INTERNATIONAL JOURNAL OF BUSINESS AND MANAGEMENT RESEARCH
Vol. 4| No. 3 | April 2024
Page No.: 72-91

CREDIT RISK MANAGEMENT AND PROFITABILITY OF DEPOSIT MONEY BANKS IN NIGERIA.

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Abstract

The survival of Deposit Money Banks (DMBs) are largely dependent on efficient management of risk associated with lending that will ensure capital adequacy and resilience to external shocks in order to avoid bank failure. The objectives were to: investigate the impact of non-performing loan, capital adequacy), cost efficiency and lending ratio on profitability deposit money banks in Nigeria. Ex-post facto research design was employed for this study. The population of the study consist of 32 listed deposit money banks on the floor of Nigeria stock market as at December, 2020. A sample of five (5) banks was purposively selected for this study. The study used secondary data obtained from audited annual financial statements of the selected deposit money banks and Central Bank of Nigeria (CBN) annual reports for the periods between 2005 and 2020. Structural Equation Modelling (SEM), which uses SmartPLS for the structural and measurement model and Eviews 9 for descriptive analysis, was employed to analyze data collected. The findings of this study were that non-performing loan (NPL) has negative significant impact on profitability of deposit money banks in Nigeria with (β = -0.327, t = -3.222 at p-value < 0.05); capital adequacy (CA) has positive significant impact on profitability of deposit money banks in Nigeria with (β = 0.252, t = 2.612 at p-value < 0.05); cost efficiency(CE) has positive significant impact on profitability of deposit money banks in Nigeria with (β = 0.214, t = 2.153 at p-value < 0.05); and average lending ratio(ALR) has positive significant impact on profitability of deposit money banks in Nigeria with (β = 0.233, t = 2.890 at p-value < 0.05). The study concluded that credit risk management has impact on profitability of Deposit Money Banks in Nigeria. The study therefore recommended that the management of deposit money banks should develop strategies that will reduce the non-performing loan so as to enhance the profitability of deposit money banks in Nigeria.

Keywords: Non-Performing Loan, Capital Adequacy, Cost Efficiency, Lending Ratio, Profitability, Deposit Money Banks.

Introduction

Over the years, Nigeria's banking sector has been in the business of lending money to both businesses and private individuals. As a result, they do this with the hope of achieving specific rates of return on the credit extensions over time and ultimately recouping their principal plus interest. Deposit money banks (DMBs) have a number of functions of which includes acting as intermediaries through a collection of excess money and lending to investors to establish projects, contributing towards the expansion of the economy by ensuring that credit is made available to the public, accepting of deposits, clearing of cheques, financing of foreign trades as well as remittance of funds (Kallberg & Udell, 2015). Banks generate most revenue through issuing loans to customers. For deposit money institutions, this has been a key source of income, as they also frequently generate income by leasing credit to businesses and individuals who need money. DMBs are essential for the distribution of a nation's economic resources.

DMBs is a lifeline in developing nations since they are the most reliable method of getting money to individuals who require it for pay. In developing nations like Nigeria, where deposit money banks account for more than 90% of the country's financial assets, they act like the blood vessels in the human body. No bank exists. to take savers' deposits while simultaneously providing lending facilities. As a result of their role as intermediaries, banks face a variety of risks that have varying impact on their performance, including credit risk, risk of liquidity, risk from market, legal risk, foreign currency risk, risk of solvency, and risk of operation. The success of their company rest on precise assessment and effectiveness of credit risk, which is one of these risks and part of the frequent yardstick of bank failures (Wood & Skinner, 2018).

