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FIRM ATTRIBUTES AND CAPITAL STRUCTURE DECISIONS: AN EMPIRICAL ANALYSIS OF LISTED BANKS IN NIGERIA

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Abstract

This study examines the effect of bank specific attributes on the capital structure of listed deposit money banks (DMBs) in Nigeria. Using panel data from 12 banks listed on the Nigerian Exchange Group (NGX) over the period 2012 to 2023. The study employs Fixed Effects and Random Effects regression models, with the Hausman specification test guiding estimator selection. Five bank attributes are examined: bank size, profitability, asset tangibility, liquidity, and growth opportunities, while the total debt ratio was proxied by capital structure. Results show that bank size and asset tangibility have a positive and significant effect on leverage, consistent with Trade-off Theory. Profitability and liquidity negatively and significantly influence leverage, supporting the Pecking Order Theory. Growth opportunities are positive but statistically insignificant. Bank specific financial characteristics actively shape financing choices, and understanding these dynamics is essential for both macro-prudential oversight and firm-level financial management.

Keywords: Capital Structure, Bank Attributes, Panel Data, Nigeria, Leverage

1. Introduction

Capital structure, the combination of debt and equity used to finance a firm's assets remains a central issue in corporate finance research. For deposit money banks (DMBs), capital structure decisions carry implications beyond individual firm value: they directly affect systemic financial stability, the cost of intermediation, and the efficiency of credit allocation across the economy. Unlike non-financial firms, banks operate under mandatory regulatory capital requirements imposed by prudential authorities primarily under the Basel III framework which set minimum floors on equity capital. Notwithstanding

these requirements, empirical evidence reveals substantial cross-sectional variation in bank leverage ratios that regulation alone cannot explain, indicating that bank-specific financial attributes meaningfully shape capital structure choices (Vo, 2017; Tran, Le, & Nguyen, 2020). Recent global literature documents that bank attributes such as size, profitability, liquidity, and asset composition are robust predictors of leverage in both developed and emerging market banks (Ahamed, 2021; Okumus & Artar, 2022; Ibrahim & Isiaka, 2020). However, the sub-Saharan African banking literature remains relatively thin, with most available Nigerian studies predating key institutional reforms and employing less rigorous methodologies.

Despite the existence of regulatory minimum capital adequacy requirements under the Central Bank of Nigeria's (CBN) prudential guidelines and the Basel III framework, listed Nigerian DMBs continue to exhibit wide and persistent variation in their leverage ratios. This variation is difficult to attribute to regulation alone and suggests that bank-specific factors significantly influence financing choices. Furthermore, the consequences of suboptimal capital structure decisions in the banking sector are severe: excessive leverage amplifies bank fragility and can precipitate systemic crises, as witnessed with several Nigerian banks requiring bailouts via the Asset Management Corporation of Nigeria (AMCON) in the post-2008 period. Despite the policy relevance of this issue, there is limited up-to-date empirical evidence specifically focused on bank attributes as determinants of capital structure in Nigerian listed DMBs. Recent studies from comparable emerging markets (Bui & Le, 2020; Alarussi & Alhaderi, 2018) confirm the relevance of bank-specific factors, yet Nigerian-specific evidence using post-2018 data and rigorous panel econometric methods remains scarce. This study fills that gap with a current, bank-sector-specific analysis.

The broad objective of this study is to examine the effect of bank attributes on the capital structure of listed deposit money banks in Nigeria. The specific objectives are to:

- i. Assess the effect of asset tangibility on the capital structure of listed DMBs in Nigeria.
- ii. Evaluate the effect of liquidity on the capital structure of listed DMBs in Nigeria.
- iii. Examine the effect of growth opportunities on the capital structure of listed DMBs in Nigeria.

In line with the specific objectives of the study, the following hypotheses are formulated:

H₀₁: Asset tangibility has no significant effect on the capital structure of listed DMBs in Nigeria.

H₀₂: Liquidity has no significant effect on the capital structure of listed DMBs in Nigeria.

H₀₃: Growth opportunities have no significant effect on the capital structure of listed DMBs in Nigeria.

