RISK MANAGEMENT AND FINANCIAL PERFORMANCE OF DEPOSIT MONEY BANK IN NIGERIA

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Abstract

Financial institutions like banks play an important role in the economy by ensuring funds are directed from savers to investors for productive investment, innovation and economic growth. This study examined risk management on the financial performance of deposit money bank in Nigeria. The study employed ex post facto research design. Purposive sampling technique was adopted to select seven (7) deposit money bank listed on the Nigerian Stock Exchange market from 2010 to 2019. A panel data regression was used to analyze the data. Risk management was proxies with credit risk (CR), liquidity risk (LR), market risk (MR), while Financial performance was proxies with Return on Equity (ROE) , Return on Asset (ROA) and total loans and advance ratio (TLAR) . Findings revealed that credit risk(CR) and liquidity risk (LR) have significant impact on return on asset (ROA) while market risk did not has significant impact on return on asset (ROA) . Results also, show that credit risk and liquidity risk have significant impact on return on equity (ROE) while market risk has no significant impact on return on equity (ROE). Results also, show that credit risk and market risk have no significant impact on the total loans advances ratio (TLAR) while liquidity risk has significant impact on the total loans advances ratio. It was concluded that Risk Management has relevant effect on the financial performance of the Deposit Money Banks in Nigeria. The study recommend that, Regulators and policy makers of banks in Nigeria should review existing risk management policies and where necessary implement new policies to ensure proper management of credit risk, liquidity risk and market risk for banks to improve utilization of firm`s assets in generating returns.

Keywords; *Risk Management, Return on Asset, Return on Equity, Market Risk*

Introduction

Banks and other financial institutions make sure that money is transferred from savings to investors, which plays a crucial role in the economy.A strong and stable financial system supports innovation and economic progress by promoting savings growth and enabling their distribution to the most profitable investments. A stable financial system is one that can allocate resources effectively, maintain employment levels that are close to the economy's natural rate, measure and manage financial risks, as well as eliminate relative price movements of real or financial assets that will affect monetary stability, according to the World Bank (2016). Financial stability is vital for economic growth; this is because as most transactions in the real economy are made through the financial system.

According to Kiyak (2016), the primary indicators of the financial stability of the banking system are capital adequacy, the central bank's discount rate, the GDP, money supply, the financial resources of the deposit guarantee fund, the annual change in the consumer price index, loans granted, liabilities, the volume of assets that

commercial banks refinance, own equity, and individual funds. The most crucial aspect of any financial and economic activity of a business in a market economy is financial stability.When an organization is financially solid, it has an edge over others with similar profiles in attracting investments, obtaining loans, selecting suppliers, and hiring qualified staff.

Kuznyetsova and Pogorelenko (2018) assert that the effects of the 2008–2009 global financial crises necessitated a review of the banking regulation and supervision tools already in place by the regulatory bodies of industrialized countries. The stability of the banking system lies at the core of banking supervision and regulation. The European Semester Thematic Factsheet (2017) argues that due to insufficient oversight or regulation, there has been a significant increase in non-performing loans during the crisis. The percentage of non-performing loans to total loans (the NPL ratio), the capital adequacy ratio (CAR), and the average return on equity on equity can all be used to gauge a bank's soundness (ROE ratio). Also weaknesses were discovered in credit risk valuation and the corporate governance of many financial institutions.

According to Swamy (2014), the financial system's stability serves as a crucial stimulant for economic growth because it makes value exchange possible. The stability of any financial system around the world depends on the safety and soundness of banks. One of the key goals of regulatory and supervisory policy for regulators is banking stability. This is so because regulators are aware of the devastating effects that a lack of confidence has on the entire financial system. According to Ozili (2019), major determinants of banking stability in Nigeria include bank efficiency, the extent of non-performing loans, regulatory capital ratios, more financial depth, and banking concentration. The bank's supervisory authorities are required to put more effort into dealing with non-performing loans, capital adequacy issues, and ensuring that rules meant to improve the efficiency of the financial system are followed.

Zidafamour (2016) defines risk management as the process of identifying, classifying, and prioritizing risks in order to balance the prudent allocation of resources and reduce the possibility and impact of unfavorable events. The current financial crisis has been revealed to be primarily caused by risk management. Risk management is a crucial technique that banks use to gain credibility with the public and regulators. The regulatory frameworks' shortcomings and the financial institutions' risk management procedures have received the majority of the blame for the problems the banking industry has experienced.

According to Adeusi, Akeke, Abebisi, and Oladunjoye (2014), risk management challenges in banking not only have a higher impact on the performance of the bank but also on overall business development and national economic growth. Aven (2016) went on to say that risk is the potential for an undefined event to occur and negatively impact an organization's capacity to accomplish its goals. Due to the scale of some banks, excessive risk exposure can result in bank failure and have an effect on a large number of individuals. If risks to banks are known, government can establish better rules to promote prudent management and decision-making. If banks make income but do not practice sufficient risk management, loan loss expenses could reduce profits. Investor decisions are also influenced by banks' capacity for managing risk.

When an organization engages in a risk management approach that enables them to notice the loss exposure from a series

of events that are changing in probability, they may build strategies to either lower the likelihood of the occurrences or lower the business's overall level of exposure to risk (Aven, 2016). According to Adegbie and David (2020), one of the main reasons financial institutions fail is due to insufficient risk management, which is attributed to bad lending practices. As a result, risk management needs to be taken very seriously and seriously. In addition to other hazards that could endanger their survival, banks also confront significant risks related to credit risk, liquidity risk, operational risk, market risk, foreign currency risk, and interest rate risk (Dugguh & Diggi, 2015). Deposit money banks are exposed to losses when these risks are not appropriately managed, which might endanger both their continued existence as commercial organizations and the stability of their financial system (CBN, 2014).

Loans subject banks to the highest amount of risk, according to Yimka, Taofeek, Abimbola, and Olusegun (2015). Numerous banks failed in the late 1990s, and this trend continued until Nigeria's commercial banks recently underwent reorganization. A strong banking system is a crucial part of a good financial system, which is essential for any nation's economic growth. An effective banking system aids in promoting economic growth, reducing poverty, and removing any barriers to that progress. Financial institutions may fail if risk management is ineffective. (Kwaku (2015), Mohammed (2012), Bassey, Tobi, Bassey, and Ekwere (2016).

