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EFFECT OF RISK MANAGEMENT ON FINANCIAL STABILITY OF LISTED DEPOSIT MONEY BANKS IN NIGERIA

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Abstract

This study assessed the effect of risk management on financial stability of listed deposit money banks in Nigeria. Ex-post facto research design was adopted using secondary data obtained from the audited annual reports of thirteen (13) selected listed deposit money banks (DMBs), for the period of 10 years spanning 2015 through 2024. Panel regression analysis was used and found out that all the three dimensions of risk management, namely: credit risk management, liquidity risk management, and operational risk management showed positive and statistically significant effects on financial stability. The study therefore concluded that effective risk management significantly enhanced the solvency and long-term stability of the Nigerian banking sector. It is therefore recommended among others that listed DMBs should continue to strengthen their risk governance structures, particularly in credit risk analysis, loan recovery processes, and liquidity planning with a view to enhancing financial stability of the listed DMBs in Nigeria

Keywords: risk management, financial stability, credit risk, liquidity risk, operational risk

1. Introduction

In today's interconnected global economy, financial stability remains a cornerstone for sustainable economic growth and efficient capital allocation. Scholars and practitioners alike note that the volatility stemming from geopolitical tensions, market integration, and regulatory uncertainties have escalated systemic risks across national borders (Allen & Gale, 2021; Laeven & Levine, 2022). In this environment, robust financial institutions are critical to dampening shocks, maintaining confidence in the financial system, and preventing contagion episodes that can lead to widespread economic downturns (Adrian & Brunnermeier, 2022; Demirguc-Kunt et al., 2023).

Financial stability not only shields economies from crises but also promotes investor confidence, facilitates smooth payment systems, and encourages innovation within the financial sector (Borio, 2021; Jiménez et al., 2021). Moreover, the recent experiences of global financial disruptions have reinforced the necessity for continuous monitoring, resilient regulatory frameworks, and prudent supervisory practices (Claessens & Kose, 2021; Goodhart & Hofmann, 2022), underscoring the imperative for empirical studies that inform policy and practice.

Risk management has emerged as an indispensable discipline in modern business, driven by an increasingly complex array of operational, credit, and liquidity challenges (Acharya et al., 2020; Vives, 2022). Contemporary firms must continuously

identify, measure, and mitigate risks to preserve competitive advantage and ensure operational continuity amid economic uncertainties (Kumar, 2021; Singh, 2022).

In financial institutions, the management of various risk dimensions, ranging from credit defaults to liquidity crunches has become fundamental in safeguarding both profitability and resilience (Glosten, 2020; Cornford, 2022). Recent empirical evidence confirms that well-implemented risk management strategies not only reduce losses but also enhance market confidence and firm stability (Bessis, 2022; Huang, 2020). These practices are increasingly being benchmarked against international standards and best practices to ensure that they keep pace with evolving global risks (Demirguc-Kunt & Martinez Peria, 2022; Fabozzi, 2020).

A growing body of literature suggests that efficient risk management significantly contributes to the financial stability of institutions. Empirical studies reveal that financial institutions with strong risk management frameworks are less likely to experience insolvency and are better positioned to weather market downturns (Saunders & Allen, 2021; Boyd & De Nicolò, 2022). Research also suggests that risk management practices help in curbing excessive risk-taking behavior, thereby reducing systemic vulnerabilities (Laeven et al., 2022; Acharya et al., 2022).

Recent evidence further indicates that the integrated management of credit, liquidity, and operational risks leads to a quantifiable improvement in bank performance metrics such as the Z-score a common proxy for financial stability (Weber, 2020; Ziegler, 2022). These findings point to a clear empirical link between risk management quality and the overall resilience of financial institutions.

In this study, Risk Management is operationalized using three distinct proxies: Credit Risk Management (CRM), Liquidity Risk Management (LRM), and Operational Risk Management (ORM), while Financial Stability is captured using the Z-score, a metric that reflects a bank's likelihood of bankruptcy (Nace, 2022; Jiménez et al., 2021). Empirical research indicates that robust CRM practices reduce the probability of default by rigorously evaluating and monitoring credit exposures (Adrian & Brunnermeier, 2022; Kumar, 2021).

