

RISK MANAGEMENT AND PERFORMANCE OF THE NIGERIAN BANKING INDUSTRY

Joel Obayagbona ¹⁾, Manson Osagiede ²⁾

^{1,2)} Department of Banking and Finance, Faculty of Management Sciences, University of Benin, Benin City, Nigeria

Corresponding author: joel.obayagbona@uniben.edu

Abstract

The study examines the relationship between risk management and the performance of the Nigerian banking industry. The panel data analysis technique based on the fixed effects estimation was employed to analyze the Nigerian banking industry performance. Risk management related factors such as credit risk, liquidity risk, market risk, interest rate risk and operational risk. A total of 18 most active deposit money banks listed on the Nigerian Stock Market for a period of 22 years (2000 to 2021) were used in the analysis. The empirical findings revealed that credit risk and operational risk variables were negative and do not have any significant relationship with the performance of the Nigerian banking industry while liquidity risk and market risk have significant positive effect on bank performance, interest rate risk has significant negative relationship with banks performance in Nigeria within the period of study. The study recommends among others that, banks' management should have proper understanding of how credit policy affects the operations of their banks to ensure judicious utilization of deposits and maximize profit. Improper credit risk management reduces bank profitability, affects the quality of its assets and increases loan losses and non-performing loan which may eventually lead to financial distress.

Keywords: Risk Management, Performance, Banking Industry

Introduction

The banking sector is unarguably among the most sensitive and crucial sector of any economy. It is often regarded as the life wire of the economy due to its ability to provide capital to other sectors of the economy. Indeed, the tendency to give the necessary funding and still remain profitable is a function of the ability of banks to mobilize sufficient deposits in the economy and other external source of financing. Banking sector provide the platform that enable savers lodge their money and borrowers are able to access those money as loans for production investment. Financial intermediation focuses on deposit transformation into real productive capital. Banks therefore guarantee that mobilized deposit funds are properly converted into productive capital. In carrying out its financial services of acceptance of deposit and pay out same on demand, offering credit facilities to credit worthy customers, coupled with several other related financial services, deposit money banks are usually expose to exchange rate risk, credit risk, liquidity risk, fraud, default risk, market and operational risk among others. In order to reduce or eliminate the effect of these risks on its daily operations, there is the need to effectively handle them via well prearranged procedures for managing risks; such that the overall profitability of the bank would be achieved at the end of the day (Zipheng, 2010).

According to Zidafamor (2016), the way for proper management of risk is necessarily not by removing the risk. For example, credit operations of deposit money bank possess insider risk of probable credit losses, but by risking, deposit money bank can work out a compensation for risky investments and makes profits. Risks can therefore be "a source of income to deposit money bank. Risk being the central focus of risk management is the exposure to loss arising from the variation between the expected and actual outcomes of investment activities" (Nzotta, 2002; Owualla, 2000). Previous bank failures in Nigeria indicate that financial institutions often take extreme risks which vary across the systems. Some banks assume risks above the scope of their capital (Meté, 2006); while others are more prudent and are able to effectively handle financial crisis. In attempt to reduce incidences of bank failures, the Central Bank of Nigerian in 2004, declared actions to secure the whole banking sector, a summarized approach and steady state that possibly will strengthen public confidence and thus, become conduits for doing appropriate intermediation (Stephen & Joseph, 2015). In spite of all these measures, managing risk in banking sector of Nigeria has not yielded needed outcome because of bottlenecks such as internal loans and ineffective policies among others. This study therefore assesses risk management and the performance of the Nigerian banking industry.

Statement of the Research Problem, several empirical studies abound on the relevance of risk management to bank profitability in Nigeria and other parts of the globe. Most of these studies employed both primary and secondary data, and have submitted mixed findings based on the specific variables used in their analysis. For instance, Kargi (2011), Wanjohi (2013), Muteti (2014) Ogboi and Unuafe (2013), Okere, Isiaka and Ogunlowore (2018) and Ogunlade and Oseni (2018) submitted that sound credit risk management and capital adequacy have significant positive relationship with banks' financial performance in Nigeria, with exception of loans and advances that was discovered to be negatively related with banks' profitability. On the other hand, while Adeusi, Akeke, Obawale and Oladunjoye (2010) observed negative connection between

doubtful loans and financial performance, capital asset ratio was found to be directly related and significant. Therefore, given the above conflicting findings, this current study became necessary in order to ascertain the current direction of connection between the performance of banks and management of risks in Nigeria.

In the context of the method of data analysis, most of the studies reviewed employed descriptive statistics, correlation, panel data, ordinary least square and VECM, among others. Less than 5 percent of these studies employed panel data investigation. Hence, this study will use the panel data analysis in its empirical analysis. The reason being that panel data analysis is found to be more sophisticated in handling studies that involve both cross section and time series data which are usually susceptible to omitted variables.

Also, drawing policy conclusion from empirical findings from studies from other countries for the Nigerian case might amount to committing error of generalization, because, their banking environment, managerial prowess coupled with the associated risks might be quite different from those of Nigeria. Thus, this study being Nigerian-specific will provide first-hand information to relevant authorities on how best to manage the risk aspect of banking services in order to sustain profitability.