Some of the financial dangers to which banks are vulnerable were noted by Cecchetti and Schoenholtz in 2011. They consist of operational risk, interest rate risk, liquidity risk, and credit risk. Banks must research their surroundings and create relevant rules that will help them lessen the degree of their exposure to situations that could jeopardize their financial stability. Huang and Ratnovski (2011) believed that in order to address and reduce the common component of financing liquidity risk among banks, suitable regulatory measures that are above the traditional reserve supply should be implemented. Due to the high level of perceived hazards brought on by certain aspects of the business environment and the consumers engaged, risk management in Nigerian deposit money banks is a major concern. These dangers include operational risk, credit risk, market risk, and liquidity risk, among others. Any of these risks that are poorly managed might very quickly and very certainly result in bank failure. According to Davies (1997), a large number of financial institutions failed because there were insufficiently effective and efficient measures to mitigate or decrease risks to a manageable or acceptable level. 2008 saw a global recession, financial instability has led to the failure of many banks in United States and other nations of the world.

Nigeria was also affected leading to Polaris bank taking over Skye bank’s operations and assets, Eco Bank acquiring Oceanic bank, United Bank for Africa acquiring standard trust bank and recently, Access Bank taking over Diamond Bank, just to mention a few. Other banks, such as International Bank for West Africa and Savannah Bank got distressed and finally liquidated. These challenges without doubt have affected the wider economy. Despite the efforts made by Central Bank of Nigeria, Nigerian banking system is yet to reach true stability. Some of the major issues are tied to the failures of some banks to effectively manage risks resulting from: Non-performing loans (NPLs), capital adequacy and corporate governance.

Many researchers have considered levels of risk management as a determinant for potential failure or success of a financial institution. Financial institutions have faced with difficulties in the past as a result of serious banking problems related to negligent in credit standards of borrowers and their colleagues, poor risk management portfolio and other situations that can lead to decline in the credit standing of the banks counterparties. Many studies have also reported unfavourable relationships between the effects of risk management and financial stability of banking sectors with series of reasons attributed to their results. Ugoani (2015); Olarenwaju and Adeyemi (2015); Akani and Uzah (2015); Abubakar, Shaba, Ezeji and Ahmad (2016); Aigbomlan and Akinlosotu (2017); Obi-Nwosu, Okaro and Atsanan (2017); Bassey (2017); Atoi (2018); Onyekwelu, Chukeuani and Onyeka (2018); Isiaka and Okpanach (2018), Lasisi (2018), Olarere, Aminul, Yusoff and Shamsuddin (2018); Saheed (2018); Yinusa, Oyindamola and obidu (2019); Ozili (2019). Therefore the aim and objective of this study is to evaluate impact of risk management on financial performance of deposit money bank in Nigeria.

Literature Review

Concept of Risk Management in the Bank

Risk management developed from a strictly banking activity, related to the quality of loans, to a very complex set of procedures and instruments in the modern financial environment. This emphasizes the fact that the survival of an organization depends heavily on its competences to anticipate and prepare for the change rather than just waiting for the change and react to it. Risk is related with uncertainty and this is reflected by way of care on the capital which is fundamental in business, which is the cushion that protects the liability holders of an institution. These risks are dependent and events affecting one area can have consequences and penetrations for a range of other categories of risk. As a result, there is need to understand the risks run by banks and to ensure that the risks are properly confronted, effectively controlled and rightly managed. Each transaction that a bank undertakes though changes the risk profile of the bank in so doing making it a near impossibility to provide real time risk update and profile of the institution.

The banking industry is a highly regulated industry with thorough and dedicated regulators. While banks struggle to keep up with the changes in the regulatory environment, regulators struggle to manage their workload and effectively regulate their banks. The results of these changes is that banks are receiving less hands-on assessment by the regulators, less time spent with each institution, and the potential for more problems slipping through the cracks, potentially resulting in an overall increase in bank failures.

According to Njogo (2012) risk management is one of the main areas in the global financial crisis in the last decades amongst the financial institutions. Risk management is characterized by identification, assessment as well as ranking of risks in connection with the direction and an economical application of available resources in order to reduce, control, and monitors the prospect or impact of unfortunate as well as unwanted events pertaining to a business. Cebenoyan and Strahan (2004) opined that risk management improves reputation efficiency and viability of banks by building their portfolio of funds resources. Rehman *et al.* (2015) stated that

risk management is a portfolio of business activities mainly planned to improve performance and reduce the possible losses faced by organization.

Effective risk management look for ways to maximize the benefits of a risk (usually a reduction in time or cost) while minimizing the risk itself. Risk management is the process of identifying risks, measuring their implications, deciding on a course of action, and evaluating the results. Wikipedia. In the study of Dei and Amoh (2016), risk management is considered to be one of the strong and important tools for financial institutions. Risk management presents the idea that the possibility of an event can be reduced and the consequences minimized.

According to Jaiye (2009), banking business is to manage risks associated with accepting deposits, granting loans and trading portfolios.

The changing economic environment has a significant impact on banks and thrifts as they struggle to effectively manage their interest. Management failure can be easily known in losses resulting from over-aggressive lending practices and risk tolerances that are too high. To ensure that banks operate in a sound risk management environment with reduced impact of uncertainty and potential losses, reliable measures are needed to direct capital activities that have best risk reward /risk ratios.

Management should request for estimates of the size of potential losses and ensures them to stay within limits set through careful internal considerations and by regulators. They also need instruments to monitor positions and create incentives for judicious risk taking by divisions and individuals

Credit risk:

Managing credit risk adequately in financial institutions is critical for the growth and survival of financial institution. The issue of credit risk in banks is of great concern because of the higher level of perceived risks resulting from some characteristics of business conditions and customers that are involved. Credit risk is one of those risk that can easily and most likely prompts bank failure. It is one of the great concerns to most authorities and banking regulators. Banking industries in Nigeria provides capital to the business community as well as the individual customers. Banks render such services with the expectations of achieving their targeted rate of returns on the extension of credit over a period of time with the intention of reclaiming their principal with interest (Kayode, Obamuyi, Owoputi & Adeyefa ,2015).

