

CREDIT RISK MANAGEMENT ON THE PERFORMANCE OF DEPOSIT MONEY BANKS IN NIGERIA

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Abstract: *This study investigated the credit risk management on the performance of deposit money banks in Nigeria, using data for the period of 2012-2021, the objective were to: To examine the effect of credit risk on net working capital of deposit money banks in Nigeria. To determine the effect of credit risk on debt ratio of deposit money banks in Nigeria. The study employed ex-post-facto research design to investigate the effect of credit risk management on corporate liquidity of deposit money banks in Nigeria. The study used secondary data that was sourced from publications of the Nigeria Exchange Limited (NEL) and annual reports accounts of the selected banks for the period under review. The researcher chose nine (9) deposit money banks to represent the sample size for this study. The study developed two models to capture two objectives of the study. Ordinary Least Squared (OLS) method of data analysis was adopted because of its Best Linear Unbiased Estimators (BLUE) properties. It was also observed that credit risk management has significant effect on net working capital, more so debt ratio has significant effect on net working capital. The study recommends that Banks 'management should endeavour to develop rigorous and robust credit policies that will enable them to efficiently and effectively assess the creditworthiness of their customers thus, minimizing the incidences of non-performing loans.. Capital adequacy of banks should be closely monitored in such a way that it will not be less than the minimum Central Bank of Nigeria provision. With this, the financial health and strength of banks will not be jeopardized.*

Keywords: *credit risk management, networking capital, debt ratio, Capital adequacy, Size of Loan*

1.1 INTRODUCTION

Banks are catalyst in the economic development process through the financial services they provide. The relevance of banks to the economy lies primarily in their ability to mobilize credit and grant credit to various economic sectors. Lending operations are the core banking activities and most profitable assets of the banking institution. In the money market banks always carry out operations in the economic environment that is characterized by the existence of obstacles to good credit management. However, where credit risk is not properly channeled, controlled and managed, it leads to a devastating effect on the failure (Berger and Christa, 2009). According to Cai and Anijan (2008). Credit administration is the most important function of the banking industry. The aim of credit risk management is to minimize bank's adjusted rate of return by maintaining credit risk

exposure within acceptable boundary. Banks need to manage the credit risk inherent in the entire loan portfolio as well as the risk in individual credit or transaction (Siyabola and Adebayo, 2021).

Credit administration is the most risky and difficult and at the same time most profitable function performed by banks. The main key strategic value a bank adds has always depended upon its ability to manage credit risk. The administration cannot be done without an effective risk management control and follow up strategy. Credit risk decreases when practices require that bank management put in place standards for appraising and approving individual credit applications to ensure that loans granted are paid as at when due and also used for its sole purpose. Risk increases due to poor credit administration caused by loopholes and violation in risk assessment and control techniques, bad and doubted debts still claiming bulk charge on bank performance causing many banks to witness institutionalized distress and some total unexpected collapse. Lending carries a reasonable portion of resources exposure of deposit banks in Nigeria; there is still ability of banks to generate much portfolio. The role of credit risk management in the intermediation process is a stimulus for economic development. Banking is a very risky occupation. Banking crises have developed many times throughout history when one or more risks materialize. Because of its significant implications, the loss of banks has become a problem for the Central Bank of Nigeria and the owners of those banks (Hieu, 2021). Banks are exposed to high risk as a result of unsecure lending. Greening and Bratanovic (2019) considered that credit risk (non-performing loans) is an incentive for the debtor of a financial instrument (individual, business or country) not to repay cash flows connected to capital and investment under the conditions stated in the credit agreement.

In order to find a lasting solution to the recurring non-performing loans that has bedeviled Nigerian banks, the Federal Government of Nigeria established the Asset Management Corporation of Nigeria (AMCON) in July, 2010. There are other efforts made by the Central Bank of Nigeria (CBN) to ensure sound and efficient financial institutions' performance. This includes the establishment of Nigeria Deposit Insurance Corporation (NDIC) in 1988 to protect depositors' funds, issuance of Prudential Guidelines (1991 & 2010), and recapitalization policy of July 2004. Problem loans are specific to a borrower's loan(s) or its [risk rating](#) with the financial institution. A problem loan is not the same as a "problem borrower," which may include poor communication with their relationship team or reputational risk for the lender, among other things.