The ratio of non-performing loans to performing loans caused many banks to fail in the past. Of all the risks to which the banking industry is subject, managing credit risk is the most challenging because it is not only reliant on collateral and defaults but also on general macroeconomic conditions. Specifically, their ongoing volatility, which has a significant impact on how well banks function. Capital adequacy is one of the important elements influencing how well Nigerian DMBs perform when evaluating the effectiveness of financial institutions in Nigeria, according to Ezu, Nwanna, and Eke-Jeff (2023). For national and international authorisation, the Central Bank of Nigeria (CBN) mandates that DMBs have a minimum capital base of 25 billion and 50 billion naira, respectively. However, the current banking reality of the economy cannot be justified by this minimal capital need. Inadequate capital is a significant issue for Nigerian DMBs. failure to satisfy the minimal capital level imposed by the CBN. This is due to the high cost of doing business, inflation, and the devaluation of the naira, which makes it difficult for banks to maintain their capital base (Haladu, 2022).

Deposit Money Banks (DMBs) in Nigeria have significant challenges related to liquidity as a component of credit risk. Illiquidity, according to Ogunbiyi & Ogunbiyi (2021), is the inability of a bank to pay its short-term commitments when they become due. This may cause customers to lose faith in the bank, which may spark a bank run and eventually end in the bank's demise. The high percentage of NPLs in Nigerian DMBs is a significant contributor to illiquidity. NPLs are delinquent loans, which default or are unlikely to be repaid. When the level of NPLs is high, it reduces the liquidity of the bank, making it difficult for the bank to meet its short-term obligations (Ogunbiyi & Ogunbiyi, 2021). In light of these circumstances, the general objective of this is to examine how credit risk management affects the profitability of a few Nigerian deposit money institutions, however

the specific are to: investigate the impact of non-performing loan, capital adequacy, cost efficiency and lending ratio on profitability deposit money banks in Nigeria.

Literature Review

Credit Risk Management

Credit risk management, which can be accomplished in a number of methods, is essential for the long-term sustainability of deposit money institutions. Credit risk management was described by Gestel & Baesens (2018) as a procedure that entails the detection of possible hazards, their suitable handling, and the actual use of risk models. Second, "according to Anwar & Murwaningsari (2019), credit risk management is a set of sensible practices that include things like creating a suitable credit risk environment". Credit risk management was defined by Greuning & Bratanovic (2019) as a systematic method of managing uncertainty through risk assessment, creating risk management strategies, and risk reduction employing managerial resources. Transferring to a third party, avoiding the risk, minimizing its consequences, and accepting it are some of the ways. The first step is to pinpoint the risk's origin, or the key factors that are contributing to it. The second is to develop methods for calculating risk using mathematical models in order to understand the risk profile of the instrument. The strategies may be used to identify and manage risks in a variety of circumstances, goods, instruments, and institutions after a broad framework has been established. Similar explanations of credit risk may be found in Baidoo, Yusif, and Ayesu (2020).

Bank Profitability and Its Determinants

According to Golubeva, Duljic, and Keminen (2019), profitability is one of those words whose definition is quite fluid since everyone uses the notion that best fits the situation at hand. It is now easier to determine how well firms are run in regard to their objectives and the value of performance reviews. They provide income for their shareholders. Its structure

and performance have been impacted by both domestic and international causes. “Profitability determinants are divided into internal and external components by Yuqi-Li (2017)”. Micro or bank-specific drivers are internal variables that come from bank accounts. Checking factors relating to external, Athanasoglou (2015) notes that a number of Profitability may be impacted by a number of things. Banks are founded with a variety of goals in mind. These may be to affect how well banks function, increase profitability, or grow shareholders typically done at the price of increased risk in exchange for reward. “According to Soyemi, Ogunleye, and Ashogbon (2014), the company must pick between the two options since the riskier an investment is, the bigger the return”.