Basel Committee on Banking Supervision (BCBS) defined credit risk as the probability that a bank borrower will fail to meet its obligations in accordance with agreed terms or the possibility of losing the outstanding loan partially or totally due to credit events (Iwedi, & Onuegbu, (2014). Poor credit administration reduces bank profitability and leads to bank distress and/or failure (Osuka, & Amako, (2015). Credit risk is a risk resulting from the failure of customers in paying back their loans or the funds they lent to the bank on time and in full (Adekunle, Alalade & Agbatogun, 2015). Among the risks faced by the banks, yet, credit risk is regarded to be the most vital risk since huge amounts of bank profit come from credit as a result of interest earned on credit (Almekhlafi, *et al*., 2016)

According to Zia, Muhammad,Sarwar and Asif Raz (2019) four areas are identified for impact of credit risk management. They are corporate governance, diversification, and hedging and capital adequacy ratio.

Banks have a strong vested interest in performing extensive due diligence, prior to committing funds, and on regular basis to reduce credit risk and achieve an improved value for their organization. Banks certifies no extension of credit because of its risk in non-payment, the terms of the financial relationship between the financier and an individual or corporate organization. Financial institutions are confronted with lot of challenges in managing credit risk as a result of its size in the effect of bank processes. Nawaz, Munir, Siddiui, Tahseen-UL-Ahad, Asif and Ateeq (2012) stated in their study how critical credit risk is since the default in repayment can generate large losses which can lead to insolvency.

Credit risk management is defined as identification, measurement, monitoring and control of risk arising from the possibility of default in loan repayments (Coyle, 2000). The real management of credit risk is a serious mechanism/ component of a comprehensive approach to managing risk and vital to the long-term success of any banking organizations (Irungu,2014). To ensure credit risk management duties and responsibilities are accomplished, institution must understand its loan documentation, financial analysis, servicing, environmental analysis, and loan covenants. A sound record of credit performance of its portfolio of risky assets also must be maintained. This is because any change in underwriting; laws and regulations can significantly alter its loan loss experience (Kenetha &Thygerson,1995).

Credit risk management in financial institutions has become crucial for the survival. Credit risk management has become an issue in the history of Nigeria banking system. The Federal government of Nigeria and as well issued additional regulatory guideline for the operation of the redesigned credit risk management system as a result of this history in September 2018, redesigned the credit risk management (CRMS) (Tega & Mojekwu,2019).

According to Iwedi and Onuegbu (2014) central bank of Nigeria entered into an agreement in 1987 with Basel 1 and Basel 2 accords in order to tackle the issues of credit risk management in the country. The essence this agreement is to emphasize the importance of capital adequacy for mitigating credit risks, in order to cushion the sudden effects of financial losses on banks. The size of non-performing loan in the banking system battered investors' confidence and also alarmed stakeholders in the banking industry (Nawaz, Manir, Siddigui, Tahseen-ul Ahad, Asif & Ateeq,2012). Osuka and Amako, (2015) in their study stated that the excessively high level of non-performing loan in the banks were caused due to poor corporate governance practices, tax credit administration process and non-adherence to credit risk management practices and this has the tendency in reducing the lending ability of deposit money banks and possibly put them out of business.

According to Badar and Javid (2013), credit risk is the grade of variations in debt instruments and derivatives as a result of underlying changes in the credit quality of borrowers and counterpart. Ali (2015) opined that, bank does not only accept deposits but also grants credit facilities, which is inevitably exposed to credit risk. Credit risk is one the most significant risk faced by banks and the success of their business is highly dependent on the accurate measurement and the effective management of this risk to a larger extent than any other risks. The main source or credit risk include, inappropriate laws, limited institutional capacity, low liquidity levels, massive licensing of banks, low capital level, direct lending, poor underwriting, poor lending practices, laxity in credit assessment,

inadequate supervision by the central bank and government interference (Hosna,2009).

In order to generate profit, business organizations need short-term funds to achieve its day to day needs in operation and other requirements. According to Ahmad (2016), liquidity shows the ability of an organization in meeting its liabilities in a short period of time, usually one year. Liquidity risk is considered as one of the serious concern and challenge for the modern era banks. Maaka (2013) stated in the study, that a bank may have a good asset quality, strong earnings and sufficient capital and fail if the liquidity is not adequately maintained. Mohiuddin (2014) saw liquidity management as one of the most important functions o f a bank. If funds collected are not properly utilized, the institution should suffer loss. Idle cash balance in hand has no yield. Proper balance of liquidity should be maintained to avoid inadequate cash position or excess cash position. During the recent global financial crisis several banks experienced some difficulties because they failed to manage liquidity in a prudent manner (Marozva, 2015; Ly, 2015).

Muriithi (2016) defined liquidity risk as a bank's ability to pay its short term debit obligation as and when become due without incurring unacceptable costs or without disturbing normal business operation. It can be calculated as Interest Rate Sensitive Asset /Total Assets. Amihud and Mendelson (2020) defines liquidity of a stock as a measure of the ease with which can be converted to an investment in stock. Lymbiko (2015) opined that liquidity risk is a vital phenomenon for commercial banks due to two reason: It is credited to the intermediation model of banks which has been applied traditionally, secondly, it is due to the increasing competitive forces in the banking sector and the financial sector at large which span from securities markets as well as non-banking institutions

Liquidity risk is the uncertainty originating from the failure of a bank to meet up with its various debts agreement and other obligations as when they fall due as a result of an inability to competently convert its assets to cash. This is an inability of the firm to source for adequate fund as a result of exceptionally high liquidity transformation costs which affects the capital and fund of an institution which may be now or at the future. According to Drehmann and Nikolaou (2009) liquidity risk refers to the probability that a bank will not be able to settle its obligations over a specified period of time. In other words, liquidity risk is the risk arising as a result of the difficulty of banks to fulfill their obligations when they arise without suffering unacceptable losses.