Finally, most of the previous studies like Onaolapo (2012), Ogboi and Unuafé (2013), Ogunlade and Oseni (2018), Noor and Prahallad and Banik (2018) focused mainly on credit risk management aspect of banks without undertaking a broader investigation of other risks components that are inherent in banking activities. However, this study thus focus not only on credit risk but also on other relevant and related risks such as (capital adequacy, exchange rate risk, asset quality, interest rate risk, liquidity risk) that are capable of undermining the overall performance of bank if not effectively managed.

Literature Review

Concept of Bank Performance

Banks' performance is same as profitability, that is, amount of profit for banks (Ceylan, Emre & Aslt, 2017). The global performance of a bank is characterized by its overall results given by the profitability level. It is usually calculated as ratios. As put forth by Tafri et al., (2015), Qin & Pastory (2016), and Ruziqa (2015), performance is obtained by using Return on Equity (ROE). It is utilized to predict success or failure of deposit money banks (Sam & Simon, 2012).

In other word, a bank's financial performance, from the perspective of firm owners, is taken to be how more improved the owners are at year end, than he has been at start of the year and we can know this via ratios calculated from financial statements; using income statement and balance sheet, or employing stock market prices data Berger and Patti (2002). These ratios offer a proxy of whether the bank is realizing owners' aim of creating more wealth, and put side by side a company's ratios with other banks or to discover trends of performance with time. The measurement of performance must give an indication of how wealthier the shareholder has become as a result of the investment over a specific time."

The ratio of profits of the firm over owners employed capital shows the use of the owners' funds in bringing about total profit of the firm given as:

Return on Equity (ROE) = $\frac{\text{Net profit after Tax Equity}}{\text{Equity}}$ Where equity is the shareholder's funds at end of the same time.

Other ratios used to evaluate performance of a firm with regards to owners' interests are the dividend rate, that calculates returns to the owners from their investment in the share of company, and the market value of the firm put side by side to its book value, which gives the change in shareholders' value of investment. Brockington (1990) gives the dividend payout rate as:

$$\text{Dividend Payout Rate} = \frac{\text{Dividend} \times 100}{\text{Share Price}}$$

Given that dividend is the amount of dividend per share and the share price is nominal price.

The ratio of market value (MV) to book value (BV) of the share shows how the share has increased from the nominal value to the market price, and is expressed as:

$$\text{MV: BV} = \frac{\text{Market value per share}}{\text{Book value per share}}$$

Concept of Risk

Risk has diverse meanings; scholars have described risk in numerous ways. Hansel (1999) defines risk as likelihood of loss, odds of casualty. Mordi (1989) sees risk as the chances of inaccuracy, odds of an event occurring or not. Nzotta (2002) defines risk as a chance of loss, chance of mishap, an unwanted and uncertain event, uncertainty of financial loss, objective doubt, concerning the outcome in a given situation or a combination of hazards. Risk is the exposure to loss arising from the variation between the expected and actual outcomes of investment activities. According to Nwankwo (1991), risk management is most important in carrying out the activities of business entity because of consequent effect it can bring on the existence of

the business entity. It shows that for a firm's certainty of achieving its aims with growth and survival, managing risk becomes imperative. In the words of Olowe (1998), risk is a possibility of loss, injury, damage or peril in life. It is inherent in every day's life especially in the life of a banker. With respect to this research work, we express risk as the likelihood of financial loss. An effective management of banking risk requires a well-articulated risk management policy and strategy.

Credit Risk and Bank's Performance

In the words of Chang (2003) credit risk is referred as default risk. He stated that "it is the risk link with repayment of a credit advances made by a deposit money bank. Credit risk is the likelihood which a bank borrower may not meet the obligations on agreed terms. Credit risk is inherent to the business of lending funds and to the operations connected closely to market risk variables. The aim of managing credit risk is to reduce risk and increases bank's risk adjusted rates of return by taking for granted and maintaining credit exposure within the allowed parameters."

Chang (2013) argues that the role of banks in credit creation process is considered very relevant in sustaining financial stability, but strong financial foundation is often shaken by impaired credits referred to as Non-Performing Loans (NPLs). He argued that the success of any business enterprise especially banks, is to add value to their shareholders' wealth by remaining in profit at the end of their financial year, and when this profit or surplus is impaired by high default rate in loan repayment, the degree of success of the bank becomes greatly challenged such that the health of the bank will become doubtful. Loans are the major output provided by banks, but loan is a risk output. There is always a foreseen risk of non-repayment of a loan before the loan will finally become non-performing which may be taken as undesirable output or cost to a bank and impact negatively on the bank (Chang, 2013).