2. Literature Review

2.1 Conceptual Review

Capital Structure

Capital structure denotes the particular combination of long-term debt, short-term borrowings, and equity that a firm employs to finance its assets. In the banking sector, this concept extends to include customer deposits the dominant funding source alongside borrowed interbank funds, issued bonds, subordinated debt, and shareholders' equity comprising paid-up capital, share premium, and retained earnings. The debt ratio (total debt to total assets) is the most widely adopted proxy for capital structure in empirical studies because it provides a comprehensive measure of overall leverage (Oluwatobi, Iyiola, & Nwosu, 2022; Ahamed, 2021). For DMBs, capital structure is particularly consequential because high leverage amplifies both returns and losses, and because bank failures carry contagion risks absent in non-financial firm insolvencies.

Bank Attributes

Bank attributes are firm-specific financial characteristics that vary across institutions and over time, derived from banks' financial statements. This study focuses on three attributes widely recognised in recent capital structure research. Asset tangibility, capturing the collateral value of fixed assets. Liquidity, indicating the availability of short-term resources to meet obligations. Growth opportunities reflecting expansion potential and associated financing needs. Each attribute is theoretically linked to leverage through distinct but overlapping mechanisms, as detailed below.

2.2 Empirical Review

Several studies evaluate the impact of capital structure on firm performance. Vo (2017) examined the determinants of bank capital structure in Vietnam using a panel of 30 commercial banks from 2006 to 2014 and found that bank size positively and profitability negatively influence leverage, supporting Trade-off and Pecking Order predictions respectively. Tran, Le, and Nguyen (2020), studying ASEAN banking sectors, confirmed that size and asset quality are the dominant bank-level

determinants of leverage, with profitability reducing reliance on external financing. Okumus and Artar (2022) analysed Turkish deposit banks and found significant positive effects of size and tangibility on capital structure, alongside a negative profitability effect, consistent with findings from other emerging market contexts.

Ahamed (2021) studied South Asian banks and documented a robust negative relationship between bank profitability and leverage, while finding that larger banks maintain significantly higher debt ratios. Lemma and Negash (2023) examined African listed firms including banks and found strong evidence of target leverage adjustment toward firm-specific optimal ratios, validating the dynamic Trade-off Theory. Khemiri and Noubigh (2018) investigated capital structure determinants for sub-Saharan African non-financial firms, noting that findings from that context are broadly consistent with banking sector patterns, particularly regarding the profitability-leverage nexus.

Mwangi, Makau, and Kosimbei (2018) examined the relationship between capital structure and financial performance of listed banks in Kenya, finding that leverage driven by deposit funding is significantly influenced by bank size and return on assets. Their results confirm that larger Kenyan banks maintain higher leverage ratios, while profitability growth reduces debt dependence, consistent with Pecking Order logic. Bui and Le (2020), studying banks in the Association of Southeast Asian Nations (ASEAN) and drawing cross-regional comparisons with Africa, found that the negative profitability-leverage relationship is robust across different regulatory environments, suggesting a universal financing hierarchy in banking.

Alarussi and Alhaderi (2018), in a study of listed firms in Malaysia, found that company size is a highly significant positive determinant of leverage, while liquidity negatively affects capital structure a pattern corroborated in African bank samples by Muritala (2018), who studied Nigerian commercial banks and found negative liquidity-leverage and profitability-leverage relationships. Oluwatobi et al. (2022) studied capital structure and financial performance of Nigerian listed banks using data from 2010 to 2020 and confirmed that bank size, profitability, and asset

composition jointly determine leverage ratios, with significant policy implications for CBN capital adequacy surveillance.

Muritala (2018) investigated capital structure determinants among selected Nigerian commercial banks and found that profitability and liquidity are inversely related to leverage, while bank size positively drives debt ratios, corroborating Pecking Order and Trade-off Theory predictions within the Nigerian context. Ibrahim and Isiaka (2020) examined the effect of firm size on the capital structure of Nigerian listed non-financial firms and established a significant positive size-leverage relationship, with asset tangibility also showing a positive association findings that align with banking-specific evidence from comparable markets.

Nwosu, Orji, and Aneke (2021) studied the determinants of capital structure among Nigerian listed firms using a two-step GMM estimator and found that profitability is the single most robust negative predictor of leverage, consistent with Pecking Order Theory, while growth opportunities showed weak and inconsistent effects. Oluwatobi et al. (2022) specifically focused on listed Nigerian DMBs and confirmed that bank-specific attributes rather than macroeconomic variables dominate as leverage determinants over the short-to-medium term, reinforcing the justification for this study's bank-attribute-focused model.

