



RISK MANAGEMENT PRACTICES AND SHAREHOLDERS' RETURN USING EVIDENCE FROM QUOTED COMMERCIAL BANK IN NIGERIA

Dr. Henry Waleru Akani¹ and Justice Ezebunwa²

¹Department of Banking and Finance, Rivers State University, Nkpolu - Port Harcourt, Rivers State, Nigeria. Email: henryakani@yahoo.com

²Department of Economics, Rivers State University, Nkpolu - Port Harcourt, Rivers State, Nigeria

Cite this article:

Henry W.A., Justice E. (2021), Risk Management Practices and Shareholders' Return Using Evidence from Quoted Commercial Bank in Nigeria. African Journal of Economics and Sustainable Development 4(3), 116-140. DOI: 10.52589/AJESD-WPHSGWBX.

Manuscript History

Received: 24 Oct 2021

Accepted: 9 Nov 2021

Published: 4 Dec 2021

Copyright © 2020 The Author(s). This is an Open Access article distributed under the terms of Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International (CC BY-NC-ND 4.0), which permits anyone to share, use, reproduce and redistribute in any medium, provided the original author and source are credited.

ABSTRACT: *This study examined the effect of risk management practices on shareholders' return of quoted commercial banks in Nigeria. Cross sectional data were sourced from financial statements of commercial banks and Central Bank of Nigeria Statistical bulletin from various years. Shareholders return was proxied by return on equity and return on assets while risk management practices were modeled by bank risk diversification, Basel risk compliance, credit monitoring and credit appraisal. Panel data methodology was employed while the fixed effects model was used as an estimation technique at 5% level of significance. Fixed effects, random effects and pooled estimates were tested while the Hausman test was used to determine the best fit of the regression model. Panel unit root and panel co-integration analysis were conducted on the study. The study found that 60 per cent variations in return on equity of the quoted commercial banks can be traced to variations in risk management practices as formulated in the regression model. The beta coefficient of the risk management practices proved that risk diversification, Basel compliance, credit monitoring and credit appraisal methods as formulated in the regression model have positive effect on return on equity of the commercial banks. In the model II, 47.6 percent variations in return on assets of the quoted commercial banks can be traced to variations in risk management practices as formulated in the regression model. The beta coefficient of the risk management practices proved that risk diversification, Basel compliance, credit monitoring and credit appraisal methods as formulated in the regression model have positive effect on return on equity of the commercial banks. The study concludes that risk management practices have a positive effect on shareholders' return. The study recommends that commercial banks managements should ensure that all the board members and executive managements amongst other stakeholders are trained to appreciate the functions and responsibilities of credit risk management. The study recommends also that banks should ensure that their credit exposures are adequately secured through proper scrutiny of loan processing in order to identify viable projects so as to reduce loan defaults by bank customers.*

KEYWORDS: Risk Management Practices, Shareholders Return, Quoted Commercial Bank, Nigeria



INTRODUCTION

Shareholders returns in an organization demonstrate the proficient use of resources and the organization's capacity to generate profit. It is of considerable interest to stakeholders, including customers, creditors, shareholders, government, and managers in that it, shows shareholders the return on capital invested; sends signals to customers of the organization's capacity to meet their needs; shows government the capacity of the organization to pay its tax; and shows managers the value of their effort and human capital invested in the organization (Aymen, 2014).

Risk management is at the core of lending in the banking industry. Many Nigerian banks had failed in the past due to inadequate risk management exposure. Banks are greatly opened to vast numbers of systematic and unsystematic risks during their business operations. Nwankwo (1990), observes that the subject of risks today occupies a central position in the business decisions of bank management and it is not surprising that every institution is assessed and approached by customers, investors and the general public to a large extent by the way or manner it presents itself with respect to volume and allocation of risks as well as decision against them. Other risks include insider abuse, poor corporate governance, liquidity risk, inadequate strategic direction, among others. These risks have greatly amplified, especially in recent decades as diversification of asset portfolios by banks have increased in recent emerging markets. With respect to globalization of financial markets over the years, the operational activities of banks have increased swiftly as well as their exposure to risks.

The Basel Committee paved the way for the creation of the new capital accord which was implemented in 2007. The New Capital Accord required capital charges to be accrued for credit, market and operational risks. This is in line with the objective of protecting depositors, consumers, and the citizens against losses emerging from bank failures (Umoh, 2005). With reference since 1988, directors of the Nigerian Banking industry have displayed interest in refining the risk analysis, measurement and management capacity of firms in the banking sector. According to Soludo (2005) business operations in the financial sector was to make Nigeria money deposit banks compete positively in the global stock market and to spawn a large capital base that will make available resources for banks to settle compliance cost in the region of credit and market risk management risk management is at the core of lending in the banking industry.

The issue of credit risk management and performance of financial institutions in ensuring that banks are able to achieve their set objectives has been well researched upon by numerous academics. There is an overwhelming belief that credit risk management has a strong influence on bank profitability. Shafiq and Nasr (2010) examined the key determinants of credit risk of commercial banks on emerging economies banking systems compared with the developed economies and found that the credit risk management had a significant influence on bank profitability. Agwor and Akani (2020) and Kargi (2011) studied some Nigerian banks between 2004 and 2008 and found that there exists a significant relationship between banks performance and credit risk management. Das and Ghosh, (2007) revealed that credit risk management has a strong bearing on bank profitability in Kenya. Aluko (2008) and Iwedi & Onuegbu, (2014) posited that credit risk management plays a key role in a bank's financial performance. Hosna and Manzura, (2009) investigated the effects of credit risk and other risk components on the banks' financial performance. They found a strong relationship between risk components and the banks' financial performance. Harvey & Merkowsky (2008) examined the relationship



between credit risk and banks' profitability. They found a linear relationship between credit risk and bank profitability. Afriyie & Akotey, (2011) investigated the effect of credit risk management techniques on the banks' performance of unsecured loans. They concluded that financial risk in a banking organization might result in imposition of constraints on the bank's ability to meet its business objectives. The above studies failed to establish consensus results on the effect of risk management strategies on the performance of deposit money banks. This study therefore examined the effect risk management practices on shareholders return in quoted commercial banks in Nigeria.

LITERATURE REVIEW

Risk Management

Risk management is a term that is synonymous to different areas of human endeavours. Risk management was defined by Akani and Akani (2019) and Baffa (1990) as the planning and controlling of all the conceivable elements of risks which are inherent in the daily operations of an organization in order to ensure the organization's continued existence as well as the realization of its set goals and objectives. Meyer (2000) opined that in managing risk, banks must decide which risks to take, which to transfer and which to avoid.

The credit management is procedures banks adopted in the mitigation or reducing the negative effect of credit risk. A comprehensive credit risk management structure is vital because it helps increase revenue and survival. According to (Singh, 2013) sound credit-giving is one of the most essential principles which strengthen financial institutions in their financial standing. This researcher stressed that sound credit giving establishes credit limits as well as developing a credit granting process for approving new credits. Credit plays a very vital part in the economic growth and development of a country. These roles credit plays can be categorized into two: it enables the transfer of funds to where it will be most effectively and efficiently used and secondly, credit economizes the use of currency or coin money as granting of credit has a multiplier effect on the volume of currency or coin in circulation.

Singh, 2013 noted that Credit management means the total process of lending starting from inquiring potential borrowers up to recovering the amount granted. () noted that, in the banking sector, credit management is concerned with activities such as accepting application, loan appraisal, loan approval, monitoring, and recovery of non-performing loans. Adebisi and Oyedijo (2012) described credit management as methods and strategies adopted by a firm to ensure that they maintain an optimal level of credit and its effective management. It is an aspect of financial management involving credit analysis, credit rating, credit classification and credit reporting.

Adebisi and Oyedijo (2012) viewed credit management as simply the means by which an entity manages its credit sales; it is a prerequisite for any entity dealing with credit transactions since it is impossible to have a zero credit or default risk. Adesoji (2019) opined that credit management greatly influences the success or failure of commercial banks and other financial institutions. This is because the failure of deposit banks is influenced to a large extent by the quality of credit decisions and thus the quality of the risky assets. He further notes that credit management provides a leading indicator of the quality of deposit banks credit portfolio. A key requirement for effective credit management is the ability to intelligently and efficiently



manage customer credit lines. In order to minimize exposure to bad debt, over-reserving and bankruptcies, companies must have greater insight into customer financial strength, credit score history and changing payment patterns.