Liquidity Risk and Bank's Performance

Liquidity risk is one of the major debt short-fall which is connected with a deposit withdrawal or a reduction in borrowing power. According to Ibe (2015), liquidity risk plays an important function in success of a business firm. Also, the capacity of banks to perform their intermediation and credit creation roles in a manner that guarantees optimal profitability and at minimum risk is greatly hinge on having adequate liquidity. This liquidity-profitability mix provides stability and confidence in banks and the financial system in general as it is the panacea for confidence (Ogbuabor & Malaolu, 2016; Okoye & Eze, 2014). The study of Niresh (2014) on the trade-off between liquidity and profitability of over 31 manufacturing firms quoted in the Colombo Stock Exchange showed that liquidity is not significantly related to profitability; thus concluded that manufacturing companies focus on maximizing profit with the goal of liquidity. However, Ajibike, & Aremu (2015) in Nigeria shows a direct connection between liquidity and performance. Adding that, banks should increase their liquidity basis to achieve higher performance, since liquidity and size are major factor of the performance of firms in Nigeria.

Market Risk and Bank's Performance

Market risk shows chance that banks may sustain losses resulting from variations in interest rates, foreign stock prices; market related measures and / or currency exchange rate. Market risk is a major source of fluctuation in earnings in banking industries across the globe today. According to Worzala (2011) "form of market risk arises also where banks accept financial instruments exposed to market price volatility as collateral for loans." As also stated by Cornelia (2012) that "price movements or volatility rises and falls in day-to-day market, market risks does result to major losses in the immediate in volatile market conditions and also complete institutional collapse in severe situations." Singh's (2013) submitted that currency swaps, forwards and spots are significantly related with commercial banks performance. In a similar view, Wong & Leung (2013) in china opined.

Interest Rate Risk and Bank's Performance

Interest rate shows the variation in value of asset or liability in financial nature caused by variation in general rates of interest. Reinvestment risk could also proxy for interest rate risk that is likelihood that financial institutions may not have the ability to plough-back its interim cash flows at interest rates needed to pay for its liabilities.

Again, interest rate is a market risk variable and banks' financial performance is exposed to interest rates movements. The impact of interest rate is also an indicator of market risk since a movement in interest rate may result in mismatch between interest paid on deposit and the interest received on loans. "Profitability rises as interest rates rise because to a greater margin between the Central Bank's rate and the rates are charged by a bank to its customers" (Opoku-Adarkwa, 2011). There is possibility of an investor loosing likely profit where interest rates increase after committing to definite interest rate. When interest rates change it impacts the value of the instrument (BCBS, 2000). It is the potential for changes in interest rates that reduces bank's earnings.

Operational Risk and Bank's Performance

With respect to operational risk, Ayodele and Alabi (2014) stated that “the concern here is that system failure or human error will result in losses to the bank that could substantially affect its viability. The operational risk is conceived as the risk of loss arising from failed processes, people and systems as well as external events. In other words, operational risk refers to the possibility that transactions or processes can fail as a result of poor design, poorly trained personnel and external disruptions.” Also, Santomero (2014) stated that “Operations risk known in treatment of customer transactions and errors, unethical conduct and certain other circumstances may results in some losses. Typical examples are disparities between actual cash and cash balances and customer complaints covering transactions. Accurate and rapid fulfillment of transactions requested by customers is the foundation of trust in the services of banks, and as banking activities become more diverse, proper management of these activities is essential to lessen and minimize operations risk.

Empirical Literature

Noor, Prahallad and Banik (2018) investigate a study on the effect of managing credit risk on performance of banks in Bangladesh for the period 2000 to 2015. Return on investment (ROI), return on equity (ROE), return on assets (ROA), were respectively proxies for bank's profitability. Using the VECM model on co-integration econometric analysis, the empirical results revealed that, there exists co-integration among the study variables. In regression analysis, it was also found that POCL has significant negative impact on ROI. The impact of POCL is not significant on ROA and ROE in the short run. But in the long run, there is significant effect of POCL on ROA and ROE.

Githaiga (2015) carried out analysis on the effect of credit risk management on the banks' financial performance. Using multiple regression analysis the study revealed that asset quality has a negative and insignificant relationship with return on asset.

Kajola et al. (2018) explored the effect of credit risk management on the bank performance of 10 listed banks in Nigeria for the period 2005–2016. Using the random effect generalized least square (RGLS) regression, credit risk (Non-performing loans to total loan ratio (NPLLR), Non-performing loans to total deposit ratio (NPLDR) and capital adequacy ratio (CAR) has significant relationship with ROA and ROE proxies for bank performance.

Okere, Isiaka and Ogunlowore (2018) examine the impact of risk management (credit and liquidity) on financial performance of 10 Deposit Money Banks in Nigeria. The study employed panel data analysis techniques. Results from the empirical results showed a positive relationship between risk management and financial performance of money deposit banks. The study recommends that banks in Nigeria should augment their capacity in, liquidity risk analysis, and credit analysis and loan administration while the regulatory bodies should pay more attention to banks' compliance to regulations of the Bank and other Financial Institutions prudential guidelines.

The study of Olalekan, Olumide and Irom (2018) examines the effect of financial risk management on profitability of 14 commercial banks listed on the Nigerian Stock Exchange for a period of 6 years (2011 to 2016). Employing the multiple regression technique, the findings revealed that liquidity risk has an insignificant positive effect on profitability. Also, the credit risk revealed a significant negative effect on the bank profitability, while the capital adequacy risk was also found to have a positive and significant effect on profitability of the commercial banks in Nigeria.