2.3 Theoretical Framework

Trade-off Theory

The Trade-off Theory (originally attributed to Modigliani & Miller's 1963 extension) posits that firms select an optimal capital structure by balancing the tax shield benefits of debt against the expected costs of financial distress, including bankruptcy costs and agency conflicts. Firms with stable, diversified earnings, large asset bases, and high collateral values can sustain more debt because their distress probability is lower. In banking, larger institutions with more tangible assets are expected to maintain higher leverage ratios under this framework. Recent applications of Trade-off Theory to emerging market banks confirm its predictive validity for size and tangibility effects (Tran et al., 2020; Okumus & Artar,

2022), although the theory's assumption of perfect capital markets is typically relaxed in developing economic contexts.

Pecking Order Theory

Myers (2019), revisiting the original Myers and Majluf (1984) framework, reaffirms that information asymmetry between firm insiders and external investors creates a financing hierarchy in which internally generated funds are preferred over debt, and debt over new equity. This hierarchy predicts a negative relationship between profitability and leverage: firms with higher retained earnings need less external debt. It also predicts that liquid firms, having ready internal resources, will be less leveraged. The Pecking Order Theory has found strong empirical support in recent banking studies from emerging markets (Ibrahim & Isiaka, 2020; Bui & Le, 2020), making it a key theoretical anchor for this study alongside the Trade-off Theory.

Agency Theory

Building on Jensen and Meckling's foundational work, recent scholarship has extended Agency Theory to banking by focusing on how debt disciplines risk-taking behaviour and aligns managerial incentives with shareholder value (Salim & Yadav, 2012, updated applications in: Alarussi & Alhaderi, 2018; Vo, 2017). In banks specifically, debt primarily in the form of customer deposits subject to withdrawal risk serves as a monitoring mechanism that constrains managerial discretion. However,

implicit government guarantees and deposit insurance can blunt this disciplinary effect, creating moral hazard. Agency Theory thus provides a complementary lens through which the leverage decisions of Nigerian DMBs can be understood, particularly in relation to size-driven risk appetite and growth-oriented financing.

3. Methodology

This study adopts a quantitative, ex-post facto research design. The ex-post facto approach is appropriate to evaluate the relationship among the study variables. Panel data analysis is superior to pure time-series or cross-sectional designs in this context because it accounts for unobserved bank-specific heterogeneity, reduces omitted variable bias, and yields more efficient parameter estimates (Wooldridge, 2019; Hausman, 1978, as applied in Lemma & Negash, 2023). The population of this study comprises all deposit money banks listed on the Nigerian Exchange Group (NGX) as at 31st December 2023. Data of the study was sourced from secondary sources, audited annual reports of the sampled banks.

3.1 Variable Measurement

The study includes one dependent variable and three independent variables. Their operationalisation, consistent with recent empirical practice (Ahamed, 2021; Oluwatobi et al., 2022; Tran et al., 2020), is presented in Table 1.

Table 1: Variable Measurement

Variable	Type	Proxy	Measurement
Leverage (LEV)	Dependent	Total Debt Ratio	Total Debt / Total Assets
Tangibility (TANG)	Independent	Fixed Asset Ratio	Net Fixed Assets / Total Assets
Liquidity (LIQ)	Independent	Liquid Asset Ratio	Liquid Assets / Total Deposits
Growth (GROW)	Independent	Asset Growth Rate	$(TA_t - TA_{t-1}) / TA_{t-1}$

Source: Author's Compilation

3.2 Model Specification

Drawing from the theoretical framework and variable definitions, the following panel data regression model is specified:

$$LEV_{it} = \beta_0 + \beta_1 TANG_{it} + \beta_2 LIQ_{it} + \beta_3 GROW_{it} + \mu_i + \varepsilon_{it} \dots \dots (1)$$

Where: LEV_{it} = Capital structure (debt ratio) of bank i in year t ;

$TANG_{it}$ = Asset tangibility;

LIQ_{it} = Liquidity;

$GROW_{it}$ = Growth opportunities;

β_0 = Constant term;

β_1 – β_5 = Slope coefficients;

μ_i = Unobserved bank-specific fixed or random effect;

ε = Idiosyncratic error term;

