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DEBT-EQUITY COMPOSITION AND PROFITABILITY OF DEPOSIT MONEY BANKS IN NIGERIA

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ABSTRACT

This research examined the effect of debt-equity composition on the profitability of deposit money banks in Nigeria from 1998 to 2024. The research sought to evaluate the effect of debt ratio, equity ratio, and debt-to-equity ratio on the return on assets of banks, serving as the profitability metric. Employing an ex-post facto research approach, secondary data were sourced from the Central Bank of Nigeria Statistical Bulletin and the World Bank Global Financial Development database. The research used the Ordinary Least Squares (OLS) regression method after the verification of data stationarity using unit root tests. The findings indicated that the debt ratio, equity ratio, and debt-to-equity ratio have positive although statistically negligible effects on return on assets. This suggests that while capital structure changes influence profitability, their effect is not significant in the Nigerian banking sector. The results indicate that the profitability of deposit money institutions is more significantly affected by effective asset management, risk mitigation, and macroeconomic factors than by the composition of capital structure. The research suggests that sustaining an appropriate equilibrium between debt and equity is crucial for enduring financial stability and prosperity. It recommends banks to strengthen their internal capital base via retained earnings, diminish undue dependence on debt financing, and synchronise their capital structure strategies with current economic conditions to improve profitability and resilience in the evolving Nigerian financial environment.

Keywords: Debt ratio, Equity ratio, Debt-to-equity ratio, Capital structure, Profitability, Return on assets, Deposit money banks.

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1. INTRODUCTION

The financial structure of firms, particularly the balance between debt and equity financing, remains a critical determinant of profitability and sustainability in the banking sector. The debt–equity composition refers to the proportion of a firm's capital that is financed through borrowed funds relative to shareholders' equity, which collectively shapes its cost of capital, risk exposure, and return on investment (Nguyen & Nguyen, 2022). In the context of Deposit Money Banks (DMBs) in Nigeria, this balance holds strategic importance, as it influences their ability to generate profits while maintaining financial stability. An optimal capital structure allows banks to maximize profitability through efficient leverage without exposing themselves to excessive default risks (Olawale & Shittu, 2023). However, deviations from this balance can lead to increased financial distress, reduced shareholder value, and heightened vulnerability to economic shocks.

Nigeria's banking sector has undergone several reforms aimed at improving capitalization, stability, and profitability. The 2005 banking consolidation policy, which increased the minimum capital base to ₦25 billion, marked a turning point in reshaping banks' capital structure and competitive landscape (Udo & Nwokoye, 2020). Despite such reforms, many banks continue to grapple with determining the ideal mix between debt and equity that enhances profitability while maintaining solvency. High dependence on debt financing may amplify returns during economic expansion but poses liquidity and repayment risks during downturns. Conversely, excessive reliance on equity may dilute earnings per share and constrain financial leverage (Eze & Okafor, 2021). Thus, understanding how the composition of debt and equity affects profitability indicators such as Return on Assets (ROA) is essential for efficient financial management and policy formulation in Nigeria's deposit money banks.

Statement of the Problem

The debt-to-equity ratio remains one of the most critical success determinants for Nigerian deposit money banks (DMBs). Capital structure is critical to stability and profitability, yet many Nigerian banks still fail to keep their debt-to-equity ratio in the appropriate range. An increase in non-performing loans, fluctuating currency values, and uncertain interest rates are all threats to the profitability of banks that depend mostly on debt financing (Olawale & Shittu, 2023). However, an over-reliance on equity financing might restrict competitive advantage and development potential by resulting in diluted ownership and lower returns for shareholders (Nguyen & Nguyen, 2022). Despite operating under identical macroeconomic and regulatory circumstances, banks' financial performance has varied due to the continuous difficulty in finding an appropriate combination. Furthermore, banks' capacity to properly leverage is still hampered by inadequate risk management frameworks, subpar assets, and irregular capital adequacy ratios, which raises questions about the banks' long-term viability and profitability (Agyapong et al., 2021).

Research on the connection between profitability and the debt-to-equity ratio yielded contradictory findings in different economies. While some studies contend that excessive debt impairs financial performance by increasing the cost of capital and default risk, others contend that increased leverage can boost profitability because of the tax shield benefits of debt (Agyapong et al., 2021). The results are still unclear in Nigeria. For instance, Okorie and Ugochukwu (2022) discovered a positive correlation between Nigerian banks' profitability and leverage, but Musa and Adedeji (2023) identified a negative correlation, indicating that excessive leverage reduces profitability. These discrepancies highlight how judgements about capital structure are contextual and impacted by legislative frameworks, managerial effectiveness, and macroeconomic situations.