Therefore, liquidity risk can impact negatively on both capital and earnings of banks therefore; it is a requirement for bank management to put in place measures that guarantees stable availability of funds so as to address at reasonable costs the demands of providers and borrowers in the future. Market risk and funding risks are used to determine the bank vulnerability to liquidity risk. Decker (2010) put forward that there is the need to monitor liquidity risk as part of an institutions risk management practices, while incorporating credit risk and market risk so as to guarantee stability in the balance sheet of an institution and also the dynamic management of liquidity risk. Likewise, Maaka (2013) records that liquidity risk does not only unfavorably impact on bank profitability alone but also on its reputation. Any delay in the provision of funds to depositors eventually lead to loss of confidence on such banks by depositors.

Liquidity risk is a risk of insufficient liquid assets to meet payouts from policies,

forcing the sale of assets at lower prices, leading to losses, despite company being solvent (Kamau & Njeru, 2016).

Theoretical Framework

Information Asymmetry

Information asymmetry theory was propounded by George Akerlof in 1970 and was later expanded by Rothschild and Stiglitz (1976). Akerlof developed the importance of trust in markets, and also used this model to explain a phenomenon called 'adverse selection' that was occurring because insurers change their behavior based on how much they know about an insured person. Information asymmetry deals with the study of decision in transactions where one party has more or better information than the other. This asymmetry creates an imbalance of power in transaction to go awry.

The adverse selection theory describes the situation where the probability of loan default increases with rising interest rate and the quality of borrowers worsens as the cost of borrowing rises (Musara and Olawale, 2012). The theory is founded on the assumption that banks are not certain in selecting credit-worthy borrowers from a pool of loan seekers with different credit risk exposures ex-ante. Thus, financial intermediaries are more likely to lend to high-risk borrowers who are not concerned about the harsh lending conditions and are prone to loan default (Ezeoha, 2011). Pagano and Jappelli (1993) argue that information sharing reduces adverse selection problems by enhancing information on loan applicants. More so, Padilla and Pagano (2000) document that if banks exchange credit information on defaults, then borrowers are encouraged to apply more energy in their projects knowing fully well that loan default carries the penalty of higher interest rates or no future access to credit facility.

Before Stiglitz and Weiss (1983) and Stiglitz (1990) proposed moral hazard model for credit market, Arrow (1963) documents that the phenomenon of using private information to benefit from an incomplete contract in the presence of information asymmetry is known as moral hazard. Musara and Olawale (2012) also noted that moral hazards exist where the borrower of bank credit takes action that adversely affects the returns to the lender. Gorton and Pennacchi (1995) posit that a bank that makes and sells loans is subject to a moral hazard problem with respect to screening borrowers. The theory is based on the assumption that the likelihood of borrowers engaging in activities that will guarantee repayment of bank credit extended to them cannot be determined ex-post by banks.

Asymmetric information can occur in any situation involving a borrower and a lender when the borrower fails to disclose negative information about his or her real financial state. This is why unsecured loans can be so costly. The lender can review the borrower's credit history and salary level but cannot foresee bad luck. The lender will charge a risk premium to compensate for the disparity in information. A situation can pose a moral hazard when the seller or buyer knows or reasonably suspects that a real but undisclosed risk is involved in the transaction.

The theory states that it may be complex to differentiate between good and bad borrowers and this may lead to adverse selection and moral hazard problems. In line with the theory, Cottarelli *et al*. (2005) and Kraft and Jankov (2005) show the role of loan growth in bank risk-taking and resulting instability. The theory also relates to contagious withdrawals when depositors are imperfectly informed about the type of shocks hitting banks and about interbank exposures (De Bandt & Hartmann, 2000).

Criticism of the theory: the borrower has more information about his financial state than the lender. The lender does not in any way know whether it is likely for the borrower to default. The lender looking at past credit history of the borrower gives limited information. This limited information allows the lenders charge higher rates to compensate for the risk.

Modern Portfolio Theory (MPT)

This theory was developed by Markowitz in 1952. This theory was developed to establish the balance between maximizing return and minimizing risk. There is need for careful selection of investments composition in a manner that diversifies risk without necessarily reducing the expected return. The central principle of this theory is that investments in a portfolio must be selected based on individual merits rather on the effects of changes in price of an investment on another in the portfolio must be considered. The tradeoff between risk and expected return must be essentially established. Generally, the higher the risk of an asset, the higher the return that an investor must demand, hence riskier assets are associated with higher returns. There is this assumption that investors are risk averse, and therefore will always prefer less risky portfolios given two investments offering equal returns.

According to Modern portfolio theory, return is defined as the weighted expected return of each asset in a given portfolio. While risk on the other hand is measured by average deviation from the mean. This theory holds that for an individual investment, two types of risk exists; systematic and unsystematic risks. Systematic risk is the undiversifiable market risk such as interest rate fluctuations, foreign exchange fluctuation, fluctuations and economic recessions. Unsystematic risk refers to that part of risks that is particular to an investment, hence diversifiable through cumulative number of investments in the portfolio which are not strongly connected (Markowitz, 1952). Glowing diversified portfolios, offer the lowest possible risk and the highest level of return. This theory holds it that investors who make most out of the market are those willing to accept higher risks.

Criticism of theory: The modern portfolio theory is silent about the number of stocks or investments to be purchased to achieve the benefit of diversification. This theory assumes that it is possible to find investments which have very less systematic risk, however in practical, these type of investments are hard to find. The modern portfolio theory assumes the existence of risk free investment in market and there is no risk free investment which suits all types of investors.

Relevance of modern portfolio theory: This theory is relevant to this study because it suggests that all securities and asset classes should be diversify. It also emphasizes the importance of portfolios, diversification, risk and the connections among different kinds of securities.