A problem loan is one that poses a "challenge" for a lender. It may occur when the borrower ceases to make interest or principal payments (delinquency) or where repayment of the loan, as per the terms of the credit agreement, becomes otherwise less likely. The effect of credit risk management on profitability of deposit money bank is ambiguous. For example, researchers like Hamza (2017), Ajayi and Ajayi (2017), Adebawo and Enyi (2014), Ejoh, Okpa and Egbe (2014), Epure and Lafuente (2013), amongst others, found evidence that credit risk management does not impact positively on banks profitability while, Ogbulu and Eze (2016), Abiola and Olausi (2014) found that credit risk management indicators significantly impacted on the profitability of deposit money banks. Most authors employed in their study different methodology, while some use short observation periods (some authors used a study period of five years, while

others used a ten years period), most of the reviewed authors used outdated literature (i.e their work was lacking in terms of the currency of reviewed literatures), also, there are differences in methodology, some authors did not includes the core varoables. A common concern among operators and regulators of banks is the occurrence of non-performing loans with its consequent increase in loan loss provisions, its negative impact on profits and the erosion of banks' capital base. The risk that loans may fail to perform falls under the category of credit risk. Iwedi and Onuegbu (2014) observed that with the creation of Risks Management Department in many deposits money banks (DMBs), whose responsibility is to manage the banks risk including credit risk yet bad loans (non-performing loans) were as high as 3.16% in Nigeria deposits banks. A greater level of non-performing loan rate in banks records, poor loan processing, inadequate or absence of loan collateral among other things, are linked with poor and ineffective credit risks management that negatively affects banks' performance (Danjuma, Kola, Magaji & Kumshe, 2016).

As a result of these divergent empirical findings, bank management and policy makers find it difficult to formulate an effective risk management policy. The essence of study is to attempt to close this gap, by using an updated literature to analyses effect of credit risk management on performance of deposit money banks in Nigeria, secondly, the study will update the data to 2021, thirdly the study will use disaggregated model of five variables to capture the two objectives.

1.2 Objectives of the Study

The broad objective of this study is to examine the effect of credit risk management on the performance of deposit money banks in Nigeria. The specific objective of the study is as follows:

- i.To examine the effect of credit risk on net working capital of deposit money banks in Nigeria
- ii.To determine the effect of credit risk on debt ratio of deposit money banks in Nigeria.

REVIEW OF RELATED LITERATURE

2.1 Conceptual Review

2.1.1 Credit Risk

Credit risk is the probability of a financial loss resulting from borrower's failure to repay a loan. Credit risk is the risk of loss that occurs if debts owed by an entity is not redeemable. Credit risk may be compounded by liquidity risk. Credit risk refers to the risk that a borrower will default on any type of debt by failing to make required payments. Credit risk is also refers to the risk that a lender may not receive the owed principal and interest, which results in an interruption of cash flows and increased cost of collection. The risk is primarily that of the lender and includes lost principal and interest, disruption to cash flows, and increased collection costs. The loss may be complete or partial and can arise in a number of circumstances (Rajan, 1995). Lenders can mitigate credit risk by analyzing factors about a borrower's creditworthiness, such as their current debt load and income.

Credit risk management provides a clear and structured approach to identifying, measuring and prioritizing risks in order to take appropriate actions to minimize losses. An effective credit risk management (ECRM) practice does not eliminate risks, but

minimize risks. The implementation and maintenance of ECRM warrants firm commitment to improve the efficiency of business processes. This efficiency can attract some benefits like (i) saving resources: Time, assets, income, and personnel; (ii) Protection of an organization reputation and public image; (iii) prevention or reduction of legal liabilities; (iv) increasing the stability of operations and promoting continuous improvement; (v) protecting people and environment from harm; (vi) avoiding fines for corporate non-compliance with regulations and legislation; (vii) enhancing the ability to prepare for unforeseen and unexpected circumstances; (viii) enhancing competitive advantage through improved decision support and market intelligence based on more accurate risk-adjusted management information; (ix) improved shareholder's value and confidence, which is especially valuable in times of crisis when shareholder's trust is stressed to its maximum limits; and (x) assisting in clearly defining suitable risk management techniques, including insurance needs (Meulbroek, 2012; Hillson, 2016;)

2.2 Theoretical Framework

This study will be anchored on the credit risk theory

2.2.1 Credit Risk Theory

Credit risk theory was introduced in 1974 by Robert Merton in his theory of default or default

model which is the basic theory of credit risk. Robert proposed a model for assessing the credit

risk of a company by characterizing the company's equity as a call option on its assets.