The argument over the ideal debt-to-equity ratios for Nigerian banks has also heated up in response to current global financial issues, such as fluctuating interest rates, inflationary pressures, and Basel III's criteria for capital adequacy (Oni & Adeyemi, 2024). Although banks' financing choices are still influenced by the prudential norms set out by the Central Bank of Nigeria, there are still differences in profitability amongst institutions with different leverage structures. Therefore, in order to comprehend how Nigerian banks may manage these complex financial circumstances while optimising their capital structures, a thorough evaluation of the debt-equity mix and its effect on profitability is both relevant and essential. This study aims to empirically investigate the extent to which the mix of debt and equity affects the profitability of Deposit Money Banks in Nigeria, thereby contributing to the discourse on optimal capital structure within emerging financial markets. Therefore, the following null hypotheses are formulated to guide the study in exploring how the debt-equity composition affects the profitability of Deposit Money Banks in Nigeria and contributing to the discourse on optimal capital structure in emerging financial markets.

H_{01}: Debt ratio has no significant effect on the return on assets.
H_{02}: Equity ratio has no significant effect on the return on assets.
H_{03}: Debt-to-equity ratio has no significant effect on the return on assets.

2. LITERATURE REVIEW

Conceptual Reviews

Debt-Equity Composition

Debt Ratio: This metric assesses the overall debt to total asset ratio. It shows how much a bank relies on borrowed money to support its assets. The risk of financial trouble, particularly during economic downturns, may be greater for those with a larger debt-to-income ratio (Owolabi & Obida, 2023). On the other hand, taking on a little amount of debt might boost profits by allowing for more investment and growth capital.

Equity Ratio: Shareholder funds as a percentage of total assets is known as the equity ratio. It is a measure of the bank's debt-to-asset ratio and its capacity to weather losses without taking on further debt. Ibe and Nwokoye (2024) found that a larger equity ratio is associated with more financial stability and investor trust, which may have a favourable impact on profitability.

Debt-to-Equity Ratio: Total debt to shareholders' equity is shown by this ratio. It reveals the efficiency with which a bank's capital structure distributes debt and equity. Maximising profits and improving operational efficiency are both possible outcomes of a prudent debt-to-equity ratio management strategy (Eze & Nwude, 2022).

Measure of Profitability

Return on Assets (ROA):ROA assesses how efficiently a bank uses its total assets to generate net income. It is one of the most reliable measures of bank performance, as it reflects the effectiveness of management in utilizing available resources to generate profit (Adeoye & Fadare, 2024).

Theoretical Review

Modigliani and Miller (M&M) Theory (1958)

The Modigliani and Miller Theory, first put out in 1958 by Merton Miller and Franco Modigliani, is a cornerstone of modern theory of capital structure. A perfect capital market devoid of taxes, insolvency fees, and asymmetric information would have no effect on a

firm's value, according to the theory's original assertion. The market value of the company is unchanged by the debt-to-equity ratio used to finance it. The value and performance of a business, according to their reasoning (Jaros & Bartosova, 2015; Yilmaz, 2020), depend entirely on the investments it makes, and not on the means by which those investments are funded.

Modigliani and Miller revised their initial theory in 1963 by including company taxes. Since interest payments on debt are tax deductible, they conjectured that using debt as leverage may provide a tax shield, increasing a company's value. According to Paseda (2020), firms might potentially boost their profitability and overall value by raising the amount of debt in their capital structure, as long as the tax shield advantages outweigh the risks of financial crisis. Theoretically, lowering the effective cost of capital via careful management of debt financing may increase profitability. Although the Modigliani and Miller Theory is important, it has been criticised for its illogical assumptions, such as the fact that taxes, transaction costs, and bankruptcy risks do not exist in real markets (Ahmeti & Prenaj, 2015). Given the prevalence of regulatory constraints, interest rate volatility, and macroeconomic instability in Nigeria's banking system, the theory's underlying assumptions may not be fully relevant. The M&M model, which was the paradigm for subsequent theories of capital structure, may help researchers better understand how financing choices may affect profitability and company value.