Empirical review:

Akani and Uzah (2018) evaluated the internal and external factors that determine banks distress in Nigeria. The study applied secondary data on monetary policy rate, treasury bill rate, broad money supply, interest rate, financial sector development and capital adequacy from 1985 to 2015 which were sourced from Central bank of Nigeria Statistical Bulletin. The data were collated and analyzed using regression test which involved ordinary least square method of co-integration, unit root test, Granger

causality test and Vector error correction. The empirical finding discovered that monetary policy rate and treasury bill rate have negative effect on capital adequacy ratio while growth of broad money supply, real interest rate and financial sector development have positive impact on bank capital adequacy ratio. From the finding, the study concluded significant relationship between the monetary policy, macroeconomic and internal variables and deposit money banks banking distress.

Atoi (2018) also carried a study on non-performing loan (NPL) and its effects on the stability of Nigerian banks with national and international operational licensed banks in Nigeria. The study employed secondary data using quarterly time series data from 2014: Q2 to 2017: Q2. A restricted dynamic GMM is employed to estimate the macroeconomic and bank specific drivers of NPL for each licensed category. Z-Score is constructed to proxy banking stability, and its response to shocks NPLs is examined in a panel vector autoregressive framework.

The results of the study showed that drivers of NPLs vary across the two categories of banks, but, weighted average lending rate is a vital macroeconomic driver of NPLs for both. The results also confirmed the moral hazard hypothesis and risk return tradeoff efficient market theory. Furthermore, international banks withstand NPLs shocks in the long run, despite temporary flux in the short horizon, while the stability of national banks is vulnerable to NPLs shocks in the long run.

Aigbomlan and Akinlosotu (2017) carried a study on credit risk management and profitability in deposit money banks in Ekpoma, Edo State, Nigeria. The study adopted descriptive research design. The population of the study covered all the bankers in the nine (9) Deposit Money Banks in Ekpoma-Edo State. One hundred and fifty (150) bankers were drawn as sample from six deposit money banks in the area. The two instruments used in the study include: Banks' Credit Risk Management Practices (BACRIMAP) for data on credit risk management practices and Profitability Satisfaction Inventory (PSI) to collect data on profitability indices of banks. Data were analyzed with percentages (%), frequency distribution table, Mean and standard deviation while the hypotheses were tested with Bivariate Pearson Product Moment Correlation (PPMC) using Statistical Package for Social Sciences (IBM SPSS). Based on the result of the study, it was discovered that credit derivatives, credit Securitization, and adoption of a sound internal lending policy are the credit management strategies used in deposit money banks in Edo State. Findings it was further reviewed further that credit risk management has positive significant relationship with profitability of deposit money banks ($r = .355$, $p < 0.001$). It was recommended that management of deposit money banks in Nigeria should enhance their skills in credit analysis and loan administration.

Munangi (2020) carried a study on the impact of credit risk on the financial performance of 18 South African banks for the period 2008 to 2018. Secondary data was employed. Panel data techniques, namely the pooled ordinary least squares (pooled OLS), fixed effects and random effects estimators were employed to test the relationship between credit risk and financial performance. Non-performing loans (NPLs) was used to proxy credit risk while return on assets (ROA) and return on equity (ROE) were used to proxy financial performance. The results of the study documented that credit risk was negatively related to financial performance.

Methodology

The study was quantitative in nature. The population for this study include deposit money bank listed on the Nigerian Stock Exchange. Purposive sampling technique was adopted to select seven (7) deposit money bank listed on the Nigerian Stock Exchange market. This was due to the fact that data needed were not sufficient in the annual reports of all the listed deposit money bank, hence the use of the seven (7) deposit money bank are First Bank Nigeria Plc, Access Bank Plc, Fidelity Bank Plc, Eco Bank Nigeria Plc. Wema Bank Plc, Polaris Bank, Zenith Bank Plc

The data used for this study were secondary data derived from the annual financial statements reports of the selected deposit money bank. The period considered for this study is from 2010 to 2019 i.e. Ten (10) years. The study involves time series and cross sectional data. Panel Least Square data regression analytical technique was used to observe all variables for the period. The dependent variable, Financial performance was measured using Return on Equity (ROE) , Return on Asset (ROA) and total loans and advance ratio (TLAR) while the independent variable, credit risk (CR), liquidity risk (LR) and market risk (MR) as its indicators.

Model Specification

Based on the utilization of panel data methods, an empirical model is developed. Because it is the most useful, this study used panel data analysis, which is a blend of time series and cross sectional data analysis.

The panel data analysis model's general form is as follows:

$Y = f(X)$……..Model1

$X = f(x_1, x_2, x_3)$……..Model 2

Therefore,

$Y = \beta_0 + \beta X_1 + \beta X_2 + \beta X_3 + \varepsilon$……Model 3

$ROA = \beta_0 + \beta_1 (CR) + \beta_2 (LR) + \beta_3 (MR)$..... Model 4

$ROE = \beta_0 + \beta_1 (CR) + \beta_2 (LR) + \beta_3 (MR)$..... Model 5

$TLAR = \beta_0 + \beta_1 (CR) + \beta_2 (LR) + \beta_3 (MR)$.....Model 6

Where

Y: ROA = Return on Asset
ROE = Return on Equity
TLAR = Total Loans and Advance Ratio
X_1 = Credit Risk
X_2 = Liquidity Risk
X_3 = Market Risk
ε = Error term Estimate
β = Unknown Population Parameter

Result and Discussion of Findings

This chapter is aimed to investigate the impact of financial risk management on the performance of the Nigeria deposit money banks. Regression analysis was employed in the study to forecast relationship between variables and to estimate the influence of each explanatory variable on the dependent variable. The data of seven (7) Nigeria commercial banks' financial variables was used to analyze cross-sectional data adopting Panel Least Square (PLS) method in estimating the multiple regressions of the models over the period of ten (10) years from 2010 to 2019. This is possible by estimating the explanatory variables; Credit Risk (CR), Liquidity Risk (LR),

and Market Risk (MR) proxies for financial risk management against the Return on assets (ROA), Return on equity (ROE), Total Loan and Advance Ratio (TLAR) proxies for financial performance of the banks.

Before we estimate the explanatory variables on dependent variable, a preliminary test is inevitable to avoid spurious regression. To this end, a test of Unit root test using Augmented Dickey- Fuller is necessary.

