

# The Effect of Regulatory Risk Management Strategies on the Financial Performance of Listed Deposit Money Banks in Nigeria

Falade Samuel Shola<sup>1</sup>, Prof. Nyor Terzungwe<sup>2</sup>, Associate Prof. Yahaya Adabenege Onipe<sup>3</sup>, Prof. Agbi Samuel Eniola<sup>4</sup>

<sup>1</sup>Internal Control Division, United Bank for Africa Kenya Limited, 2<sup>nd</sup> Floor, Imperial Courts, Westlands, Kenya.

<sup>2,3&4</sup>Faculty of Management Sciences, Nigeria Defence Academy, Kaduna, Nigeria.

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## ABSTRACT

Studies on risk management have gained increasing focus as several regulators and other related bodies such as the Basel accord, International financial reporting standard authorities and various country's central banks had formulated several frameworks for effective regulation and management of risks by financial institutions across the world with the expectation of improvement in the performance of the financial institutions. This study focuses on the effect that regulatory risk management strategies, measured with independent variables of strategic, reputational, legal/regulatory and operational risk has on the financial performance of the Nigerian deposit money banks. This study used a population of fourteen (14) banks listed on the Nigeria exchange from which a sample of twelve (12) banks to extract data for a period of ten years and conducted a multivariate regression analysis using capital adequacy and market values as financial performance measurement in which it was observed that the regulatory risk management strategies have an overall positive and significant effect on both capital adequacy and market values of the banks and thus concludes that the adoption of effective regulatory risk management strategies would further lead to maintenance of stable and improved financial performance of the banks. Consequently, the study recommends the need for executive management of deposit money banks to pay attention to the level of compliance with these regulatory risk management codes to ensure the optimum financial performance of the banks.

**Keywords:** Regulatory Risks, Risk strategies, Risk Management, Financial Performance, Capital Adequacy, Price Earnings Ratio

**JEL Codes:** G110, G320 M410, M480

## INTRODUCTION

### Background

Banks are exposed to various risks requiring effective management in order to remain in business and achieve the organisational performance goals. The Basel accord, international standard setting bodies, such as IFRS, and various country's central banks had at one time or the other formulated frameworks for the effective management of risks. The Central Bank of Nigeria (CBN) introduced several regulatory risk management frameworks to compel banks to put their risks in perspectives and ensure they are properly

managed. It is on this basis that this study focusses on the effect of management of strategic, operational, reputational and legal/regulatory risks (bundled as regulatory risk management strategies) on the financial performance of listed deposit money banks (DMBs) in Nigeria.

In the year 2014 the CBN implemented a framework for the management of nine major risk elements of credit risk, market risk, liquidity risk, operational risk, strategic risk, solvency risk, legal/ regulatory risk, reputational risk, and counterparty risk (CBN, 2014). It is expected that with the introduction of these risk management frameworks by the regulatory bank, that banks would performed better, be healthier, remain more stable and be better capitalised. However, the new banks' recapitalisation requirement announced by the CBN which had increased banks' capital base to N50 billions for banks with regional authorisation, N200 billions for banks with national authorisation and N500 billions for banks with international authorisation together with the revocation of the banking license of Heritage bank in June 2024 seems to imply that the risk management framework implemented a decade ago might not have produced the desired effect on the performance of the banks (CBN, 2024; Aduloju, 2024). It is on this backdrop that this study seeks to investigate the effect of management of these strategic, operational, reputational and legal/regulatory risks elements (bundled as regulatory risks strategies) on the financial performance measured with capital adequacy and market values of the Nigerian DMBs.

Meanwhile, some reviews which had investigated the effect of risk management on the financial performance of DMBs measured by capital adequacy and market value have produced varying results. Some studies reported negative effect and some others reported positive effect while some reported mixed effect with varying significant levels. This study therefore, examines the effect of the management of these regulatory risk strategies variables of strategic, operational, reputational and legal/regulatory risks on the dependent variables (DVs) of Capital adequacy and market value of DMBs in Nigeria by endeavouring to provide answer to the research question, what is the effect of the management of these strategic, operational, reputational and legal/regulatory risks on the financial performance of DMBs in Nigeria? While the main objective is the examination of the effect of regulatory risk management strategies on the financial performance of listed DMBs in Nigeria. However, the specific objectives are to evaluate the effects of the management of strategic risk, legal/regulatory/ compliance risk, reputational risk, and operational risk, on the financial performance of the listed DMBs in Nigeria and to evaluate these objectives, the following hypotheses in the null form are formulated:

$H_{01}$ : strategic risk management has no significant effect on the financial performance of (DMBs) in Nigeria