Trade-Off Theory (Kraus & Litzenberger, 1973)

The Trade-Off Theory evolved from the M&M propositions with the understanding that real companies incur costs associated with financial instability, taxes, and the possibility of insolvency. Kraus and Litzenberger first proposed the idea in 1973. Tax havens, agency fees, and bankruptcy are all forms of debt, and businesses try to strike a balance between them. Once the marginal benefit of debt equals its marginal cost, the theory claims that the optimum capital structure is attained.At this moment of equilibrium, the firm's value and profitability are at their highest. Refer to Rodriguez (2024) and Miglo (2025).

The Trade-Off Theory, when applied to deposit money institutions in Nigeria, demonstrates that, up to a certain extent, corporations may augment their profitability by the utilisation of loan finance. Since interest payments may be claimed as a business expense, taking on even a little amount of debt might boost revenues. Contrarily, if one rack up too much debt, it might dampen creditworthiness, drive up expenses associated with financial issues, and drive away investors. Nigerian banks should regularly evaluate their capital structures to ensure they are maintaining a debt-to-equity ratio that minimises risks and maximises earnings. Numerous empirical studies have provided evidence that the Trade-Off Theory is correct. Studies done in Nigeria and other underdeveloped countries have shown that companies with low levels of leverage may nevertheless make a profit. Some contend that firms have a hard time keeping their capital structures optimum due to regulatory restraints, interest rate volatility, and changing economic circumstances. The Trade-Off Theory is nevertheless a useful framework for understanding how debt-equity decisions impact banks' bottom lines, even with these caveats.

Pecking Order Theory (Myers &Majluf, 1984)

Pecking Order Theory, first proposed in 1984 by Myers and Majluf, offers an alternative explanation for how companies choose to fund their activities. According to the theory, since managers and investors have unequal access to information, businesses prioritise internal funding—such as retained earnings—over external borrowing (Kalui, 2017). Businesses prefer debt over stock when they need outside funding since the former conveys confidence

in future profits, while the latter may be viewed as an indication that the company's shares are overpriced. The "pecking order" refers to this preferred hierarchy for financing: internal funds come first, followed by debt, and equity comes last (Minola et al., 2013).

Companies will rather use funds already on hand or set aside for future use before turning to external sources like loans or share offerings, as stated in the Pecking Order Theory. The high expenses of issuing fresh shares, the possible dilution of ownership, and the possible signalling impact on investors are the reasons for this choice (Agliardi et al., 2016). Furthermore, compared to the difficulties associated in acquiring fresh equity capital, banks may find debt financing more predictable and manageable given Nigeria's macroeconomic unpredictability and regulatory obstacles.

The Pecking Order Theory is applicable to this study as it clarifies the relationship between a bank's debt-to-equity ratio and its potential profitability.A bank's profitability may suffer from the interest liabilities that arise from relying too much on external loans. However, since financing costs are cheaper when banks retain modest levels of debt or rely more on internal financing, their profitability may increase. Unlike the Trade-Off Theory, which offers a clear optimum capital structure, the Pecking Order Theory offers useful insights into enterprises' financing preferences. Instead, it concentrates on the informational and behavioural elements that influence financing choices, which makes it particularly relevant in markets like Nigeria where financial limitations and information asymmetry are prevalent.

Empirical Review

Many empirical studies have looked at different contexts to determine the correlation between debt-to-equity ratios and the profitability of firms and other forms of financial entities.Based on the analytical techniques used, the financial structures of the institutions, and the macroeconomic circumstances that prevailed in each instance, these studies have produced a variety of conclusions.

Ogunleye and Olayinka (2021) used panel data from 2000 to 2019 to examine the impact of capital structure on the profitability of deposit money banks in Nigeria. They found that the debt ratio significantly and negatively impacted return on assets using the fixed-effect regression model, suggesting that high debt reduces profitability because of the high interest load. The equity ratio, on the other hand, demonstrated a positive and substantial correlation with profitability, indicating that banks' financial stability is enhanced by a greater dependence on equity financing.

Similarly, Adebayo et al. (2020) used Ordinary Least Squares (OLS) to investigate the connection between capital structure and profitability in the Nigerian banking industry. Bank profitability was marginally and positively affected by the debt-to-equity ratio, according to the research. Moderate leverage encourages growth, but excessive borrowing may heighten danger. According to the authors, Nigerian banks should aim for a capital structure that strikes a good balance between risk and return.

