Capital Adequacy and Financial Performance of Deposit Money Banks in Nigeria

IGEMOHIA, MOHAMMED[1], OMOYE EZIE ISRAEL[2], PROFESSOR V.I.O. ODIRI[3]
[1]*PhD Student, Department of Business Administration, Faculty of Management Sciences, Delta State University, Abraka*
[2]*Department of Business Administration, Faculty of Management Sciences, Delta State University, Abraka*
[3]*Department of Business Administration, Faculty of Management Sciences, Delta State University, Abraka*

Abstract- ***This study investigated the effect of capital adequacy on financial performance of listed deposit money banks in Nigeria from 2012-2023. The study population comprised all listed deposit money banks, out of which fourteen (14) were selected. Secondary data was obtained from the yearly published financial statements of the banks and was analyzed via descriptive statistics (mean, standard deviation, minimum value, maximum value, skewness, kurtosis and Pearson correlation), diagnostic statistics (variance inflation factor, Breusch-Pagan/Cook-Weisberg, Ramsey RESET, Cameron & Trivedi's decomposition of information –matrix, and Hausman specification tests), and inferential statistics (fixed and random effects). The result revealed that capital adequacy ratio (t-value = 2.81; p-value = 0.006 < 0.05%) significantly influence financial performance of deposit money banks. On the basis of the findings, it was recommended among others that deposit money banks' regulators need to sustain the current capital cash requirements by constantly reviewing it to meet with global best practices. In addition, stakeholders including investors, management and deposit money banks' regulators should focus attention and put beam light on the level of capital requirements of listed deposit money banks in Nigeria.***

Indexed Terms- ***Capital adequacy; Deposit money banks; Financial performance; Credit risk***

I. INTRODUCTION

Banking is a business and like all businesses, its primary goal is to maximize performance (profit) or shareholders' wealth. Husaini and Saiful (2017) opined that DMBs cannot obtain maximum returns or be able to maximize shareholders' wealth or performance without taking risk; therefore DMBs acting as intermediary between surplus and deficit units take on a number of risks. If DMBs avoid risks to reduce their failure rates, it would be harmful to the financial stability and sustainability of the economy. Furthermore, because risks and returns (performance) are interconnected, studies demonstrate simultaneous outcome of risks and performance (Garba, Salleh & Hafiz, 2022). In practical terms, the Hawley (1893) risk-profit and Bowman (1979) paradox of risks and returns theories offer adequate justification of the nexus between credit risk management and performance.

The first research problem identified in this study is that some loan applicants find it cumbersome to provide acceptable collateral securities. This inhibits DMBs from being able to offer credit to them, thus decreasing DMBs' performance and in general, economic growth. In some instance, DMBs management boycott bank lending procedures and offer credits to the domestic sector which results to non-performing loans, regardless of the policy framework for granting credits. To be able to address the problems caused by non-performing loans that plagued Nigerian DMBs, the federal government established Assets Management Corporation of Nigeria (AMCON). However, there are still cases of non-performing loans which has led to the revocation and seizure of some DMBs licenses.

Second, DMBs had significant amount of bad debts in their loan portfolio; this resulted in the liquidation of several DMBs and the need for banking sector reforms by the CBN. Also, over the years, DMBs performance had experienced a sharp decline; this according to Madugba (2020) was caused by numerous factors such as loan losses, bad debts, large-scale insider misuse, subpar corporate governance and a high percentage of non-performing loans. Third, capital adequacy ratio appears to be another problem; this has made the CBN to increase the minimum capital requirements to ₦25 billion to ₦500 Billion for DMBs with international authorization, ₦200 billion for DMBs with national authorization while ₦50 billion for DMBs with regional authorization.

The question is that does the series of move by the CBN in the past and present be able to bring about favourable performance indicators for DMBs and the nation in general? On the other hand, DMBs' main economic role is to assume risks to be able to strike a suitable balance between hazard and performance (Teichman, 2019). Hence, a deeper understanding of how the management of capital level influence DMBs performance is vital as it would help the banking industry run more smoothly in this current era characterized by high inflation, rate, exchange rate, low dividend payouts, among others. Hence, the goal of this study was to investigate the relationship between capital adequacy and DMBs performance in Nigeria.