$H_{02}$ : operational risk management has no significant effect on the financial performance of (DMBs) in Nigeria

$H_{03}$ : reputational risk management has no significant effect on the financial performance of (DMBs) in Nigeria

$H_{04}$ : legal/regulatory/compliance risk management has no significant effect on the financial performance of (DMBs) in Nigeria

This study is of significance to the board of directors and senior management staff of the deposit money banks of Nigeria, as it will assist the banks in formulating strategies for appropriate risk management processes and procedures that will guarantee continuity in businesses despite the stiff competitions and the harsh business environment in which the banks operate. The research is also important to the employees of the deposit money banks, consultants, regulators, policy makers, law enforcement agencies such as the central bank of Nigeria (CBN), independent corrupt practices commission (ICPC), Nigeria financial intelligent units (NFIU) Asset management company of Nigeria (AMCON), Nigeria deposit insurance corporation (NDIC) and others who are vested with the monitoring and supervision of the activities of the

deposit money banks in Nigeria by ensuring compliances with the prescribed risk management frameworks, reviewing new and emerging risks and providing policy and procedural guidelines for the players in the deposit money banks. Meanwhile the focus of this study is mainly on the DMBs operating in Nigeria with specific attention on the four (4) risk elements of strategic risk, legal/regulatory/ compliance risk, reputational risk, and operational risk of Nigeria DMBs with effect from 2013 as the base year to 2022.

## LITERATURE REVIEW

Risk is usually seen in the light of uncertainty as the actual risk may never crystallise to losses, yet it cannot be divorced from businesses because any business that is totally averse to risk may never achieve full success. Risk can be defined as an event that has an element of uncertainty but predictable to certain level of probabilities and has the potential to cause loss. Consequently, where an event has an expected outcome that can be predicted with all accuracy, such event no longer constitute risk.

Risk management involve a process of identifying, analysing, evaluating, monitoring and controlling probable threats that has the potential to cause losses and deploying measure to mitigate its consequences to the barest minimum. Ololade et al (2023) described risk management as deliberate activities geared towards ensuring the achievement of the organisational goals and objectives while at the same time keeping in check the underlying risks inherent in the business activities. Also Sithipolvanichgul (2016) described risk management as a measure employed to evaluate certain events or actions that may impact an organisation's ability to create values for its stakeholders. He affirmed that whether risk is viewed as a traditional or contemporary value, that risk management's objective is to manage and control risks effectively so as to ensure continued operations and processes are geared towards the achievement of the organisational goals. The CBN had outlined the nine major risk element that are facing the deposit money banks in Nigeria. However, in this study, four of the CBN risks management elements being considered are strategic, operational, legal/regulatory/compliance and reputational risks and the outcome from the measurement of these risk elements are indication of the extent to which risks has been managed by the banks.

Strategic risk (SGR) can be defined as the risk that a bank or an organisation may be unable to achieve its set strategic goals and objectives. Recently banks now face stiffer level of strategic risk emanating from some emerging financial technology driven companies called fintechs which had become major competitors to banks now threatening the ability of banks to achieve their strategic performance goals (Chockalingam et al., 2018). legal/regulatory/compliance risk, is the risk that emanates from the nature of agreements and contracts that the banks enter into with its clients. Such agreements or contracts may be defective and become un-enforceable thus leading to litigation risk. This risk could also stem from unstable government policies and regulations, Law suits and adverse judgements, losses coming from decided cases, penalties and sanctions which may put the banks licence into danger (CBN, 2014; Deloitte, 2015).

Operational risk (OPR) is the risk that resulted from internal control failures and breakdown of internal processes, procedures, people, policies and systems. It could also arise from failures from the external environment in which the organisation operates (CBN, 2014). While Reputational risk has to do with trust and good will which focus on the attributes built over the years that an organisation is known. Banking is built on the trust that customers fund will be safe and available when demanded (CBN,2014; Deloitte, 2015). Failure to meet such obligations could lead to run off as was experienced by the trio of First Republic bank. Silicon Valley bank and Signature Bank that failed in 2023 and experienced run off within a very short time (Karl & Christine, 2023). Banks are mandated to implement a monitoring process for all the risks inherent in their banking activities. They are to ensure compliance and periodic assessment of the effectiveness of the controls put in place to mitigate the effect of such risks (CBN, 2007). Further banks are required to establish independent control and compliance units that will provide assurances to the executive management and board that activities of the banks are conducted in line with laid down policies and

procedures and where risk and non-compliances are identified, that they have been duly mitigated.