Theoretical Framework

Anticipated Income Theory

Prochanow developed the anticipated income hypothesis in 1949, following the end of World War 11, due to composition of DMBs' earnings assets starting alter as resources started to flow once more from the government to the private sector. The early postwar years saw a dramatic surge in loan demand, which gave deposit money institutions tremendous incentives to grow their loan portfolios and, as a result, boost bank profitability. Deposit money banks started making loans after the war that had longer maturities, covered a far larger range of borrowers, and stretched to many more purposes than had been initially planned. A combination of extremely liquid and not-so-liquid assets can be used to reach the necessary level of total liquidity through smart asset management, according to the bank's management, which has greater expertise in handling deposits withdrawals. As a result, in the years following World War II, the loan portfolios of deposit money banks contained goods like medium- and long-term loans to clients, property owners, and commercial firms that would only partially, if at all, qualify as liquid assets under the shiftability theory. However, this hypothesis of projected income qualifies loans of this kind. According to Prochanow (1949), projected income theory contends that if loan

repayments are planned in accordance with of the borrower's expected income rather than how the money from the given collateral was used. The default attitude of some borrowers may be due to intentional or unintentional reasons as a result of mismanagement, negligence and other factors that make them not to fulfil their financial obligations is really affecting banks' performance at large. In line with this theory, it is of the interest that only loan repayments suited to the anticipated income of the borrower will allow a bank to leverage its liquidity capacity customers who are borrowers irrespective of any collateral provided.

Empirical Review

Kwashie, Baidoo and Ayesu (2022) investigated the effects of credit risk, with an emphasis on non-performing loans, on the Ghanaian commercial banks' financial performance. Taken into account are internal bank parameters including the bank's age and size. The study takes into account macroeconomic variables including the gross domestic product, inflation, and monetary policy rate. The research makes use of panel data on 15 commercial banks in Ghana from 2013 to 2018. Non-performing loans have a detrimental influence on both metrics of financial performance, according to the findings of the random effect estimate approach. Additionally, while not significantly for economic value added, the monetary policy rate has a negative influence on both metrics of financial success measure. Further investigation finds that the size, age, and gross domestic product of the bank have a strong positive influence on both indices of financial performance, with the exception of return on asset. Based on the negative correlation between non-performing loans and financial performance, it is advised that commercial banks develop strict credit risk management policies. These policies should also be revised on a regular basis to guide actions and procedures to award loans and monitor credit risk. It is also suggested that the depreciable assets pledged to the banks as collateral be routinely (probably yearly) inspected to account for a decline in their value.

Similar to this, Zubairi and Ahson (2021) looked at the correlation between five Islamic financial institutions' financial performance and the approaches currently used for risk management. Using primary (a survey questionnaire) and secondary (annual reports) data, we looked into banks in Pakistan for seven years (2007–2013). The dependent variables in this study, as in a number of earlier ones, are ROA and ROE. Interest rates, branch count, GDP per capita, advances & total assets, competition, & taxation are the explanatory variables. Pooled regression was used. According to the statistics, risk management significantly decreased profits between 2007 and 2013.

Methodology

Ex-post facto design was adopted by this research. This will involve the collection of data from the company's financial information. Ex-post facto design is being utilized by this study since these variables cannot be controlled, this will give a form of reliability and validity of data being gathered because the variables will not be manipulated and this type of design is effective for collection of opinions on a particular situation which is impacting another variable and for determining the relationship between two different variables. As of 2021, there were 32 Nigerian DMBs listed on the floor of the Nigeria Stock Exchange. These include, but are not limited to: Access Bank, First Bank of Nigeria, Zenith Bank, United Bank for Africa (UBA), Guaranty Trust Bank, Ecobank Nigeria, Fidelity Bank Nigeria, Sterling Bank, Union Bank of Nigeria, Stanbic IBTC Bank, First City Monument Bank (FCMB), Wema Bank, Heritage Bank, Keystone Bank, and Polaris Bank. This represents the study's population.

Furthermore, the banks selected are just five (5) important banks with acronym FUGAZ which include Zenith Bank Plc, United Bank for Africa, Guarantee Trust Bank Plc, Access Bank Plc, and First Bank Holding Plc. These banks are also called the tier I banks (Rapheal, 2022). The Tier ranking is capital and asset base which affects the credit or loan risk