Unit Root Test

Table 1: ***Unit Root Test Using Augmented Dickey Fuller (ADF) 2010-2019.***

Variables	**ADF-Statistic**	**Critical Values**	**Order of Integration**
ROA	-7.958594 (0.0019)	1% = -4.889197 5% = -3.571842 10% = -2.625121	Stationary at first difference
ROE	-6.256010 (0.0003)	1% = -4.323979 5% = -3.580628 10% = -3.225334	Stationary second difference
TLAR	-4.655165 (0.0000)	1% = -3.483972 5% = -2.120628 10% = -1.426350	Stationary at second difference
CR	-5.029926 (0.0055)	1% = -4.374307 5% = -3.603202 10% = -3.238054	Stationary at first difference
CR	-5.029926 (0.0055)	1% = -4.374307 5% = -3.603202 10% = -3.238054	Stationary at first difference
LR	-4.526936 (0.00005)	1% = -3.974906 5% = -2.403208 10% = -3.638052	Stationary at first difference
MR	-3.734427 (0.00130)	1% = -3.374307 5% = -2.603202	Stationary at second difference

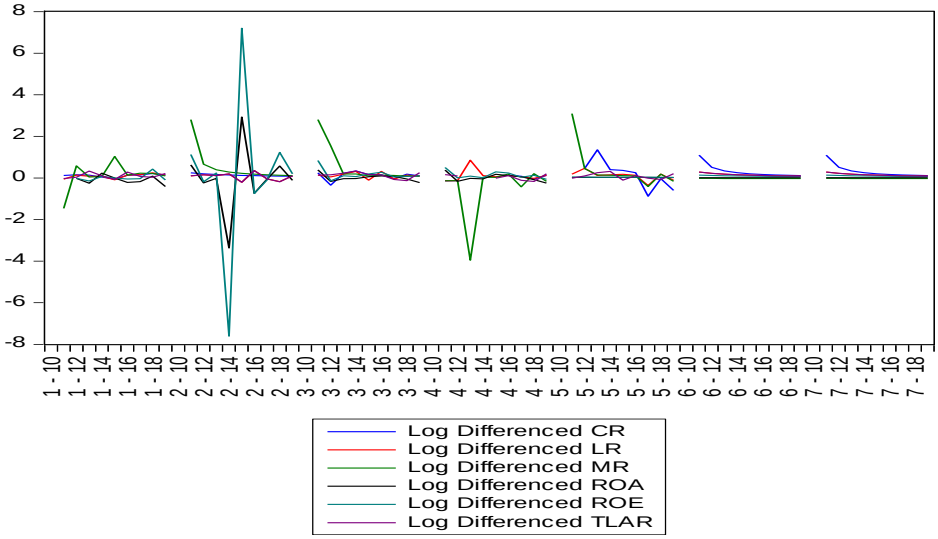
		10% = -2.238054	

Source: *E-view Statistical Software Version 9.0*; *Analyzed, 2021.*

The results of the Stationary (unit root) test indicate that ROA, CR, and LR were stationary at first difference while ROE, TLAR and MR stationary at second difference. Therefore, it implied that all variables are stationary at the different levels. The descriptive statistics of the result is presented in the table below:

The results of the Stationary (unit root) test indicate that ROA, CR, and LR were stationary at first difference while ROE, TLAR and MR stationary at second difference. Therefore, it implied that all variables are stationary at the different levels. The descriptive statistics of the result is presented in the table below:

Figure 1 Stationary Graph at Level, for the Combined Variables



Descriptive Statistics of the Return on Assets (ROA), Return on Equity (ROE), Total Loan and Advance Ratio (TLAR), Credit Risk (CR), Liquidity Risk (LR), and Market Risk (MR) in the study between 2010-2019

	CR	LR	MR	ROA	ROE	TLAR
Mean	596,000,000	620,000,000	302,000,000	0.035275	6.117301	367,000,000
Median	123,000,000	504,000,000	14912634	0.035418	5.850989	312,000,000
Maximum	281,000,000	2,450,000,000	1,090,000,000	0.070100	12.90060	1,420,000,000
Minimum	-256,000,000	1525608.	25643.00	-0.000200	-1.013400	552526.0

Std. Dev.	788,000,000	678,000,000	337,000,000	0.016632	3.196846	398,000,000
Skewness	1.208790	0.822724	0.472212	0.071123	0.142142	0.778727
Kurtosis	3.419398	2.780221	1.768372	2.514721	2.347371	2.710457
Jarque-Bera	17.05833	7.808101	6.825053	0.724567	1.435768	7.110237
Probability	0.000198	0.020160	0.032958	0.696085	0.487783	0.028578
Sum	40,500,000,000	42,200,000,000	20,600,000,000	2.398698	415.9765	25,000,000,000
Sum Sq. Dev.	4.16E+19	3.08E+19	7.59E+18	0.018534	684.7284	1.06E+19
Observations	68	68	68	68	68	68

Source: E-view, Statistics 9.0

From the descriptive Statistics above, it shows the average mean value of Credit Risk (RC) to be 596,000,000 shows Probability value of 0.000198 < 0.05 level of significant; average mean value of Liquidity Risk (LR) to be 620,000,000 shows Probability value of 0.020160 < 0.05 level of significant; average mean value of Market Risk (MR) to be 302,000,000 shows Probability value of 0.032958 < 0.05 level of significant; Return on Assets (ROA) to be 0.035275 with Probability of 0.696085 > 0.05 level of significant; average mean value of Return on Equity (ROE) to be 6.117301 shows Probability value of 0.487783 > 0.05 level of significant; and Lastly the average mean value of Total Loan and Advance Ratio (TLAR)) to be 367,000,000 with Probability of 0.028578 < 0.05 level of significant. The above results shows that some of the variables concerned were satisfactory and accurate for the research analysis under the Probability, which shows that they were statistically significant at 5 percent level of significant.

