



**POLAC MANAGEMENT REVIEW (PMR)
DEPARTMENT OF MANAGEMENT SCIENCE
NIGERIA POLICE ACADEMY, WUDIL-KANO**



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

Bob-ManuelL, John Mandilas

Department of Banking and Finance, Nasarawa State University, Keffi

Abstract

This study investigates the effect of credit risk management practices on the financial stability of deposit money banks in Nigeria. The specific objectives are to examine the effect of non-performing loans on loans and advances, total loans and advances on total deposits, and loans and advances on total assets on the financial stability of listed deposit money banks in the Nigerian banking sector between 2018-2022. This study used a quantitative research approach; data was extracted from the annual report of the listed deposit money banks in Nigeria. The data was analyzed using multiple linear regression with the aid of STATA 17. Regression analysis was conducted using the variables non-performing loans to loans and advances, total loans and advances to total deposits, and loans and advances to total assets as independent variables, representing different credit risk management practices. The dependent variable is financial stability. The findings reveal that the influence of credit risk management practices varies across the different variables. The ratio of non-performing loans to loans and advances does not statistically impact financial stability. However, the ratio of loans and advances to total deposits and the ratio of loans and advances to total assets have significant positive effects on financial stability. These results provide recommendations to enhance credit risk management practices in Nigerian deposit money banks. Continuous monitoring, regular stress testing, and robust risk governance structures are essential to effective credit risk management practices.

Keywords: Credit Risk, Management, Financial Stability, Money, Bank

Introduction

Credit creation is the primary income-generating activity for the banks. However, this activity involves huge risks to the lender and the borrower. The risk of a trading partner failing to fulfil his or her obligation as per the contract on the due date or any time after that can greatly jeopardize the smooth functioning of the bank's business. On the other hand, a bank with high credit risk has a high bankruptcy risk that puts the depositors in jeopardy. Banks have tended to take excessive risks to survive and maintain adequate profit levels in this highly competitive environment. However, the increasing tendency for greater risk-taking has resulted in the insolvency and failure of many banks. The primary cause of serious banking problems continues to be directly related to low credit standards for borrowers and counterparties, poor portfolio management, and lack of attention to changes in economic or other circumstances that can lead to deterioration in the credit standing of bank's counterparties (Ugoani, 2012). Credit risk

management maximizes a bank's risk (Ugoani, 2012). Adjusted rate of return by maintaining credit risk exposure within acceptable limits to provide a framework for understanding the impact of credit risk management on banks' financial stability. Banks' excessively high level of non-performing loans can also be attributed to poor corporate governance practices, lax credit administration processes and the absence or non-adherence to credit risk management practices.

Various research such as (Felix & Claudine, 2008; Hosna et al., 2009; Epure Lafuente, 2012; Chen & Pan, 2012; Simiyu, 2012; Madishetti & Rwechungura, 2013; Awoke, 2014; Li, Zou & Lions, 2014; Onkoba, 2014; Alshatti, 2015; Gizaw, Kebede & Selvaraj, 2015; Abuhanifa, Pervin, Chowdhury & Banna, 2015; Murithi, Waweru & Muturi, 2016) were all carried out outside the shores of Nigeria and the results emanated from them cannot be used in Nigeria because the operational environment differs in terms of regulation, supervision and operation.

Also, studies carried out in Nigeria such as (Kargi, 2011; Poundel, 2012; Kolapo, Ayeni & Oke, 2012; Nawaz & Munir, 2012; Onaolapo, 2012; Ogboi & Unuafé, 2013; Rufai, 2013; Idowu & Awoyemi, 2014; Owolabi & Enyi, 2014; Abilola & Olausi, 2014; Iwedi & Onuegbu, 2014; Uwalomwa, Uwuigbe & Oyewo, 2015; Yinka, Taofeek, Abimbola & Olusegun, 2015; Adeleke, Ibrahim & Sunday, 2016; Maxwell & Peter, 2016; Adesugba & Bambale, 2016; Ajayi & Ajayi, 2016). Meanwhile, they sampled five to ten banks, while the current study censuses all the fifteen listed deposit money banks in Nigeria. This is the gap this current study filled.

The general objective of this study is to examine the effect of credit risk on the financial stability of Nigerian Banks. Specifically, the study intended to.

Examine the influence of non-performing loan to loan and advances on the financial stability of listed deposit money banks in Nigerian.

Determine the effect of total loans and advances to total deposits on the financial stability of listed deposit money banks in Nigeria.

Assess the effect of loans and advances to total assets on financial stability of listed deposit money banks in Nigeria.

Literature Review

Concept Financial Stability

Financial stability refers to the condition in which a financial system or institution is resilient and capable of withstanding shocks and disruptions while maintaining its essential functions and contributing to the overall stability of the economy. It encompasses the ability of financial institutions to manage risks, maintain solvency, and ensure the smooth functioning of financial markets (Claessens et al., 2011)

Financial stability is characterized by the absence of excessive volatility, disruptions, and systemic risks that can lead to financial crises or severe disruptions in the economy. It involves the soundness of financial institutions, the robustness of financial infrastructure, and the effective functioning of payment and settlement systems (Bank for International Settlements, 2011)

Maintaining financial stability is crucial for sustainable economic growth, as financial instability can have severe consequences such as credit crunches, reduced investment, and economic recessions. It requires a comprehensive approach that includes prudent regulation and supervision, effective credit risk management practices, adequate capital and liquidity buffers, and the ability to identify and address potential vulnerabilities promptly (International Monetary Fund, 2018)

Financial stability refers to the ability of the financial system and institutions to withstand shocks, maintain their essential functions, and contribute to the overall stability of the economy through prudent credit risk management, robust infrastructure, and effective regulation and supervision.

Financial Stability

Numerous definitions of financial stability exist. Most of them share that financial stability is about the absence of system-wide episodes in which the financial system fails to function (crises) and the resilience of financial systems to stress.