II. REVIEW OF RELATED LITERATURE

2.1 Capital Adequacy Ratio (CAR)

Aside the aforementioned variables of credit risk management, Baten and Koch (2017) incorporated CAR as a conventional empirical driver of credit risk in their research. The Basel Accord (1998) as cited in Gieseche (2024), proposed the use of the CAR, which is ratio of bank's total capital to its risk-adjusted assets, to assess asset quality and determine adequate credit risk management. It is essentially a ratio of the bank's risk-weighted assets (loans) to its tier 1 and tier 2 equity; it shows percentage of a bank's own equity allocated to risk. As per the Basel II accord, banks are required to maintain capital adequacy of no less than 8% of their high-risk assets (Baten & Koch 2017).

The relationship between minimum regulatory capital and underlying credit risk, market risk, and corporate risk exposure of banks was made clear by Basel II, demonstrating the significance of capital management as a step in the mitigation and management of risk (Baten & Koch 2017). Two (2) approaches are suggested by Basel Committee to determine the capital needs for credit risk: the first involves measuring credit risk in a standard way, and the second involves obtaining supervisor clearance and permitting banks to employ the internal ratings-based approach (IRB) methodology (Baten & Koch 2017)

CAR was employed as a stand-in for credit risk management by Gizaw et al. (2015). The amount of equity and other reserves that a bank retains against hazardous assets to shield depositors from unforeseen loss is known as CAR (Gizaw et al., 2015Belas, Misankova, Schonfeld & Gavurova, 2017). The vital metric used by regulators to assess a bank's financial health is its CAR, which is calculated as shareholders' fund divided by total assets and adopted as regulatory capital requirement (Goddard, Molyneux & Wilson, 2024). Ratio of total equity to total asset is used to assess CAR. CAR was calculated by Goddard et al (2024) using ratio of bank capital and reserves to total assets.

According to Sufian and Chong (2024), a bank's capacity to sustain operational and abnormal losses makes capital sufficiency a gauge of its financial health. CAR assists regulators in safeguarding depositors against banks that make large loans without repaying the majority of the money lent (Goddard, 2024). This is because a bank may file for quick bankruptcy, which would mean depositors would lose their money, if it has significant loan losses that completely deplete its equity (Sufian & Chong, 2024). A higher percentage indicates improved asset quality and bank. It is made up of the most dependable and liquid forms of financial capital, mostly shareholders' equity. CAR assesses banks' risk-taking behaviour and evaluates their solvency and capacity to take on risk (Sufian & Chong, 2024). In this study, CAR was measured as capital requirements divided by total bank deposit

2.2 Performance of Deposit Money Banks (DMB)

Profitability, or the amount of deposit profits, is another term for deposit bank performance (Ruziqa, 2015). Ruziqa (2015) claimed that ratios are used to measure the profitability level, which in turn characterizes the overall performance of banks worldwide. These ratios are return on equity (ROE), which is calculated as net income divided by average equity; return on asset (ROA), which is calculated as net income divided by total assets, and net interest margin (NIM) (Ruziqa, 2015). According to Abiola and Olausi, (2024), NIM, RO and ROE are good indicators of performance of DMBs; however, there are other metrics that can be employed to measure DMBs performance – gross profit divided by gross profit margin; a measure that was employed in this study.

There are several ideas about the relationship between credit risk and deposit money bank performance, ranging from the risk theory of profit to the theory of financial intermediation advanced the notion of financial intermediation (Abiola & Olausi, 2024). According to Kolapo et al. (2012), financial intermediation is perceived as the process of gathering funds from the general public and extending them to borrowers under commercial terms, so exposing them to banking risk. asserts that intermediation forces banks to meet their liquidity needs, mobilize deposits, and provide credit (Kolapo et al., 2012). However, it is also associated with default risks, which have the potential to impede the intermediation process. Therefore, risk management was integrated into financial intermediation by Gieseche (2024). They maintained that risk management plays a crucial role in intermediary activity, facilitating risk transfer and transactions in financial instruments and markets as well as enabling effective intermediation procedures.