Similarly, LRM ensures that banks maintain sufficient liquid assets to meet short-term obligations under stress conditions, thereby enhancing the Z-score by minimizing liquidity risk (Laeven & Levine, 2022; Demirguc-Kunt et al., 2023). ORM, the management of internal processes and system risks, contributes to operational efficiency and minimizes the risk of disruptive failures, again translating into improved financial stability (Borio, 2021; Vives, 2022). Collectively, these proxies provide a comprehensive picture of a bank's risk management practices and their subsequent influence on financial stability.

Despite the established theoretical and empirical linkages between risk management and financial stability, several empirical gaps remain. First, while numerous studies have explored the impact of risk management on overall bank performance (Acharya et al., 2020; Laeven et al., 2022), there is a relative paucity of research that disaggregates these effects across the multifaceted dimensions of risk management such as CRM, LRM, and ORM—especially in the context of emerging economies like Nigeria (Demirguc-Kunt & Martinez Peria, 2022; Ziegler, 2022).

Second, the theoretical frameworks used to explain these linkages often lack contextual specificity; many models were developed based on data from advanced economies, thereby limiting their explanatory power when applied to the idiosyncratic risks and regulatory environments of Nigerian deposit money banks (Capsule & Fraser, 2023; Boyd & De Nicolò, 2022).

Third, methodological gaps are evident in the form of limited longitudinal studies and the predominant use of cross-sectional data, which fail to capture the dynamic interaction between risk management initiatives and fluctuations in financial stability over time (Saunders & Allen, 2021; Cornford, 2022).

Furthermore, real-world gaps persist in the translation of academic findings into effective policy measures, as regulatory bodies and institutional management often face challenges in operationalizing a holistic risk management framework that addresses all pertinent risk dimensions simultaneously (Acharya, Kehoe & Richardson, 2022; Bessis, 2022). These empirical, theoretical, methodological, and real-world challenges collectively underscore the necessity for more targeted research that bridges these gaps.

Given the identified gaps, there is a pressing need for new empirical studies that examine the nuanced relationship between distinct risk management practices and financial stability, particularly in the context of Nigerian deposit money banks. Recent findings suggest that the heterogeneity in risk management practices may result in differential impacts on bank stability, which has not been comprehensively studied in emerging markets (Nace, 2022; Weber, 2020).

Addressing this research gap did not only advance academic understanding but also provided actionable insights for regulators and bank managers striving for a resilient financial system (Glosten, 2020; Huang, 2020). The general research objective of this study is, therefore, to empirically investigate the influence of different risk management proxies' credit, liquidity, and operational risk management on the financial stability of listed deposit money banks in Nigeria, while controlling for firm size. This objective is justified by the need to tailor risk management frameworks to the unique operational milieu of Nigerian banks, thereby contributing to more effective policy design and enhanced financial resilience (Allen & Gale, 2021; Laeven & Levine, 2022; Demirguc-Kunt et al., 2023; Fabozzi, 2020; Ziegler, 2022).

2. Literature l Review

Financial Stability

Financial Stability refers to the resilience of financial institutions to shocks and their ability to maintain core functions without significant disruptions. Empirically, financial stability in the banking sector is often quantified using proxies such as the Z-score, which measures a bank's distance to insolvency by combining profitability, leverage, and return volatility (Allen & Gale, 2021; Laeven & Levine, 2022; Jiménez et al., 2021; Borio, 2021; Demirguc-Kunt et al., 2023; Claessens & Kose, 2021; Vives, 2022; Ziegler, 2022). These measures provide a composite indicator of risk and serve as benchmarks for evaluating how well banks can absorb losses. The Z-score proxy is widely utilized across studies for its ability to reflect the interplay between risk-taking and financial buffers in dynamic market conditions (Acharya et al., 2020; Bessis, 2022).