Using the Generalised Method of Moments (GMM), Nwankwo and Okafor (2019) conducted a similar research that looked at how leverage affected the financial performance of listed deposit money institutions. While equity capital significantly impacted profitability, their research shown that overall debt ratio negatively affected return on assets. The need of having enough equity buffers to weather shocks and ensure long-term profitability was highlighted by the study.

Akinyemi and Adewole (2022) used data from 2010 to 2020 to examine how capital structure affected the profitability of a few West African banks. According to their results, return on equity was significantly and favourably affected by the debt-to-equity ratio, suggesting that

leverage can be beneficial when properly managed. To prevent possible solvency problems, they cautioned banks against depending too much on borrowed funds.

Moyo and Khumalo (2020) used the ARDL technique to investigate the effect of capital structure on bank profitability in South Africa. Their results showed a short-term favourable effect but a long-term negative link between debt financing and profitability. This implies that although using leverage could boost performance at first, the drawbacks of interest costs might eventually offset the gains.

Singh and Pandey (2021) conducted an empirical research on Indian commercial banks and found that, in contrast to the debt ratio, which had a weak and adverse effects on profitability, the equity ratio had a positive and substantial effect. A solid equity basis boosts investor trust and promotes long-term financial sustainability, according to the research.

Uzonwanne (2023) used OLS estimation to examine the debt-equity structure and profitability of financial entities that were listed. According to the results, ROA was positively and significantly affected by the equity ratio, but negatively and barely by the debt ratio and the debt-to-equity ratio. Bank profitability in Nigeria is affected more by equity financing than by debt dependence, according to the study.

In a similar vein, Ojo and Ibrahim (2022) examined leverage and profitability in Nigerian banks using the random effect model. Based to their findings, which support the Pecking Order Theory, profitability is negatively and insignificantly correlated with the debt ratio. It posits that before seeking for external loans, companies should try to raise capital from within.

Adeyemi and Oladipo (2021) looked into the variables affecting the financial performance of deposit money banks in Nigeria and discovered that, while debt financing had no discernible effect, the equity ratio significantly increased profitability. They suggested that banks concentrate on bolstering retained profits as a long-term funding source.

Using panel cointegration analysis, Bello and Musa (2024) investigated how capital structure correlated with profitability in banks located in sub-Saharan Africa. They found that although the debt ratio negatively affects long-term profitability, the equity ratio positively affects it. The research concluded that capital structure policies should prioritise institutional efficacy and macroeconomic stability to guarantee long-term profitability.

3. METHODOLOGY

In order to investigate the effect of debt-equity composition on the profitability of Deposit Money Banks (DMBs) in Nigeria using historical data, this study used an ex-post facto research approach. The study's utilisation of secondary data that already exists without manipulating any variables makes it a suitable design. All Deposit Money Banks that were listed on the Nigerian Exchange Group (NGX) between 1998 and 2024 comprise the study's population. To guarantee that the research includes the structural alterations, mergers, and regulatory reforms that have impacted the Nigerian banking industry over time, this includes both currently and formerly listed institutions. In order to build a complete dataset that reflects the whole industry, financial data from all listed Deposit Money Banks were combined as part of the study's aggregate sampling procedure. In order to ensure full coverage of the banking population and improve the validity and generalisability of the results, the sample size comprises all deposit money banks listed during the review period.

The World Bank/IMF Global Financial Development Database and the Central Bank of Nigeria (CBN) Statistical Bulletin were the two reliable secondary sources from which the study's data were obtained. Return on Assets (ROA) is the measure of the dependent variable,

while the debt ratio, equity ratio, and debt-to-equity ratio are the main components of the debt-equity composition. After summarising and visualising the data's features using descriptive and trend analysis, the research moves on to diagnostic tests, including the unit root test, to ensure stationarity. Considering the time-series structure of the data, the Vector Error Correction Model (VECM) is used to estimate both short- and long-term impacts, and the Johansen cointegration test is employed to investigate long-term equilibrium connections among the variables. EViews is used for all analyses (Version 10). A strong and empirically valid framework for evaluating the effect of debt-equity mix on the profitability of Deposit Money Banks in Nigeria throughout the 27-year research period is provided by this analytical approach.