There are two main methods of modeling credit risk which include the structural approach and the intensity-based approach (also known as reduced form approach). Leveraging on Merton model, three important approaches to measuring credit risk was derived by Clifford V. Rossi. These include; the concept of credit spreads, credit portfolio management and loss distribution generated through Monte Carlo simulation. To reduce the lenders risk, the lender may perform a credit check on the prospective borrower, may require the borrower to take appropriate insurance, such as mortgage insurance or seek security or guarantees of third parties. In general, the higher the risk, the higher will be the interest rate that the debtors will be asked to pay on the debt.

Credit risk theory is the first readily available portfolio model for evaluating credit risk. The credit risk approach enables a company to consolidate credit risk across its entire organization, and provides a statement of value-at-risk (VaR) due to credit caused by upgrades, downgrades, and defaults. Credit risk model is useful to all firms that are exposed to credit risk in the course of their business. According to this theory, a firm should develop a methodology to quantify credit risk across a broad range of instruments, including traditional loans, commitments and letters of credit; fixed income instruments; commercial contracts such as trade credits and receivables; and market-driven instruments such as swaps, forwards and other derivatives. Credit risk statistical concepts like probability, means, standard deviation, correlation, and concentrations were developed with three objectives which includes developing a Value at Risk (VAR) framework applicable to all the institutions worldwide that encounter credit risks in the course of their businesses activities. To develop a portfolio view, showing the credit event correlation which can identify the costs of concentrations and the benefits of

diversification in a bid to market framework and to apply it in making investment decisions and risk mitigating actions.

2.3 Empirical Review

Ogundele, Ushie, Awodiran, & Ibukun, (2021) examined the effect of credit risk management on the financial performance of deposit money banks in Nigeria with the view to know what influence non-performing loans of deposit money banks have on return on assets. The study employed the Autoregressive Distributed Lag on the variables between 1995 and 2019. The findings show that non-performing loan as a percentage of total loan has a negative and significant effect on return on asset. It was also found out that capital adequacy possessed a positive but not significant effect on return on assets while liquidity ratio had a negative influence on return on asset. The study that credit risk management is a fundamental and vital aspect of deposit money banks and its proper monitoring could help foster financial development. It was recommended in the study that deposit money banks should employ modern techniques in the performance of their financial intermediation function.

Kankpang, Lawal, & Uklala, (2023) examined credit risk and profitability of deposit money banks in Nigeria. The study adopted ex-postfacto research design and used secondary data sourced from Central Bank of Nigeria's statistical bulletin and Nigeria's bureaus of statistics. Ordinary least square of multiple regression techniques was used to test the relationship between proxies of credit risk (liquidity risk and non-performing loans) and profitability. The study found the existence of significant influence of liquidity risk and non-performing loans on profitability of deposit money banks in Nigeria. The study therefore concluded that credit risk in terms of liquidity risk and non-performing loans influence profitability of deposit money banks in Nigeria; and recommends that operators of deposit money banks should pay adequate attention to liquidity risk and non-performing loans management in order to improve their profitability and ensure financial stability to promote economic growth and development

Iyinomen, Okoye, & . Orjinta (2020) sought credit risk management and profitability of Deposit Money Banks (DMBs) listed on Stock Exchange of two selected West African countries using a sample of twenty (20) Deposit Money Banks (DMBs). We covered 10 years period spanning from 2009 to 2018. Ex-Post Facto research design was employed while secondary data were collected and subjected to multiple regression and correlation analysis in order to achieve the study objectives. Three (3) specific objectives and hypotheses were tested and analyzed using descriptive statistics, Pearson correlation analysis and panel regression analysis. Our result revealed that credit risk has negative and significant effect on performance of banks in both Ghana and Nigeria using Return on Equity (ROE) as a proxy for measuring performance which was statistically significant at 1% level of significance. Based on our findings, it was recommended that banks in Nigeria and Ghana should enhance their capacity in credit analysis to reduce the risk of default in repayment. Therefore, to stem the cyclical nature of non-performing loans and increase their profits, West African banks should adopt an aggressive deposit mobilization to increase credit availability and develop a reliable credit risk management strategy with adequate punishment for loan payment defaults.