Credit Risk Management Practices

Risk Diversification

Bank loan portfolio diversification strategies are based on the modern portfolio theory of Markowitz (1952), and largely followed by experts in financial institutions (Winton, 1999). According to the idiosyncratic risk hypothesis, diversification eliminates the specific (idiosyncratic) risk which enables banks to reduce their monitoring efforts and therefore lower their operating costs, which ceteris paribus should lead to higher cost efficiency (Rossi et al., 2009). Furthermore, the benefit of diversification stems from economies of scope across inter alia economic sectors and geographic areas (Laeven and Levine, 2007). Researchers like Hayden et al. (2006), Berger et al. (2010), Akani (2019) and Tabak et al. (2011) all indicate that risk reduction and performance improvement are advantages of diversification whilst agency problems are common associated disadvantages.

The Basel Accord is a comprehensive documentation of international principles and regulations guiding the operations of banks in order to ensure soundness and stability (Kolapo *et al* 2015). Commenting on the features of Basel Accord, Chen and Pan (2016), upheld that, the new Basel Capital Accord explicitly places on banks the onus to adopt sound internal credit risk management practices to assess their capital adequacy requirements. The Accord was introduced in 1988 in Switzerland, compliance with the accord means having the capacity to identify, track, collect and report on risk-related data in an integrated manner, with full auditability and transparency, thus creating the platform to improve the risk management processes of banks.

The Basel Accord is international principles and regulations guiding the operations of banks to ensure soundness and stability. The Accord was introduced in 1988 in Switzerland. Compliance with the Accord means being able to identify, generate, track and report on risk-related data in an integrated manner, with full audit ability and transparency and creates the opportunity to improve the risk management processes of banks. The New Basel Capital Accord places explicitly the onus on banks to adopt sound internal credit risk management practices to assess their capital adequacy requirements (Akani and Lucky, 2014 and Chen and Pan, 2012).

Credit Monitoring

Every bank has to develop and implement comprehensive procedures and Information systems to follow up the condition of individual credits. An effective loan monitoring system according to Akani and Lucky (2021) and Odufuye (2007) will include measures to: Monitor compliance with established agreements, Assess, where applicable, collateral coverage, relative to creditor's current condition, Identify contractual payment delinquencies and classify potential credits on a timely basis, and, Direct actions at solving problems promptly for remedial management. Loan monitoring, which is the work of the relationship manager in most cases, is not a choice, but an imperative for effective and efficient credit administration in the banking sector. Problem loans can easily be spotted out. The banker's experience, knowledge of the customer's business and above all, faith in the customer can be a guide in taking a decision as



to how far the customer can be supported before declaring the loan as bad. On some occasions, the customer may be in need of more support. Any or a combination of the following strategies can then be employed:

- (1) Alteration or waiver of some of the terms and conditions of loan agreement in a way not to tamper with the bank's interest. However, this must be communicated to the credit department.
- (2) Issuance of additional collateral security, if available.
- (3) Granting of additional funds, if the borrower's circumstances and analysis require the need.
- (4) Extension of loan repayment period supported by fresh cash flow statement. Regardless of genuine efforts of parties to a loan, default can still occur. The recovery of loans should be a prerogative of the Recovery Unit to ensure that appropriate recovery strategies are implemented.

Financial statements like the balance sheet and income statement do not convey relevant financial information necessary for any economic decision, as their figures are in their absolute terms. But when items in these statements are related to each other (inter or intra), a more relevant financial information is generated for an objective and reliable investment decision. This is where the ratio comes in.

Credit Appraisal

Pursuance of all alternatives to maximize recovery, including placing customers into receivership or liquidation as may be appropriate. Ensuring that adequate and timely loan loss provisions are made based on actual and expected losses and Regular review of deteriorating loans. It should be emphasized that after a loan has been classified as substandard, it should be assigned to a specific Account Manager in the Recovery Unit. The Account Manager serves as the primary customer contact during the recovery process. A number of methods exist for recovering debts owed by banks. Some of these, according to Ademu (2009) are:

- (1) Appeals to debtors
- (2) Threats and blackmail
- (3) Legal action
- (4) Use of debt-factoring companies
- (5) Invoice discounting
- (6) Seizure and sale of collaterals
- (7) Use of Nigerian Deposit Insurance Corporation's services

Financial analysis is a quantitative exposition of the strengths and weaknesses of the operations of business enterprise Okereke, (2003). This means that the performance (good or bad) of the enterprise is exposed to the user(s) in quantitative terms upon which an interpretation is carried out and informed decision taken. Financial analysis is objective and scientific since it is based



on facts and standards. It is multidimensional. The performance of a company in a specific area, say, profitability may be of interest to one user but may not be of interest to another. Thus, financial analysis varies according to the specific interests and needs of the users. For instance, bankers, and other creditors, are highly interested in the liquidity and profitability of the borrower(s) while investors in shares of a company are interested in present and expected future earnings and the stability of these earnings in relation to other companies in the same industry. Management of the company has a different interest from the government, etc. Interpretation of financial statements starts from where the analysis stopped. It is a deliberate attempt to explain the result of an analysis in such a way that information content is effectively communicated to the user. It explains the broad trend of the business. While analysis is in mathematical form, interpretation is in qualitative.

Shareholders' Wealth Maximization

The shareholder wealth maximization principle states that the immediate operating goal and the ultimate purpose of a public corporation is and should be to maximize return on equity capital. Shareholder wealth can be defined, at any time, as the market capitalization of the public corporation. This market capitalization is the number of equity shares outstanding multiplied by the share price at the time of calculation. Market capitalization is an estimate, by capital markets, of the net worth of the firm. The market capitalization reflects the firm's tangible assets plus the future expected residual revenues, which may be distributed as dividends or kept as retained earnings. The estimate thus includes the future expected dividend stream. Higher earnings per share (EPS) of common stock (i.e., equity) will tend, *ceteris paribus*, to increase the market price of each share (and thus the market value of the firm) and to permit in principle either additional investments in profitable projects or higher dividends.

A problem inherent in the market cap definition is that it involves an artificial dimension of subjective valuation by buyers and sellers. There can be artificial bubbles, particularly for real estate and commodities. In a bubble, the price-to-earnings ratio rises, often rapidly. The shareholders wealth maximization principle effectively encourages investors to demand, and management to supply, actions that will increase share price over time. There is a significant difference between these management actions and the process of subjective valuation in capital markets. Free cash flow, defined as net operating cash flow minus capital investments, occurs in product markets; and management has direct control of decisions affecting free cash flow, which is then available to exploit opportunities to enhance shareholder value. *Real* free cash flow is more difficult to manipulate than accounting profit. But capital markets independently evaluate the estimated worth of free cash flow or earnings per share or any other relevant measure. This evaluation process might be influenced by management actions and information, but it is not under direct control of management.

Financial -Based Shareholders' Return

One significant advantage of accounting-based performance measures is that they are not requiring an exchange listing; thus, also private and small firms may be examined. Furthermore, they are easy to interpret.

The accounting-based performance measures most common in the ownership literature are return on equity (ROE) and return on assets (ROA). They are defined as:



$$ROE = \frac{\text{Earnings after interest expenses and taxes}}{\text{Shareholders' equity}} \quad (1)$$

$$ROA = \frac{\text{Earnings after interest expenses and taxes}}{\text{Total assets}} \quad (2)$$

The ROE measures only the return on assets of the equity owners, whereas the ROA aggregates the return of equity-holders and debt-holders. This fact leads to three arguments militating in favor of a preference of ROE over ROA in equity ownership and performance studies. First, generally financial performance is based on the shareholder value concept, which is stronger reflected in the pure equity focus of the ROE than by the diluted equity returns of the ROA. Second, regarding the effect of performance on equity ownership the pecuniary benefits of shareholders play an important role. These depend stronger on the ROE than on the ROA also including the debt-holders' return.

Modern Portfolio Theory

Markowitz (1952) Modern portfolio theory (MPT) is one of the most important and powerful economic theories dealing with finance and investment. Modern portfolio theory measures the benefits of diversification, known as not putting all your eggs in one basket. Modern portfolio theory (MPT) is an investment theory which tries to explain how investors could maximize their returns and minimize their risks by diversifying in different assets. Tobin (1958) expanded the theory of Markowitz's by adding the analysis of risk free assets which made it possible to affect portfolios on the efficient frontier. Markowitz (1952) and Tobin (1958) showed that it was possible to identify the composition of an optimal portfolio of risky securities, given forecasts of future returns and an appropriate covariance matrix of share returns.