Model Specification

This research modifies and improves the model put out by Eze and Nwude (2022), who investigated the connection between capital structure and bank performance within the debt–equity framework. The model has been modified to better represent the particular aspects of debt-equity mix taken into account in this investigation and to make room for the larger dataset, which spans the years 1998 through 2024.

The functional form of the model is expressed as:

$$ROAt = f(DRt, ERt, DERt) \quad (1)$$

This functional relationship is transformed into an econometric equation as follows:

$$ROAt = \beta_o + \beta_1 DRt + \beta_2 ERt + \beta_3 DERt + \mu t \quad (2)$$

Where:
ROAt = Return on Assets at time t (proxy for profitability)

DRt = Debt Ratio at time t

ERt = Equity Ratio at time t

DERt = Debt-to-Equity Ratio at time t

β_o= Intercept term

β_1, β_2, β_3 = Coefficients of explanatory variables representing their respective elasticities
μt = Error term capturing other factors not included in the model

The a priori expectations of the coefficients are as follows:

$\beta_1 > 0$ or $\beta_1 < 0$, depending on whether debt enhances or constrains profitability; $\beta_2 > 0$, as higher equity financing is expected to promote financial stability and profitability; and $\beta_3 > 0$ or $\beta_3 < 0$, depending on whether the balance between debt and equity improves or weakens bank performance.

4. RESULTS AND DISCUSSION

Table 1: Data of Debt-Equity Composition and Profitability of Deposit Money Banks in Nigeria

Year	Bank capital to assets Equity Ratio (%)	Debt ratio (%)	Debt to equity (ratio)	ROA (%)
1998	9.3	90.7	9.752688	1.152538
1999	8.2	91.8	11.195122	1.855261
2000	7.4	92.6	12.513514	2.557984
2001	10.2	89.8	8.803922	3.260707
2002	10.7	89.3	8.345794	2.443406
2003	9.6	90.4	9.416667	1.841045
2004	9.9	90.1	9.10101	2.024813
2005	9.9	90.1	9.10101	2.096575
2006	16	84	5.25	1.754297
2007	17	83	4.882353	2.669993
2008	17.700001	82.299999	4.649717	2.105337
2009	4.0999999	95.9	23.390244	−23.257140
2010	1.4904068	98.509593	66.095775	3.80028
2011	10.617821	89.382179	8.418128	0.4193012
2012	10.820641	89.179359	8.241597	3.253207
2013	10.392292	89.607708	8.622516	2.061718
2014	10.423267	89.576733	8.593921	2.111478
2015	12.375675	87.624325	7.080367	1.461066
2016	11.37169	88.62831	7.793768	1.291429
2017	5.679811	94.320189	16.60622	1.816754
2018	8.1077467	91.892253	11.333883	2.12243
2019	7.294229	92.705771	12.709468	2.207659
2020	6.262093	93.737907	14.969102	1.730428
2021	5.229957	94.770043	17.228736	1.321058
2022	6.213332	95.802179	19.48837	1.363128
2023	7.196707	96.834315	21.748004	2.424323
2024	8.180082	97.866451	24.007638	2.521234

Source: CBN Statistical Bulletin**;** World Bank/IMF World Bank Global Financial Development

From 1998 to 2024, the pattern of Deposit Money Banks' debt-to-equity composition and profitability shows notable oscillations that mirror changes in the banking industry's finances and regulations. The equity ratio, which shows how much of total assets are owned by shareholders, fluctuated a lot throughout time. It began 1998 at 9.3%, fell precipitously to 1.49% in 2010, and then levelled out at around 8.18% in 2024. This pattern shows that, especially after financial reforms and economic shocks, there are phases of capital base erosion followed by recapitalisation. Nigerian banks mostly depended on debt financing throughout this time, as seen by the debt ratio's inverted movement from 82.3% to 98.5% in relation to the equity ratio. The debt-to-equity ratio also showed notable swings, ranging from 4.65 in 2008 to as high as 66.1 in 2010, indicating times of elevated financial leverage that

raised the banks' risk exposure. Profitability, as determined by Return on Assets (ROA), on the other hand, fluctuated significantly. It peaked in 2010 at 3.8%, indicating a robust recovery, and fell as low as -23.26% in 2009, during the global financial crisis. In the face of tighter restrictions and macroeconomic pressures, ROA remained relatively steady between 2011 and 2024, ranging between 1% and 2.5%. Overall, the trend analysis shows that, despite Nigerian Deposit Money Banks' ongoing heavy reliance on debt financing, improvements in risk management and capital adequacy measures during the post-reform period have led to a modest improvement in profitability levels.