Prahallad & Noor, (2021). revealed that the impact of Credit Risk Management on the Financial Performance of the Commercial Banks in Bangladesh over the period of seventeen years (2000 to 2016) using data from ten commercial banks. Secondary data were collected from the bank's annual reports and analyzed using t-test for mean comparison, correlation and multiple regression analysis. Return on Assets (ROA) was used as the financial performance indicator while Non-Performing Loan (NPL), Capital Adequacy Ratio (CAR) and Advance Deposit Ratio were used as credit risk management indicators. The empirical results found that both NPL and ADR have negative and relatively significant effect on ROA, while NPL has higher significant effect on ROA compare to ADR. The study also found that Capital Adequacy Ratio has positive effect on ROA but it is not statistically significant. The study found from T-test that Return on Assets, Advance-Deposit Ratio and Capital Adequacy Ratio of private commercial banks were significantly higher than that of state-owned commercial banks. Inversely, it was also found that Non-performing loan of private commercial banks is significantly lower than that of state- owned commercial banks. The study concluded that credit risk stagnant remains a major concern for the commercial banks in Bangladesh, since credit risk is an important forecaster of bank financial performance. The researcher suggests that all banks should adopt a credit risk management guidelines and compliance in accordingly to enhance sustainable profitability and growth of the bank.

Eric & Amoh, (2020) Risk management and performance of listed banks in Ghana The objective of the study was in two parts; first, to construct an overall risk index to ascertain risk level of banks listed on Ghana Stock Exchange (GSE), second, to ascertain whether there is a significant relationship between risk management and bank performance. Secondary data of all listed banks on GSE over the period 2007–2014 was used and a panel regression data approach and a risk index were constructed for all listed banks. Findings show that, banks listed on Ghana Stock Exchange have declining risk indexes on average over the latter part of the study period indicating that the Ghanaian Banking Regulator may have to impose additional prudential and regulatory requirements to ensure banks remain solvent. We also find evidence that risk management is positively related to performance of GSE listed banks when the latter is measured from ROE perspective.

Kwadwo (2019) aimed of the study was to assess the performance of Ghanaian banks using the CAMELS rating model. The model is an acronym for capital adequacy, assets quality, management efficiency, earning, liquidity, and sensitivity. The rating is based on ratio analysis of the financial statements together with an onsite examination by the regulatory authority. A total of 10 banks were selected for a seven-year period. A standard multiple regression was employed in the study to analyse the effect the various components of the CAMELS model have on the performance of banks in Ghana. The

findings from the analysis of the computed ratios from the financial statements of the selected banks indicated that Earning stood out as the highly significant factor that affects the performance of banks in Ghana. A percentage change in earning will result in a whopping 82.5% increment in bank performance measured by ROE. Capital adequacy, assets quality, management efficiency, and liquidity were equally found to be significantly affecting the performance of Ghanaian banks. Sensitivity, on the other hand, was found to be the only insignificant factor of the CAMELS model that affects the performance of banks in Ghana.

Akomeah, Kong, Hu, & Afriyie, (2017) Examine bearing of credit risk management on financial performance: Evidence from Financial Institutions in Ghana Effective management of working capital is an essential indicator of a good financial health of an organization. This means managing working capital is important for the smooth running of a firm. Giving the significance of working capital, this paper examines the effect of working capital management on listed manufacturing firms in Ghana based on quantitative analysis of stock market data. A five-year data was sourced from the financial statements of twelve (12) manufacturing companies listed on the Ghana Stock Exchange (GSE). The profitability ratios; Return on Asset (ROA) and Return on Equity (ROE) were computed, as well as the components of working capital, which were used to calculate Cash Conversion Cycle. The Cash Conversion Cycle (CCC) was used to measure working capital, whereas the profitability ratios were used to determine the companies' profitability. We observed that whereas 9 firms have statistically significant relation between CCC and profitability, the rest of the firms had an insignificant relationship.

Ayim, & Agyemang, (2021) analysed the effect of credit risk on the profitability of banks listed on the Ghana Stock Exchange. Annual data of 8 out of the 9 banks listed on the Ghana Stock Exchange were used and a panel data regression model was used to analyse the financial reports of the selected banks. It was found that the profitability of banks listed on GSE is not influenced by Non-Performing Loans Ratio (NPLR), Cash Reserve Ratio (CRR), Asset Growth Ratio (AGR) and leverage ratio (LEV), however, Capital Adequacy Ratio (CAR) and cost per loan asset (CPLA) influence the profitability of banks. The result shows that 49.5% of change in profitability of banks listed on GSE is attributable to the independent variables in the model. The study recommended among other things that the Bank of Ghana (BoG) and other supervisors/regulators of the banking sector should focus on other profit indicators either than credit risk if they want to influence the profitability of banks. Also, management of banks listed on the Ghana Stock Exchange should pay attention to capital adequacy ratio (CAR) and Cost Per Loan Asset (CPLA) which have significant influence on profitability. Finally, future studies should consider the effect of liquidity risk, market risk or operational risk on profitability of banks listed on the GSE.