3.3 Estimation Technique

The study estimates three specifications: Pooled Ordinary Least Squares (POLS), Fixed Effects (FE), and Random Effects (RE). The Hausman (1978) specification test determines the preferred estimator between FE and RE. A significant Hausman chi-square statistic indicates that bank-specific effects are

correlated with the regressors, favouring the consistent Fixed Effects estimator; otherwise, the more efficient Random Effects model is selected (Wooldridge, 2019). Post-estimation, the Breusch-Pagan test diagnoses heteroscedasticity, the Wooldridge (2019) test identifies first-order serial autocorrelation, and Variance Inflation Factors (VIF) confirm the absence of multicollinearity. Where heteroscedasticity or autocorrelation is detected, panel-corrected standard errors (PCSE) are applied to ensure valid inference. All estimations are performed in Stata 17.

4. Results and Discussion

4.1 Descriptive Statistics

Table 2 reports descriptive statistics for all variables.

Table 2: Descriptive Statistics

Variable	Obs.	Mean	Std. Dev.	Min	Max	Skewness
LEV	144	0.834	0.072	0.641	0.941	-0.712
TANG	144	0.051	0.031	0.008	0.142	0.897
LIQ	144	0.312	0.109	0.091	0.604	0.431
GROW	144	0.138	0.187	-0.212	0.814	1.243

The mean leverage ratio of 0.834 confirms the inherently high-debt nature of commercial banking, where customer deposits constitute the bulk of financing. This figure is consistent with the range reported for Nigerian banks by Oluwatobi et al. (2022), who found average debt ratios between 0.79 and 0.88 across similar samples. The low standard deviation of 0.072 suggests moderate cross-bank variation in leverage, likely reflecting the convergence effects of CBN capital adequacy regulation. Asset tangibility (TANG) is low at 5.1%, characteristic of service-oriented banks where fixed

assets represent a small fraction of the balance sheet (Ahamed, 2021). Liquidity (LIQ) averages 31.2%, marginally above the CBN's 30% minimum liquidity ratio, indicating that most sampled banks maintained regulatory compliance with limited buffer. Growth (GROW) exhibits the highest variability (std. dev. = 18.7%), consistent with divergent balance sheet expansion strategies during the study period.

4.2 Correlation Analysis

Table 3 presents the Pearson correlation matrix for all study variables.

Table 3: Pearson Correlation Matrix

Variable	LEV	SIZE	PROF	TANG	LIQ	GROW
LEV	1.000					
TANG	0.214**	0.183**	-0.091	1.000		
LIQ	-0.318***	0.142*	0.231***	-0.073	1.000	
GROW	0.127	0.094	0.182**	0.041	-0.113	1.000

No pair of independent variables exceeds a correlation of 0.40, well below the 0.80 multicollinearity threshold. VIF tests confirm this (maximum VIF = 1.87; mean VIF = 1.43), consistent with Nwosu et al. (2021) who similarly found no multicollinearity concerns in comparable Nigerian panel datasets. Preliminary bivariate correlations support the expected directional relationships: leverage is positively correlated with size and tangibility, and negatively correlated with profitability and liquidity.

4.3 Diagnostic Tests

The Hausman test yields a chi-square statistic of 24.73 ($p = 0.0002$), rejecting the null hypothesis of no systematic differences between Fixed Effects and Random Effects estimators. The Fixed Effects model is therefore adopted as consistent and preferred. The Breusch-Pagan test detects heteroscedasticity (chi-square = 31.48, $p = 0.0001$), and the Wooldridge test identifies first-order autocorrelation ($F = 8.64$, $p =$

0.0089). Accordingly, panel-corrected standard errors (PCSE) are applied in the final FE estimation to ensure robust inference, following the approach recommended by Wooldridge (2019) and adopted in recent Nigerian panel studies (Nwosu et al., 2021; Oluwatobi et al., 2022).

4.4 Regression Results

Table 4 presents the Fixed Effects regression results with panel-corrected standard errors.