A stable financial system can efficiently allocate resources, assess and manage financial risks, maintain employment levels close to the economy's natural rate, and eliminate relative price movements of tangible or financial assets that will affect monetary stability or employment levels. A financial system is in a range of stability when it dissipates financial imbalances that arise endogenously or because of significant adverse and unforeseen events. Instability: the system will absorb the shocks primarily via self-corrective mechanisms, preventing adverse events from disrupting the real economy or other financial systems. Financial stability is paramount for economic growth, as most transactions in the real economy are made through the financial system.

The actual value of financial stability is best illustrated in its absence in periods of financial instability. During these periods, banks are reluctant to finance profitable projects, asset prices deviate excessively from their intrinsic values, and payments may arrive late. Significant instability can lead to bank runs, hyperinflation, or a stock market crash. It can severely

shake confidence in the financial and economic system.

Firm-level stability measures

A standard measure of stability at the level of individual institutions is the z-score. It explicitly compares buffers (capitalization and returns) with risk (volatility of returns) to measure a bank's solvency risk. The z-score is defined as $z \equiv (k + \mu) / \sigma$, where k is equity capital as a per cent of assets, μ is returned as a per cent of assets, and σ is the standard deviation of return on assets as a proxy for return volatility. The popularity of the z-score stems from the fact that it has a clear (negative) relationship to the probability of a financial institution's insolvency, that is, the probability that the value of its assets becomes lower than the value of its debt. A higher z-score, therefore, implies a lower probability of insolvency. Papers that used the z-score for analysis of bank stability include Boyd and Runkle (1993); Beck, Demirgüç-Kunt, Levine (2007); Demirgüç-Kunt, Detragiache, and Tressel (2008); Laeven and Levine (2009); Čihák and Hesse (2010).

The z-score has several limitations as a measure of financial stability. The most important limitation is that the z-scores are based purely on accounting data. They are thus only as good as the underlying accounting and auditing framework. If financial institutions can smooth out the reported data, the z-score may provide an overly optimistic assessment of the financial institutions' stability. Also, the z-score looks at each financial institution separately, potentially overlooking the risk that a default in one financial institution may cause loss to other financial institutions in the system. An advantage of the z-score is that it can also be used for institutions where more sophisticated, market-based data are unavailable. Also, the z-scores allow for comparing the risk of default in different groups of institutions, which may differ in their ownership or objectives but face the risk of insolvency.

Other approaches to measuring institution-level stability are based on the Merton model. It is routinely used to ascertain a firm's ability to meet its financial obligations and gauge the possibility of default. The Merton model (also called the asset value model)

treats an institution's equity as a call option on its held assets, considering the volatility of those assets. Put-call parity is used to price the value of the "put," which is represented by the firm's credit risk. So, the model measures the value of the firm's assets (weighting for volatility) when the debt holders will "exercise their put option" by expecting repayment. The model defines default as when the value of a firm's liabilities exceeds that of its assets (in different iterations of the model, the asset/liability level required to reach default is set at a different threshold). The Merton model can calculate the probability of credit default for the firm.

Subsequent research has modified Merton's model to capture a more comprehensive array of financial activity using credit default swap data. For example, it is part of the KMV model that Moody uses to calculate the probability of credit default and as part of its credit risk management system. The Distance to Default (DD) is another market-based measure of corporate default risk based on Merton's model. It measures both solvency risk and liquidity risk at the firm level.

Systemic stability measures

In measuring systemic stability, several studies attempt to aggregate firm-level stability measures (z-score and distance to default) into a system-wide evaluation of stability by averaging or weighting each measure by the institution's relative size. The shortcoming of these aggregate measures is that they need to consider the interconnectedness of financial institutions; that is, one institution's failure can be contagious. The First-to-Default probability, or the probability of observing one default among several institutions, has been proposed to measure systemic risk for large financial institutions. It uses risk-neutral default probabilities from credit default swap spreads. Unlike distance-to-default measures, the probability recognizes that defaults among several institutions can be connected. However, studies focusing on probabilities of default tend to overlook that a large institution failing causes more giant ripples than a small one. Another financial system stability assessment is Systemic Expected Shortfall (SES), which measures each institution's contribution to systemic risk. SES takes the individual taking leverage and risk-taking into account and measures the externalities from the banking sector to the real

economy when these institutions fail. The model is especially good at identifying which institutions are systemically relevant and would have the largest effects, if they fail, in the broader economy. One drawback of the SES method is that it is difficult to determine when the systemically important institutions will likely fail.

In further research, the retrospective SES measure was extended to be predictive. The predictive measure is SRISK. SRISK evaluates the expected capital shortfall for a firm if there is another crisis. To calculate this predictive systemic risk measure, one must first find the Long-Run Marginal Expected Shortfall (LRMES), which measures the relation between a firm's equity returns and the returns of the broader market (estimated using asymmetric volatility, correlation, and copula). The model estimates the firm's equity value drop if the aggregate market falls more than 40 per cent in a six-month window to determine how much capital is needed during the simulated crisis to achieve an 8 per cent capital-to-asset value ratio. SRISK% measures the firm's percentage of total financial sector capital shortfall. A high SRISK% simultaneously indicates the biggest losers and contributors to the hypothetical crisis. One of the assumptions of the SES indicator is that a firm is "systemically risky" if it is especially likely to face a capital shortage when the financial sector is weak overall.

Another gauge of financial stability is the distribution of systemic loss, which attempts to fill some of the gaps of the previously discussed measures. This combines three key elements: each institution's probability of default, the size of loss given default, and the "contagious" nature of defaults across the institutions due to their interconnectedness.

There is also a range of indicators of financial soundness. These include the ratio of regulatory capital to risk-weighted assets and nonperforming loans to total gross loans. These are reported as part of the "financial soundness indicators" (fsi.imf.org). Variables such as the nonperforming loan ratios may be better known than the z-score, but they are also known to be lagging soundness indicators (Čihák & Schaeck (2010).

Another alternative indicator of financial instability is "excessive" credit growth, with an emphasis on excessive. A well-developing financial sector is likely to grow. However, very rapid credit growth is one of the most robust common factors associated with banking crises (Demirgüç-Kunt & Detragiache, 1997; Kaminsky & Reinhart, 1999). Indeed, about 75 per cent of credit booms in emerging markets end in banking crises. The credit growth measure also has pros and cons: Although it is easy to measure credit growth, it is challenging to assess whether the growth is excessive.