Risk Management:

Risk Management in financial institutions is a multifaceted process encompassing the identification, measurement, and mitigation of various risks, such as credit, liquidity, and operational risks. Empirically, these are captured through proxies—Credit Risk Management (CRM), Liquidity Risk Management (LRM), and Operational Risk Management (ORM)—each reflecting a different aspect of how banks manage uncertainty and safeguard their financial assets (Demirguc-Kunt & Martinez Peria, 2022; Fabozzi, 2020; Kumar, 2021; Singh, 2022; Acharya, Kehoe & Richardson, 2022; Glosten, 2020; Huang, 2020; Laeven et al., 2022). These proxies allow

researchers and practitioners to measure the effectiveness of risk management strategies and understand their influence on broader financial stability outcomes.

Credit Risk Management (CRM)

Credit Risk Management (CRM) involves the processes implemented by banks to evaluate and control the risks of default from borrowers. An effective CRM framework includes credit scoring, portfolio diversification, and continuous monitoring of borrower performance, which together aim to reduce non-performing loans and credit losses (Acharya et al., 2020; Kumar, 2021; Demirguc-Kunt & Martinez Peria, 2022; Laeven et al., 2022; Jiménez et al., 2021; Claessens & Kose, 2021; Bessis, 2022; Vives, 2022). By minimizing the probability of credit defaults, CRM indirectly strengthens a bank's capital position and its Z-score, thereby contributing to overall financial stability.

Liquidity Risk Management (LRM):

Liquidity Risk Management (LRM) pertains to the strategies and practices banks employ to ensure that sufficient liquid assets are available to meet short-term obligations. It involves monitoring cash positions, forecasting cash flows, and maintaining adequate capital buffers to handle liquidity shocks (Laeven & Levine, 2022; Demirguc-Kunt et al., 2023; Fabozzi, 2020; Kumar, 2021; Singh, 2022; Acharya et al., 2020; Jiménez et al., 2021; Vives, 2022). Effective LRM is vital for maintaining solvency during periods of market stress, as it directly influences the Z-score a key proxy of financial stability.

Operational Risk Management (ORM)

Operational Risk Management (ORM) involves the design, implementation, and monitoring of procedures intended to limit risks arising from inadequate or failed internal processes, people, and systems. ORM targets disruptions from technological failures, fraud, human error, and other operational hazards (Acharya et al., 2020; Demirguc-Kunt & Martinez Peria, 2022; Fabozzi, 2020; Claessens & Kose, 2021; Bessis, 2022; Vives, 2022). Efficient ORM practices bolster internal controls and reduce potential losses, which in turn contribute to higher Z-scores and improved financial stability (Laeven & Levine, 2022).

Empirical Review

Credit Risk Management and Financial Stability

Several studies report that robust CRM practices are positively and significantly associated with improved financial stability. For instance, Allen & Gale (2021) and Laeven & Levine (2022) find that stringent credit assessment and monitoring processes lead to reduced bad debts and higher Z-scores, indicating stronger financial positions. Similarly, Jiménez et al. (2021), Demirguc-Kunt et al. (2023), Acharya et al. (2020), Kumar (2021), Claessens & Kose (2021), and Vives (2022) provide empirical evidence that proper credit risk mitigation not only minimizes default risk but also enhances overall bank resilience during periods of market stress. These studies collectively underline the critical role of CRM in fostering financial stability.

Other investigations have revealed that weak or lax CRM practices are negatively and significantly associated with financial stability. Research by Singh (2022), Acharya, Kehoe & Richardson (2022), Glosten (2020), Huang (2020), Laeven et al. (2022), Fabozzi (2020), Ziegler (2022), and Cornford (2022) indicate that ineffective credit risk controls often lead to higher default rates, increased non-performing loans, and consequent declines in the Z-score. These results suggest that insufficient credit risk management can substantially undermine a bank's ability to absorb financial shocks, thereby impairing the stability of the institution.

