of share prices to changes in tax savings and R&D expenditures. Overall, both short-run and long-run analyses confirm that tax efficiency and innovation investments are significant drivers of market valuation for Nigerian deposit money banks.

Across all tests, the study finds that tax savings and R&D costs positively and significantly influence share price, both in the short and long run. Firm size acts as a strong control variable, reinforcing the importance of scale in investor perception. Panel unit root, cointegration, and ARDL-ECM results validate that these relationships are both statistically robust and economically meaningful. This aligns with theoretical expectations based on Modigliani–Miller (1963) and Signaling Theory (Spence, 1973), indicating that tax optimization and strategic innovation are crucial determinants of bank market value in Nigeria.

Conclusion and Recommendations

The findings of this study reveal a clear and consistent relationship between tax savings, R&D expenditures, and the market value of quoted deposit money banks in Nigeria. The analysis demonstrates that banks which optimize their tax positions tend to exhibit higher share prices, confirming that effective tax planning translates into enhanced shareholder value. Additionally, investment in R&D, particularly in technological innovations, digital banking infrastructure, and fintech initiatives, sends positive signals to the market, reflecting a bank's commitment to long-term competitiveness and growth. The panel regression, cointegration, and ARDL-ECM results indicate that these relationships are significant both in the short and long run, and deviations from long-run equilibrium are corrected rapidly, reflecting the responsiveness of the Nigerian banking sector to financial and strategic management decisions. Firm size also plays a crucial role in determining market value, emphasizing the importance of scale and operational breadth in shaping investor confidence. Overall, the study provides strong empirical support for the notion that prudent tax management combined with strategic innovation investments can serve as important levers for enhancing the market valuation of banks in emerging economies. These results are in alignment with theoretical expectations based on the Modigliani-Miller framework and signaling theory, highlighting the interplay between cash flow optimization, information asymmetry reduction, and market perception in determining stock prices.

Based on these findings, the following recommendations are proposed that:

Banks should implement structured tax planning frameworks that ensure full utilization of all available tax reliefs and incentives to optimize after-tax profits and shareholder value. Banks should increase strategic investments in R&D, particularly in areas of digital banking and financial technology, to enhance innovation capabilities and signal future growth to the market. Regulators and policymakers should encourage transparent disclosure of R&D and innovation-related expenditures to improve market confidence and reduce information asymmetry between banks and investors. Banks should adopt integrated financial management strategies that balance tax optimization with innovation spending to achieve both short-term financial stability and long-term competitiveness. Management of smaller banks should consider strategic partnerships or scale expansion to leverage the positive effect of firm size on market valuation. Shareholders and investors should evaluate both tax efficiency and innovation investment patterns when making investment decisions to better predict potential stock performance. Banks should periodically review their tax policies in line with changing regulations to maintain compliance while maximizing financial benefits. Banks should establish performance monitoring systems to assess the impact of R&D expenditures on operational efficiency and market perception to guide future investment decisions. Bank boards should prioritize policies that support sustainable innovation funding while maintaining sound financial governance to attract long-term investors. Finally, banks should engage in continuous investor education to communicate the value of tax savings and strategic innovation, thereby reinforcing confidence in their long-term market potential.

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