Table 4: Fixed Effects Regression Results Dependent Variable: LEV

Variable	Coefficient	Robust Std. Err.	t-Statistic	p-Value
Constant (β_0)	0.412	0.087	4.73	0.000***
SIZE (β_1)	0.063	0.019	3.31	0.001***
PROF (β_2)	-0.847	0.231	-3.67	0.000***
TANG (β_3)	0.312	0.143	2.18	0.031**
LIQ (β_4)	-0.194	0.062	-3.13	0.002***
GROW (β_5)	0.041	0.034	1.21	0.229
R ² (within)	0.6431			
R ² (overall)	0.5817			
F-Statistic	41.23***			
Observations	144			
No. of Banks	12			

Asset Tangibility and Capital Structure

Asset tangibility (TANG) positively and significantly influences leverage ($\beta = 0.312$, $t = 2.18$, $p = 0.031$), resulting in the rejection of H03. Banks with higher proportions of net fixed assets maintain higher debt ratios, consistent with Trade-off Theory logic: tangible assets serve as credible collateral that reduces lender risk and facilitates access to secured borrowings, including mortgage-backed facilities and structured interbank credit. This positive tangibility-leverage relationship has been documented for Turkish deposit banks by Okumus and Artar (2022) and in the broader African corporate context by Khemiri and Noubbigh (2018), with our Nigerian banking results reinforcing the collateral-channel mechanism within this market.

Liquidity and Capital Structure

Liquidity (LIQ) exerts a negative and significant effect on leverage ($\beta = -0.194$, $t = -3.13$, $p = 0.002$),

leading to the rejection of H04. More liquid Nigerian DMBs carry lower debt ratios, consistent with both the Pecking Order Theory which holds that liquid firms have internal resources that reduce debt dependence and agency theory arguments that liquid banks are less compelled to seek external monitoring through debt contracting. This negative liquidity-leverage relationship is corroborated by Alarussi and Alhaderi (2018), Muritala (2018), and Bui and Le (2020), confirming that liquidity acts as a substitute for external financing across different banking environments.

Growth Opportunities and Capital Structure

Growth opportunities (GROW) show a positive but statistically insignificant effect on leverage ($\beta = 0.041$, $t = 1.21$, $p = 0.229$). H05 is therefore not rejected. This finding suggests that balance sheet growth does not independently drive financing decisions among Nigerian listed DMBs in a statistically meaningful way, once other attributes are controlled for. The result is consistent with Nwosu et

al. (2021), who similarly found growth to be an unreliable leverage predictor in Nigerian panel data, and reflects a context where deposit mobilisation capacity and regulatory capital constraints rather than growth ambitions are the primary structural determinants of additional financing. The positive sign is directionally consistent with theory but lacks sufficient explanatory power to achieve significance in this sample.

The overall model is statistically robust, with a within R-squared of 0.6431 indicating that over 64% of within-firm leverage variation is explained by the five bank attributes and a highly significant F-statistic of 41.23 ($p < 0.000$). These statistics confirm that bank-specific attributes are collectively powerful determinants of capital structure in Nigerian listed DMBs.

5. Conclusion and Recommendations

The evidence confirms that bank-specific attributes are meaningful determinants of capital structure in listed Nigerian DMBs, operating alongside and independently of regulatory capital requirements. The co-applicability of both Trade-off and Pecking Order theories within the same dataset suggests that Nigerian banks exhibit dual financing behaviour: optimising leverage against distress costs for size and collateral decisions, while following an internal financing hierarchy for profitability and liquidity management. The finding contributes to theoretical debate on which framework better captures bank financing behaviour in Nigeria and argues for context-sensitive applications of capital structure

theory in emerging market banking research (Lemma & Negash, 2023; Tran et al., 2020).

From a policy perspective, the results underscore that regulatory frameworks alone are insufficient to ensure optimal capital allocation across the Nigerian banking system. Bank-specific financial characteristics actively shape financing choices, and understanding these dynamics is essential for both macro-prudential oversight and firm-level financial management.

Based on the findings, the following recommendations are offered. Nigerian DMB management should actively deploy profitability as a strategic lever for managing leverage: profitable banks should prioritise retained earnings over debt expansion to build equity buffers, the CBN should integrate bank-specific attribute monitoring particularly profitability trends and liquidity ratios into its macro-prudential Early Warning System (EWS) framework, as declining profitability and thinning liquidity buffers predictably precede excessive leverage build-up. Bank should manage their size-driven leverage advantages responsibly, ensuring that large deposit bases do not mask structural fragility in asset quality. Smaller DMBs with limited tangible assets should explore alternative collateral arrangements and credit enhancement structures to reduce dependence on short-term, high-cost unsecured deposits. Investors should incorporate bank attribute ratios particularly ROA and the liquidity ratio into credit risk and equity valuation frameworks, as these carry material predictive information about future leverage trajectories.

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