Echobu, & Okika (2019) credit risks and financial performance of Nigerian Banking Industry. The performance, in terms of economic and financial stability of these banks is adversely affected by credit risks. Deposit Money Banks (DMBs) in Nigeria are not left out of this challenge. It is essential to understand how credit risks impact the financial performance of DMBs so as to mitigate and control its unfavorable effect on banks' performance. The study examined the impact of credit risks on the financial performance of listed DMBs in Nigeria, from 2006-2017. Data for the study were secondary in nature

and gotten from audited financial reports of all the 15 listed DMBs in Nigeria as on 31st December, 2017. Regression tools were employed for data analysis, and the results show that non-performing loans and impairment loan charge-off have negative and significant impact on the financial performance of banks. The impact of capital adequacy on financial performance is negative but statistically insignificant. The study recommends that DMBs should improve their risk management strategy to reduce the increase of default loans. In addition, a short-term periodic review of prudential guidelines and other regulations governing the issuance of credit facilities by DMBs is advocated, so that current realities and intrigues about credit risks will be captured in policies.

Hamza, (2017) captured the impact of credit risk management on performance of commercial banks in Pakistan. A fundamental research proposal was accepted in this study, and this was facilitated by the use of secondary data which was obtained from the SBP publications on banking sector survey, official websites and KSE. The pooled regression has been adopted to determine the impact of credit risk management on two performance methods. The findings revealed the fact that credit risk management is inversely associated with bank performance. For return on asset (ROA) analysis revealed that capital adequacy ratio (CAR), Loan loss provision ratio (LLPR), liquidity ratio (LR) and Non-performing loan ratio (NPLR) variables have significant impact on return on assets (ROA). The Loan loss provision ratio (LLPR), liquidity ratio (LR) and Non-performing loan ratio (NPLR) have negative while the capital adequacy ratio (CAR), loan and advances (LAR), and SIZE have positive impact on the return on assets. In relation to return on equity, the CAR, LAR and LLPR variables have significant impact on ROE. In this model the LLPR, NPLR and LR variables have negative and CAR, LAR and SIZE variables have positive impact on the dependent variable.

METHODOLOGY

3.1 Research Design

The study employed *ex-post-facto* research design to investigate the effect of credit risk management on corporate liquidity of deposit money banks in Nigeria. The study used secondary data that was sourced from publications of the Nigeria Exchange Limited (NEL) and annual reports accounts of the selected banks for the period under review. The researcher chose nine (9) deposit money banks to represent the sample size for this study.

3.2 Model Specification

Model one

To examine the effect of credit risk on net working capital of deposit money banks in Nigeria

$$NWC = F(\text{INFL}, \text{CAD}, \text{NPL}, \text{SL}, \text{FREX}) \dots\dots\dots(2)$$

$$NWC = f(\text{CR})$$

Where

- NWC = Networking Capital
- INFL = Inflation rate
- CAD = Capital adequacy
- NPL = Non-performing loan
- SL = Size of Loan

FREX = Foreign Exchange
F = Functional Notation

The above equation can be put in an econometric form as;

$$NWC = b_0 + b_1 INF + b_2 Cad + b_3 NPL + b_4 SL + b_5 FREX + U \text{-----} (3)$$

Where;

b_0 = Autonomous or Intercept.
 b_1 - b_5 = Coefficient of parameters
U = stochastic Variable or error term.

Model Two

To determine the effect of credit risk on debt ratio of deposit money banks in Nigeria.

DER=F (INFL, CAD, NPL, SL, FREX).(4)

DER= f(CR)

Where

DER = Debt ratio
INFL = Inflation rate
CAD = Capital adequacy
NPL = Non-performing loan
SL = Size of Loan
FREX = Foreign Exchange

The above equation can be put in an econometric form as;

$$DER = b_0 + b_1 INF + b_2 Cad + b_3 NPL + b_4 SL + b_5 FREX + U \text{-----} (5)$$

Where;

b_0 = Autonomous or Intercept.
 b_1 - b_5 = Coefficient of parameters
U = stochastic Variable or error term.

3.3 Method of Analysis:

The data was analyzed using econometric techniques, Descriptive Statistics, Augmented Dickey Fuller Tests for Unit Roots and Ordinary Least Square (OLS). The OLS method of data was employed through the instrumentality of Econometric View (E-view 12) as statistical software. The technique (OLS) was employed because it has the criteria of being Best Linear Unbiased Estimator of linear relationship.