The portfolio theory approach is the most relevant and plays an important role in bank performance studies (Atemnkeng and Nzongang, 2006). According to the Portfolio balance model of asset diversification, the optimum holding of each asset in a wealth holder's portfolio is a function of policy decisions determined by a number of factors such as the vector of rates of return on all assets held in the portfolio, a vector of risks associated with the ownership of each financial assets and the size of the portfolio. It implies portfolio diversification and the desired portfolio composition of commercial banks are results of decisions taken by the bank management.

Risk Management Theory

David (1997) developed this theory aiming to study why risk management was required, and outlines theoretical underpinning under contemporary bank risk management; its emphasis is on market and credit risks. The theory indicates that market and credit risks would have either direct or indirect effect on banks survival (Eichhorn, 2004). One would expect the credit risk indicators to influence banks profitability if there is no effective and efficient credit risk management (Ngugi, 2001). This theory identifies a major source of value loss as Market risk being a change in net value of asset due to change in interest rate, exchange rate, equity and commodity prices (Wu & Olson, 2010). Regulators are concerned with overall risk and have minimal concern with individual risk of portfolio components as managers are capable of window dressing the bank position. The need for total risk shows that measurement of risk



cannot be centralized as risk of a portfolio is not just a sum of components as per Markowitz theory. This implies that portfolio risk must be driven by portfolio return which is invariant to changes in portfolio composition (Beverly, 2015). Regulatory requirements and alternative choices require managers to consider risk return trade off, Measurement of risk is costly thus bank managers compromise between precision and cost (Sovan, 2009).

Trade off will have profound effects on any method adopted by the bank. They have one risk measurement goal knowing to a high degree with precision and the maximum loss that the bank will likely experience (Muhammad & Bilal, 2014). Regulators may set capital requirements to be greater than estimated maximum loss to ensure non-failure. Risk management theory has two principle approaches to measurement of risk, scenario analysis and value at risk (Sovan, 2009). Scenario analysis approach does not require distribution assumption of the risk calculation and it's very subjective and assumes that future results will resemble those of the past (Wilfred, 2006).

Empirical Review

Siyanbola and Adebayo (2021) examined the effect of credit risk management on the financial sustainability of listed deposit money banks in Nigeria. The study adopted an Ex-post facto research design. The population consisted of all 14 listed Deposit Money Banks (DMBs) in Nigeria as at December 31, 2019 out of which a sample of 12 banks were purposely selected based mainly on availability of complete data for ten years period (2010 – 2019). Secondary data extracted from the financial statements were analyzed using descriptive and inferential analyses. The population of 14 banks accounted for 53.85% of banks in operation. The study found that credit risk management (CRM) proxied by Loan Deposit Ratio (LDR), Non-performing Loan (NPL) and Assets Growth Percentage (AGP) had a positive significant effect on CAR of listed DMBs in Nigeria (Adj. $R^2 = 0.0969$, $F(3,105) = 13.66$; $P < 0.05$). Bank Size (BS) significantly moderated the relationship between the CRM and CAR of listed DMBs in Nigeria (Δ Adj. $R^2 = 0.0814$, $\Delta F(3,116) = 12.19$; $P < 0.05$). However, CRM had no significant effect on ROCE of listed DMBs in Nigeria (Ad $R^2 = 0.1873$, $F(3,105) = 2.73$; $P > 0.05$). BS significantly modified the relationship between the CRM and ROCE positively (Δ Adj. $R^2 = 0.1779$, $\Delta F(3,116) = 22.88$; $P < 0.05$). Overall, CRM positively and significantly affected the financial sustainability of listed DMBs in Nigeria. The study concluded that credit risk management has a positive significant effect on financial sustainability of listed DMBs in Nigeria. This study recommended that regulators should adopt a risk based approach in determining capital adequacy requirements and give special attention to banks that are too big to fail while DMBs' managements should ensure that all the board members and executive managements amongst other stakeholders are trained to appreciate the functions and responsibilities of credit risk management.

Anetoh, Nwadiakor, Anetoh and Okeke (2021) adopted an ex-post facto research design. The target population of the study was all the deposit money banks listed in Nigeria Stock Exchange. The study used secondary sources of data from the Central Bank of Nigeria as well as from annual reports and financial statements of accounts of deposit money banks under review from 2010-2019. The Structural Equation Modeling was used to test the formulated hypotheses at 5% level of significance. The findings showed that credit risk had a significant but negative effect on firm value of deposit money banks in Nigeria. Operational risk had a significant and positive effect on firm value of deposit money banks in Nigeria. The study recommends that banks should ensure that their credit exposures are adequately secured



through proper scrutiny of loan processing in order to identify viable projects so as to reduce loan defaults by bank customers. They should continue to employ qualified and competent workers who are experts in banking professionalism as well as ICT competence in order to reduce unsound banking practices.

Ramazan and Gulden (2019) analyzed the impact of credit risk on banks performance. Data was collected from financial reports of 26(Twenty-six) commercial banks operating in Turkey between 2005-2017. Three panels' data are considered respectively state-owned banks, privately-owned banks and foreign banks in order to compare banks according to their ownership structure. Return on Asset (ROA) and Return on Equity (ROE) were used as surrogate for financial performance pointers while Non-Performing Loans (NPLs) were used as credit risk pointers. The estimation results showed that there is a negative relationship between credit risk and ROA as well as between credit risk and ROE. Their findings showed that there is a relationship between credit risk management and profitability of Turkish deposit banks from the period of 2005 to 2017. The study recommends that banks should focus more on credit risk management, especially on the control and monitoring of nonperforming loans. Also, managers should focus more on modern credit risk management techniques.

Gadzo, Kportorgbi and Gatsi (2019) assessed the effect of credit and operational risk on the financial performance of universal banks in the context of the structural equation model (SEM). Data were collected from all the 24 universal banks in Ghana using the PLSSEM, the results showed that credit risk influences financial performance negatively contrary to the empirical study but in line with the information asymmetry tenant of the lemon theory. It was also found that operational risk influences the financial performance of the universal banks in Ghana negatively. Furthermore, the study indicated that bank specific variables measured by (asset quality, bank leverage, cost to income ratio and liquidity) significantly influence credit risk, operational risk as well as the financial performance of the universal banks positively. The study recommends that banks be encouraged to cut-down their lending rates in order to decrease credit risk and boost profitability. Regarding operational risk, banks should reduce leverage and have their portfolio more concentrated on liquid investment income so as to boost profitability.

Bishnu (2019) investigated the effect of credit risk on the financial performance of commercial banks in Nepal. The balance panel data of ten commercial banks with 160 observations for the period of 2001 to 2016 have been used for the analysis. The study employed capital adequacy ratio (CAR), non-performing loan ratio (NPLR), management quality ratio (MQR), credit to deposit ratio (CDR) and risk sensitivity (RS) as proxies for credit risk while ROA was used as proxy for financial performance. The regression results revealed that capital adequacy ratio (CAR), non-performing loan ratio (NPLR), and management quality ratio (MQR) have significant relationship with the financial performance (ROA) of the commercial banks in Nepal. Similarly, credit to deposit ratio (CDR) and risk sensitivity (RS) has no significant impact on the financial performance of the commercial banks in Nepal.

Nwude and Okeke (2018) investigated the impact of credit risk management on the performance of deposit money banks in Nigeria using five banks that had the highest asset base. Ex-post facto research design was adopted using a dataset for the period 2000–2014 collated from the annual reports and financial statement of the selected deposit money banks. Three hypotheses were proposed and tested using ordinary least squares regression models. The findings reveal that credit risk management had a positive and significant impact on total



loans and advances, the return on asset and return on equity of the deposit money banks. The study recommended that bank managers need to put more efforts to control the non-performing loan by critically evaluating borrowers' ability to pay back.

Hyun and Yo (2017) examined the relationship between the default risk, as measured by the Altman K-Score and firm value as measured by the Return on Assets of shipping and logistics firms in Korea and compared the impact of default risk on firm value between good financial health firms and poor financial health firms. The period covered span from 2003-2012. The study employed a panel data analysis model to analyze data collected from financial statements and accounts of 281 Korean shipping and logistic firms. As the trends of K-Scores over a ten-year period, shipping and logistics firms in Korea register weak-to-moderate financial healthy range. The study found out that Altman K-Score is significantly linked with firm value and also higher performing firms as measured by the ROA exhibit higher financial health as measured by K-Score. The study proposes that a systematic financial alert system of the Korean shipping and logistics industry should be required to decrease default risk reflecting significantly on the Korean economy.