Model Specification

To conduct the investigation of the impact of financial risk management on the performance of the Nigeria deposit money banks. The models for this study are stated below;

$Y = C + \beta_1 X_1 + \beta_2 X_2 + \ldots + \beta_i X_i + \mu_i$

Where,

Y = Dependent Variable
C = Intercept
β_1 = Slope of the independent variables
X_1 = Independent Variable and
μ = Error term

The general representation of the models is given in the equation of the analysis below:

Testing of Research Hypotheses

The following hypotheses were tested at 5% level of significance in this study:

Hypothesis One

H_0: Risk Management has no relevant effect on the Return on Asset of the Deposit Money Banks in Nigeria.

H_1: Risk Management has relevant effect on the Return on Asset of the Deposit Money Banks in Nigeria.

Model Representatives (1)

$ROA = \beta_0 + \beta_1 \log(CR) + \beta_2 \log(LR) + \beta_3 \log(MR) + \mu_i$

Where:

ROA = Return on Assets (dependent variables)
CR = Credit Risk (independent variables)
LR = Liquidity Risk (independent variables)
MR = Market Risk (independent variables)

Panel Least Square (Regression Analysis) I

Estimation Command:
==========
LS(?) ROA C CR LR MR

Estimation Equation:
==========
ROA = C(1) + C(2)*CR + C(3)*LR + C(4)*MR

Substituted Coefficients:
==========
ROA = 0.021132116871 - 3.23818830809e-11*CR + 5.37986220543e-11*LR + 2.27381085367e-13*MR
Dependent Variable: ROA

Method: Panel Least Squares

Date: 07/13/21 Time: 10:38

Sample: 2010 2019

Periods included: 10

Total panel (unbalanced) observations: 68

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.021132	0.001741	12.14097	0.0000
CR	-3.240000	7.14E-12	-4.532157	0.0000
LR	5.380000	8.90E-12	6.045092	0.0000
MR	2.270000	4.92E-12	0.046172	0.9633

R-squared	0.674211	Mean dependent var	0.035275
Adjusted R-squared	0.658939	S.D. dependent var	0.016632
S.E. of regression	0.009713	Akaike info criterion	-6.373658
Sum squared resid	0.006038	Schwarz criterion	-6.243099
Log likelihood	220.7044	Hannan-Quinn criter.	-6.321927
F-statistic	44.14863	Durbin-Watson stat	0.638693
Prob(F-statistic)	0.000000		

Source: *E-view Statistical Software Version 9.0*; *Analyzed, 2021*

Interpretation of the coefficients of determination

The estimation results show that the variable- Credit Risk (CR) and Liquidity Risk (LR) have statistical significant impact on the Return on Assets (ROA) at (β= -3.240000; 5.380000), indicated that 1% decrease in Credit Risk led to -32.4% decrease in Return on Assets at the (P-Value 0.0000 < 5% alpha significant level) and 1% increase in Liquidity Risk led to 53.8% increase in Return on Assets at the (P-Value 0.0000 < 5% alpha significant level).

While the Market Risk (MR) did not has statistical significant impact on the Return on Assets (ROA) at (β= 2.270000), indicated that 1% increase in Market Risk led to 22.7% increase in Return on Assets at the (P-Value 0.9633 > 5% alpha significant level).

Hypothesis Two

H_0: Risk Management has no relevant effect on the Return on Equity of the Deposit Money Banks in Nigeria.

H_1: Risk Management has relevant effect on the Return on Equity of the Deposit Money Banks in Nigeria.

==========

LS(?) ROE C CR LR MR

Estimation Equation:

==========

ROE = C(1) + C(2)*CR + C(3)*LR + C(4)*MR

Substituted Coefficients:

==========

ROE = 4.18662265911 - 3.55341893865e-09*CR + 7.43808151391e-09*LR - 1.87060256845e-09*MR

Model Representatives (1I)

$ROE = \beta_0 + \beta_1 \log(CR) + \beta_2 \log(LR) + \beta_3 \log(MR) + \mu_i$

Where:

ROA = Return on Equity (dependent variables)

CR = Credit Risk (independent variables)

LR = Liquidity Risk (independent variables)

MR = Market Risk (independent variables)

Panel Least Square (Regression Analysis) II

Estimation Command:

Source: *E-view Statistical Software Version 9.0*; *Analyzed, 2021* Substituted Coefficients:

==========

ROE = 4.18662265911 - 3.55341893865e-09*CR + 7.43808151391e-09*LR - 1.87060256845e-09*MR

Dependent Variable: ROE
Method: Panel Least Squares
Date: 07/13/21 Time: 10:40
Sample: 2010 2019
Periods included: 10
Cross-sections included: 7
Total panel (unbalanced) observations: 68

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	4.186623	0.435653	9.609998	0.0000
CR	-3.550009	1.79E-09	-1.987002	0.0512
LR	7.440009	2.23E-09	3.339194	0.0014
MR	-1.870009	1.23E-09	-1.517605	0.1340

R-squared	0.447566	Mean dependent var	6.117301
Adjusted R-squared	0.421671	S.D. dependent var	3.196846
S.E. of regression	2.431136	Akaike info criterion	4.671617
Sum squared resid	378.2670	Schwarz criterion	4.802176
Log likelihood	-154.8350	Hannan-Quinn criter.	4.723348
F-statistic	17.28367	Durbin-Watson stat	0.347294
Prob(F-statistic)	0.000000		

Source: *E-view Statistical Software Version 9.0*; *Analyzed, 2021*

Interpretation of the coefficients of determination

The estimation results show that the variable- Credit Risk (CR) and Liquidity Risk (LR) have statistical significant impact on the Return on Equity (ROE) at (β= -3.550009; 7.440009), indicated that 1% decrease in Credit Risk led to -35.5% decrease in Return on Equity at the (P-value 0.05102 < 5% alpha significant level) and 1% increase in Liquidity Risk led to 74.4% increase eturn on Equity at the (P-value 0.0014 < 5% alpha significant level). While the Market Risk (MR) has no statistical significant impact on the Return on Equity (ROE) at (β= -1.870009), indicated that 1% decrease in Market Risk led to 18.7% decrease in Return on Equity at the (P-value 0.1340 > 5% alpha significant level).