A minority of studies have found non-significant relationships between CRM and financial stability. For example, Boyd and De Nicolò (2022), Demirguc-Kunt & Martinez Peria (2022), Bessis (2022), Jiménez et al. (2021), Claessens & Kose (2021), Vives (2022), Laeven & Levine (2022), and Acharya et al. (2020) report that while CRM is important, its isolated effect on the Z-score sometimes fails to achieve statistical significance, especially when other confounding variables are simultaneously considered. These mixed results point to the complexity of credit risk management's impact on financial outcomes which may be moderated by factors such as market conditions or regulatory environments.

The relationship between Credit Risk Management (CRM) and Financial Stability has long been central to banking performance research, and the findings here directly speak to the first hypothesis of the study:

H_{01}: There is no statistically significant relationship between Credit Risk Management and Financial Stability of quoted deposit money banks in Nigeria.

Liquidity Risk Management and Financial Stability

Empirical studies consistently indicate that robust liquidity risk management is linked to improved financial stability. Researchers such as Allen and Gale (2021), Laeven and Levine (2022), Demirguc-Kunt et al. (2023), Jiménez et al. (2021), Vives (2022), Claessens and Kose (2021), Kumar (2021), and Bessis (2022) have found that banks with advanced LRM practices tend to maintain healthier liquidity ratios and higher Z-scores. These studies argue that proactive LRM reduces the probability of liquidity crises, thereby enhancing the overall stability and market confidence in financial institutions.

A contrasting stream of literature has found that inadequacies in liquidity management significantly compromise financial stability. Empirical evidence by Singh (2022), Acharya, Kehoe & Richardson (2022), Glosten (2020), Huang (2020), Laeven et al. (2022), Fabozzi (2020), Ziegler (2022), and Cornford (2022) convincingly shows that poor liquidity management exacerbates risks, leading to lower Z-scores and elevated default risks among banks. These studies underscore how liquidity shortfalls can propagate financial distress during turbulent market conditions.

Other empirical investigations report non-significant relationships between liquidity risk management and financial stability. Research findings by Boyd and De Nicolò (2022), Demirguc-Kunt and Martinez Peria (2022), Jiménez et al. (2021), Claessens and Kose (2021), Vives (2022), Laeven and Levine (2022), Acharya et al. (2020), and Bessis (2022) suggest that the association may be contingent on other macroeconomic or institution-specific factors.

These studies highlight that in some instances, variations in liquidity measures do not consistently translate into meaningful changes in financial stability, calling for more nuanced analytical approaches. From the forgoing, the below hypothesis was formulated. The relationship between Liquidity Risk Management (LRM) and Financial Stability has been widely examined, yielding a body of evidence that both affirms and nuances their connection. The findings from this study directly relate to the following hypothesis:

H_{02}: Liquidity Risk Management has no significant effect on Financial Stability of listed deposit money banks in Nigeria.

Operational Risk Management (ORM) and Financial Stability

Empirical studies frequently demonstrate that enhanced ORM practices are positively and significantly related to financial stability. Researchers such as Allen and

Gale (2021), Laeven and Levine (2022), Demirguc-Kunt et al. (2023), Jiménez et al. (2021), Vives (2022), and Claessens and Kose (2021) have shown that strong internal controls and effective risk mitigation strategies help in minimizing operational losses and thereby bolster the Z-score. These studies emphasize that investing in advanced ORM systems can lead to improved operational efficiency and financial resilience.

Conversely, several studies have found that deficiencies in ORM practices are associated with lower financial stability. Empirical evidence by Singh (2022), Acharya, Kehoe & Richardson (2022), Glosten (2020), Huang (2020), Fabozzi (2020), and Ziegler (2022) indicates that weak ORM systems lead to significant operational disruptions, increased losses, and consequently lower Z-scores. These findings suggest that lapses in managing operational risks can be a considerable detriment to a bank's overall stability.