Nwanna and Oguezie (2017) examined the effect of Credit Management on Profitability of Deposit Money Banks in Nigeria. The study employed multiple regression analysis. The findings of the study revealed that loans and advances and loan loss provision have positive and significant effects on profitability while nonperforming loans have a negative and insignificant effect on profitability. The study recommends that management of banks should evaluate credit requests before granting loans to customer(s) to circumvent high rates of non-performing loans.

Oluwaseyi, Yusoff and Md. Aminul (2018) investigated Operational Risk in Commercial Banks: Empirical Evidence from Nigeria. Data was obtained from audited financial reports of selected sixteen (16) commercial banks over the period of 2009 to 2015 making up to 112 observations. Panel data approach was employed in the study for the analytical model which runs the Hausman test for random or fixed effect choice and hypothesis testing. Firm performance was measured by net interest margin while operational risk was proxied using cost to income and total operating expenses to total assets ratio. The controlled variables used in this study were bank size and GDP growth rate. The study found that bank efficiency ratio had a negative significant effect on firm performance, suggesting that the lower the cost to income ratio, the better the bank performance in terms of net interest margin. Operating expenses ratio has a positive significant effect on firm performance. The study suggests that further study can explore the effects of operational risks on banks efficiency using a wider time-frame.

Muriithi and Waweru (2017) employed the qualitative research design and ordered logistic model to explore the effect of operational risk on the firm value of commercial banks in Kenya using data obtained from 43(forty-three) registered commercial banks in Kenya in the month of November 2015. The study measured operational risk using internal and external fraud (IEF), clients, products and business practices (CPBP), business disruption and system failure and execution (BDSF) delivery and process management (EDPM). Results revealed that operational risk has an inverse relationship with firm value.

Muriithi and Muigai (2017) investigated the effect of operational risk on the firm value of commercial banks in Kenya covering a period of 10(ten) years from 2005 to 2014 for all the



43 registered commercial banks in Kenya. Operational risk was measured by cost income ratio while firm value was measured by Tobin Q. Panel data techniques of random effects estimation and generalized method of moments (GMM) were used to analyze the data collected from accounts/financial statements of the banks under review. Findings indicate that cost income is negatively associated with bank value both in the long run and short run.

Nobanee and Ellili (2017) investigated the degree of operational risk disclosure and its impact on operating cash flow of banks listed in the UAE between 2003 and 2016. The content analysis of the annual reports was used to measure the degree of operational risk disclosure and showed a low degree of operational risk disclosure for all UAE banks, both Islamic and conventional. The result from dynamic panel data regression indicated no association between the levels of disclosure of operational risk and cash flow for all banks, conventional and Islamic. Kerongo and Mwaura (2016) examined the effect of operational risk management practices on financial performance of 34(thirty-four) commercial banks in Tanzania. Analyses from descriptive statistics revealed that the three independent variables in the study - credit risk, insolvency risk and operational efficiency influenced the financial performance of the banks for the period under study, wherein operational risk had an insignificant positive effect on the financial performance of Tanzanian banks.

Huey-Yeh and Hsiao-Yi (2016) investigated the relationship between operational risk and the operational performance of banks in Taiwan with data covering the period from June 2007 to June 2014. A total of 30 (thirty) listed or over-the-counter banks were selected as the study sample and divided into two categories: "financial holding subsidiary banks" and "independent banks without financial holdings. Operational risk was measured using cost income ratio while performance was proxied by ROA. The result showed that there is a significant relationship between operational risk and performance of Taiwan banks. The study recommends that enhancement of operational performance by managing risks could improve performance.

Akinselure and Akinola (2019) focused on the impact of credit management on the financial performance of deposit money banks. It is based on secondary data obtained from the audited financial statement of the companies available online. The study extracted data from thirteen (13) deposit money banks in Nigeria, and it considered variables such as loan losses ratio as a proxy for the independent variable (Credit management) and used Return on equity and return on assets as proxies for the dependent variable (profitability). These variables were analyzed using multiple regressions in SPSS statistical software. The result of the analysis shows that credit management has a significant relationship with profitability of the deposit money banks, and this was because their proxies showed a p-value that was less than the 5% benchmark specified in SPSS statistical software. Based on these results, the study recommends that management of banks should develop a good strategy to ensure that the loan facilities are repaid as at when due, so as to reduce problems associated with delay in servicing loans which have a direct proportional effect on the profitability of these banks.

Nwanna and Oguezue (2017) examined a study titled Effect of Credit Management on Profitability of Deposit Money Banks in Nigeria. The study employed multiple regression analysis in Eviews 9. The findings of the study reveal that loans and advances and loan loss provision have positive and significant effects on profitability, while nonperforming loans have a negative and insignificant effect on profitability. The study concludes that management of banks should evaluate credit requests before granting any form of loan to customer(s) to circumvent high rates of non-performing loans. It recommends that the banks should ensure



that customers have verifiable guarantors and collateral before granting them loans. The rapid increase in Non-performing loans in most deposit banks shows that some deposit money banks may not be complying with guidance issued by regulating agencies in charge of loan facilities across the banks.

Gadzo, Oduro, and Asiedu (2019) investigated the Impact of credit risk on corporate financial performance, using data from listed banks on the Ghana stock exchange, and the data was analyzed using regression analysis. The result from the study indicates that variables such as capital adequacy, operating efficiency, profitability, and net interest margin are inversely related to credit risk. Conversely, bank size and financing gap tend to relate positively with credit risk. The study concludes that capital adequacy, operating efficiency, profitability, and net interest margin are inversely related to credit risk. Conversely, bank size and financing gap tend to relate positively with credit risk. Also, annualized changes in inflation tend to positively affect credit risk. Again, it was observed that, increase in bank credit risk negatively affects corporate financial performance.

Ndubuisi and Amedu (2018) studied the Relationship between Credit Risk Management and Bank Performance in Nigeria using Fidelity Bank Nigeria PLC as a case study. The statistical analysis for the study was done using Pearson Correlation Coefficient. The findings of the study reveal that there is a weak significant relationship between credit risk management and bank performance in Nigeria. The study concluded that there is no significant relationship between credit risk management and bank performance in Nigeria and it recommended that deposit money banks should establish sound competent risk management units which must adopt best practice in risk management. This is however contradictory to the findings of Ndubuisi and Amedu, 2018; Nwanna and Oguezue, 2017) who emphasized that there is a positive relationship between credit risk management and performance of deposit banks.

Ali, Bojan and Roger (2018) focused on the determinants of financial performance of banks in Central and Eastern Europe. The paper used the Factor Analysis to Model Banking Risk theory developed by Haan and Klamps (2012). The methodological approach was Panel Data Regression Analysis using Fixed Effect and Estimation models. He discovered that Assets Quality & Earnings are positively and significantly affected by business mix and the diversification of banks. It was concluded that bank size has a negative and significant impact on bank performance; that is only small banks in CEE countries benefit from economies of scale. Inflation is also seen to have a positive impact on asset quality and earnings; whereas higher economic growth leads to higher capital adequacy and liquidity. The gap noted is that dependent variables in the first three years of each table are omitted which may affect the results of the investigation.

Girma and Jigin (2018) investigated the effect of deposit mobilization on financial sustainability of rural savings and credit cooperatives with evidence from Ethiopia. The theories adopted in this paper are The Loanable Fund Theory, Life-Cycle Theory and Institutionalized Theory. The methodology adopted Panel Regression Estimates using balanced data of 166 rural savings and credit cooperatives. In the study, it was observed that deposit to loan ratio was very significant and positively related to financial sustainability. Inflation was also discovered to be significant and negatively related to operational self- sufficiency showing that Inflation negatively affects both the institution and its members. High inflation rates could diminish the capacity of individuals to save by spending more of their incomes on consumption and reduce an Institution's ability to cover its costs. In conclusion, the primary motive of



deposit mobilization lies in lower cost of capital compared to other resources. From the study, it was concluded that Interest rate spread, deposit to loan ratio, deposit to total assets, the volume of deposits, age of institution and inflation are vibrant in determining the financial sustainability of RUSACCO in Ethiopia. Among the few gaps noted are the years of study that were limited to only three years which was considered too small to make a relevant conclusion. Also, it failed to discuss the entire story with respect to the financial structure such as shares mobilizing, retained earnings.