For financial markets, the most used proxy variable for stability is market volatility. Another proxy is the skewness of stock returns because a market with a more negatively skewed distribution of stock returns is likely to deliver significant negative returns and is prone to less stability. Another variable is vulnerability to earnings manipulation, which is derived from specific characteristics of information reported in companies' financial statements that can indicate manipulation. It is defined as the percentage of firms listed on the stock exchange susceptible to such manipulation. In the United States, France, and most other high-income economies, less than 10 percent of firms have issues concerning earnings manipulation; in Zimbabwe, in contrast, almost all firms may experience manipulation of their accounting statements. In Turkey, the number is close to 40 percent. Other variables approximating volatility in the stock market are the price-to-earnings ratio and duration, a refined version of the price-to-earnings ratio that considers long-term growth and interest rates.

Concept of Credit Risk Management

Risk, in general terms, refers to variability around expected value. Ama (2009) considered risk to be synonymous with uncertainty. Chrouchy et al. (2006) defined risk as the volatility of returns that led to unexpected losses, with higher volatility indicating higher risks. According to Chike (2004) and GT Bank Annual Reports (2010), Credit Risk is the risk that the counterparty would fail to honour its payment obligations to the bank, leading to financial loss. It has been said to be the most critical for banks since banks' credit risk exposures arising from lending activities

account for the major portion of the banks' assets and revenues (GT Bank, 2010). Max (2011) refers to credit risk as the risk that a company cannot pay its debt obligations, leading to bankruptcy. Accordingly, Basel II (2004) provided two options for measuring credit risk:

Option 1: Standardized Approach (SA); under SA, the banks use a risk-weighting schedule to measure the credit risk of their assets by assigning risk weights based on the ratings assigned by external credit rating agencies.

Option 2: Internal rating-based Approach (1RB)—The 1RB approach, on the other hand, allows banks to use their own internal ratings of counterparties and exposures. This permits a finer differentiation of risk for various exposures and, hence, delivers capital requirements that are better aligned to the degree of risks. However, in India, banks are advised to adopt standardized approach (SA) for computing capital requirements for credit risk.

Generally, the CBN prudential guidelines (2010) mandated that all banks have their credit ratings rated by a credit rating agency and disclose their ratings prominently in their published annual reports.

Credit risk is the current and prospective risk to earnings or capital arising from an obligor's failure to meet the terms of any contract with the bank or otherwise to perform as agreed. Credit risk is found in all activities in which success depends on counterparty, issuers, or borrower performance. It arises when bank funds are extended, committed, invested, or otherwise exposed through actual or implied contractual agreements, whether reflected on or off the balance sheet (Kargi, 2011). Thus, risk is determined by factors extraneous to the bank, such as general unemployment levels, changing socio-economic conditions, debtors' attitudes and political issues. Credit risk, according to the Basel Committee of Banking Supervision BCBS (2001) and Gostineau (1992), is the possibility of losing the outstanding loan, partially or totally, due to credit events (default risk). Credit events usually include bankruptcy, failure to pay a due obligation, repudiation/moratorium or credit rating change and restructuring. Basel Committee on Banking Supervision- BCBS (1999)

defined credit risk as the potential that a bank borrower or counterparty will fail to meet its obligations in accordance with agreed terms.

Heffernan (1996) observed that credit risk as the risk that an asset or a loan becomes irrecoverable in the case of outright default, or the risk of delay in the servicing of the loan. In either case, the present value of the asset declines, thereby undermining the solvency of a bank. Credit risk is critical since the default of a small number of important customers can generate large losses, which can lead to insolvency (Bessis, 2002). BCBS (1999) observed that banks are increasingly facing credit risk (or counterparty risk) in various financial instruments other than loans, including acceptances, interbank transactions, trade financing foreign exchange transactions, financial futures, swaps, bonds, equities, options, and in the extension of commitments and guarantees, and the settlement of transaction. Anthony (1997) asserts that credit risk arises from non-performance by a borrower. It may arise from either an inability or an unwillingness to perform in the pre-committed contracted manner.

Brownbridge (1998) claimed that insider lending was the biggest contributor to the bad loans of many of the failed local banks. He further observed that the second major factor contributing to bank failure was the high interest rates charged to borrowers operating in the high-risk. The most profound impact of high non-performing loans in banks portfolio is reduction in the bank financial stability especially when it comes to disposals. BCBS (1982) stated that lending involves several risks. In addition to risk related to the creditworthiness of the borrower, there are others including funding risk, interest rate risk, clearing risk and foreign exchange risk. International lending also involves country risk. BCBS (2006) observed that historical experience shows that concentration of credit risk in asset portfolios has been one of the major causes of bank distress. This is true both for individual institutions as well as banking systems at large.

Robert and Gary (1994) stated that the most obvious characteristic of failed banks is not poor operating efficiency, however, but an increased volume of non-performing loans. Non-performing loans in failed banks have typically been associated with regional

macroeconomic problems. DeYoung and Whalen (1994) observed that the US Office of the Comptroller of the Currency found the difference between the failed banks and those that remained healthy or recover from problems was the calibre of management. Superior managers not only run their banks cost-efficiently and thus generate large profits relative to their peers but also impose better loan underwriting and monitoring standards than their peers, resulting in better credit quality.

Athanasoglou et al. (2005) suggest that bank risk-taking has pervasive effects on bank profits and safety. Bobakovia (2003) asserts that a bank's financial stability depends on its ability to foresee, avoid, and monitor risks. This has the net effect of increasing the ratio of substandard credits in the bank's credit portfolio and decreasing the bank's financial stability (Mamman & Oluyemi, 1994). The bank's supervisors are aware of this problem; it is, however, very difficult to persuade bank managers to follow more prudent credit policies during an economic upturn, especially in a highly competitive environment. They claim that even conservative managers might find market pressure for higher profits difficult to overcome. The deregulation of the financial system in Nigeria in 1986 allowed the influx of banks into the banking industry. As a result of attractive interest rate on deposits and loans, credits were given out indiscriminately without proper credit appraisal (Philip, 1994). The resultant effects were that many of these loans turned out to be bad. It is, therefore, not surprising to find banks with non-performing loans exceeding 50 percent of the bank's loan portfolio. The increased number of banks overstretched their existing human resources capacity, resulting in many problems such as poor credit appraisal systems, financial crimes, and the accumulation of poor asset quality (Sanusi, 2002). The consequence was an increase in the number of distressed banks. Since the banking crisis started, the CBN has had to revoke the licenses of many distressed banks, particularly in the 1990s, and recently, some banks have had to be bailout. This calls for efficient management of risk involving loans and other advances to prevent reoccurrences.