However, the estimation of the co-efficient of determination R-squared is at 0.447566 reveals that all the explanatory variables jointly account for 44.7% changes in Return on Equity. It tells us the model is of good fit, that the independent variables to a very large degree explain the changes in the dependent variable.

Interpretation of Durbin Watson and F-Statistics

From the estimation, the Durbin Watson statistics is (0.347294), this implies that there is positive serial correlation or autocorrelation in the regression residual. While the F-statistics value is (17.27367) with a probability or significant level of P-value 0.000000 < 0.05 shows that the overall analysis of variance of the model is of good fit; this confirming that explanatory variables were fundamental explaining the variation in the dependent variable.

In conclusion, since at the overall level, credit risk, liquidity risk, and market risk were significantly have changes on return on equity, therefore, **H_0** that says, "*Risk Management has relevant effect on the Return on Equity of the Deposit Money Banks in Nigeria*", accepted since at overall, the explanatory variables have significant effect on the explained variable.

Hypothesis Three

H_0: Risk Management has no relevant effect on the total loans and advances ratio of the Deposit Money Banks in Nigeria.

H_1: Risk Management has relevant effect on the total loans and advances ratio of the Deposit Money Banks in Nigeria.

Model Representatives (1II)

$TLAR = \beta_0 + \beta_1 \log(CR) + \beta_2 \log(LR) + \beta_3 \log(MR) + \mu_i$

Where:

TLAR = Total Loans and Advances Ratio (dependent variables)
CR = Credit Risk (independent variables)
LR = Liquidity Risk (independent variables)
MR = Market Risk (independent variables)

Panel Least Square (Regression Analysis) III

Estimation Command:
==========
LS(?) TLAR C CR LR MR

Estimation Equation:
==========
TLAR = C(1) + C(2)*CR + C(3)*LR + C(4)*MR

Substituted Coefficients:

==========

TLAR = 7808609.80578 - 0.053839929762*CR + 0.63581225409*LR - 0.00878703776258*MR

Dependent Variable: TLAR

Method: Panel Least Squares

Date: 07/13/21 Time: 10:42

Sample: 2010 2019

Periods included: 10

Cross-sections included: 7

Total panel (unbalanced) observations: 68

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	7808610.	14966794	0.521729	0.6037
CR	-0.053840	0.061438	-0.876331	0.3841
LR	0.635812	0.076526	8.308476	0.0000
MR	-0.008787	0.042346	-0.207506	0.8363

R-squared	0.957860	Mean dependent var	3.67E+08
Adjusted R-squared	0.955884	S.D. dependent var	3.98E+08
S.E. of regression	83521353	Akaike info criterion	39.37613
Sum squared resid	4.46E+17	Schwarz criterion	39.50668
Log likelihood	-1334.788	Hannan-Quinn criter.	39.42786
F-statistic	484.9102	Durbin-Watson stat	0.726430
Prob(F-statistic)	0.000000		

Source: *E-view Statistical Software Version 9.0*; *Analyzed, 2021*

Interpretation of the coefficients of determination

The estimation results show that the variable- Liquidity Risk (LR) has statistical significant impact on the Total Loans and Advances Ratio (TLAR) at (β= 0.635812), indicated that 1% increase in Liquidity Risk led to 63.5% increase in Total Loans and Advances Ratio at the (P-value 0.00000 < 5% alpha significant level) While the Credit Risk (CR) and Market Risk (MR) have no statistical significant impact on the Total Loans and Advances Ratio (TLAR) at (β= -0.053840; -0.008787), indicated that 1% decrease in Credit Risk led to -5.3% decrease in Total Loans and Advances Ratio at the (P-value 0.3841 > 5% alpha significant level). And indicated that 1% decrease in Market Risk led to -0.8% decrease in Total Loans and Advances Ratio at the (P-value 0.8363 > 5% alpha significant level).

However, the estimation of the co-efficient of determination R-squared is at 0.957860 reveals that all the explanatory variables jointly account for 95.7% changes in Total Loans and Advances Ratio. It tells us the model is of good fit, that the independent variables to a very large degree explain the changes in the dependent variable.

Interpretation of Durbin Watson and F-Statistics

From the estimation, the Durbin Watson statistics is (0.726430), this implies that there is positive serial correlation or autocorrelation in the regression residual. While the F-statistics value is (484.9102) with a probability or significant level of P-value 0.000000 < 0.05 shows that the overall analysis of variance of the model is of good fit; this confirming that explanatory variables were fundamental explaining the variation in the dependent variable. In conclusion, since at the overall level, credit risk, liquidity risk, and market risk were significantly have changes on total loans and advances ratio, therefore, $\mathbf{H_0}$ that says, "*Risk Management has relevant effect on the Total Loans and Advances Ratio of the Deposit Money Banks in Nigeria*", accepted since at overall, the explanatory variables have significant effect on the explained variable.

Conclusion and Recommendations

This study examined the effect of risk management on financial performance of deposit money banks in Nigeria. The findings between risk management and financial performance follow the same pattern. Based on the findings stated above, the study concluded that risk management has significant effect on the return on Asset of the Deposit Money Banks in Nigeria, accepted since at over all, the explanatory variables have significant effect on the explained variable. Also, the study concluded "Risk Management has relevant effect on Return on Equity of the Deposit Money Banks in Nigeria", accepted since at overall, the explanatory variables have significant effect on the explained variable.

In the same vein, the study concluded "Risk Management has relevant effect on the Total Loans and Advances Ratio of the Deposit Money Banks in Nigeria", accepted since at overall, the explanatory variables have significant effect on the explained variable. Based on conclusion above, the study recommended that, from the significance of risk management on return on equity, management of banks should pay particular attention to proper management of credit risk, liquidity risk and market risk to enhance their financial soundness.

Regulators and policy makers of banks in Nigeria should review existing risk management policies and where necessary implement new policies to ensure proper management of credit risk, liquidity risk and market risk for banks to improve utilization of firm`s assets in generating returns. Also, management of deposit money banks should put strict policies in place and implement the policies to gear and guarantee efficient performance that will improve profitability, return on equity and return on

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