Methods

Research Design

The basic design adopted in here is the longitudinal survey (ex-post facto) research design. The ex-post facto suggests that the variable under investigation have already occurred and therefore, the researcher cannot manipulate them.

Population and Sample Size

The population comprises of all deposit money banks listed on the Nigerian Stock Market as at December 31, 2021. As at December 31, 2021, a total of 24 banks were listed on the Nigerian Stock Market. From this population, a sample size of 12 most active banks were simply chosen because of data availability coupled with those banks that must have fulfilled their obligation of publishing annual reports for the year ended 31st December 2000 to 2021.

Model Specification

The model specified in this section therefore flows from the above theoretical framework, based on the panel regression analysis procedure that is adopted in the study. The baseline panel data model (following Woodridge, 2004) is specified as:

$$y_{it} = x'_{it}\beta + z'_i\alpha + \varepsilon_{it} \quad (3.1)$$

- Where y = The dependent variable (measured as return on asset (ROA))
- x = Vector of all the variables used in the estimation including:
- BPER = Deposit Money Banks' Performance
- CRDR = Credit Risk
- LIQR = Liquidity Risk
- MKTR = Market Risk
- INTRR = Interest Rate Risk
- OPRR = Operational Risk
- z = unobserved factors that are specific to each bank that is selected in the sample
- β = estimated coefficients in the model
- α = the constant within the company-specific factor
- ε = stochastic error term.

The a-priori expectations are $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5 > 0$

More specifically, the econometric form of the above model is further stated as follows:

$$BPER_{t-1} = \beta_0 + \beta_1 CRDR_{t-1} + \beta_2 LIQR_{t-1} + \beta_3 MKTR_{t-1} + \beta_4 INTRR_{t-1} + \beta_5 OPRR_{t-1} + \varepsilon \dots \dots \dots (3.2)$$

Data Analysis Techniques

The analytical technique employed here are the correlation analysis, descriptive statistics and the panel data regression analysis. The use of panel data regression is justified in this study because of the pooled data set involving several listed banks in Nigeria. The purpose for this is to be able to isolate other bank-specific risk determinants which impact bank's performance in Nigeria and be able to evaluate them. Moreover, pooled data have been known to possess endogeneity problems' arising from the lack of uniformity in distribution. This is due to firm-level characteristics that exert further influences on the variables. These factors may not be articulately captured in OLS estimation; the panel data modeling technique helps to avoid this problem. Thus, in conducting panel data analysis, two major effects (random effects and the fixed effects) are conducted. However, in order to choose between the two effect regression (fixed effect and random effect), the Hausman test specification is performed using the Eviews 8.0 econometric software package.

Result and Discusssion

In this section, we brought to bear the methods of data analysis earlier stated in previous section. These include descriptive statistics and panel data analysis.

Descriptive Statistics

The descriptive statistics for the entire sample is presented in Table 1

Table 1. Descriptive Statistics Table

	Mean.	Med.	Max.	Min.	Std. Dev.	Skew.	Kurt.	J-B.	Prob.
ROA	0.0229	0.0187	0.7107	-0.4479	0.0694	4.2124	56.958	42501.1	0.000
CRDR	0.0977	0.0519	1.256800	-0.3502	0.1393	3.0664	19.323	4332.9	0.000
LIQR	0.5382	0.3307	11.379	0.0218	1.2060	6.7382	51.932	36708.7	0.000
INTRR	4.2913	0.4232	381.74	0.0301	35.097	10.111	105.45	155408.1	0.000
MKTR	4.0228	1.6050	43.750	-7.19	5.2439	3.2013	18.812	4147.1	0.000
OPRR	1.5548	1.1062	23.596	0.0172	2.1470	6.7100	63.010	53883.7	0.000

Source: Author's computation (2022)

The mean performance (ROA) value is N0.0229 million Naira for the entire sample, while the median value is 0.0187. The data appears to be skewed to the right, and that explains why the mean is greater than the median value. This was further confirmed by the skewness coefficient of 4.2124 which indicates that the distribution was positively skewed to the right. The maximum value of the entire sampled banking industry performance overtime was about 0. 0.7107, while the minimum value is -0.4479. This suggests that more banks in the industry perform very well than others within the period of investigation. That is while the minimum ROA (performance) value negative (-0.44791). Again, the pattern of performance among the banks in the industry also varies as indicated by the high standard deviation value of 0.0694 when compared to the mean value of 0.02595. The Jaque-Bera (J-B) statistic value of 1794.862 for the industry performance variable is significant at the 1 percent level and implies that the probability distribution of the sample for the variable is not normally distributed. This invariably suggests the existence of heterogeneous and bank-specific characteristic among the sampled banks in the industry.

The mean value for credit risk (CRDR) is 0.0977, while the maximum value is 1.256800. By implication, more banks in Nigeria are faced with credit risk management even though the average industry risk seems to be low. In other word, credit risk liabilities are higher than financial performance for the Nigerian banking industry. The degree of variability in terms of risk among the banks is also high. The 0.1393 value of the standard deviation being higher than the compared to the mean value clearly attests to this. The skewness

coefficient of 1.45062 indicates that the distribution is positively skewed to the right, which was a common feature of the credit risk.