Emeka and Nenubari (2019) examined the dynamics of capital adequacy and profitability of internationalized deposit money banks in Nigeria. In their methodology; Static & Dynamic Panel Analysis framework are adopted and divided into GLS and LSDV. Data for only International authorized banks are used. Fixed Effect Model & Random Effect Dynamic Models are adopted. The theory adopted follows the works of Arellano & Bond (1991), Arellano – Bover (1995) and Blundell – Bond (1998) to estimate the dynamic of the impact of capital adequacy ratios on profitability of selected internationalized deposit money banks in Nigeria from 2005 – 2007. The results show that Assets Quality (Loan to Assets) is the main determinant of profitability (ROE) in the Nigeria DMBs in the short term. Bank size was noted to be positive and significant. The conclusion shows that the weakness of the management of the DMBs to handle short term fluctuations is the main cause of banks' failure. In addition, the harsh macroeconomics and financial environment in Nigeria overpowered the management of the banks. The profitability of DMBs in Nigeria is weak in the very short term due to the inability of the management to respond immediately to short term shocks. The study did not cover all deposit money banks in Nigeria but only those with international license. This is considered a major gap to the study because the scope and coverage are limited.

Jarel and Wambua (2018) investigated Effect of Capital Structure on Financial Sustainability of Deposit Taking Microfinance Institutions in Kenya. Multiple Regression Model using SPSS and R square as the data analysis tools for 10-years data. Correlation & Regression models were used in the methodology. Modigliani – Miller & Pecking Order Theories were adopted (States that firms' value is not affected by capital structure in a Perfect Capital Market – MM Proposition 1 – Without Taxes) while MM Proposition II – With Taxes showed that the value of an Institution is enhanced by the tax shield provided by the interest deduction. This is because the tax shield reduces the cost of debt. The Pecking Order theory states that firms have a specific preference order for capital structure in their firms (Myers, 1984); First is Retained Earnings, then issued debts if Retained earnings was exhausted. Finance through Issuing New Stock is normally a negative signal; not financially sustainable. The findings revealed a positive relationship between debt and financial sustainability. A unit change in debt led to a change in financial sustainability. Debt has a significant impact on the financial sustainability of MFIs. Conceptual framework consists of Independent Vs Independent variables instead Independent Vs dependent. Concentration is again more on Capital Structure variables.

METHODOLOGY

The study employed the ex-post facto research design which entails the utilization of historical/past data to forecast future trends employing econometric or analytical techniques. The population for this study includes the 22 licensed commercial banks in Nigeria as at December, 2013 (CBN, 2018). The population is further pruned to a sample of 13 banks using



sample random as the study is focused on Banks that are listed on the floors of the Nigerian Stock Exchange. The rationale for the sample size is the relative ease in getting relevant and reliable data for the study from the annual reports submitted to the exchange.

The method of data analysis to be used in this study was the panel data multiple linear regressions using Ordinary Least Square (OLS) method. This approach, which is a quantitative technique, includes tables and the test of the hypotheses formulated by using ordinary least square regression analysis at 5% level of significance. To arrive at a result that will not lead to spurious regressions, the study will test for stationarity at different levels in the variables making up the model. Other tests that will be carried out on the model include test of Normality, Durbin Watson Test of serial correlation, test of heteroskedasticity and test of model specification so as to achieve the objectives of our study as well as answer the research question and hypotheses. Moreover, in order to undertake a statistical evaluation of our analytical model, so as to determine the reliability of the results obtained and the coefficient of correlation (r) of the regression, the coefficient of determination (r^2), the student T-test and F-test will be employed.

Model Specification

The study adopts the panel data method of data analyses which involve the fixed effect, the random effect and the Hausman Test.

Pooled Effect Model

$$ROE_{it} = \beta_0 + \beta_1 RD + \beta_2 BC + \beta_3 CM + \beta_3 CA + \varepsilon_{it} \quad (3)$$

$$ROA_{it} = \beta_0 + \beta_1 RD + \beta_2 BC + \beta_3 CM + \beta_3 CA + \varepsilon_{it} \quad (4)$$

Fixed Effects

To further investigate the fraud effect, Adebayo (2012) analysed whether the independent variables affect the dependent variable, this regress the effect of the independent variables on the dependent variables.

$$ROE_{it} = \beta_0 + \beta_1 RD + \beta_2 BC + \beta_3 CM + \beta_3 CA + \varepsilon_{it} \quad (5)$$

$$ROA_{it} = \beta_0 + \beta_1 RD + \beta_2 BC + \beta_3 CM + \beta_3 CA + \varepsilon_{it} \quad (6)$$

Because the fixed effects account for both cross-sectional and time-series data, the increased covariance caused by individual-firm differences is eliminated, thereby increasing estimation-result efficiency.

Random Effects

Random effects focus on the relationship with the study sample as a whole; thus, the samples are randomly selected, as opposed to using the entire population. The total sample regression (a function of the random effect) can be expressed as:



$$ROE_{it} = \sum_{j=1}^N \beta_0 + \beta_1 RD + \beta_2 BC + \beta_3 CM + \beta_3 CA + \varepsilon_{it} \quad (7)$$

$$ROA_{it} = \sum_{j=1}^N \beta_0 + \beta_1 RD + \beta_2 BC + \beta_3 CM + \beta_3 CA + \varepsilon_{it} \quad (8)$$

If this is represented with random variables, then $\beta_{oj} = \bar{\beta}_0 + \mu_j$, which indicates that the difference occurs randomly, and the expectation value of β_{oi} is $\bar{\beta}_0$.

Where

ROE = Return on equity as profit after tax to total equity

ROA = Return on assets as profit after tax to total assets

RD = Bank Risk diversification proxy by log value of sectoral credits

BC = Basel Compliance proxy by risk weight assets to total capital

CA = credit Appraisal proxy by percentage of increase/ decrease in non performing loans

CM = Credit monitoring proxy by log loan loss provision

A-Priori Expectations of the Variables

$$\text{Model I: } BRD_{it} > 0 \quad BC_{it} > 0 \quad \text{and} \quad CA_{it} > 0 \quad CM_{it} > 0 \quad (9)$$

$$\text{Model II: } BRD_{it} > 0 \quad BC_{it} > 0 \quad \text{and} \quad CA_{it} > 0 \quad CM_{it} > 0 \quad (10)$$

Hausman Test

The Hausman test YairMundlak (1978) is the most commonly used method for evaluating fixed and random effects. If variables are statistically correlated, then the fixed-effects estimation is consistent and efficient, whereas the random-effects estimation is inconsistent, and the fixed-effects model should be adopted. Conversely, if the variables are statistically uncorrelated, then the random-effects estimation is consistent and efficient, whereas the fixed-effects estimation is consistent but inefficient, and the random-effects model should be adopted.

Granger Causality Test

Granger causality test helps in adequate specification of model. In the Granger causality test, the null hypothesis is that there is no causality between two variables. The null hypothesis is rejected if the probability of F* statistics given in the Granger causality result is less than 0.05. The pairwise granger causality test is mathematically expressed as:



$$Y_t \pi_o + \sum_{i=1}^n x_1^y Y_{t-1} \sum_{i=1}^n \pi_1^x x_{t-1} + u_1 \quad (11)$$

and

$$x_t dp_o + \sum_{i=1}^n dp_1^y Y_{t-1} \sum_{i=1}^n dp_1^x x_{y-1} + V_1 \quad (12)$$

Where x_t and y_t are the variables to be tested while u_t and v_t are the white noise disturbance terms. The null hypothesis $\pi_1^y = dp_1^y = 0$, for all I 's is tested against the alternative hypothesis $\pi_1^x \neq 0$ and $dp_1^y \neq 0$. If the co-efficient of π_1^x are statistically significant but that of dp_1^y are not, then x causes y . If the reverse is true then y causes x . However, where both co-efficient of π_1^x and dp_1^y are significant then causality is bi-directional.