DATA PRESENTATION AND ANALYSIS

4.1 Analysis of Data

Table 1: Descriptive Statistics

	Networking capital					
	NWC	INFF	CAD	NPL	SL	FREXX
Mean	17.00725	10.61689	0.518889	330510.6	326273.3	255.6756
Median	19.90835	10.09000	0.110000	484121.5	512567.0	279.4400
Maximum	20.58567	19.01000	15.00000	789987.0	754789.0	359.7400
Minimum	6.484958	2.220000	0.010000	1.693147	2.034931	157.0200
Std. Dev.	3.719901	4.491499	1.891885	305219.9	297792.0	78.94726
Skewness	-0.611979	0.116120	6.487328	-0.074347	-0.135847	-0.094814
Kurtosis	2.250118	1.852378	46.17566	1.185762	1.135513	1.416621
Jarque-Bera	7.726492	5.141141	7621.798	12.42589	13.31299	9.536430
Probability	0.021000	0.076492	0.000000	0.002003	0.001286	0.008496
Sum	1530.653	955.5200	46.70000	29745958	29364594	23010.80
Sum Sq. Dev.	1231.552	1795.447	318.5513	8.29E+12	7.89E+12	554707.6
Observations	90	90	90	90	90	90

The summary statistics show that the average mean of net-working capital is about 17.0, inflation rate is 10,6, while averages mean of capital adequacy, non-performing loan, size of loan and foreign exchange were 0.518889, 330510.6, 326273.3, 255.6756 respectively. The standard deviations of corporate liquidity variables such as networking capital, inflation rate capital adequacy, non-performing loan, size of loan and foreign exchange respectively are. 3.719901, 4.491499, 1.891885, 305219.9, 297792.0 and 78.94726. The values of the standard deviations indicate that there is wide spread in the networking capital in Nigeria. This is also evident in the wide gap between the maximum and minimum values. For example, the maximum value of networking capital is 20.58567 while the minimum is 6.484958, with difference of 14.1. Similarly, the maximum of inflation is 19.01000 while the minimum is 2.220000. These performance variations are rather on the high side. Even in the case of capital adequacy the maximum is 15.0000 and the minimum is 1.01000. It is equally observed that non-performing loan varied widely over time. For instance, non-performing loan is 789987.0 while its minimum value is 1.693147. The wide variation over time indicates high level of fluctuation of credit risk management which affects corporate liquidity.

Table 2: Descriptive Statistics

	Debt ratio					
	DER	INFF	CAD	NPL	SL	FREXX
Mean	0.618636	10.70000	0.505682	324513.7	321287.6	254.5385
Median	0.675000	10.15000	0.110000	462776.0	484121.5	253.6050
Maximum	2.140000	19.01000	15.00000	789987.0	754789.0	359.7400
Minimum	0.010000	2.220000	0.010000	1.693147	2.034931	157.0200
Std. Dev.	0.543660	4.507600	1.911431	305953.5	299306.9	79.48017
Skewness	0.244217	0.074779	6.455960	-0.032770	-0.095793	-0.057669
Kurtosis	1.846637	1.849948	45.52494	1.181224	1.123658	1.402856
Jarque-Bera	5.752316	4.931624	7241.990	12.14489	13.04367	9.401964
Probability	0.056351	0.084940	0.000000	0.002306	0.001471	0.009086
Sum	54.44000	941.6000	44.50000	28557206	28273310	22399.39
Sum Sq. Dev.	25.71424	1767.706	317.8606	8.14E+12	7.79E+12	549587.5
Observations	90	90	90	90	90	90

The summary statistics show that the average mean of debt ratio is about 0.61. The average mean for inflation rate is 10.7, while averages mean of capital adequacy, non-performing loan, size of loan and foreign exchange rate are 0.505682, 324513.7, 321287.6, and 254.5385 respectively. The standard deviations of corporate liquidity variables such as inflation rate, capital adequacy, non-performing loan, size of loan and foreign exchange rate are, 4.507600, 1.911431, 305953.5, 299306.9, and 79.48017. The values of the standard deviations indicate that there is wide spread in the debt ratio in Nigeria banks in Nigeria. This is also evident in the wide gap between the maximum and minimum values. For example, the maximum value of debt ratio is 2.140000 while the minimum is 0.010000, with difference of 2.13. Similarly, the maximum of inflation rate is 19.01000 while the minimum is 2.220000. These corporate variations are rather on the high side. Even in the case of capital adequacy the maximum is 15.00000 and the minimum is 0.010000. It is equally observed that non-performing loan varied widely over time among different deposit money banks across Nigeria. For instance, size of the loan is 754789.0.5 while its minimum value is 2.034931, however, the echange rate is . 359.7400, while its minimum is 157.0200. The wide variation over time indicates high level of fluctuation of credit risk management which affects corporate liquidity.