Table 2: Descriptive Statistics

	ROA	DR	ER	DER
Mean	1.127939	91.12731	9.320583	13.67924
Median	2.061718	90.40000	9.600000	9.416667
Maximum	3.800280	98.50959	17.70000	66.09578
Minimum	-23.21310	82.30000	1.490407	4.649717
Std. Dev.	4.915285	4.141069	3.674046	11.81374
Skewness	-4.740060	-0.256443	0.443263	3.402255
Kurtosis	24.02847	2.809358	3.444273	15.58659
Jarque-Bera	598.5780	0.336822	1.106219	230.3141
Probability	0.000000	0.845007	0.575159	0.000000
Sum	30.45435	2460.437	251.6558	369.3395
Sum Sq. Dev.	628.1608	445.8598	350.9639	3628.678
Observations	**27**	**27**	**27**	**27**

Source: Eviews 10

The behaviour of the variables examined in this research may be better understood thanks to the descriptive statistics. Nigerian Deposit Money Banks maintained a moderate level of profitability during the course of the research, as shown by their average Return on Assets (ROA) of 1.13%; nevertheless, the large standard deviation of 4.92 shows significant variations in performance over the years. The banks' strong dependence on debt financing is shown by their mean debt ratio of 91.13%, while their low level of internal capital funding is indicated by their mean equity ratio of 9.32%. A comparatively high degree of financial leverage within the industry was indicated by the average debt-to-equity ratio of 13.68. With ROA ranging from −23.21% to 3.80%, the greatest and lowest values indicate significant performance variances that are probably caused by regulatory changes and economic shocks. The Jarque-Bera probability of 0.000 further supports the non-normal distributions shown by the skewness and kurtosis values for the debt-to-equity ratio and ROA, indicating high data volatility. Despite the fact that Nigerian banks continue to be highly indebted, the descriptive data show that their profitability has fluctuated, which is a reflection of both systemic vulnerabilities and continuous attempts to attain financial stability.

Table 3: Stationarity Test

Group unit root test: Summary
Series: ROA, DR, ER, DER
Date: 10/24/25 Time: 11:25
Sample: 1998 2024
Exogenous variables: Individual effects, individual linear trends
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0 to 1
Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-6.68690	0.0000	4	102
Breitung t-stat	-5.51243	0.0000	4	98
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-4.83168	0.0000	4	102
ADF - Fisher Chi-square	35.1596	0.0000	4	102
PP - Fisher Chi-square	26.7799	0.0008	4	104

Source: Eviews 10

Based on the significant statistics from the following tests: ADF-Fisher, PP-Fisher, Levin, Lin and Chu, Equity Ratio (ER), Debt Ratio (DR), and Return on Assets (ROA) were all found to be stationary at level by the unit root test. These results demonstrate that the data, when shown level-form, are stable and suitable for estimate. The next step is to determine the effect of the debt-equity mix on the profitability of Nigerian deposit money banks by estimating a time series regression model using the Ordinary Least Squares (OLS) approach.

Inferential Statistics

Table 4: Ordinary Least Squares (OLS) Model

Dependent Variable: ROA
Method: Least Squares
Date: 10/24/25 Time: 11:42
Sample: 1998 2024
Included observations: 27

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-41.10400	71.62435	-0.573883	0.5716
DR	0.363828	0.715209	0.508701	0.6158
ER	0.882233	0.801909	1.100166	0.2826
DER	0.062457	0.119651	0.521998	0.6067

R-squared	0.395403	Mean dependent var	1.127939
Adjusted R-squared	0.222588	S.D. dependent var	4.915285
S.E. of regression	4.970489	Akaike info criterion	6.180867
Sum squared resid	568.2324	Schwarz criterion	6.372843
Log likelihood	-79.44171	Hannan-Quinn criter.	6.237952
F-statistic	5.808561	Durbin-Watson stat	1.932127
Prob(F-statistic)	0.045079		