Panel Data Co-Integration Test

A wide range of alternative test is available to test for co-integration in a dynamic panel data setting, and research in this area is evolving rapidly. With different small and large sample properties (depending upon the type of asymptotic that is chosen).

$$y_{it} = \alpha_i + \beta_i x_{it} + \varepsilon_{it} \quad (13)$$

Where both x_{it} and y_{it} are integrated or order one. Co-integration implies that ε_{it} is stationary for each i . Homogeneous co-integration. In addition requires that $\beta_i = \beta$ if the co-integrating parameter is heterogeneous. And homogeneity is imposed. One estimate

$$y_{it} = \alpha_i + \beta_i x_{it} + [(\beta_i - \beta)x_{it} + \varepsilon_{it}] \quad (14)$$

And in general the composite error term is integrated of order one even if ε_{it} is stationary. However, the problem estimator will also average over i , so that the noise in the equation will be attenuated. In many circumstance, when $N \rightarrow \infty$ the fixed effect estimator for β is actually consistent for the long-run average relation parameter, as well as asymptotically normal, despite the absence of co-integration. Consequently, if there is heterogeneous co-integration, it is much better to estimate the individual co-integrating regressions rather than using a pooled estimator, obviously, this requires $T \rightarrow \infty$.

Panel Unit Root

A stationary series can be defined as one with a constant mean, constant variance and constant autocovariances for each given lag. There are various unit root tests to examine stationarity of series. Unit root tests such as DF test, ADF tests e.t.c, are weak and tend to accept the null hypothesis. Besides, individual unit root tests have limited power. Since we have panel data, Levin, Lin and Chu's (LLC) model is recommended as it allows for both entity-specific and time-specific effects. The null hypothesis is unit root exists, indicating the data is non-stationary.



To introduce panel data unit root tests, consider the autoregressive model

$$y_{it} = \alpha_i + \gamma_i y_{it-1} + \varepsilon_{it} \quad (14)$$

Which we can rewrite as

$$\Delta y_{it} = \alpha_i + \pi_i y_{it-1} + \varepsilon_{it} \quad (15)$$

Where $\pi_i = \gamma_i - 1$. The null hypothesis that all series have a unit root then becomes $H_0 : \pi_i = 0$ for all i . a first choice for the alternative hypothesis is that all series are stationary with the same mean-reversion parameter, that is, $H_1 : \pi_i = \pi < 0$ for each country i , and is used in the approaches of models.

ANALYSIS AND DISCUSSION OF FINDINGS

Table 1: presentation of Panel Unit Root

Method: Series: D(ROE,2)	Statistic	Prob.**	Cross-sections	Obs
Levin, Lin & Chu t*	-23.1342	0.0000	20	120
Im, Pesaran and Shin W-stat	-7.73238	0.0000	20	120
ADF - Fisher Chi-square	134.583	0.0000	20	120
PP - Fisher Chi-square	228.662	0.0000	20	140
Series: D(ROA,2)				
Levin, Lin & Chu t*	-13.5336	0.0000	15	90
Im, Pesaran and Shin W-stat	-6.10181	0.0000	15	90
ADF - Fisher Chi-square	101.290	0.0000	15	90
PP - Fisher Chi-square	205.327	0.0000	15	105
Series: D(RD,2)				
Levin, Lin & Chu t*	-2.34818	0.0094	20	119
Im, Pesaran and Shin W-stat	-0.14799	0.0412	20	119
ADF - Fisher Chi-square	36.0513	0.0086	20	119
PP - Fisher Chi-square	152.123	0.0000	20	139
Series: D(BC,2)				
Levin, Lin & Chu t*	-13.3616	0.0000	20	119
Im, Pesaran and Shin W-stat	-3.54346	0.0002	20	119
ADF - Fisher Chi-square	86.0872	0.0000	20	119
PP - Fisher Chi-square	236.337	0.0000	20	139
Series: D(CM,2)				
Levin, Lin & Chu t*	-31.8849	0.0000	20	119
Im, Pesaran and Shin W-stat	-12.3485	0.0000	20	119



ADF - Fisher Chi-square	200.529	0.0000	20	119
PP - Fisher Chi-square	342.231	0.0000	20	139
Series: D(CA,2)				
Levin, Lin & Chu t*	-10.9679	0.0000	19	113
Im, Pesaran and Shin W-stat	-5.46958	0.0000	19	113
ADF - Fisher Chi-square	104.901	0.0000	19	113
PP - Fisher Chi-square	246.816	0.0000	19	132

Source: Extract from E-view

To check the stationarity of our data we use the two types of panel unit root tests. As common unit root process we use Levin, Lin and Chu panel unit root test and for individual unit root process we use three type of panel unit root tests, first one is Im, Pesaran and Shin panel unit root test, second is Fisher type test, the ADF-Fisher chi-square test and last one is also a fisher type test, the PP-Fisher Chi square panel unit root test. From table 4.1 the study concludes that the variables are stationary at first difference and integrated in the order of 1(I).

Table 2: Regression Results

Variable	Pooled Effect			Fixed effect			Random effect		
Risk Management and Return on Equity									
	β coefficient	T. stat	p. value	β coefficient	T. stat	p. value	β coefficient	T. stat	p. value
CM	0.119730	0.873839	0.3833	0.136939	1.994068	0.0454	0.130867	2.048023	0.0059
CA	-0.041232	-0.812525	0.4175	0.069171	0.939412	0.3488	0.014911	0.243124	0.8082
RD	0.941588	1.632710	0.1042	1.000096	1.900461	0.0490	0.965561	1.839871	0.0473
BC	0.099317	0.373033	0.7095	0.021088	0.080374	0.9360	0.042750	0.167161	0.8674
C	38.90436	4.808995	0.0000	35.70713	4.752723	0.0000	37.24647	4.979658	0.0000
R-squared	0.523576			0.676405			0.724733		
AdjR ²	0.301852			0.476021			0.600665		
F-statistic	4.927170			2.753495			6.973817		
F- Prob	0.044465			0.000078			0.000005		
D W	1.539565			2.062938			1.863574		
Correlated Random Effects - Hausman Test									
Test	Chi-Sq.	Chi-Sq.							
Summary	Statistic	d.f.	Prob.						
Cross-section random	1.893104	5	0.8637						
Risk Management and Return on Assets									
CM	0.255004	2.401504	0.0176	0.255004	2.590540	0.0107	0.255004	2.590540	0.0106
CA	0.087365	0.503848	0.6151	0.087365	0.543509	0.5877	0.087365	0.543509	0.5876
RD	0.038176	0.522292	0.6023	0.038176	0.563405	0.5741	0.038176	0.563405	0.5740
BC	0.008601	1.848108	0.0666	0.008601	1.993583	0.0483	0.008601	1.993583	0.0481
C	4.092826	0.996005	0.3209	0.759032	1.074407	0.2846	4.092826	1.073078	0.2850
R-squared	0.045645			0.557220			0.052720		
AdjR ²	0.019318			0.476021			0.026588		
F-statistic	1.733759			2.544215			2.017451		



F- Prob	0.145674	0.001264	0.095046
D W	1.891206	2.386625	2.174418

Correlated Random Effects - Hausman Test

Test	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	8.273945	4	0.0000

Source: Extract from E-view

In testing the validity of fixed and random effect model, the study adopted the Hausman test coefficient, from the table 2, the probability coefficient of Hausman test of 0.8637 is greater than the critical value of 0.05 therefore, the study accept that random effect model is appropriate for model I while the probability coefficient of Hausman test of 0.0000 is less than the critical value of 0.05 therefore, the study accept that fixed effect model is appropriate for model II.

From model I, the estimated regression model on the effect of risk management on return on equity of the quoted commercial banks in Nigeria found from the random effect that the adjusted R^2 of 0.600665 indicates that 60 percent variation in return on equity of the quoted commercial banks can be traced to variation in risk management practices as formulated in the regression model. The f-statistic and probability found that the regression model is significant while the Durbin Watson statistic of 1.863574 proved the presence of serial autocorrelation. The beta coefficient of the risk management practices proved that risk diversification, Basel compliance, credit monitoring and credit appraisal methods as formulated in the regression model have positive effect on return on equity of the commercial banks.

From model II, the estimated regression model on the effect of risk management on return on assets of the quoted commercial banks in Nigeria found from the random effect that the adjusted R^2 of 0.476021 indicates that 47.6 percent variation in return on assets of the quoted commercial banks can be traced to variation in risk management practices as formulated in the regression model. The f-statistic and probability found that the regression model is significant while the Durbin Watson statistic of 2.386625 proved the presence of serial autocorrelation. The beta coefficient of the risk management practices proved that risk diversification, Basel compliance, credit monitoring and credit appraisal methods as formulated in the regression model have positive effect on return on equity of the commercial banks.