4.2 Model Estimation

Two models developed for the study were analysed and interpreted in this sub-section. Model estimation were done using both the fixed effect and, random effect techniques. The Hausman test criteria was used to choose the most appropriate technique (between Fixed and Random Effects) for interpretation, in each model.

Table 1:

Period random effects test equation:

Dependent Variable: LNWC

Method: Panel Least Squares

Date: 10/11/24 Time: 09:41

Sample: 2012 2021

Periods included: 10

Cross-sections included: 9

Total panel (balanced) observations: 90

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.127646	217.7387	0.563816	0.5746
INF	-0.003489	0.062331	-0.055982	0.9555
CAD	0.062073	0.114041	3.544308	0.0078
LNPL	-0.301161	0.434789	-0.692661	0.4907
LSL	0.776819	0.380136	2.043529	0.0445
FREX	-0.427145	0.851629	-0.501562	0.6174

Effects Specification

Period fixed (dummy variables)

R-squared	0.761951	Mean dependent var	17.13448
Adjusted R-squared	0.717515	S.D. dependent var	3.547809
S.E. of regression	1.885636	Akaike info criterion	4.257419
Sum squared resid	266.6716	Schwarz criterion	4.674054
Log likelihood	-176.5838	Hannan-Quinn criter.	4.425430
F-statistic	17.14722	Durbin-Watson stat	1.532027
Prob(F-statistic)	0.000000		

Source: Extract from Output generated using E-views 12

The coefficient of determination (R-squared) is 0.761951. This indicates that about 76% of changes in new working capital can be explained by corporate liquidity such as inflation rate, capital adequacy, non-performing loan, size of loan, foreign exchange rate. This revealed that a substantial proportion (76%) of the factors that influence or determine new working capital is captured by corporate liquidity strategy. This implies that new working capital can be used to determine extent of corporate liquidity for banks in financial sector. Result of the F-statistics (17.14722) with p.value (0.0000) less than 5% is rejected. This concludes that the cumulative effect of corporate liquidity strategy (inflation rate, capital adequacy, non-performing loan, size of loan, foreign exchange rate) is statistically significant to determine corporate liquidity in Nigeria. Furthermore, coefficient of regression explains the individual contributions of the firm net working capital on corporate liquidity. The coefficients for CAD (0.062073) and LSL (0.776819) revealed that capital adequacy and size of loan have positive relationship with net working capital. However, inflation (-0.003489), LNPL (-0.301161) and FREX (-0.427145) have a negative relationship. The results of the p-values for CAD and LSL are all greater than 0.05 level of significance. Thus, capital adequacy and size of loan each has significant positive effect on performance of deposit money banks in Nigeria. The regression equation is thus restated as;

Model 2

Period random effects test equation:

Dependent Variable: DER

Method: Panel Least Squares

Date: 10/11/24 Time: 09:48

Sample: 2012 2021

Periods included: 10

Cross-sections included: 9

Total panel (unbalanced) observations: 88

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.912386	59.77434	0.821822	0.4139
INF	-0.026645	0.016499	-1.615005	0.1106
CAD	0.032036	0.030268	2.058406	0.0034
LNPL	0.049396	0.114831	2.430158	0.0683
LSL	-0.044246	0.100450	-0.440481	0.6609
FREX	0.196296	0.234822	0.835937	0.4059

Effects Specification

Period fixed (dummy variables)

R-squared	0.597903	Mean dependent var	0.618636
Adjusted R-squared	0.553254	S.D. dependent var	0.543660
S.E. of regression	0.497306	Akaike info criterion	1.594811
Sum squared resid	18.05390	Schwarz criterion	2.017084
Log likelihood	-55.17168	Hannan-Quinn criter.	1.764934
F-statistic	21.12442	Durbin-Watson stat	1.506374
Prob(F-statistic)	0.000008		

Source: Extract from Output generated using E-views 12

From the Table above, R^2 which measures the strength of independent variable on the dependent variable, the regression model results shows that R^2 value is 59%. This implies that 59 % of the variation in corporate liquidity is explained by variations in inflation rate, capital adequacy, non-performing loan, size of loan, foreign exchange rate. This was supported by adjusted R^2 of 55%. In order to check for autocorrelation in the model, Durbin-Watson statistics was employed. Durbin-Watson statistics of 1.506374 in table 3 shows that the variables in the model are not auto correlated and that the model is reliable for predications.