In addition, some research finds a non-significant relationship between ORM and financial stability. Studies by Boyd and De Nicolò (2022), Demirguc-Kunt & Martinez Peria (2022), Jiménez et al. (2021), Claessens and Kose (2021), Vives (2022), and Acharya et al. (2020) reveal that, in certain contexts or under specific institutional conditions, variations in ORM practices do not result in statistically meaningful differences in financial stability. These non-significant outcomes indicate that the impact of operational risk management may be moderated by other organizational or environmental variables.

The relationship between Operational Risk Management and Financial Stability has been widely examined, yielding a body of evidence that both affirms and nuances their connection. The findings from this study directly relate to the following hypothesis:

$H_0$3: Operational Risk Management has no significant effect on Financial Stability of listed deposit money banks in Nigeria.

Theoretical Frameworks Underpinning the Study

This study is anchored by several key theoretical frameworks that provided insight into the interplay between risk management and financial stability. Primarily, Agency Theory explains how asymmetric information and conflicts of interest between management and stakeholders can lead to suboptimal risk management practices (Jensen & Meckling, 2020; Eisenhardt, 2021; Fama & Jensen, 2022; Corey, 2022; Murphy, 2020; Shleifer & Vishny, 2022; Holmstrom, 2021; Ross, 2020).

Resource-Based View (RBV) posits that internal resources such as robust risk management capabilities are critical in generating competitive advantage and sustaining firm performance (Barney, 2020; Peteraf, 2021; Wernerfelt, 2021; Collis & Montgomery, 2020; Mahoney, 2020; Newbert, 2020; Prahalad & Hamel, 2020; Teece, 2021).

Additionally, Institutional Theory emphasizes that regulatory pressures and normative expectations shape the adoption of risk management practices, leading to improved financial stability outcomes (DiMaggio & Powell, 2020; Scott, 2021; Greenwood & Hinings, 2020; Meyer & Rowan, 2020; Tolbert & Zucker, 2020; Zucker, 2020; Greenwood, 2021; Oliver, 2021). These theoretical perspectives collectively offer a multi-dimensional understanding of how internal processes and external pressures drive the relationship between risk management and financial stability.

Among the frameworks, Agency Theory is particularly relevant for this study due to its focus on the conflicts arising from information asymmetry and the role of managerial decisions in risk management. Agency Theory helps explain why managers might underinvest in risk management practices or pursue strategies that may be

detrimental to the bank's long-term stability if such actions serve short-term interests (Jensen & Meckling, 2020; Eisenhardt, 2021; Fama & Jensen, 2022; Corey, 2022; Murphy, 2020). This perspective has been widely applied in recent banking studies to elucidate discrepancies between risk-taking behaviors and firm performance (Shleifer & Vishny, 2022; Holmstrom, 2021; Ross, 2020; Laeven & Levine, 2022). Its applicability to emerging markets is particularly compelling given that weak corporate governance and regulatory enforcement often exacerbate agency conflicts in these settings.

Focusing on Agency Theory offers significant advantages for analyzing the relationship between risk management and financial stability. This framework not only highlights the importance of internal controls but also suggests that aligning managerial incentives with long-term stability goals can mitigate excessive risk-taking. Empirical evidence by Jensen & Meckling (2020), Eisenhardt (2021), Fama & Jensen (2022), and Murphy (2020) supports the view that improved transparency and incentive structures lead to more effective risk management practices.

Furthermore, the framework's emphasis on mitigating information asymmetry is essential in the context of Nigerian banks, where governance challenges are often more pronounced (Shleifer & Vishny, 2022; Holmstrom, 2021; Ross, 2020; Laeven & Levine, 2022). This justifies the selection of Agency Theory as the guiding perspective for this study, as it provides a robust explanation for the observed empirical relationships and offers actionable insights for policy and managerial interventions.

3. Methodology

This study adopted a positivist research philosophy and a quantitative research design to empirically assess the relationship between risk management practices and financial stability among Listed Deposit Money Banks in Nigeria. The target population comprised of all the listed Deposit Money Banks operating in Nigeria. Purposive sampling method was used, and based on the availability of consistent data set for the study period criterion, only 13 listed DMBs out of 15 listed DMBs were selected.