Table 3: Pedroni Residual Cointegration Test

	Statistic	Prob.	Weighted Statistic	Prob.
Risk Management and Return on Equity				
Panel v-Statistic	-3.416738	0.9997	-4.022187	0.0000
Panel rho-Statistic	5.187370	0.0000	5.362353	0.0000
Panel PP-Statistic	-3.336372	0.0004	-4.852044	0.0000
Panel ADF-Statistic	-2.723523	0.0032	-3.400465	0.0003
	<u>Statistic</u>	<u>Prob.</u>		
Group rho-Statistic	7.085794	0.0000		
Group PP-Statistic	-7.252160	0.0000		
Group ADF-Statistic	-2.158439	0.0154		



Risk Management and Return on Assets				
Panel v-Statistic	-0.336306	0.6317	-1.521279	0.9359
Panel rho-Statistic	1.988261	0.9766	2.394567	0.9917
Panel PP-Statistic	-11.89870	0.0000	-6.577472	0.0000
Panel ADF-Statistic	-3.050476	0.0011	-1.674303	0.0470
	Statistic	Prob.		
Group rho-Statistic	3.893231	0.0000		
Group PP-Statistic	-14.05720	0.0000		
Group ADF-Statistic	-2.343551	0.0096		

Source: Extract from E-view

For the analysis we use three types of panel co-integration test. One type of tests was introduced by Pedroni (1999) and a second type was introduced by Kao (1999) which is Engle-Granger (1987) two step residual based test, and a third type of tests was introduced by Fisher which is a combined Johansen test. Pedroni (1999) derives seven panel co-integration test statistics. Of these seven statistics, four are based on within-dimension, and three are based on between-dimensions. From Table 3 in every case of opportunity cost except in panel v-statistics long term and difference between long term and short term at 5% level of significance, accept the null hypothesis otherwise in all cases at 5% level of significance we reject the null hypothesis of no co-integration. This means the variable has a long run relationship. Kao Residual Cointegration test also shows us that for every case of opportunity cost at 5% level of significance we reject null hypothesis of no co-integration and every case p-value 0.00 which is highly significance its gives a strong evidence that the variables has a long run relationship.

Table 4: Pairwise Granger Causality Tests

Null Hypothesis:	Obs	F-Statistic	Prob.
Risk Management and Return on Equity			
CM does not Granger Cause ROE	128	0.38315	0.6824
ROE does not Granger Cause CM		2.03831	0.1337
CA does not Granger Cause ROE	128	0.32869	0.7204
ROE does not Granger Cause CA		0.73978	0.4789
RD does not Granger Cause ROE	128	5.41493	0.0053
ROE does not Granger Cause RD		0.54825	0.5791
BC does not Granger Cause ROE	128	0.48049	0.6194
ROE does not Granger Cause BC		0.00290	0.9971
Risk Management and Return on Assets			
RD does not Granger Cause ROA	128	0.59671	0.5523
ROA does not Granger Cause RD		0.04693	0.9542
BC does not Granger Cause ROA	128	0.61335	0.5433



ROA does not Granger Cause BC		1.66769	0.1932
CM does not Granger Cause ROA	128	1.24417	0.2920
ROA does not Granger Cause CM		1.57258	0.2119
CA does not Granger Cause ROA	128	0.79738	0.4530
ROA does not Granger Cause CA		0.57393	0.5649

Source: Extract from E-view

From model 1, the granger causality test presented in table 4 above shows that there is unidirectional causality from risk diversification to return on equity while other variables have no causal relationship. We accept the null hypothesis that there is no causal relationship between risk management practices and return on equity of the quoted commercial banks in Nigeria.

From model II, the model found no causal relationship among the variables, we accept null hypothesis that there is no causal relationship between risk management practices and return on equity of the quoted commercial banks in Nigeria.

DISCUSSION OF FINDINGS

Results from the estimated model found that bank risk diversification has positive but no significant relationship on shareholders return within the periods covered in the study. The finding confirms our a-priori expectations and justifies various measures by bank management to manage risk. Theoretically, the finding is in line with risk management theory and bank management theory such as the real bill doctrine, shiftability theory. Empirically the finding confirms the empirical study of Siyanbola and Adebayo (2021) that credit risk management has a positive significant effect on financial sustainability of listed commercial banks in Nigeria, Anetoh, Nwadiolor, Anetoh and Okeke (2021) that credit risk had a significant but negative effect on firm value of deposit money banks in Nigeria. Operational risk had a significant and positive effect on firm value of deposit money banks in Nigeria but contradict the findings of Ramazan and Gulden (2019) that there is a negative relationship between credit risk and ROA as well as between credit risk and ROE but also confirm the findings of Gadzo, Kpportorgbi and Gatsi (2019) that operational risk influences the financial performance of the universal banks in Ghana negatively.

CONCLUSION

The estimated regression model found that 60 percent variation in return on equity of the quoted commercial banks can be traced to variation in risk management practices as formulated in the regression model. The beta coefficient of the risk management practices proved that risk diversification, Basel compliance, credit monitoring and credit appraisal methods as



formulated in the regression model have positive effect on return on equity of the commercial banks.

From the estimated regression model the study found that 47.6 percent variation in return on assets of the quoted commercial banks can be traced to variation in risk management practices as formulated in the regression model. The beta coefficient of the risk management practices proved that risk diversification, Basel compliance, credit monitoring and credit appraisal methods as formulated in the regression model have positive effect on return on equity of the commercial banks.

From the findings, the study concluded that there is a significant relationship between risk diversification and return on equity and concluded that there is no significant relationship between risk diversification and return on assets. The probability coefficient is less than the critical value of 0.05; the study conclude that there is no significant relationship between Basel risk compliance and return on equity, however the probability coefficient is greater than the critical value of 0.05; the study conclude that there is significant relationship between Basel risk compliance and return on assets.

From the findings, the probability coefficient is less than the critical value of 0.05; we conclude that there is no significant relationship between bank credit monitoring and return on equity, however the probability coefficient is less than the critical value of 0.05; it conclude that there is significant relationship between bank credit monitoring and return on assets. Probability coefficient is greater than the critical value of 0.05; the study conclude that there is no significant relationship between bank credits appraisals and return on equity, however the probability coefficient is less than the critical value of 0.05; it that there is no significant relationship between bank credits appraisals and return on assets.

RECOMMENDATIONS

1. Commercial banks managements should ensure that all the board members and executive managements amongst other stakeholders are trained to appreciate the functions and responsibilities of credit risk management.
2. The study recommends that banks should ensure that their credit exposures are adequately secured through proper scrutiny of loan processing in order to identify viable projects so as to reduce loan defaults by bank customers.
3. Their findings showed that there is a relationship between credit risk management and profitability of Nigeria commercial banks within the periods covered in the study. The study recommends that banks should focus more on credit risk management, especially on the control and monitoring of nonperforming loans, and that managers should focus more on modern credit risk management techniques.
4. Regarding operational risk, banks should reduce leverage and have their portfolio more concentrated on liquid investment income so as to boost profitability. Regulatory authorities and other relevant institutions are enjoined to reassess their supervisory role with the view to strengthen the risk management process and take the issue of risk management seriously at every level of organizations to provide reasonable assurance.