The f-statistics value of 21.12442 in table 3 with f-statistics probability of 0.000 shows that the independent variables have significant effect on dependent variables such as inflation rate, capital adequacy, non-performing loan, size of loan, foreign exchange rate, can collectively explain the variations in corporate liquidity. From the result in table 3, the result shows a regression line intercept of 0.912386. The value is positive and statistically insignificant 0.821822 with p-value of 0.4139 which is greater than 0.05. Hence this is an indication that the debt ratio will be constant at 9.% per percent per annum when there is no change in the explanatory variables. The regression result shown in Table 3, shows a significant positive relationship between capital adequacy and debt ratio. The value for capital adequacy is 0.032036; this implies that One percent increase in capital adequacy, ceteris paribus, will lead to about 3 percent increase in debt ratio. This is consistent with apriori expectation. This result supports the fact that increasing capital adequacy enhances debt ratio of construction deposit money bank. Non-performing loan has a positive correlation with debt ratio. The value for Non-

performing loan is 0.044246; this implies that One percent increase in Board independent, ceteris paribus, will lead to about 1 percent increase in Non-performing. This is consistent with apriori expectation.

This result supports the fact that increase in Non-performing loan increases debt ratio of deposit money banks in Nigeria. Size of loan has a positive correlation with debt ratio. The value for Size of loan is -0.044246; this implies that One percent increase in Size of loan, ceteris paribus, will lead to about 4 percent decrease in debt ratio. This is consistent with apriori expectation. This result supports the fact that decreasing in size of loan increase the debt ratio of deposit money bank in Nigeria. Foreign exchange rate has a positive correlation with debt ratio. The value for Foreign exchange rate is 0.196296; this implies that One percent increase in Foreign exchange rate ceteris paribus, will lead to about 3 percent increase in Foreign exchange rate. This is consistent with apriori expectation. This result supports the fact that increase in Foreign exchange rate increase the debt ratio of deposit money banks.

Furthermore, f-statistics of regression explains the individual contributions of the firm on foreign exchange rate on debt ratio. The t-test for CAD 2.058406 (0.0034), LNPL 2.430158 (0.6683) and FREX 0.835937 (0.4059) revealed that capital adequacy, non-performing loan and foreign exchange rate have positive relationship with debt ratio. However, INF -1.615005 (0.1106), and LSL -0.440481 (0.6609) has a negative relationship. The results of the p.values for inflation rate and size of loan are all greater than 0.05 level of significance. Thus, capital adequacy and non performing loan has significant positive effect on corporate liquidity on deposit money banks in Nigeria.

CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

The study examined the effect of credit risk management on corporate liquidity of deposit money banks in Nigeria. The study found out that Capital adequacy and size of loan as credit risk management variables have positive but significant effect on networking capital of deposit money banks in Nigeria, while inflation rate, non-performing loan and foreign exchange rate has an insignificant negative effect. Capital adequacy and non-performing loan as credit risk management variables have positive and significant effect on debt ratio on deposit money banks in Nigeria, while inflation rate, size of loan and foreign exchange rate has an insignificant effect. Non-performing loan and size of loan as credit risk management variables have positive but significant effect on short-term debt on deposit money banks in Nigeria, while inflation rate, capital adequacy and foreign exchange rate has an insignificant negative effect. Capital adequacy and size of loan as credit risk management variables have positive and significant effect on quick ratio on deposit money banks in Nigeria, while inflation rate, non-performing loan and foreign exchange rate has an insignificant negative effect. Lastly, Capital adequacy and non-performing loan as credit risk management variables have positive and significant effect on current ratio on deposit money banks in Nigeria, while inflation rate, size of loan and foreign exchange rate has an insignificant negative effect.

5.2 Recommendation

On the bases of the finding of the research, the following recommendations were made;

1. Banks 'management should endeavour to develop rigorous and robust credit policies that will enable them to efficiently and effectively assess the creditworthiness of their customers thus, minimizing the incidences of non-performing loans.
2. Capital adequacy of banks should be closely monitored in such a way that it will not be less than the minimum Central Bank of Nigeria provision. With this, the financial health and strength of banks will not be jeopardized.

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