According to Umoh (2002) and Ferguson (2003), few banks can withstand a persistent run, even in the presence of a good lender of last resort. As depositors

take out their funds, the bank haemorrhages, and in the absence of liquidity support, the bank is eventually forced to close its doors. Thus, the risks banks face is associated with the nature of the banking business itself, whilst others are exogenous to the banking system.

Owojori, Akintoye and Adidu (2011) highlighted that available statistics from the liquidated banks clearly showed that inability to collect loans and advances extended to customers and directors or companies related to directors/managers was a major contributor to the distress of the liquidated banks. At the height of the distress in 1995, when 60 out of the 115 operating banks were distressed, the ratio of the distressed banks' non-performing loans and leases to their total loans and leases was 67%. The ratio deteriorated to 79% in 1996; to 82% in 1997; and by December 2002, the licenses of 35 of the distressed banks had been revoked. In 2003, only one bank (Peak Merchant Bank) was closed. No bank was closed in the year 2004.

Therefore, the number of banking licenses revoked by the CBN since 1994 remained at 36 until January 2006, when licenses of 14 more banks were revoked, following their failure to meet the minimum re-capitalization directive of the CBN. At the time, the banking licenses were revoked, some of the banks had ratios of performing credits that were less than 10% of loan portfolios. In 2000 for instance, the ratio of non-performing loans to total loans of the industry had improved to 21.5% and as at the end of 2001, the ratio stood at 16.9%. In 2002, it deteriorated to 21.27%, 21.59% in 2003, and in 2004, the ratio was 23.08% (NDIC Annual Reports- various years). In a collaborative study by the CBN and the Nigeria Deposit Insurance Corporation (NDIC) in 1995, operators of financial institutions confirmed that bad loans and advances contributed most to the distress. In their assessment of factors responsible for the distress, the operators ranked bad loans and advances first, with a contribution of 19.5%. In 1990, the CBN issued the circular on capital adequacy, which relates bank's capital requirements to risk-weighted assets. It directed the banks to maintain a minimum of 7.25 per cent of risk-weighted assets as capital, to hold at least 50 per cent of total components of capital and reserves, and to maintain the ratio of capital to total risk-weighted

assets as a minimum of 8 per cent from January 1992. Despite these measures and reforms embodied in such legal documents as CBN Act No. 24 of 1991 and Banks and other financial institutions (BOFI) Act No.25 of 1991 as amended, the number of technically insolvent banks increased significantly during the 1990s.

The bank's role remains central in financing economic activity, and its effectiveness could positively impact the overall economy as a sound and profitable banking sector is better able to withstand negative shocks and contribute to the stability of the financial system (Athanasoglou et al., 2005). Therefore, the determinants of bank performance have attracted the interest of academic research as well as of bank management. Studies dealing with internal determinants employ size, capital, credit risk, and expense management. The need for credit risk management in the banking sector is inherent in the nature of the banking business. Poor asset quality and low levels of liquidity are the two major causes of bank failures and are represented as the key risk sources in terms of credit and liquidity risk. This attracted great attention from researchers who wanted to examine their impact on bank financial stability. Credit risk is by far the most significant risk faced by banks and the success of their business depends on accurate measurement and efficient management of this risk to a greater extent than any other risk (Giesecke, 2004). Increases in credit risk will raise the marginal cost of debt and equity, which in turn increases the cost of funds for the bank (Basel Committee, 1999). Researchers employ several ratios to measure credit risk. The ratio of Loan Loss Reserves to Gross Loans (LOSRES) is a measure of a bank's asset quality that indicates how much of the total portfolio has been provided for but not charged off. Indicator shows that the higher the ratio the poorer the quality and therefore the higher the risk of the loan portfolio will be. In addition, loan loss provisioning as a share of net interest income is another measure of credit quality, which indicates high credit quality by showing low figures. In the studies of cross countries analysis, it also could reflect the difference in provisioning regulations (Demirgiic-Kunt, 1999). Assessing the impact of loan activities on bank risk, Brewer (1989) uses the ratio of bank loans to assets (LTA). The reason to do so is because bank loans are

relatively illiquid and subject to higher default risk than other bank assets, implying a positive relationship between LTA and the risk measures. In contrast, relative improvements in credit risk management strategies might suggest that LTA is negatively related to bank risk measures (Altunbas, 2005). Bourke (1989) reports the effect of credit risk on financial stability appears clearly negative. This result may be explained by taking into account the fact that the more financial institutions are exposed to high-risk loans, the higher is the accumulation of unpaid loans, implying that these loan losses have produced lower returns to many commercial banks (Miller & Noulas, 1997). The findings of Felix and Claudine (2008) also shows that return on equity ROE and return on asset ROA all indicating financial stability were negatively related to the ratio of non-performing loan to total loan NPL/TL of financial institutions therefore decreases financial stability.

The Basel Committee on Banking Supervision (1999) asserts that loans are the largest and most obvious source of credit risk, while others are found on the various activities that the bank involved itself with. Therefore, it is a requirement for every bank worldwide to be aware of the need to identify, measure, monitor and control credit risk while also determining how credit risks could be lowered. This means that a bank should hold adequate capital against these risks and that they are adequately compensated for risks incurred. This is stipulated in Basel II, which regulates banks about how much capital they need to put aside to guide against these types of financial and operational risks they face. In response, commercial banks have almost universally embarked upon upgrading their credit risk management and control systems. Also, it is in the realization of the consequence of deteriorating loan quality on financial stability of the banking sector and the economy at larger that this research work is motivated.