In order to give a framework for analysing the impact of credit risk management on banks' profitability, credit risk management aims to maximize banks' risk-adjusted rate of return by keeping credit risk exposure within acceptable bounds (Kargi, 2021). One can assess a deposit money bank's financial success using a variety of yardsticks. Profitability and asset base are the two conventional metrics used to assess a bank's success in Nigeria, according to (Kargi, 2021). The board of directors is pleased with the asset base while shareholders are pleased with profitability. Similar to this, Return on Assets (ROA) and Return on Capital Employed (ROCE) are cited by as the most widely used standard indicators of bank performance historically. A common way to assess a bank's success is to divide its profits by its total assets, or return on assets (Athanasoglou, et al., 2016). Profits before and after taxes can be a numerator; it provides insight into how successfully the available resources are being used for management and shareholders. Although ROA has the disadvantage of ignoring the impact of debt and tax, it might reveal low quality enterprises (Athanasoglou, et al., 2016).

According to Omar and Rahman (2018), another common metric used to assess bank performance is return on capital employed. By examining the net profit made from each naira of capital used, it is intended to demonstrate how well a bank uses its available capital (Omar & Rahman, 2018). It reveals shareholders how well management is using their investments and long-term obligations based on book value to increase their wealth. Since ROCE measures profitability after deducting the amount of capital required to achieve that level of profitability, it is a helpful indicator of financial efficiency (Athanasoglou, et al, 2014). ROCE serves as a gauge for the effectiveness and financial success of a company's capital expenditures. ROCE is of importance to investors as it indicates the efficiency with which a company employs its money and its long-term financing strategies (Athanasoglou, et al, 2014; Elkington, 1997).

The rate at which businesses are returning on their assets should always exceed the rate at which they are borrowing. ROCE also takes other liabilities and debt into account (Athanasoglou, et al, 2014). This offers a more accurate picture of the financial performance of businesses with large debt. A greater ROCE denotes a more economical use of capital. If ROCE is less than the capital cost of the business, it means that capital is not being used effectively and that shareholder value is not being created (Athanasoglou, et al, 2014). ROE gives investors insight into how well a firm is managing equity shareholders.. ROE is flawed in two main ways. First, reported profits are manipulated and can be detracted from cash flow (Borio, 2002). Overly aggressive accounting techniques can exaggerate

reported earnings at the expense of cash flow (Ajanthan, 2023).

In this study, DMBs performance will be measured using gross profit divided by gross profit margin (gross profit divided by turnover). Basically, gross profit margin is expressed by deducting direct expenses from net sales and then multiplied by 100 percent. On the other hand, gross profit divided by gross profit margin also known as profit ratio is used to indicate how successful a firm is at both generating revenue, keeping expenses low and the profit margin they can obtain from both revenue and expenses.

2.3 Theory of Credit Rationing

The credit rationing idea was tested in 1969 by Dwight M. Jaffee and Franco Modigliani (Onaolapo, 2012). It was first proposed by Donald R. Hodgman in a paper titled Credit Risk and Credit Rationing in 1960. Credit rationing, according to Jaffe and Modigliani (1969), occurs when there is a greater demand than there is supply of commercial loans at the rates that the banks quote (Onaolapo, 2012). As a result, the market's surplus demand for loans cannot be satisfied by increases in interest rates. Credit rationing is defined by Kargi, (2021) as situations in which some loan applicants who appear to be identical are granted credit while others are denied credit, even if they offer a higher interest rate; or identifiable groups of people who, despite having a greater supply of credit, are unable to obtain loans at any interest rate (Onaolapo, 2012).

Credit rationing is the practice of a bank denying credit to customers who request money and are prepared to pay a higher interest rate (Onaolapo, 2012). According to this idea, lenders should limit the amount of credit they extend to borrowers by taking into account the market interest rates, the availability of collateral, and the alternatives to collateral (Onaolapo, 2012). The type of guarantee that borrowers provide to lenders determines whether or not they will lend money. Lenders offer cheap interest loans in order to deter riskier investments and the possibility that borrowers won't pay back their debts (Onaolapo, 2012). Because their relationship with the lender is weaker when collateral is included, borrowers who have loans based on alternatives to collateral have a way to avoid repaying their debts (Kargi, 2021).