The average liquidity risk value (LIQR) is 0.5382 with corresponding high maximum value of 11.379. The standard deviation value of 1.2060 shows that, there is a large spread in liquidity risks among the sampled banks in the industry. The variable is positively skewed to the right and the J-B statistic values (36708.7) for variable is significant at the 1% level. This also indicate non-normal distribution, an indication of heterogeneity in the pattern of liquidity risk in the industry overtime.

The mean value of interest rate risk variable and those of market risk (4.2913; 4.0228) are very high compared to their median values of 0.4232 and 1.6050. The wide gap between their maximum values (381.74; 43.750) and their minimum values (0.0301; -7.19) coupled with those of standard deviation values of (35.097; 5.2439) are clear indications of the high level of disparity in terms of interest rate risks and market risks faced by banks in the industry. The variables are also skewed to the right and the J-B statistic values (155408.1; 4147.1) for variables are significant at the 1% level respectively.

The average value operational risk stood at about N1.5548 and its maximum value reaches over N23.596 billion. There appeared to be wide variations in the operational risk of banks, the standard deviation is high as compared to the mean value across the sampled banks in the study. Although the skewness value (6.7100) is positively skewed, indicating that more banks in the industry have operational risks that are higher than the reported mean value. The J-B statistic also shows non-normal distribution, an indication of heterogeneity in the pattern of banks operational risks within the period of study.

Hausman Test for Panel Effects

The standard test for the method of panel data analysis is the Hausman test specification for random effects (Green, 2008). Hence, we conduct the Hausman test in order to determine the best effects model to be adopted. The Chi-square statistic value for the model is significant at the 1 percent level. From this result, the statistic provides little evidence against the null hypothesis that there is no misspecification when the Fixed-effect model is employed for the analysis. Hence, the best method to apply for the model estimation is the Fixed-effect strategy.

Table 2. Hausman Test for Panel Effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	24.951	6	0.0003

Source: Author's computation 2022

Estimation of Risk Management and Performance of the Nigerian Banking Industry

The empirical estimation of the effect of risk management on the performance of the Nigerian banking industry is carried out in this section. Although, the Hausman test has shown that the Fixed Effect (FE) estimates are more appropriate in the estimations, we also include the Random Effects (RE) estimates for the purpose of robustness checks. The result of the estimates of the initial model with basic banking industry performance related factors is presented in Table above. From the result, the goodness of fit is not too impressive due to the R squared value of 0.33, indicating that over 33 percent of the systematic variations in banking industry performance is captured by changes in the explanatory variables. The adjusted R-squared value of 0.28 percent is equally weak and it implies that the model has a weak predictive ability. However, given that the data set used is a panel, the outcome of the adjusted R squared may not pose estimation threats to the results (Madalla, 2004; Wooldridge, 1994). The F-statistic value of 6.3637 for the result is high and passes the significance test at the 1 percent level, suggesting existence of significant relationship between Nigerian banking industry performance and all the independent variables.

Risk Management and Performance of the Nigerian Banking Industry Estimates (Dependent Variable =ROA)

Table 3. Risk Management and Performance of the Nigerian Banking Industry Estimates

Variable	<i>Fixed Effects(EF)</i>			<i>Random Effects(RE)</i>		
	Coeff.	t-Stat.	Prob.	Coeff.	t-Stat.	Prob.
Constant	0.001345	0.207828	0.8355	0.004079	0.740102	0.4598
CRDR	-0.006088	-0.173292	0.8625	0.001910	0.078649	0.9374
LIQR	0.025342	4.553401	0.0000**	0.026956	5.466161	0.0000
INTRR	-0.000624	-3.624595	0.0003**	-0.000740	-4.512973	0.0000
MKTR	0.001010	1.192210	0.0234*	-0.000326	-0.554563	0.5796
OPRR	-0.001482	-1.021843	0.3077	-0.001223	-0.890981	0.3736
ROA(-1)	0.317488	6.158607	0.0000**	0.372499	7.763737	0.0000
R-squared	0.33			0.26		
Adj.R-squared	0.28			0.25		
F-statistic	6.3637	DW = 1.84		18.982	DW = 1.80	

Source: Author's computation (2022) Note: **1% level of sig; *5% level of sig.

The relevance of each of the variables in the model is determined by considering the individual coefficients of the variables in terms of significance and signs. From the analysis in table above, the coefficients of credit risk (CRDR), interest rate risk (INTRR) and operational risk (OPRR) variables do not possess the correct positive signs in line with the apriori expectation in the model, as they were negatively signed. However, the coefficients of liquidity risk (LIQR), and market risk (MKTR) are the only variables possessing the expected positive apriori signs.