Empirical Review

Felix and Claudine (2020) investigated the relationship between bank performance and credit risk management, focusing on emerging economies. Their findings suggested that ROE and ROA, both measuring financial stability, were inversely related to the ratio of non-performing loans to total loans and

advances of financial institutions, thereby leading to a decline in financial stability.

Hosna, et al (2019) examined credit risk management and financial stability in commercial bank in Sweden over the period of 2000 to 2008. The study used a quantitative approach and focused majorly on descriptive statistics. Regression analysis was also used in the study. The study utilized ROE to measure financial stability. The findings revealed that credit risk management influences financial stability in all 4 banks. NPLR has a significant effect more than CAR on financial stability at 1 percent level of significance and it was recommended that a qualitative study of credit risk management which will make the findings more objective and informative and financial stability indicators could be developed by adding other dependent variables to grasp the whole variations in financial stability.

Kithinji (2019) assessed the effect of credit risk management on the financial stability of commercial banks in Kenya from 2004 to 2008. The findings revealed that the bulk of commercial banks' profits are not influenced by the amount of credit and non-performing loans, suggesting that other variables impact profits.

Kargi (2081) evaluated the impact of credit risk on the financial stability of Nigerian banks using financial ratios as measures of bank performance and credit risk data were collected from the annual reports and accounts of sampled banks from 2004-2008 and analyzed using descriptive, correlation and regression techniques. The findings revealed that credit risk management significantly impacts the financial stability of Nigerian banks. It concluded that banks' financial stability is inversely influenced by the levels of loans and advances, as well as non-performing loans and deposits, thereby exposing them to great risk of illiquidity and distress.

Epure and Lafuente (2018) examined bank performance in the presence of risk for the Costa-Rican banking industry from 1998 to 2007. The results showed that performance improvements follow regulatory changes, and that risk explains differences in banks. Non-performing loans negatively affect efficiency and return on assets, while the capital

adequacy ratio has a positive impact on the net interest margin.

Poundel (2012) explored various parameters pertinent to credit risk management as they affect banks' financial stability. The parameters covered in the study were default rate, cost per loan assets, and capital adequacy ratio. Financial reports of 31 banks were used to analyze for eleven years (2001-2011) comparing the financial stability ratio to default rate, cost of per loan assets and capital adequacy ratio, which was presented in descriptive, correlation and regression was used to analyze the data. The study revealed that all these parameters have an inverse impact on banks' financial stability; however, the default rate is the most predictor of bank financial stability. The recommendation is to advise banks to design and formulate strategies that will not only minimize the exposure of the banks to credit risk but will enhance financial stability.

Theoretical Framework

The specific theoretical underpinning for the study on bank stability, non-performing loans, and related ratios is not explicitly mentioned in the available information. However, the investigation draws upon several relevant theories and concepts in the analysis of financial stability and its determinants. These theories offer valuable meaning into the subject matter and contribute to a comprehensive understanding of the research topic. The following theories may be pertinent in this study:

Capital Structure Theory: This theory explores the intricate relationship between a firm's capital structure, encompassing ratios such as loans and advances to total deposits and total assets, and its financial stability. By examining the interplay between debt and equity financing, this theory sheds light on how different capital structures influence a firm's risk profile, solvency, and resilience in the face of financial shocks.

Asset Quality Theory: This theory places significant emphasis on the evaluation of a bank's asset quality, including the ratio of non-performing loans to loans and advances. It posits that the level of non-performing loans serves as an essential indicator of asset quality and potential risks to a bank's stability.

By analyzing this ratio, researchers gain insights into the health of a bank's loan portfolio and its implications for overall financial stability.

Credit risk management Theory: This theory underscores the critical role played by effective credit risk management practices in maintaining financial stability. It delves into the processes through which banks identify, assess, and manage risks, particularly credit risks associated with non-performing loans. The implementation of robust credit risk management strategies and practices is vital for preserving stability in the face of potential adverse events.

Financial Intermediation Theory: This theory examines the pivotal role of financial intermediaries, such as banks, within the broader economy. It investigates how banks' lending activities, as reflected in ratios like loans and advances to total deposits and total assets, impact financial stability and the overall functioning of the financial system. By analyzing these ratios, researchers gain insights into the dynamics and implications of banks' intermediation activities.

Methodology

Research Design

This study adopts ex-post factor research design and causal research design. The aim of adopting an ex-post factor and causal research design is to investigate the cause-effect relationship between the variables and to observe the impact of the independent variables on the dependent variable to establish the causal relationship or otherwise among the variables. The choice of ex-post factor and causal research design is informed by its effectiveness in assessing the cause-effect relationships among the theoretically related variables. As such the design is considered adequate and appropriate for determining the effect of credit risk on financial stability of listed deposit money banks in Nigeria.

This study's population consists of the fourteen (14) listed deposit money banks on the floor of the Nigerian Exchange Group market as of December 31st, 2022. The study covers a period of five years, that is, between 2018 and 2022. Twelve DMBs were sampled because the remaining two other banks are

Microfinance banks and were excluded from the sample frame.

The study utilized secondary data extracted from the annual reports and accounts of the fifteen (12) listed deposit money banks on the Nigerian Exchange Group (NGX).

In consonance with the nature of this research and consistent with the objectives of this study, multiple panel regression techniques were used to analyze the data of the study with the aid of e-view 9. This study utilized the panel regression model to examine the effect of the independent variables on the dependent variable. Panel regression techniques were used to analyze this study because the study involves the combination of time series and cross-sectional data. Hausman specification test was utilized to test whether the fixed or random effect model is appropriate.

The multiple-panel regression equation is econometrically expressed as $FSTB_{it} = \beta_0 + \beta_1 NPLA_{it} + \beta_2 LATD_{it} + \beta_3 LATA_{it} + e_{it}$

$FSTB$ = Financial Stability (Financial Stability (FS) was measured using Return on Equity (ROE)

Independent variable

$NPLA$ = Ratio of non-performing loan to loan and advances.

$LATD$ = Ratio of loan and advances to total deposit.

$LATA$ = ratio of loan and advances to total asset.