III. METHODOLOGY

The study adopted ex-post facto design. Secondary data, particularly annual reports of deposit money banks formed the major instrument of data collection. The population of the study was the twenty-three (23) publicly listed DMBs on the Nigerian Exchange Group (based on their authorisations – National, Regional and International). However, a sample of fourteen (14) publicly listed DMBs with national and international authorisation was obtained via inclusion and exclusion criteria.

The study used descriptive, regression diagnostic, and inferential statistics Furthermore, fixed effect model was used to ascertain unobserved time-invariant individual effect of the independent variable on dependent variable while the random effect model was used to measure the difference(s) between the average score at DMBs and average score in time and it is 'random' since the sample has been randomly obtained from a larger population of sample. Data obtained were analyzed via STATA 16.0 version. Based on the theoretical postulations and hypotheses, the following multiple regression models were estimated.

$$DPerf = f(Dcar) \quad \text{- Equation 1}$$

$$DPerf_{it} = \beta_0 + \beta_1 Dcar_{it} + u_{it} \quad \text{- Equation 2}$$

Where:

β0= Intercept term or constant intercept of the observations obtained for the variables of DMBs in Nigeria

β1-5= Slope coefficient or slope parameters which measure the independent (capital adequacy ratio) of DMBs in Nigeria,

ε= Stochastic term, error term or random disturbance term; it is so called because εis supposed to disturb the exact linear relationship which is assumed to exist between the dependent, mediating and independent variables of the study.

i=cross-section data.It consists of a sample 14 DMBs taken at a given point in time.

t=Time period. It consists of the intended 168 observations on the variable or several variables over time at equal intervals.

DPerf = DMBs performance; Dcar = Capital adequacy ratio; Capital Adequacy Ratio = Capital Requirements divided by Total Bank Deposits

IV. RESULTS

Table 1: Summary of Statistics

Statistics	Financial Performance (Dperf)	Capital Adequacy Ratio (Dcar)
Mean	0.9529	1.1075
Standard Deviation	0.1269	1.5237
Minimum Value	0.5200	0.0210
Maximum Value	1.4500	11.300
Skewness	0.8698	3.8087
Kurtosis	6.7271	20.401

Source: Researcher's Computation via STATA 16.0

Table 1 is the mean scores (average) for each of the variables and their respective standard deviation values (degree of dispersion); the results shed light on the nature of the variables of the selected DMBs in Nigeria. First, Dcar has a mean score of 1.1078; this is an indication that DMBs in Nigeria had significant numbers of capital (Dcar), particularly during the period under investigation.

Financial performance (Dperf) had the least dispersion with a standard deviation of 0.1269; the dispersion values for all the variables range from 0.1269 to 16.2765. Also, Dcar average of 1.1075. The results of the minimum values for Dcar and Dperf were 0.021, and 0.52 and maximum values for Dcar and Dperf were 11.3, and 1.45 respectively, suggesting among others that most likely, the variables of the study were not constant over time.

Additionally, the skewness values which is a measure of the degree of asymmetry revealed that the variables (Dcar, and Dperf) were positively skewed with coefficients of 3.80(Dcar), and 0.86 (Dperf) respectively. The highest kurtosis is 20.405(Dcar); also, the kurtosis value for Dcar and Dperf shows platykurtic curve.

Table 2: Pearson Correlation Matrix

Statistics	Financial Performance (Dperf)	Capital Adequacy Ratio (Dcar)
Dperf	1.0000	
Dcar	0.2696	1.0000

Source: Researcher's Computation via STATA 16.0

In Table 2, the result revealed that Dcar (0.2969) is positively correlated with financial performance (Dperf); hence there is positively relationship between capital adequacy and financial performance of deposit money banks in Nigeria

Table 3: Fixed/Random Effects Results

Dependent Variable: Return on Assets (Dperf)				
Estimator(s)	Fixed Effect (FE)		Random Effect (RE)	
Variable(s)	Coefficient	Probability	Coefficient	Probability
Dcar	0.0156 (2.81)	0.006	0.0188 (3.18)	0.001
_Cons.	1.1177 (15.02)	0.000	1.1505 (14.41)	0.000
F-value	(4, 151) = 6.74			
F-Probability	0.0001			
R-Squared (within)	0.1515		0.1424	
R-Squared (between)	0.1670		0.3663	
R-Squared (overall)	0.1473		0.1568	

Wald Ch2(4)			30.13	
Prob. Ch2			0.0000	
Hausman Test	Chi2(2) = 23.40		Prob>Chi2= 0.0001	

Source: Researcher's Computation via STATA 16.0

Table 3 is the results of fixed effect (FE) and random effect (RE) panel regression for credit risk management variables. In Table 3, we found that Dcar is significant at 5% level in explaining Dperf. Using FE, the coefficient is 0.0156 (Dcar), indicating that when DMBs in Nigeria have good capital requirements, it would lead to approximately 1.56% changes in their level of financial performance.