services and capability of banks. The tier I banks are referred to as the fulcrum of the country's finance system. These banks are seen as banks that will not fail due to their vital importance to the nation's economy (Rapheal, 2022). Also, these banks are also selected because they made up 85% of capitalization of the banking sector in Nigeria (Wallstreetmojo, 2022). The study employed secondary data from the financial statements of all the deposit money institutions that were sampled for the study over a fifteen-year period (2005–2020). This was used because the Nigerian economy has undergone three economic phases during this time: Downturn (2013Q1 to 2015Q3); Recession (2016Q1 to 2017Q1); and Recovery (2018Q1 to 2019Q4). In these periods, Fiscal, monetary and exchange rate policies, among others, have focused on stimulating the economy, while ensuring price and exchange rate stability. Structural Equation Modelling (SEM), which uses SmartPLS for the structural and measurement model and Eviews 9 for descriptive analysis, was employed to determine how credit risk management affected banks' performance.

Model Information

The model used for this study made the underlying assumption that the profitability of Nigeria's DMBs and CRM were related. The methodology adopted for this study is identical to that of Ajayi & Ajayi (2017) and Kolapo, Ayeni & Oke (2012). E.g., the econometric model of Kolapo, Ayeni, and Oke (2012) is described as follows:

The following is how the hypotheses are stated numerically.

$PAT=a+ \beta_1 NPL +\beta_2 CAD +\beta_3 COE +\beta_4 ALR + e$ ……***(1)***

Where:

PAT = Profitability

a= Constant Variable

β (1234) =the slopes of X

NPL = Non-Performing Loan

CAD = Capital Adequacy

COE = Cost Efficiency

ALR= Average Lending Ratio

e= Residuals or Error terms

Data Analysis

Descriptive Statistics

Investigating the fundamental and general characteristics of the variables necessitates estimating descriptive statistics for the variables in the model. The factors for profitability (PR), non-performing loans (NPL), capital adequacy (CAD), cost effectiveness (COE), and average lending ratio (ALR) are all described statistically in Table 1. The results from Table 1 show that, with the exception of CAD, all of the variables have positive coefficients of skewness. As a result, positive skewness indicates that the variable distribution is dragged to the right when compared to the normal distribution. The negative skewness coefficient for CAD demonstrates that the variable distribution is drawn to the left.

Table 1: *Descriptive statistics variables of Profitability (PR), Non-Performing Loan (NPL) Capital adequacy (CAD), Cost Efficiency (COE) and Average Lending Ratio (ALR)*

	PR	**NPL**	**COE**	**CAD**	**ALR**
Mean	0.242614	372259.7	0.589573	0.111250	1.353499
Median	0.240877	355089.0	0.602621	0.110000	1.164114
Maximum	0.542915	1117473.	1.133306	0.150000	12.89062
Minimum	-0.057170	19443.00	0.010817	0.070000	0.616454
Std. Dev.	0.126402	243148.7	0.176769	0.018784	1.343645
Skewness	0.356646	0.598687	0.084069	-0.158914	8.074527
Kurtosis	3.414330	2.911553	4.063939	2.354847	69.70709
Jarque-Bera	2.268178	4.805099	3.867457	1.724123	15702.09
Probability	0.321715	0.090487	0.144608	0.422291	0.000000

Sum	19.40909	29780778	47.16583	8.900000	108.2799
Sum Sq. Dev.	1.262228	4.67E+12	2.468531	0.027875	142.6251
Observations	80	80	80	80	80

Source: *E-views Printout (2022).*

Unit Root Test

The unit root result presented in Table 2, which outlines the Augmented Dickey Fuller (ADF) results, indicate that only COE and CAD within the dataset demonstrated stationarity at the initial level. Conversely, all the remaining variables featured in the dataset (PR, NPL, CAD, COE, and ALR) were discovered to be stationary at first difference since the likelihood of each series at first difference consistently produces a value less than 5%. This suggests that there are no unit root tangles in any of the variables. As a result, the study accepted instead of disproving the original hypothesis that there is no unit root in the data series chosen for the study, the alternative hypothesis that there is a unit root in the data series is selected for the study.