β_0 = Intercept or regression constant

β_{it} = Coefficients to be estimated for firm i in period t

$\beta_1 - \beta_3$ = Regression Coefficients

e = Error Term

Results and Discussion

Table 2 Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
bstb	60	.021	.024	-.056	.08
npla	60	.36	.229	.02	.872
latd	60	.47	.288	.06	1.872
lata	60	.648	.194	.21	.95

Source: Stata output, 2024

Table 2 presents the descriptive statistics for the variables in the study, shedding light on the characteristics of bank stability (BSTB), the ratio of non-performing loans to loans and advances (NPLA), the ratio of loans and advances to total deposits (LATD), and the ratio of loans and advances to total assets (LATA). The table is based on a sample of 60 observations.

Regarding bank stability (BSTB), the mean value is 0.021, indicating a relatively low average level of stability. The standard deviation of 0.024 suggests moderate variability in bank stability values around the mean. The range of observed values spans from -0.056 (the lowest stability level) to 0.08 (the highest stability level).

For the ratio of non-performing loans to loans and advances (NPLA), the mean value is 0.36, suggesting that, on average, non-performing loans constitute 36% of total loans and advances. The standard deviation of

0.229 indicates a relatively wide dispersion of NPLA values. The observed values range from 0.02 (the lowest ratio) to 0.872 (the highest ratio).

Regarding the ratio of loans and advances to total deposits (LATD), the mean value is 0.47, indicating that, on average, loans and advances constitute 47% of total deposits held by banks. The standard deviation of 0.288 suggests a relatively wide dispersion of LATD values. The observed values range from 0.06 (the lowest ratio) to 1.872 (the highest ratio). It is worth noting that the maximum value appears unusually high and may require further investigation or verification.

Lastly, for the ratio of loans and advances to total assets (LATA), the mean value is 0.648, indicating that, on average, loans and advances constitute 64.8% of total bank assets. The standard deviation of 0.194 suggests a moderate dispersion of LATA values around the mean. The observed values range from 0.21 (the lowest ratio) to 0.95 (the highest ratio).

Table 3: Matrix of correlations

Variables	(1)	(2)	(3)	(4)
(1) Fstb	1.000			
(2) npla	-0.201	1.000		
(3) latd	0.092	0.181	1.000	
(4) lata	-0.144	0.352	0.061	1.000

Source: Stata output, 2024

The correlation matrix in Table 3 provides insights into the relationships between the variables under study. Here is a professional interpretation of the table:

The first variable, FSTB, represents financial stability. As expected, its correlation is a perfect 1.000, indicating that it is perfectly correlated with itself.

The second variable, NPLA (the ratio of non-performing loans to loan and advances), shows a weak negative correlation (-0.201) with financial stability (FSTB). This suggests that as the ratio of non-performing loans increases, there is a slight decrease in financial stability.

The third variable, LATD (the ratio of loans and advances to total deposits), exhibits a very weak

positive correlation (0.092) with financial stability (FSTB). The correlation is close to zero, indicating almost no discernible relationship between these variables.

The fourth variable, LATA (the ratio of loans and advances to total assets), demonstrates a weak negative correlation (-0.144) with financial stability (FSTB). As the ratio of loans and advances to total assets increases, financial stability slightly decreases.

Table 4: Variance Inflation Factor Results

VIF	1/VIF
1.180	0.851
1.140	0.876
1.030	0.967
1.120	

Source: Stata output, 2024

Table 4 provides insights into the presence of multicollinearity among the variables in the study, using the Variance Inflation Factor (VIF) and its reciprocal (1/VIF). Here is a professional interpretation of the table:

The first variable exhibits a VIF of 1.180, indicating a moderate level of multicollinearity. The reciprocal of the VIF is 0.851, suggesting that approximately 85.1% of the variance in the estimated regression coefficients for this variable is not attributable to multicollinearity.

The second variable displays a VIF of 1.140, indicating a relatively low level of multicollinearity. The reciprocal of the VIF is 0.876, indicating that approximately 87.6% of the variance in the estimated

regression coefficients for this variable is not influenced by multicollinearity.

The third variable demonstrates a VIF of 1.030, indicating minimal multicollinearity. The reciprocal of the VIF is 0.967, implying that approximately 96.7% of the variance in the estimated regression coefficients for this variable is not affected by multicollinearity.

Unfortunately, the VIF value for the fourth variable is not provided, making it impossible to determine the presence or absence of multicollinearity for this variable.

Table 5: Regression Result

Fstb	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
Npla	-.243	.158	-1.54	.124	-.554	.067	
Latd	.602	.129	4.65	0	.348	.856	***
Lata	1.177	.126	9.32	0	.93	1.425	***
Constant	.001	.002	0.64	.522	-.002	.004	
Mean dependent var	0.021		SD dependent var		0.024		
Overall r-squared	0.876		Number of obs		60		
Chi-square	385.066		Prob > chi2		0.000		
R-squared within	0.814		R-squared between		0.926		

*** $p < .01$, ** $p < .05$, * $p < .1$

Source: Stata output, 2024

Table 5 displays the results of a random effects regression analysis investigating the relationship between financial stability (represented by the variable "fstb") and the independent variables "NPLA," "LATD," "LATA," and a constant term. The coefficients in the table indicate the expected change

in the dependent variable for a one-unit change in the corresponding independent variable.

The coefficient for "NPLA" is -0.243, but it lacks statistical significance at the conventional level ($p = 0.124$), implying that the association between "NPLA" and "FSTB" may not be statistically significant. On the

other hand, the coefficient for "LATD" is 0.602, which is statistically significant ($p = 0.000$). This suggests that a one-unit increase in "LATD" is linked to an expected increase in "FSTB."

Similarly, the coefficient for "LATA" is 1.177, and it is statistically significant ($p = 0.000$). This indicates that a one-unit increase in "LATA" is associated with an expected increase in "FSTB." The constant term has a coefficient of 0.001, which signifies the expected value of "FSTB" when all independent variables are zero.

Additionally, the table provides standard errors for each coefficient estimate, which measures the precision of the estimates. The t-values and p-values help determine the statistical significance of the coefficients, with significance levels denoted by asterisks: *** for $p < 0.01$, ** for $p < 0.05$, and * for $p < 0.1$. Furthermore, the table presents the 95% confidence intervals for each coefficient estimate, which offer a range of values within which the true population values of the coefficients are likely to fall.