Besides, when RE is employed, the coefficient is 0.0188 (Dcar), indicating that when DMBs in Nigeria have good capital requirements, it would lead to approximately 1.88% changes in their level of financial performance. The z-score for Dcar (3.18; p-value = 0.001) was found to be statistically significant. Furthermore, the z-score confirmed that Dcar is statistically significant in explaining financial performance. The R^2 (overall) is 0.1473 for FE and 0.1568 for RE; however, this was higher for RE; hence, the R^2 value provides evidence that the variable explained about 15.7% of the variation in financial performance.

The result of Hausman test (Prob. > Chi2 = 0.0001 < 0.05) suggests that FE is more efficient than RE thus, FE showed that the subjects from which measurements were drawn are fixed and that the differences between deposit money banks in Nigeria are therefore not of interest. Given the t-value for capital adequacy ratio (Dcar) is 2.81 with a probability value (p-value) of 0.006 signify that it is less than 0.05%; this implies that Dcar is statistically significant.

V. DISCUSSION

Capital adequacy ratio (CAR) is a conventional measure of credit risk management in most empirical research. The Basel Accord(1998) cited in Gieseche (2024), proposed the use of CAR, which is ratio of bank's total capital to its risk-adjusted assets, to assess asset quality and determine adequate credit risk management. It is usually a ratio of bank's risk-weighted assets (loans) to its tier 1 and tier 2 equity and it reveals percentage of a bank's own equity allocated to risk. As per Basel II accord, DMBs are required to maintain capital adequacy of not less than 8% of their high-risk assets (Baten & Koch 2017; Baten & Koch, 2017)

The relationship between the minimum regulatory capital and underlying credit, market, and corporate risks exposure of DMBs were made clear by the Basel II, demonstrating the significance of capital management as a major step in the management of credit risks (Baten & Koch 2017). Two (2) approaches have been recommended by Basel Committee to determine the capital needs for credit risk: the first entails measuring credit risk in a standard way, and the second is obtaining supervisor clearance and permitting banks to use the internal ratings-based approach (IRB) methodology (Baten & Koch 2017). Hence, the amount of equity and other reserves that a bank retains against hazardous assets to shield depositors from unforeseen loss is known as CAR (Gizaw et al., 2015; Belas, et al, 2017).

In this study, CAR was measured as capital requirements divided by total bank deposit (a proxy for credit risk management). The result between capital adequacy ratio and financial performance of DMBs revealed that capital adequacy ratio is statistically significant (t-value = 2.81; p-value = 0.006 < 0.05%). The result led to the rejection of the null hypothesis and an acceptance of the alternate hypothesis, indicating that capital adequacy ratio has significant positive impact on the performance of deposit money banks in Nigeria. The results agree with the findings of Madugba (2020); Kurawa and Garba (2017); Yi and Peng (2016); Misker (2015) who found that capital adequacy significantly influence DMBs performance. On the other hand, our results disagree with the findings of Aruwa and Musa (2014) who found insignificant influence of capital adequacy ratio on DMBs performance.

CONCLUSION RECOMMENDATIONS

The management of capital is believed to be a consistent key indicator of how companies are managed presently and in assessing their level of performance in the future. The study concludes that capital adequacy has significant effects on the performance of deposit money banks in Nigeria. On the basis of the findings, it was recommended among others that deposit money banks' regulators need to sustain the current capital cash requirements by constantly reviewing it to meet with global best practices.

Furthermore, stakeholders including investors, management and deposit money banks' regulators should focus attention and put beam light on the level of capital requirements of listed deposit money banks in Nigeria. The study contributes to knowledge by establishing that capital adequacy has significant influence on the performance of deposit money banks in Nigeria

REFERENCES

[1] Abiola, I. & Olausi, A.S. (2024). The impact of credit risk management on the commercial banks' performance in Nigeria. *International Journal of Management and Sustainability, 3*(5), 295-306.