In particular, the coefficient of credit risk (CRDR) being one of the most important and sensitive aspect of all deposit money banks risks management activities is negatively signed and it failed the 5 percent level of significance. This indicates that credit risk has an insignificant negative relationship with the performance of the Nigerian banking industry over time. The implication of this result is imperative because the negative sign (though not significant) is an indication of the tendency of inappropriate management of credit risk could have adverse effect on performance. This result suggests that the Nigerian bank industry within the period of study has actually adhere to credit appraisal policies which ensures that only credit worthy borrowers have access to loanable funds; hence, the negative consequences were not severe on the banks overall performance. This aligns with the arguments in the extant literature that sound credit risk management strategies can boost investors and savers confidence in banks and lead to a growth in funds for loans and advances to the private sector of the economy, which in turn, leads to increased bank profitability. The finding agrees with those of Kithinji (2010) who find insignificant negative relationship between performance and credit risk. The finding however agrees with the studies of Oluwafemi and Obawale (2010), Mohd and Salina (2010), Muhammed et al (2012), Kamau (2010), Wanjohi (2013) and Muteti (2014) who submitted significant positive relationship with performance, as well as those of Serwadda (2018), Adeusi, Akeke, Obawale and Oladunjoye(2010), Ogboi and Unuafe (2013) who concluded significant negative relationship between credit risk management and bank performance.

Liquidity risk (LIQR) is significant and passes the 1 percent significance level. This implies that the level of liquid assets held by a bank at any point in time is a significant determination of its performance. An increase in deposits will help the banks to increase their profitability. Liquid assets such as cash and government securities generally have a relatively low return; therefore, holding them imposes an opportunity cost on a bank. This finding is also seen to align with those of Oluwasegun and Samuel (2015), Ahmad (2016), Saleem and Rehman (2011), and Shafana (2015) who submitted positive and negative relationships between liquidity ratio and banks' performance. This finding however disagreed with the studies of Kamau (2010), Olalekan, Olumide & Irom (2018) who did not find any significant relationship between liquidity risk and banks' performance.

The coefficient of interest rate risk (INTRR) has significant negative relationship with bank performance as it passes the 1 percent significance level. Indeed, it is seen that a unit change in interest rate risk reduces overall banks' performance by -0.000624 percent. This implies that effective management of interest rate risk portion of banks is very key to the industry performance and failure to do so will mar the fortune of the entire banking industry. For this reason, management and relevant stakeholders must focus more attention on this all important macroeconomic variables in order to continuously assure performance. Theoretically, changes in interest rate should lead to a mismatch between interest paid on deposit and the interest received on loans. This view was also corroborated by Opoku-Adarkwa (2011) that, interest rate risk factor has adverse effect on bank's earnings and economic position, estimated in each currency that banks have interest rate sensitive securities and off-balance sheet positions. The finding disagrees with those of Muteti (2014), Doyran (2013), Saksonova (2014), Ghani and Mahmood (2015) who submitted significant positive relationship between interest rate risk and bank performance.

The coefficient of market risk (MKTR) has significant positive relationship with banks' performance, it was significant at the 5 percent level. Indeed, a unit increase in market risk leads to more than 0.001010 percent increase in banks performance in Nigeria. Usually, market risk is outside the control of the banks as it is determined by factors that affect the overall economy (Aruwa & Musa, 2014). It shows the chance that banks may sustain losses resulting from variations in interest rates, foreign stock prices, market related measures and/or currency exchange rate. This finding is in conformity with the studies of Singh's (2013), Aburime (2014) and Mouna and Anis (2015) who concluded significant positive relationship between market risk and banks' financial performance.

Banks operational risk (OPRR) is the risk of losses arising from failed processes, people and systems as well as external events. It is the possibility that transactions or processes can fail as a result of poor design, poorly trained personnel and external disruptions. According to Eptimehin and Obafemi (2015), "operational risk, thus, result in operational losses and these losses made are cost to bank". The result from this study therefore has shown that operational risk has an insignificant inverse relationship with banks' performance. This suggests that though, operational risk may have the tendency of reducing performance but its impact has not been significant to the extent of affecting/reducing banks' overall performance within the period of investigation.

The lagged value of return on assets (ROA) passes the 1 percent level of significance. It indicates that the previous values have significant impact on banks' performance than the current values. The overall results obtained from the model estimation are effectively acceptable because the D.W. statistic value of 1.84 is appropriate and shows the absence of multicollinearity among the hypothesized variables. Thus, the results are applicable for structural analysis as well as policy directions.

Conclusion

The study has examined the relationship between risk management and performance of the Nigerian banking industry. Banking industry performance was specifically examined in the light of risk management related factors such as credit risk, liquidity risk, market risk, interest rate risk and operational risk of 18 most active banks listed on the floor of the Nigerian Stock Market for a period of 22 years (2000 to 2021) the panel data analysis technique based on the fixed effects estimation was employed. The study therefore conclude that the place of effective risk management in banking industry cannot be under estimated due to the fact that it involves the exposure to loss arising from the variation between the expected and actual outcomes of investment activities.