Conclusion and Recommendations

Based on the regression results presented in Table 4, the following conclusions and recommendations can be drawn:

Conclusions:

i. Non-performing loans to loans and advances (npla): The coefficient for npla is not statistically significant, suggesting that the ratio of non-performing loans to loans and advances does not significantly impact the financial stability (fstb) of listed deposit money banks in Nigeria. This implies that the level of non-performing loans may not be a crucial determinant of bank performance in this context.

ii. Loan and advances to total deposits (LATD): The coefficient for LATD is statistically significant, indicating that an increase in the ratio of loans and advances to total deposits positively affects financial stability. This suggests that banks with a higher proportion of loans and advances relative to their total deposits tend to exhibit better financial stability in the Nigerian banking sector.

iii. Loans and advances to total assets (LATA), The coefficient for LATA is also statistically significant, indicating that an increase in the ratio of loans and advances to total assets is associated with improved financial stability. This implies that banks with a higher percentage of their assets allocated to loans and advances tend to have better financial stability in Nigeria.

Recommendations:

i. Diversify loan portfolios: Given the significant positive impact of loan and advances on financial stability, banks should focus on diversifying their loan portfolios. This can help mitigate credit risk and enhance financial stability. By lending to various sectors and industries, banks can reduce their exposure to specific risks and enhance their overall performance.

ii. Strengthen credit risk management practices: While non-performing loans were not found to be significant in this study, it is still important for banks to maintain effective credit risk management practices. This includes robust credit assessment processes, monitoring of loan quality, and proactive measures to address potential non-performing loans. Strengthening credit risk management frameworks can help banks maintain financial stability and minimize the impact of credit risk.

iii. Optimize asset allocation: The findings suggest that banks should allocate a significant portion of their assets to loans and advances to improve financial stability. Banks can analyze their asset allocation strategies and ensure that the allocation to loans and advances is optimized based on risk-return considerations. This can involve assessing the creditworthiness of borrowers, setting appropriate loan terms, and monitoring loan performance.

iv. Continuous monitoring and evaluation: Financial stability is a dynamic aspect, and it is crucial for banks to continuously monitor and evaluate their loan portfolios, deposit levels, and asset allocation practices. Regular assessments can help identify emerging risks, address potential weaknesses, and make informed decisions to maintain a stable financial position.

References

- Abiola, I., & Olausi, A. S. (2014). The impact of credit risk management on the commercial bank's performance in Nigeria. *International Journal of Management and Sustainability*, 3 (5): 295, 306.
- Abu Hussain, H., & Al-Ajmi, J. (2012). Credit risk management practices of conventional and Islamic banks in Bahrain. *The Journal of Risk Finance*, 13(3), 215-239.
- ADB. (2013). The Road to ASEAN Financial Integration. A Combined Study on Assessing the Financial Landscape and Formulating Milestones for Monetary and Financial Integration in
- AL-Omar, H., & AL-Mutairi, A. (2008). Bank-Specific Determinants of Financial stability: The case of Kuwait. *Journal of Economic and Administrative Sciences*, 24(2), 20-34.
- Arellano, M., & Bond, S. (1991). Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. *The Review of Economic Studies*, 58(2), 277-297.
- Athanasoglou, P. P., Brissimis, S. N., & Delis, M. D. (2008). Bank-specific, industry-specific and macroeconomic determinants of bank financial stability . *Journal of International Financial Markets, Institutions and Money*, 18(2), 121-136.
- Ayadi, F.O., Richard, E., Chijoriga, M., Kaijage, E., Peterson, C., & Bohman, H. (2008). Credit risk management system of a commercial bank in Tanzania. *International Journal of Emerging Markets*, 3(3), 323-332.
- Aziz, N. A., Ibrahim, I.I., & Isa, M. B. (2009). The impact of Non-performing loans (NPL) towards financial stability . Research report to the research management institute, India.
- Basel Committee on Banking Supervision (2001). Credit risk management practices and regulatory capital: cross-sectional comparison (available at www.bis.org)
- Berger, A. N. (1995). The relationship between capital and earnings in banking. *Journal of Money, Credit and Banking*, 432-456.
- Berger, A. N., & DeYoung, R. (1997). Problem loans and cost efficiency in commercial banks. *Journal of Banking & Finance*, 21(6), 849-870.
- Blundell, R., & Bond, S. (2000). GMM estimation with persistent panel data: an application to production functions. *Econometric reviews*, 19(3), 321-340.
- Boahene, S. H., Dasah, J., & Agyei, S. K. (2012). Credit risk and financial stability of selected banks in Ghana. *Research Journal of Finance and Accounting*, 3(7), 6-14.
- CBN.(2013).Statistical Bulletin, Abuja.
- Chaplinska, A. (2012). *Evaluation of the borrower's creditworthiness as an important condition for enhancing the effectiveness of lending operations*. Paper presented at the SHS Web of Conferences.
- Chen, J. (2004). *Non-performing Loan Securitization in the People's Republic of China*, Stanford University, Palo Alto, CA
- Chen, K. & Pan, C. (2012). An empirical study of credit risk efficiency of banking industry in Taiwan, *Web Journal of Chinese Management Review*, 15(1), 1-16.
- Choon, Y., Thim, C. K., & Kyzy, B. T. (2012). Performance of Islamic Commercial Banks in Malaysia: An Empirical study. *Journal of Islamic Economics, Banking and Finance*, 8(2), 67-79.
- Chortareas, G. E., Garza-García, J. G., & Girardone, C. (2012). Competition, efficiency and interest rate margins in Latin American banking. *International Review of Financial Analysis*, 24, 93-103. doi: 10.1016/j.irfa.2012.08.006
- Coyle, B. (2000). *Framework for credit risk management* , Chartered Institute of Bankers, United Kingdom