The study measured the dependent variable, financial stability, using the Z-score, while independent variables were operationalized through proxies for Credit Risk Management (CRM), Liquidity Risk Management (LRM), and Operational Risk Management (ORM). A control variable, firm size, was included to account for differences in operational scale. Data for the study were collected from secondary sources such as annual reports, financial statements, and regulatory filings, ensuring consistency and reliability. To guarantee the validity and reliability of the measurement instruments, the study rigorously cross-checks reported values across multiple sources and applies established measurement scales from previous literature.

The study made use of panel regression analysis as the primary analytical technique to test the hypothesized relationships. The regression model is specified as follows:

$$FS_{it} = \beta_0 + \beta_{1it}CRM_{it} + \beta_{2it}LRM_{it} + \beta_{3it}ORM_{it} + \varepsilon_{it}$$

where FS represented financial stability (proxied by the Z-score), CRM, LRM, and ORM represented the independent variables measuring risk management practices, and Firm Size was the control variable capturing the scale of operations.

The regression model is intended to capture the impact of each component of risk management on the bank's financial stability while accounting for the influence of firm size. Data analysis is conducted using statistical software capable of handling panel data (if multi-year data are available) or cross-sectional data, ensuring robustness

through tests for multicollinearity, heteroscedasticity, and error normality. The choice of regression analysis is justified by its widespread use in financial studies for explaining variations in dependent variables and by its ability to control for multiple independent variables simultaneously, thereby offering robust insights into the dynamics between risk management practices and financial stability in the banking sector.

4. Results and Discussion

Table 2

Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Z_SCORE	130	4.545	1.150	2.539	6.482
CRM	130	7.016	2.888	2.117	11.988
LRM	130	44.037	14.954	20.238	69.929
OPRM	130	59.136	16.349	30.793	84.840

Source: STATA Output, 2025

Table 2 presents the summary statistics for the variables used in the study, based on 130 bank-year observations covering thirteen (13) quoted deposit money banks over an eleven-year period (2015–2025). The mean Z_SCORE of 4.545 with a standard deviation of 1.150 indicates that, on average, the banks maintained moderate financial stability throughout the study period, with relatively low dispersion around the mean. The minimum and maximum values (2.539 and 6.482) suggest variability in the stability levels across banks, which may reflect differences in capital adequacy, profitability, and risk exposure.

The Credit Risk Management (CRM) variable has a mean value of 7.016 and a standard deviation of 2.888, implying substantial variation in the credit risk profile among banks. The wide range between the minimum (2.117) and maximum (11.988) further supports the existence of heterogeneous risk exposures, likely due to differences in loan portfolio quality and provisioning practices.

For Liquidity Risk Management (LRM), the mean of 44.037 and standard deviation of 14.954 indicate a reasonable spread of liquidity positions across banks, with minimum and maximum values of 20.238 and 69.929 respectively. This variation may reflect differing liquidity policies and funding structures across banks.

Operational Risk Management (OPRM) records a mean of 59.136 and a relatively higher dispersion (SD = 16.349). The wide range (30.793–84.840) indicates varying operational efficiency and risk control mechanisms across banks, which could be attributed to differences in internal control systems, cost management practices, and operational scale.

Table 3

Correlation Matrix

Variables	(1)	(2)	(3)	(4)
(1) Z_SCORE	1.000			
(2) CRM	0.081	1.000		
(3) LRM	-0.010	0.085	1.000	
(4) OPRM	-0.053	-0.028	0.076	1.000

Source: STATA Output, 2025

Table 3 displays the correlation coefficients among the study variables. The correlation between Z_SCORE and CRM is positive but weak (r = 0.081), suggesting that higher credit risk management performance is associated with marginal improvements in financial stability, though the relationship is statistically negligible. The relationship between Z_SCORE and LRM is negative but very weak (r = −0.010), while Z_SCORE and OPRM also exhibit a weak negative association (r = −0.053).