[2] Ajanthan, A. (2023). The relationship between dividend payout and firm profitability: A study of listed hotels and restaurant companies in Sri Lanka. *International Journal of scientific and Research Publications*, *3*(6), 1-6.

[3] Athanasoglou, P., Delis, D., & Staikoras, C. (2016). Determinants of bank profitability in the south eastern European region. Bank of Greece. *Working Paper, 47,10-27.*

[4] Baten, C. & Koch, C. (2017). The countercyclical capital buffer. *BIS Working Papers, 511*.

[5] Belas, J., Misankova, M., Schonfeld, J. & Gavurova, B. (2017). Credit risk management: Financial safety and sustainability aspects. *Journal of Security and Sustainability Issues, 7*(1), 79-9

[6] Elkington, J. (1997). *Cannibals with forks: The triple bottom line of 21st century business.* London, England: Capstone.

[7] Garba, M. Salleh, F. & Hafiz, U.A. (2022). Underpinning Hawley's risk theory of profit on risk intelligence and sustainability relations of SMEs in Nigeria. *Ilomata International Journal of Management, 3*(2), 140-15 doi.org/10.52728/ijjm.v3i2.469.

[8] Gieseche, K. (2024). Credit risk modelling and valuation: An introduction. *Credit Risk: Models and Management*, *2*, 1-40.

[9] Gizaw, M., Kebede, M. & Selvaraj, S. (2015). The impact of credit risk on profitability performance of commercial banks in Ethiopia. *African Journal of Business Managemen*t, *9*(2), 59-66.

[10] Goddard, J., Molyneux, P., & Wilson, J. (2024). Dynamics of growth and profitability in banking. *Journal of Money, Credit and Banking, 36*(15), 1069–1090. http://dx.doi.org/10.1353/mcb.2015.0015.

[11] Husaini, R. & Saiful, H. (2017). Enterprise risk management, corporate governance and firm value: Empirical evidence from Indonesian public listed companies. *International Journal of Advances in Management and Economics*, *6*(6), 16-23.

[12] Kargi, H.S. (2021*). Credit risk and the performance of Nigerian banks*. Zaria: Ahmadu Bello University Press.

[13] Kolapo, T.F, Ayeni, R. & Oke, M.O. (2012). Credit risk management and commercial banks performance in Nigeria: A panel model approach. *Australian Journal of Business Management Research 2*(2), 31-38.

[14] Kurawa, J.M., & Garba, A. (2017). The effect of liquidity on the profitability of Nigerian banks. *Research Journal of Management, 2*(7), 68-82.

[15] Madugba J.U. (2020). Recapitalization and performance of banks: The Nigeria experience. Afro-*Asian Journal of Economics and Finance*, 1(2), 151-168

[16] Misker, B. (2015). *The effect of credit risk on financial performance of banks in Ethiopia. A thesis submitted to* Addis Ababa University,

Addis Ababa. (Retrieved from: http://etd.aau.edu.et/bitstream/handle/123456789/4477/Misker%20Bizuayehu.pdf?seq uence=1&isAllowed=yon 5th August, 2024).

[17] Omar, F. & Rahman, S., (2018). Performance evaluation of private commercial banks of Bangladesh: A trend analysis. *Asian Business Review, Asian Business Consortium*, *8*(1), pages 35-40.

[18] Onaolapo, A. R. (2012). Analysis of credit risk management efficiency in Nigeria commercial banking sector, (2004-2009). *Far East Journal of Marketing and Management, 2*(4), 39-52.

[19] Ruziqa, A. (2015). The impact of credit and liquidity risks 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.

[20] Sufian, F. & Chong, R. (2024). Determinants of banks' profitability in a developing economy: empirical evidence from Philippines. *Journal of Accounting and Finance, 4(2), 91-112*.

[21] Teichman, J., (2019). *Policymaking in Mexico: from boom to crisis*. Routledge.

[22] Yi, & Peng (2016). An empirical study of classification: algorithm evaluation for financial risk prediction. *Applied Soft Computing, 11*, 2906-2915.