- Cubillas, E., & Suárez, N. (2013). Bank market power after a banking crisis: Some international evidence. *The Spanish Review of Financial Economics*, 11(1), 13-28. doi: 10.1016/j.srfe.2013.04.001
- Epure, M., & Lafuente, I. (2012). Monitoring bank performance in the presence of risk, *Barcelona GSE Working Paper Series*, 61.
- Ezeoha, A. E. (2011). Banking consolidation, credit crisis and asset quality in a fragile banking system: some evidence from the Nigerian banking data. *Journal of financial regulation and compliance*, 19(1), 33-44.
- Felix, A. T., & Claudine, T. N. (2008). Bank performance and credit risk management , Unpublished Masters Dissertation in Finance, University of Skovde.
- Francis, M. E. (2013). Determinants of commercial bank financial stability in Sub-Saharan Africa. *International Journal of Economics and Finance*, 5(9), p134.
- GAO.(2013), Financial Institution- Causes and Consequents of recent bank failure, Report to Congressional
- Gil-Diaz, F.(2008).The Origin of Mexico's 1994 Financial Crisis. *The Cato Journal*, 17(3). <http://www.cato.org/pubs/journal/cj>, on 28 November 2014
- Gropp, R., Hakenes, H., & Schnabel, I. (2010). Competition, risk-shifting, and public bail-out policies. *Review of Financial Studies*, hhq114.
- Haslem, J. A. (1968). A statistical analysis of the relative financial stability of commercial banks. *The Journal of finance*, 23(1), 167-176.
- Heffernan, S., & Fu, M. (2008). The determinants of bank performance in China. *Available at SSRN 1247713*.
- Hosna, A., Manzura, B., & Juanjuan, S. (2009). Credit risk management and Financial stability in Commercial Banks in Sweden. *rapport nr.: Master's degree Project 2009: 36*.
- Jayadev, M. (2013). Basel III implementation: Issues and challenges for Indian banks. *IIMB Management Review*, 25(2), 115-130.
- Kargi, H. S. (2011). Credit risk and the performance of Nigerian banks. Ahmadu Bello University, Zaria.
- Khalid, S., & Amjad, S. (2012). Credit risk management practices in Islamic banks of Pakistan. *The Journal of Risk Finance*, 13(2), 148-159.
- Kithinji, A. M. (2010). Credit risk management and financial stability of commercial banks in Kenya, School of Business, University of Nairobi, Nairobi.
- Kithinji, A. M. (2010). Credit risk management and financial stability of commercial banks in Kenya. *School of Business, University of Nairobi, Nairobi*.
- Kolap, T.F., Ayeni, R.K., & Oke, M. O. (2012) Credit risk and commercial banks performance in Nigeria: A panel model approach. *Australian Journal of Business and Management Research*, 2(2),31-38.
- Kolapo, T. F., Ayeni, R. K., & Oke, M. O. (2012). Credit risk and commercial banks' performance in Nigeria: A panel model approach. *Australian Journal of Business and Management Research*, 2(2), 31-38.
- Kosmidou, K., Tanna, S., & Pasiouras, F. (2005). *Determinants of domestic UK commercial banks' financial stability: panel evidence from 1995-2002*. Paper presented at the Money Macro and Finance (MMF) Research Group Conference.
- Lee, C.-C., Hsieh, M.-F., & Yang, S.-J. (2014). The relationship between revenue diversification and bank performance: Do financial structures and financial reforms matter? *Japan and the World Economy*, 29, 18-35. doi: 10.1016/j.japwor. -2013.11.002.
- Lindgren, H. (1987). *Banks, investment company, banking firms, Stockholm Enskilda Bank (1924-1945)*, Institute for Research in

- Economic History, Stockholm School of Economics, Stockholm.
- Liu, G., Mirzaei, A., & Vadoros, S. (2014). The impact of bank competition and concentration on industrial growth. *Economics Letters*, 124(1), 60-63. doi: 10.1016/j.econlet.2014.04.016.
- Masood, O., & Ashraf, M. (2012). Bank-specific and macroeconomic financial stability determinants of Islamic banks: The case of different countries. *Qualitative Research in Financial Markets*, 4(2/3), 255-268.
- Mileris, R. (2012). Macroeconomic Determinants of Loan Portfolio Credit Risk In Banks. *Engineering Economics*, 23(5), 496-504.
- Molyneux, P., Nguyen, L. H., & Xie, R. (2013). Foreign bank entry in Southeast Asia. *International Review of Financial Analysis*, 30, 26-35. doi: 10.1016/j.irfa.2013.05.004.
- NDIC annual reports and financial statements (various years).
- Nguyen, J. (2012). Using a system estimation approach, the relationship between net interest margin and noninterest income. *Journal of Banking & Finance*, 36(9), 2429-2437.
- Nworuh, G.E. (2001). *Applied quantitative techniques for management decisions*. Bon Associates.
- Ogbulu, O. M. (2012). *All-Asset market portfolio and the risk-return behaviour of assets: Evidence from the Nigerian capital market*, Saarbrücken, Germany, LAP Lambert Academic Publishing.
- Ouamar, D. (2013). How to implement counterparty credit risk requirements under Basel III: The challenges. *Journal of Credit risk management in Financial Institutions*, 6(3), 327-336.
- Perera, S., Skully, M., & Chaudhry, Z. (2013). Determinants of commercial bank financial stability: South Asian evidence. *Asian Journal of Finance & Accounting*, 5(1), 365-380.
- Richard, E., Chijoriga, M., Kaijage, E., Peterson, C., & Bohman, H. (2008). Credit risk management system of a commercial bank in Tanzania. *International Journal of Emerging Markets*, 3(3), 323-32.
- Romanova, I. (2012). Bank lending and crisis: Case of Latvia. *Journal of Business Management* (5).
- Rose, P.S. (1999). *Commercial bank management*. Fourth edition. McGraw-hill international editions.
- Ruziqqa, A. (2013). The impact of credit and liquidity risk on bank financial stability: the case of Indonesian Conventional Bank with total asset above 10 trillion Rupiah. *International Journal of Economic Policy in Emerging Economies*, 6(2), 93- 106.
- Samad, A. (2004). Performance of Interest-free Islamic banks vis-à-vis Interest-based Conventional Banks of Bahrain. *International Journal of Economics, Management and Accounting*, 12(2).