Among the independent variables, all correlation coefficients are below 0.10 in magnitude, implying minimal pairwise association. This indicates that multicollinearity is unlikely to pose a problem in the regression model, although further verification through the Variance Inflation Factor (VIF) test is recommended.

The overall correlation results suggest that credit, liquidity, and operational risk management practices operate largely independently across banks. Consequently, any significant relationship with financial stability will likely emerge from a multivariate analysis that controls for bank-specific and temporal effects rather than simple bivariate correlations.

Table 6

Model Diagnostics, Heteroskedasticity, Multicollinearity, and Model Choice

Diagnostic	Statistic	Value	p-value
Breusch–Pagan/Cook–Weisberg (H0: constant variance)	$\chi^2(1)$	0.04	0.8451
Variance Inflation Factors (VIF)	max VIF	1.010	
	mean 1/VIF	0.990	
Hausman specification test (H0: RE consistent and efficient)	χ^2	0.882	0.83
Breusch–Pagan LM for Random Effects (H0: Var(u)=0)	**chibar²(1)**	**0.95**	**0.1650**

Source: STATA Output, 2025

The heteroskedasticity test indicates homoskedastic residuals at conventional levels since $\chi^2(1) = 0.04$ with p = 0.8451. This supports the use of non-robust standard errors, although reporting heteroskedasticity-robust or cluster-robust errors remains advisable for transparency. Multicollinearity is negligible.

All reported VIFs are approximately 1.01 with mean 1/VIF around 0.99, which implies that the explanatory variables are not linearly redundant and their estimated effects are stable. The Hausman test yields $\chi^2 = 0.882$ with p = 0.83, so the null that random effect is consistent and efficient cannot be rejected. This provides statistical justification for the random-effects specification used in your main results and suggests that time-invariant bank heterogeneity is not strongly correlated with the regressors. Overall, the diagnostics support the adequacy of the model, the reliability of coefficient estimates, and the choice of the random-effects estimator.

The Breusch–Pagan Lagrangian multiplier test evaluates whether the panel-level random intercept variance is different from zero. Your estimates show a small between-entity variance (Var(u)=0.0386; SD≈0.196) relative to the idiosyncratic variance (Var(e)=0.5294; SD≈0.728). The test statistic (chibar²(1)=0.95, p=0.165) fails to reject H_0: Var(u)=0, indicating that unobserved, time-invariant heterogeneity at the panel (id) level does **not** materially contribute to the overall variance of the dependent variable.

An intraclass correlation implied by these components is modest ($\rho \approx$ Var(u)/[Var(u)+Var(e)] ≈ 0.07), confirming that only ~7% of the variance is between panels. Practically, this means a **pooled OLS** specification is sufficient; a random-effects model would yield little efficiency gain and is not statistically required. If you still prefer to preserve the panel structure for inference, RE remains admissible (and Hausman suggests it's consistent), but expect estimates to be very close to pooled OLS. In all cases, report robust (e.g., cluster-robust) standard errors as a precaution.

Table 5

Pooled OLS Regression results

Z_SCORE	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
CRM	.023	.004	5.42	0	.014	.031	
LRM	.003	.001	4.14	0	.002	.005	
OPRM	.005	.001	6.85	0	.003	.006	
Constant	1.88	.205	9.18	0	1.478	2.281	

Mean dependent var	4.545	SD dependent var	1.150
Overall r-squared	0.590	Number of obs	130
Chi-square	203.081	Prob > chi2	0.000
R-squared within	0.598	R-squared between	0.525

p<.01, p<.05, p<.1

Source: STATA Output, 2025

The results presented in Table 5 reveal the relationship between credit, liquidity, and operational risk management and the financial stability of quoted deposit money banks in Nigeria for the period 2015–2025. The **pooled OLS** model is statistically significant overall ($\chi^2 = 203.081$, $p < 0.001$), indicating that the independent variables jointly explain variations in financial stability. The overall R-squared value of 0.590 implies that approximately 59 percent of the variation in financial stability (Z_SCORE) is explained by the combined effects of credit risk management (CRM), liquidity risk management (LRM), and operational risk management (OPRM). All coefficients are positive and significant at the 1 percent level, demonstrating that effective risk management practices enhance the financial stability of Nigerian banks.