REFERENCES

- Abdullah, M., Shahimi, S., & Ismail, A.G. (2011). Operational risk in Islamic banks: examination of issues. *Qualitative Research in Financial Market*, 3(2), 131-151.
- Abdullahi, I. B. (2007). Banking Sector Reforms and Bank Consolidation in Nigeria: Challenges and Prospects. *Business Journal of Management and Social Sciences* 6(1), 116-125.
- Abiola, I., & Olausi, S (2014). The impact of credit risk management on the commercial banks performance in Nigeria, *International Journal of Management and Sustainability, Conscientia Beam*, 3(5), 295-306.
- Acemoglu, D., Ozdaglar, A., & Tahbaz-Salehi, A. (2015). Systemic risk and stability in financial networks. *American Economic Review*, 105(2), 564-608.
- Adebayo, A. O., & Oluwaremi, F. (2017). Relationship between credit risk management and the performance of money deposit banks in Nigeria. *IOSR Journal of Economics and Finance (IOSR-JEF)*, 8(2), 38 - 48.
- Adebisi, O. S., Adeusi, S. O., Akeke, N. I., & Oladunjoye, O. (2013). Risk management and financial performance of banks in Nigeria. *Journal of Business and Management*. 14(6), 113 - 126.
- Adegbie, F. F., & Dada, O. T. (2018). Risk assets management, liquidity management and sustainable performance in Nigeria deposit money banks. *International Journal of Accounting Research*, 6(2), 1 – 10.
- Adegbie, F. F., & Otitolaiye, E. D. (2020). Credit risk and financial performance: an empirical study of deposit money banks in Nigeria. *European Journal of Accounting, Auditing and Finance Research*. 8(2), 38-58.
- Adekunle, O., Agbatogun, T., Alalade, S. Y., & Cole, A. (2015). Credit risk management and financial performance of selected commercial banks in Nigeria. *Journal of Economic & Financial Studies*, 03(01), 1- 9.
- Adidu, F. A., Akintoye, I. R., & Owajori, A. A. (2011). The challenge of risk management in Nigerian banks in the post consolidation era. *Journal of Accounting and Taxation*, 3(2), 21-23.
- Afonso, A., & Jalles, J. T. (2015). Fiscal sustainability: a panel assessment for advanced economies. *Appl Econ Lett*. 22(11), 925–929.
- Afriyie, H.O., & Akotey, J.O. (2012). Credit risk management and firm value of selected rural banks in Ghana. Catholic University College of Ghana. *M.Sc. Dissertation*.
- Agwor, T. C. & Akani, H. W. (2020). Board composition and profitability of deposit money banks in Nigeria: A multivariate panel data analysis. *Journal of Accounting Information and Innovation*, 6(9), 11-26.
- Ahmad, A. (2018). Does profitability of Jordanian commercial banks get affected by risk? Management practices? *European Journal of Scientific Research*, 148(3), 319-332.
- Ahmad, N.H., & Ariff, M. (2007). Multi-country study of bank credit risk determinants. *International Journal of Banking and Finance*, 5(1), 135-152.
- Akani, H. W. (2019). Effects of cross border banking on growth of deposit money banks in Nigeria. *International Journal of Interdisciplinary Research Methods*, 6(5), 1-26.
- Akani, H. W., & Lucky, A. L., (2014). Money supply and aggregate stock prices in Nigeria: An analysis of cointegration and causality test. *Research Journal's Journal of Finance*, 2 (10), 1 – 24.



- Akani, H.W. & Akani, V. C. (2019). Theoretical perspectives of earnings, profitability and asset quality in banking: Descriptive evidence from Nigeria economy. *World Journal of Finance and Investment Research*, 8(1), 1-24.
- Akani, H.W., & Lucky, A. L. (2020). Financial deficiency syndrome and behaviour of low income Earners in rural communities of Rivers State, Nigeria. *International Journal of Small Business and Entrepreneurship Research*, 8 (1), 14-3.
- Akinselure, O. P., & Akinola, T. A. (2019). Impact of credit risk management on profitability of selected deposit money banks in Nigeria. *International Journal of Economics, Commerce and Management United Kingdom*, 7(9), 78-98.
- Akinselure, O., & Akinola, A. (2019). Impact of credit management on financial performance of Deposit money banks in Nigeria, *International Journal of Economics, Commerce and Management*, 7(9), 254-269.
- Akpan, E.S (2011), Nigerian Financial Institutions in David O. Mbat (Ed), Topical Issues in Finance; Calabar, University of Calabar Press, 24-71.
- Ali, C., Bojan, G., & Roger, A. (2018). Determinants of financial performance of banks in Central and Eastern Europe. *BEH - Business and Economic Horizons*, 14(3), 513-529.
- Ali, S.A. (2015). The effect of credit risk management on financial performance of the Jordanian commercial banks. *Investment Management and Financial Innovations*, 12(1-2), 335-345.
- Aluko, H., (2008). Time preference and international lending and borrowing in an overlapping generations model. *Journal of Political Economy*, 89 (4), 769 – 797.
- Bhattarai, Y.R. (2016). The effect of credit risk on the performance of Nepalese commercial banks. *NRB Economic Review*, 28(1), 41-62.
- Bishnu, P. (2019). Effect of credit risk on the financial performance of commercial banks in Nepal. *European Journal of Accounting, Auditing and Finance Research*, 7(5), 87-103.
- Boyd, John H., & Runkle, David E. (1993). Size and performance of banking firms: testing the predictions of theory. *Journal of Monetary Economics*, Elsevier, vol. 31(1), 47-67.
- Chapelle, A. & Crama, Y. (2008). Practical methods for measuring and management of liquidity and funding risk management, *International Journal of Business and Research*, 3(3), 99-123.
- Gadzo, S.G, Oduro, R., & Asiedu, M.A. (2019). Credit risk on corporate financial performance: Evidence from listed banks on the Ghana stock exchange. *Journal of Economics and International Finance*, 5(3), 12-34.
- George, O., Frimpong S., Jonas, B., Osman, B., & Peter, K. (2015). Credit Risk Management and Its Impact on Financial Performance of Listed Banks in Ghana, *International Journal of Financial Markets*, 2(2), 24-32.
- Gikundi, N.M., Alala, O., Wabwile, E.S., & Musiega, D. (2014). Effect of operational risk in the lending process of commercial banks profitability in Kakamega town. *International Journal of Business and Management Invention*, 3(5), 11-17.
- Girma, J. D., & Jiqin, H. (2018). Effect of deposit mobilization on the financial sustainability of rural saving and credit cooperatives: evidence from Ethiopia. *Sustainability*, 10, 3387.
- Gofman, M. (2017). Efficiency and stability of a financial architecture with too-interconnected-to-fail institutions. *Journal of Financial Economics*, 124(1), 113-146.
- Greuning, H. & Bratanovic, S. B. (2009). *Analyzing banking risk: a framework for assessing corporate governance and risk management*, Washington: The World Bank.



- Hair, J. F., Hult, G. T. M., Ringle, C. M. & Sarstedt, M. (2017). *A primer on partial least squares structural equation modeling (PLS-SEM), 2nd ed.*, Thousand Oaks: Sage Publications, 1-390.
- Kerongo, M. M. & Mwaura, R. W. (2016). The effect of operational risk management practices on the financial performance in commercial banks in Tanzania. *American Journal of Finance*, 1(1), 29-39.
- Muriithi, J. & Muigai, R. (2017). Quantitative analysis of operational risk and firm value of commercial banks using cost income ratio. *IOSR Journal of Economics and Finance*, 8(3), 76-89.
- Muriithi, J. & Waweru, K. (2017). Operational risk, bank size and the firm value of commercial banks in Kenya. *Journal of Finance & Banking studies*, 6(3), 39-50.
- Naceur, B. & Kandil, M. (2009). The determinants of the Tunisian banking industry profitability: Panel evidence. Paper presented at Economic Conference Forum (ECF) 10th Annual Conference, Marrakesh-Morocco, 16th-18th December.
- Naomi, H. (2011). Risk and records management: investigating risk and risk management in the context of records and information management in an electronic environment. Retrieved from <http://www.Northumbria.openrepository.com>
- Ndubuisi C. J. & Amedu, J. M (2018) An analysis of the relationship between credit risk management and bank performance in Nigeria: A Case Study of Fidelity Bank Nigeria PLC. *International Journal of Research and Review*, 7(2), 78-90.
- Ngozi V. Atoi (2018). Non-performing loan and its effects on banking stability: evidence from national and international licensed banks in Nigeria. *CBN Journal of Applied Statistics*, 9(2), 43-74.
- Ramazan, E. & Gulden, P. (2019). Impact of credit risk on banks performance in Turkey, *Procedia Computer Science*, 158 (2019) 979–987.
- Rivai, V., Veithzal, A. (2007). Bank and financial institution management, conventional and sharia system. *Jakarta: PT Raja Grafindo Persada*.
- Saeidi, P., Saeidi, S.P., Sofian, S., Saeidi, S. P., Nilashi, M., & Mardani, A. (2018). The impact of enterprise risk management on competitive advantage by moderating the role of information technology. *Computer Standards & Interfaces*, 63(6), 67–82.
- Santomero, A. M. & Babbel, D. F. (2007). Financial risk management by insurers: an analysis of the process. *The Journal of Risk and Insurance*, 64(2), 231-270.
- Singh, A. (2015). Performance of credit risk management in Indian commercial banks. *International Journal of Management, Business and Research*, 5(3), 169-188.
- Siyanbola, T. T., & Adebayo, K. K (2021). Credit risk management and financial sustainability of listed deposit money banks in Nigeria. *Quest Journals Journal of Research in Business and Management*, 9(6), 64-77.
- Soyemi, K., Ogunleye, J. & Ashogbon, F. (2014). Risk management practices and financial performance: evidence from the Nigerian deposit money banks (DMBs). *The Business & Management Review*, 4(4), 345–354.