Table 2 *ADF - Fisher Chi-square Unit root test*

Variable	**At level**		**First Difference**	
	Statistic	**Prob.**	**Statistic**	**Prob.**
PR	11.6892	0.3064	28.3082	0.0016
NPL	1.12938	0.9997	31.6003	0.0005
COE	22.3284	0.0135	52.5865	0.0000
CAD	19.1312	0.0386	36.0103	0.0001
ARL	11.7347	0.3032	63.1561	0.0000

Source: *E-views Printout (2022).*

Panel Co-integration

Panel co-integration is tested to analyze the possibility of long run relationship among the variables selected in this study using Pedroni Residual Cointegration Test. The result in table 3 shows that It is acceptable to accept the null hypothesis that claims there is no cointegration between PR, NPL, CAD, COE, and ALR. The probability value of the Panel v-Statistic, Panel rho-Statistic, Panel PP-Statistic, and Panel ADF-Statistic are all more than 0.05 significant level, which explains this. The model's dependent and independent variables can be inferred to not be permanently connected. model within the period under study.

Table 3 *Pedroni Residual Cointegration Test*

	Statistic	**Prob**
Panel v-Statistic	-1.189741	0.8829
Panel rho-Statistic	2.661836	0.9961
Panel PP-Statistic	-0.303983	0.3806
Panel ADF-Statistic	-1.176946	0.1196