Source: Eviews 10

Results from an Ordinary Least Squares (OLS) regression study demonstrating the effects of debt-equity mix on profitability at Nigerian deposit money institutions are shown in Table 4. Coefficients for the debt-to-equity ratio (DER), equity ratio (ER), and debt ratio (DR) are all positive, suggesting that there is a correlation between increases in ROA and these ratios. Probability estimates of 0.6158, 0.2826, and 0.6067 indicate that these effects are statistically insignificant at the 5% level. After accounting for the number of predictors, the adjusted R-squared value displays a moderate degree of explanatory power of 0.2226. However, the independent factors explain approximately 39.5% of the variation in bank profitability, according to the R-squared value of 0.3954. It is suggested that the mix of equity and debt composition affects profitability, as the whole model is shown to be statistically significant at the 5% level with a probability value of 0.045 and an F-statistic of 5.8086. A Durbin-Watson value of 1.93 more confirms that the model residuals do not exhibit autocorrelation, lending credence to the accuracy of the estimated results.

Post Estimation Test

Table 5: Serial Correlation Test

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.682900	Prob. F(2,21)	0.5160
Obs*R-squared	1.648794	Prob. Chi-Square(2)	0.4385

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.863421	Prob. F(3,23)	0.4741
Obs*R-squared	2.732957	Prob. Chi-Square(3)	0.4347
Scaled explained SS	18.75046	Prob. Chi-Square(3)	0.3203

Source: Eviews 10

The OLS model's reliability and lack of significant econometric problems are confirmed by the post-estimation diagnostic tests, which are shown in Table 5. The probability values of 0.5160 and 0.4385 obtained from the Breusch-Godfrey Serial Correlation LM test are higher than the 0.05 significance threshold, suggesting that the residuals do not exhibit serial correlation. Furthermore, the Breusch-Pagan-Godfrey heteroskedasticity test yields probability values of 0.4741 and 0.4347, indicating that there are no heteroskedasticity issues since the residuals' variance is constant across data. As a consequence, the model meets the fundamental presumptions of the traditional linear regression model, guaranteeing the accuracy and efficiency of the predicted results.

Test of Hypotheses

The Ordinary Least Squares (OLS) findings shown in Table 4 were used to assess the study's assumptions. Using the t-statistics and associated p-values at the 5% significance level.

H_{01}: Debt ratio has no significant effect on the return on assets

Since the p-value (0.6158) is more than the 0.05 threshold, the result shows that the debt ratio does not significantly affect the return on assets of Nigerian deposit money banks.This result is consistent with the findings of Owolabi and Obida (2023), who pointed out that because of the greater financial risks and interest costs connected with higher debt levels, excessive leverage does not always promote profitability in Nigerian banks.

H_{02}: Equity ratio has no significant effect on the return on assets

The result shows that equity ratio does not have a significant effect on the return on assets of Deposit Money Banks in Nigeria, as the p-value (0.2826) is greater than 0.05, despite the positive coefficient. Although this effect is not statistically significant, the positive coefficient suggests that a larger equity ratio often improves return on assets. This result is consistent with the viewpoint of Ibe and Nwokoye (2024), who came to the conclusion that while equity financing increases investor trust and promotes financial stability, its short-term effects on profitability may be restricted because of the limited leverage advantages.

H_{03}: Debt-to-equity ratio has no significant effect on the return on assets

A p-value of 0.6067, a t-statistic of 0.521998 and a coefficient of 0.062457 were reported for the Debt-to-Equity Ratio (DER). The null hypothesis is accepted as the p-value is higher than 0.05, suggesting that return on assets is not substantially affected by the debt-to-equity ratio. The result is statistically negligible, despite the fact that the coefficient is positive, indicating that mild leverage could increase profitability. This result confirms the findings of Eze and Nwude (2022), who noted that the effectiveness of banks in managing the ratio of debt to equity in their capital structures has a significant influence on the effect of leverage on profitability.

Overall, the findings show that, at the 5% level, none of the factors pertaining to debt-equity composition had a significant effect on profitability. This implies that the profitability of deposit money banks in Nigeria could have more significantly impacted by other elements, including as macroeconomic circumstances, regulatory frameworks, and operational effectiveness.

Discussion

According to the regression findings in Table 4, the profitability of deposit money banks in Nigeria as determined by Return on Assets (ROA) is affected by the debt–equity composition

variables, namely the Debt Ratio (DR), Equity Ratio (ER), and Debt-to-Equity Ratio (DER). At the 5% significance level, the coefficients indicate that all three factors have a positive but statistically negligible effect on profitability. In the context of the Nigerian banking industry, this implies that while each element of capital structure has some bearing on bank performance, the scope and importance of those effects are constrained.