References

- Adeusi, S. O., & Obawale, S. (2010). Risk management and financial performance of banks in Nigeria. *International Journal of Economics and Financial Issues*, 14(6), 52-56.
- Adeusi, S. O., Akeke, N.I.A., Obawale, S., & Oladunjoye, O. (2010). Risk management and financial performance of banks in Nigeria. *IOSR Journal of Business and Management*. 14(6), 52-56. s.
- Ahmad, B. R. (2016). A study of relationship between liquidity and profitability of standard chartered bank Pakistan: Analysis of financial statement approach. *Double Blind Peer Reviewed International Research Journal*, 16(1), 40-53.
- Aremu, O. S., Suberu, O. J., & Oke, J. A. (2010). Effective credit processing and administration as a panacea for non-performing assets in the Nigerian Banking System. *Economics 1 Entrepreneurship*, 1(11),514-522.
- Ashraf,Rajan, R., & Dhal, S. (2009). Non-performing loans and terms of credit of public sector 1 Macroeconomic Determinants of Bank Profitability. *MPRA Paper*. 153; 1-15.
- BCBS (2001). Risk management practices and regulatory capital: Cross-sectional comparison. Retrieved on 5/8/2020 from at:www.bis.org.
- Ayodele, T.D., & Alabi, R.O. (2014). Risk management in Nigeria banking industry. *Research Journal of Finance and Accounting*, 5(2), 131-136.
- Bain, J. S. (1959). *Industrial organization*. New York: Wiley.
- Barney, J. B., & Arikan, A. M. (2001). The resource-based view: Origins and implications. In M. A. Hitt, R. E. Freeman,& J. S. Harrison (Eds.), *The Blackwell handbook of strategic management*: 124-188. Oxford, UK: Blackwell.
- Brandenburger, A., & Nalebuff, B. (1996). *Co-opetition*. New York: Doubleday.
- Ceylan, O., Emre, O., & Ash, D. H., (2017). The Impact of Internet-Banking on Bank Profitability: The Case of Turkey. *Oxford Business & Economics Conference Program*.
- Crook, T., Ketchen, D., Jr., Combs, J., & Todd, S. (2008). Strategic resources and performance: A meta-analysis. *Strategic Management Journal*, 29, 1141-1154.
- Demsetz, H. (1973). Industry structure, market rivalry, and public policy. *Journal of Law and Economics*, 16, 1-9.
- Demsetz, H. (1974). Two systems of belief about monopoly. In H. J. Gold schmid, H. M. Mann, & J. F. Weston (Eds.), *Industrial concentration: The new learning*: 164-184. Boston: Little, Brown.
- Doyran, M.A. (2013). Net interest margins and firm performance in developing countries. *Management Research Review*, 36(7), 720-742.
- Gimeno, J. (1999). Reciprocal threats in multimarket rivalry: Staking out “spheres of influence” in the U.S. Airline Industry. *Strategic Management Journal*, 20, 101-128.
- Ghani, R.A., & Mahmood, R.(2015). Risk management practices and performance of microfinancing banks in Malaysia. *Academia Journal UiTMT*, 4(2), 26-33.
- Githaiga, J. W. (2015). *The Effect of Credit Risk Management on the Financial Performance of Commercial Banks*.
- Hansel, D. H. (1999). *Elements of Insurance* London, periodic Publications.
- Kamau, P.N. (2010). *Research on adoption of risk management by commercial banks in Kenya*. Unpublished MBA project, School of Business, University of Nairobi
- Karnani, A., & Wernerfelt, B. (1985). Research note and communication: Multiple point competition. *Strategic Management Journal*, 6, 87-96.
- Kargi, H. S. (2011). *Credit risk and the Performance of Nigeria banks*. Unpublished M.sc Thesis Ahmadu Bello University Zaria, 1-60.
- Kithinji, K.M. (2010). *Research on Credit Risk Management and Profitability of Commercial Banks in Kenya*. Unpublished MBA project, School of Business, University of Nairobi, 1-65
- Kojola, S. O., Olayiwola, P. O., & Ekpudu, J. E. (2018). Working Capital Management Practices and profitability in Nigeria. *Izvstiya, Varna University of Economics*, No.3-4, 200-218.
- Kolapo, T. F., Ayeni R. K., & Oke, O. (2012). Credit risk management and banks Performance. *Australian Journal of Business and Management Research*, 1-16.
- Lalon, M. R. (2015). Credit risk management (CRM) practices in commercial banks of Bangladesh: A study on basic bank Ltd. *The International Journal of Economics, Finance and Management Sciences*, 3(2), 78-

90.