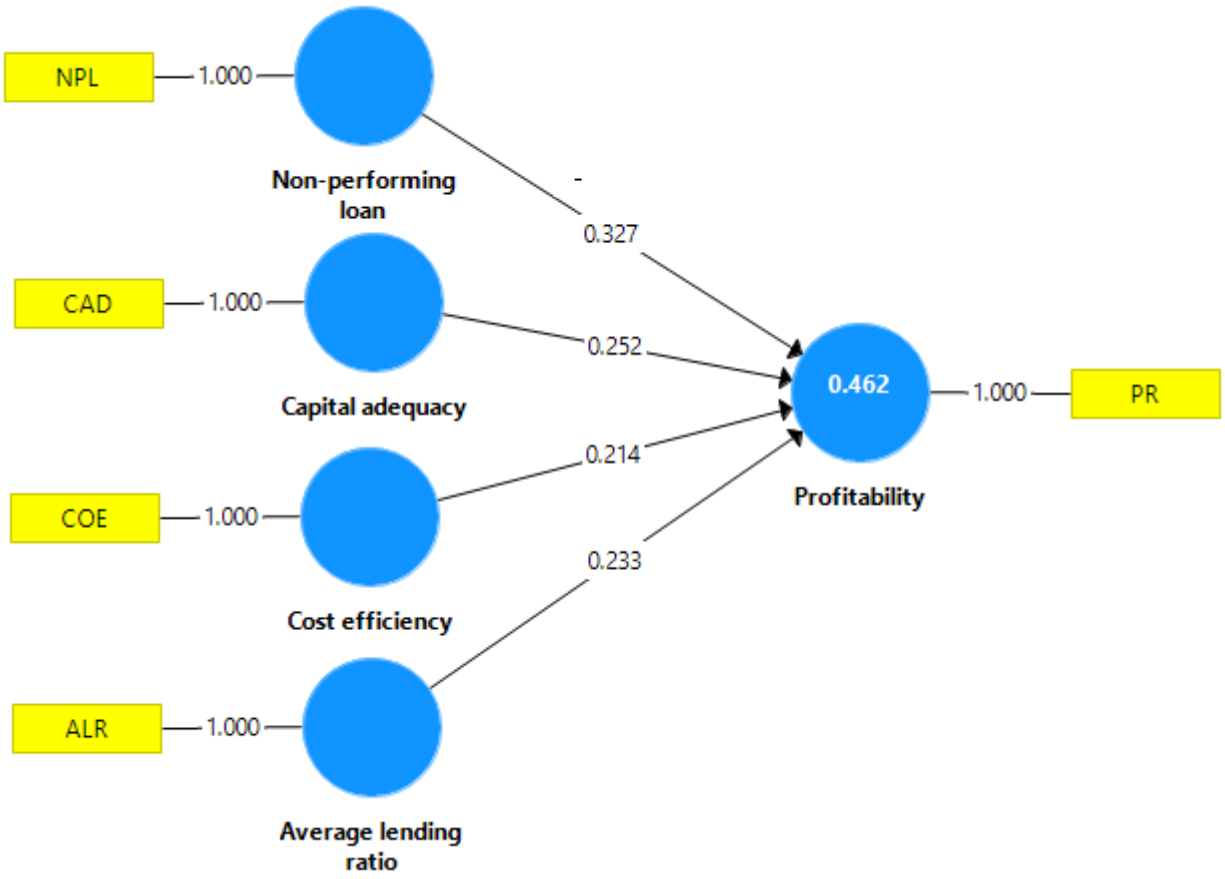
Source: *E-views Printout (2022).*

Variance Inflation Factor (VIF) Multicollinearity

Variance inflation factor (VIF) is the most common techniques of testing multicollinearity. However, the VIF that is greater than 4 implies the presence of multicollinearity which required further investigation. On the extreme, VIF >10 implies the existence of multicollinearity which must be corrected.

Hypotheses Test on Credit Risk Management's Impact on Profitability

Figure 1: A path model (PLS Algorithm Result) of credit risk management and profitability



Source: SmartPLS Output, 2023

The path model is depicted in Figure 1. Regarding the effect of credit risk management on profitability. Non-performing loans, adequate capital, cost-effectiveness, and average lending rate are the credit risk management parameters used in the study. These variables were checked against the profitability proxies. The figure presents interaction effects where more than single variables contribute to the latent variables. The outer weight model was absolute maximum value of 1, it has been established that the more the indicators for a latent variable, the lower the maximum and the lower the average outer model weight. The results were greater than 0.50, hence, can't be removed. Also, these variables were major constituents of the latent variables from the literature.

Table 4 Bootstrapping Path Coefficients

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
Average lending ratio -> Profitability	0.233	0.240	0.081	2.890	**0.004**
Capital adequacy -> Profitability	0.252	0.242	0.097	2.612	**0.009**
Cost efficiency -> Profitability	0.214	0.221	0.099	2.153	**0.032**
Non-performing loan -> Profitability	-0.327	-0.330	0.102	-3.222	**0.001**

Source: SmartPLS Output, 2023

The PLS bootstrapping output showing the t and p-value revealed that any t value above 1.96 will be significant at a 95% confidence interval and 5% significance level.

Ho1: Non-performing loans don't have a big impact on profitability.

As regard the study's findings on the impact of The impact of NPL on profitability revealed that these loans had a standard beta value of 0.327, which indicates that for every 1% increase in non-performing loans, the profitability of the enterprises under test will increase by 0.327. This also suggests that non-performing loans have a beneficial impact on profitability. Additionally, non-performing loans have t-values and P-values of 3.222 and 0.001, respectively, which are higher than the average t-value of 1.96 and lower than the significant level of 0.05. Thus, non-performing loans have a considerable impact on the selected enterprises' profitability. This has the implication that managers must carefully

monitor non-performing loans as a component of credit risk management in order to boost profitability.

H_{02}: Capital sufficiency has no discernible impact on profitability

According to the study's findings, capital adequacy has a standard beta value of 0.252, which means that for every 1% improvement in capital adequacy, the profitability of the tested firms will increase by 0.252. This further suggests that enough capital has a beneficial impact on profitability. The P-values and t-values of the capital adequacy on profitability are 2.612 and 0.009 respectively which is greater than the standard 1.96 t-value and less than the significant level of 0.05. Hence, capital adequacy significantly affects the profitability of sampled firms. The implication of this is that capital adequacy as a variable of CRM is vital for managers to monitor it critically to increase profitability.

H_{O3}: Cost efficiency has no significant effect on profitability (PAT).