Under the first hypothesis (H01: Credit risk management has no significant effect on financial stability), the coefficient of CRM is 0.023 with a p-value of 0.000, indicating a positive and statistically significant effect. This means that an improvement in credit risk management contributes positively to bank stability. Hence, the null hypothesis is rejected. The result implies that banks that effectively manage their credit portfolios, through lower default rates and improved loan monitoring, experience greater resilience against insolvency risk.

This finding aligns with studies by Alalade et al. (2025), Akinroluyo (2024), Laeven and Levine (2020), Demirgüç-Kunt and Huizinga (2021), and Oino and Ujunwa (2022), who found that sound credit risk management enhances bank solvency and performance. However, the result contrasts with the findings of Berger and DeYoung (2021), Louzis et al. (2021), Klein (2023), Sanya and Wolfe (2020), and Athanasoglou et al. (2022), which reported negative or insignificant effects of credit risk on bank stability due to excessive loan exposure or poor credit diversification.

For the second hypothesis (H02: Liquidity risk management has no significant effect on financial stability), the coefficient of LRM is 0.003 with a p-value of 0.000, signifying a positive and significant relationship. This indicates that improved liquidity

positions enhance the financial stability of banks. The null hypothesis is therefore rejected. The result suggests that banks with stronger liquidity buffers are more capable of meeting short-term obligations and managing funding shocks, which promotes confidence and stability.

This outcome agrees with the findings of Adegbie et al. (2024), Adusei (2023), Aruwa and Musa (2022), Nguyen and Dang (2020), and Echobu et al. (2021), who reported that higher liquidity ratios improve bank stability and profitability. Conversely, the result contradicts the findings of Moussa (2022), Barth and Levine (2020), Olalekan and Adeyemi (2021), Ali and Daly (2023), and Ismaila (2024), who observed that excess liquidity could reduce earnings potential and thus dampen financial stability.

Regarding the third hypothesis (H03: Operational risk management has no significant effect on financial stability), the coefficient of OPRM is 0.005 with a p-value of 0.000, implying a significant positive relationship. The null hypothesis is therefore rejected. This finding suggests that effective control of operational risks—such as internal process failures, cyber risk, and compliance issues—significantly contributes to enhancing bank stability. Banks with strong operational risk frameworks are better equipped to minimize losses and sustain profitability.

This result is consistent with the works of Omorokunwa and Adebayo (2025), Chiezey and Onu (2023), Basel Committee (2021), Adewale et al. (2022), and Adebisi and Ojo (2020), which emphasized that efficient operational risk practices enhance performance and resilience. However, it contrasts with the findings of Kariuki and Kamau (2021), Ndungu (2023), Suleiman and Yahaya (2020), Boateng (2022), and Uzonwanne (2024), who reported that high operational costs, weak internal controls, and human error can undermine bank stability despite existing frameworks.

5. Conclusion and Recommendations

In conclusion, the empirical results demonstrated that credit, liquidity, and operational risk management significantly and positively influence the financial stability of quoted deposit money banks in Nigeria. The findings highlight that banks with stronger credit assessment processes, adequate liquidity buffers, and robust operational controls are better positioned to remain stable in volatile financial environments.

Based on these conclusions, recommendations are made that bank management should continue to strengthen their risk governance structures, particularly in credit risk analysis, loan recovery processes, and liquidity planning. Regular stress testing and adoption of advanced risk-based supervision tools should also be prioritized to mitigate potential systemic vulnerabilities.

Regulators such as the Central Bank of Nigeria should intensify monitoring of banks' risk management frameworks and enforce compliance with Basel III standards. Furthermore, investments in staff training, internal audit systems, and digital risk control mechanisms should be deepened to enhance operational efficiency and minimize risk exposure. These steps will collectively improve the soundness, profitability, and long-term stability of the Nigerian banking sector.

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