- MacDonald, G., & Ryall, M. D. (2004). How do value creation and competition determine whether a firm appropriates value? *Management Science*, 50, 1319-1333.
- Maddala, G.S., & Wu, S. (1999). A comparative study of unit root tests with panel data and a new simple test. *Oxford Bulletin of Economics and Statistics*, 61(S1), 631-652.
- Mete, F. (2006). Risk management in banks and other financial institutions: lessons from the crash of long-term capital management (LTCM). *Bank and Bank Systems*, 1, 3-20
- Mohd, N., & Salina, H.J.K. (2010). Risk management practices and financial performance of Islamic Banks: Malaysian Evidence. 8th International Conference on Islamic Economics and Finance, 1-26.
- Molyneux, P., & William, F. (1995). Market structure and performance in European Banking, *Applied Economics*, 27, 155-159.
- Mordi, O. (1989). Lecture Notes on Principles on Insurance at Anambra State University of Science and technology (Unpublished)
- Muhammed, et al (2012). Credit risk and the performance of Nigerian banks. *Interdisciplinary Journal of contemporary research in business*, 1-14.
- Muteti, S.R. (2014). Research on relationship between financial risk management and financial Risk management in Kenya. Unpublished MBA project, School of Business, University of Nairobi, 1-60
- Noor, A., Prahallad, C. D., & Banik, B.P. (2018). Impact of credit risk management on financial performance of banks: a study on major state-owned commercial banks in Bangladesh. *The Cost and Management*, 46(1), 12-19.
- Nwankwo G.O. (1991). *Bank Management, Principle and Practice*, Lagos: Malt House Press Ltd.
- Nzotta, M.S. (2002). *Corporate Financial Decisions*, Owerri: Oliverson Industrial Publishers.
- Ogboi, C., & Unuafe, O.K. (2013). Impact of credit risk management and capital adequacy on the financial performance of commercial banks in Nigeria. *Journal of Emerging Issues in Economics, Finance and Banking. An Online International Monthly Journal*, 2(3), 703-717.
- Ogunlade, O., & Oseni, M. (2018). Credit management practices and bank performance: evidence from first bank. *South Asian Journal of Social Studies and Economics*, 1(1), 1-10.
- Okere, W., Isiaka, M. & Ogunlowore, A. (2018). Risk management and financial performance of deposit money banks in Nigeria. *European Journal of Business, Economics and Accountancy*, 6(2), 30-42.
- Olalekan, L.I., Olumide, M.L., & Irom, I.M. (2018). Financial risk management and the profitability: an empirical evidence from commercial banks in Nigeria. *Sahel Analyst. Journal of Management Sciences*, 16(2), 118-135
- Oluwasegun, A. J., & Samuel, A. (2015). The impact of liquidity on Nigerian bank performance: A dynamic panel approach. *Journal of African Macroeconomic Review*, 5(2), 318-324.
- Onaolapo, A. R. (2012). Analysis of credit risk management efficiency in Nigerian commercial banking sector. *Far East Journal of Marketing and Management*, 1, 11-21.
- Owualla, S.I (2000). *Principles of Financial Management*, Lagos: G. Mag Investment Ltd.
- Ricardo, D. (1817). *Principles of political economy and taxation*. London: J. Murray.
- Ruziqa, A., (2015). The Impact of Credit and Liquidity Risk on Bank Financial Performance: The case of Indonesian Conventional Banks with Total Assets above 10 Trillion Rupiah. *International Journal of Economics Policy in Emerging Economics*, 6(2), 93-106.
- Saksonava, S. (2014). The role of net interest margin in improving bank's asset structure and assessing the stability and efficiency of their operations, *Procedia-Social and Behavioural Sciences*, 150(5), 132-141.
- Saleem, Q., & Rehman, R. U. (2011). Impacts of liquidity ratios on profitability. *Interdisciplinary Journal of Research in Business*, 1(7), 95-98.
- Sam, H., & Simon, N. (2012). Profitability and Risk Management in Banking: A Comparative Analysis of Egypt and Lebanon. In Simon, N., & Colton, N.A., (eds): *Money and Finance in the Middle East: Miss Opportunities or Future Prospect(s)*. *Research in Middle East Economics*. 6.
- Serwadda, I. (2018). Impact of credit risk management systems on the financial performance of commercial banks in Uganda. *Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis*, 66(6), 1627 – 1635.
- Shafana, M. (2015). Liquidity and profitability of financial institutions in Sri Lanka. *International Journal of Science and Research*, 4(6), 589-593.
- Shapiro, C. (1989). Theories of oligopoly behavior. In R. Schmalensee & R. D. Willig (Eds.), *Handbook of industrial organization*: 329-414. Amsterdam: North-Holland.
- Stephen, I.D., & Joseph, D. (2015). Risk management strategies in financial institutions in Nigeria: the experience of commercial banks. *International Journal of Research in Business Studies and Management*, 2, 66-73.
- Tafri, F., Hamid, Z., Meara, A., & Omar, M., (2016). The Impact of Financial Risks on Profitability of Malaysian Commercial Banks. *Journal of Emerging Market on Finance*.
- The Economic Times (2018). Definition of risk Management, 1-2.
- Thomas, D.A., & Raphael, O. A. (2014). Risk management in Nigeria banking industry. *Research Journal of*

- Finance and Accounting, 2, 123-130
- Wanjohi, C.M. (2013). Research on relationship between financial risk management and financial performance of banks in Kenya. Unpublished MBA project School of Business, University of Nairobi, 1-72.
- Wooldridge, J.M. (2002). *Econometric Analysis of Cross Section and Panel Data*. MIT Press, Massachusetts.
- Zidafamor, E. (2016). Risk Management in Nigerian Financial Institutions - A Literature Review, 1-16.
- Zipheng, Y. (2010). Risk management and financial institutions. *Journal of Financial Risk Management*. 45, 125-130.