As regard the study's findings on the relationship between cost efficiency and profitability showed that cost efficiency has a standard beta value of 0.214, meaning that the profitability of the tested enterprises will rise by 0.214 for every 1% improvement in cost efficiency. this demonstrates the beneficial impact of cost effectiveness on profitability. Additionally, the t-value and P-value for the impact of cost efficiency on profitability are 2.153 and 0.032, respectively, which are higher than the average t-value of 1.96 and lower than the significance level of 0.05. Therefore, cost effectiveness has a big impact on how profitable the sampled companies are. This has the implication that managers must carefully evaluate cost effectiveness as a credit risk management variable in order to enhance profitability.

H_{04}: Average lending ratio has no discernible impact on profitability.

As regard the impact of lending rate average on profitability, the study's findings showed that the average loan rate had a standard beta value of 0.233 which indicates that for every 1% increase in average lending rate, profitability of the sampled firms will increase by 0.233. This also indicate a positive effect of average lending rate on profitability. Also, the

t-value and P-values of average lending rate on profitability are 2.890 and 0.004 respectively which is greater than the standard 1.96 t-value and less than the significant level of 0.05. Hence, average lending rate significantly affect the profitability of sampled firms. This implies that managers must closely monitor average lending rates as a credit risk management variable in order to boost profitability.

Discussion of Findings

The results of objective one demonstrated a significant correlation between profitability and credit risk control. However, the path analysis showed that the non-performing loans of the study's selected firms significantly increased profitability. From the result of objective four, the findings showed that there was a substantial correlation between profitability and the average loan rate. However, it was discovered that the study's sampled enterprises' average loan rate produces a substantial positive result for profitability in the route analysis. Intriguingly, this study's conclusion is distinct because more than 30 empirical investigations on the subject fell short of include cost effectiveness as a factor in credit risk management. This suggests that, generally speaking, it is possible to predict the profitability of sampled businesses using the average loan rate.

Summary of findings

The findings of this study were that non-performing loan (NPL) has negative significant impact on profitability of deposit money banks in Nigeria with (β = -0.327, t = -3.222 at p-value < 0.05) this implies that non-performing loan yields no profits for DMBS, the more non-performing loan they accumulate the lower their profit; capital adequacy (CA) has positive significant impact on profitability of deposit money banks in Nigeria with (β = 0.252, t = 2.612 at p-value < 0.05) with a good check on capital adequacy DMBS can absorb losses without become insolvent and help them maintain profitability ratio; cost efficiency(CE) has positive significant impact on profitability of deposit money banks in

Nigeria with ($\beta = 0.214$, $t = 2.153$ at p-value < 0.05) by maintaining a good cost efficiency DMBS can sky rocket their profit margin; and average lending ratio(ALR) has positive significant impact on profitability of deposit money banks in Nigeria with ($\beta = 0.233$, $t = 2.890$ at p-value < 0.05) the more money DMBS lends the more profit they expect in return.

Conclusion

The dissertation assessed the impact of credit risk management on the operation of a selected Nigerian deposit money banks between 2005 and 2020. The study's dependent variables were profitability, while its independent variables were capital sufficiency, non-performing loans, cost effectiveness, and average lending rate. The study used secondary sources to get its data, including financial records from banks, journals, articles, textbooks, internet publications, and newspapers. In conclusion, it was discovered that over the course of the research period, credit risk management had a significant impact on the profitability of the selected deposit money banks in Nigeria.

Recommendations

The following suggestions were given in light of the findings in order to help Nigerian deposit money institutions achieve reasonably high profitability;

1. Management of bank should develop strategies to reduce their non-performing loan so as to influence their profitability. This can be done by checking credit score of loanees and ensure strict follow up and monitoring of loanees to reduce the rate of loans not performing as expected.
2. Management of bank should maintain optimal capital adequacy as required by bank to avoid possibility of expectation of high profit from bank's investors as higher profit may be expected by investors when bank's capital adequacy falls below the benchmark.

3. Management of bank should promote strategies that can enhance cost efficiency in deposit money banks, such that can help influence their profitability level. By ensuring that they incur relatively low operating cost to generate output (cost efficiency) is reflected its financial performance as bank's investors would expect high profit in an organization experiencing cost efficiency.

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