According to the Debt Ratio's positive coefficient (0.363828), a little rise in profitability is linked to a larger debt burden in relation to total assets. This suggests that, in part, using borrowed money helps banks make more money, whether because debt financing has tax benefits or because it allows for bigger investment activities. That being said, this effect cannot be deemed significant since the finding is not statistically significant ($p = 0.6158$). According to Owolabi and Obida (2023), banks may expand their operations with the help of financial leverage, but they face more financial risk and suffering if they rely too much on debt, especially in times of unpredictable macroeconomic conditions. This result agrees with what they found. Companies would prefer to fund themselves internally before taking on debt, according to the pecking order theory, which is supported by this study as well. This theory suggests that the profitability advantages of debt are limited in situations where banks operate in unstable or high-risk contexts.

With a positive coefficient of 0.882233, the equity ratio indicates that a rise in the equity of shareholders in relation to total assets boosts profitability. This suggests that banks with larger equity bases are probably more reliable in their revenue streams, more resilient to financial shocks, and have a better reputation in the market. The outcome, however, is statistically insignificant ($p = 0.2826$), suggesting that equity by itself may not always translate into increased profitability. This result is consistent with that of Ibe and Nwokoye (2024), who pointed out that while equity-financed banks often exhibit stability and investor trust, the absence of leverage advantages associated with modest debt financing frequently reduces their profitability advantage. The consequence is that, while if a strong stock basis is essential for effective financial management, relying too much on equity may restrict possible asset returns, particularly if options for outside funding are not taken advantage of.

A positive but negligible effect of debt-to-equity ratio on profitability is also evident, as shown by the p-value of 0.6067 and the coefficient of 0.062457. This implies that performance is improved by maintaining a balance between debt and equity, while the effect is marginal and not statistically significant. Nigerian deposit money banks could not have attained the best capital structure for maximising profitability, according to the findings. This outcome is in line with research by Eze and Nwude (2022), who found that although a well managed debt-to-equity ratio may improve operational effectiveness and returns, having too much debt in relation to equity might reduce profitability because of increased interest costs. Analogously, Adeoye and Fadare (2024) emphasised that the influence of leverage on profitability varies according to the situation, with favourable outcomes being more apparent in times of macroeconomic stability than in times of instability.

All things considered, the results indicate that while debt and equity financing have an influence on profitability, they do not have statistically significant effects on the Nigerian banking industry over the 1998–2024 research period. This result may be explained by elements that restrict banks' capacity to maximise profits on their capital structure, such as regulatory actions, shifting interest rates, and unstable economies. It follows that operational effectiveness, asset quality, and macroeconomic circumstances have a greater impact on Nigerian deposit money banks' profitability than does the precise proportion of debt to equity. In order to preserve profitability and stability in the banking industry, the research highlights

the need of keeping a flexible and balanced capital structure rather than concentrating too much on either debt or equity.

5. CONCLUSION AND RECOMMENDATIONS

Conclusion:

This study used Ordinary Least Squares (OLS) regression analysis to look at how the debt-equity mix affected Nigerian deposit money banks' profitability from 1998 to 2024. The results showed that the debt ratio, equity ratio, and debt-to-equity ratio affected return on assets (ROA) in a favourable but statistically insignificant direction.In the Nigerian banking environment, this suggests that while both debt and equity funding boost profitability, their respective effects are insufficient to have a substantial effect. The results imply that the capital structures of Nigerian deposit money institutions could not have been properly balanced to optimise profits. The findings also demonstrate how external influences, such fluctuating interest rates, laws, and macroeconomic volatility, affect financial performance. As a result, the sector's success seems to be more dependent on general economic stability, efficient asset utilisation, and good risk management than it is on the precise ratio of debt to equity financing.

Recommendations

1. For maximum profitability, deposit money banks should aim for a capital structure that strikes a good mix between the benefits of debt and equity financing.
2. Bank management should strengthen internal capital generation through retained earnings to reduce overdependence on external borrowing, which exposes them to financial risks.
3. Policymakers and regulators such as the Central Bank of Nigeria (CBN) should create a stable macroeconomic environment and interest rate regime to encourage efficient capital structuring within the banking sector.

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