This study adopted two proxies for financial performance measurement of capital adequacy ratio (CAR) and price earnings ratio (PER). CAR is one of the vital measures, used to evaluate a bank's capital in relation to its risk weighted credit exposures. CAR therefore can be described as a concept that measures a level of protection the banks has against excess leverage and insolvency by acting as a hedge during business difficulties and prevent banks' run. CAR matches a bank's capital with its current liabilities and its risk weighted asset. Meanwhile the risk weighted assets can be described as a measure of the amount of assets of a bank after adjusting for the various risks it carries (Obiakor & Adeleke, 2016; Thumbi, 2014; Yaaba & Sanusi, 2020). Thus for Nigeria DMBs, the CBN after its breakfast meeting with banks CEOs on 29<sup>th</sup>, January 2009 produced a circular to guide the banks for the computation of the CAR as the risk weighted asset ratio of the total qualifying capital to the total risk weighted asset (CBN, 2009).

Another prominent measure of organisational performance is market value, which can be defined as the sum total and asset is worth in the financial market. It can be mutually derived by the market participants and is concurrently used to mean market capitalisation especially when referring to the assets of a company and the company as a whole (CFI, 2020). It is a company's worth based on the total value of its outstanding shares in the market (Fidelity, 2017). In most cases market value is usually greater than a company's book value because market value captures profitability, other intangibles as well as prospective future growth. The proxy adopted for market value in this study is price earnings ratio (PER). Price earnings ratio is one of the metrics that investors normally use to compare the financial performance of organisations within a market in relation to their past earnings. Investors are willing to pay higher share prices for firms with higher PER and lower prices for firms with lower PER. For the purpose of this study, PER focusses on the value of the banks' from the investors' point of view. It is usually computed as a function of the three variables of the cost of equity which relates the expected growth rates on earnings to its the pay-out Ratio (Jason, 2024).

Stewardship theory stipulates that managers of organizations are stewards of the firms with goals that are in consonance with that of the principal shareholders. Thus stewards satisfaction are attained only when the organization excels and in so doing they are also effectively building their own careers (Davis et al., 1997; Fama, 1980). The theory posits that stewards take risk management very seriously by adding value to the shareholder's wealth (capital). Meanwhile, Moral hazard theory on the other hand describes a situation where an individual possesses the tendency to take high risks because the ultimate cost of taking such risks if and when it crystallizes will not be felt by the individual or the party. This theory attempts to explain why banks directors take increasing risks because the potentials burden of taking such risks may not be borne by them but by the owners or third parties such as insurance and government bailouts (Andrew, 2019; Omanufeme, 2013; Pritchard, 2019). It is of note that efficient and adequate risk management process cannot be explained by just one theory but a combination of related theories. Consequently, these two theories of Stewardship theory and Moral hazard theory among many others seem to have more bearing to this study.

Regulatory risk management strategies are concerned with those risks that were specifically mandated by the topmost regulatory body for banks in Nigeria mandating the banks to develop strategies that wil assist them pay focal attention to the management of the associated risks. Tijani and Abdullahi (2021) reviewed the relationship between risk management and banks performance in Nigeria. The study adopted credit risk management as variable for risk management, proxied by non-performing loans, liquidity ratio and loan to deposit ratio. Meanwhile capital adequacy ratio was used as proxy for performance. Panel regression was used to analyse the secondary data from ten (10) commercial and microfinance banks covering a period of 2008 to 2017. Result from the study revealed a direct relationship between bank performance. However, the three risk management variables adopted did not include any of the four risk management elements being



considered in the current study thus limiting the applicability and generalisation of the study.

Yaaba and Sanusi (2020) investigated the relationship between banks performance measured with capital adequacy ratio and risk behaviours of deposit money banks in Nigeria using the Generalised method of moment (GMM). Annual reports of DMBs in Nigeria from 2007 to 2018 were utilised. Findings revealed that capital adequacy ratio moderate banks appetite for risk and vice versa. That is risk taking behaviour enhances the capital adequacy ratio of the banks. The study however has same gap already identified in previous studies as the independent variables did not represent all the business risk management variables being reviewed in this study.

Obiakor and Adeleke (2016) reviewed banks performance proxied with CAR and risk management proxied with risk weighted assets ratio, deposit to asset ratio, and non-performing loans ratio of twelve (12) DMBs in Nigeria from 2009 to 2015. Pooled OLS was used to estimate the model which produced a varying degree of negative effects on CAR. Meanwhile risk- weighted asset ratio singly had a statistically significant effect at 5% level. However, the explanatory variables exerted a joint statistically significant effect on CAR. The shortcoming of the study is that all four attributes of risk management being reviewed in this study were not fully represented by the three variable proxies adopted thus limiting the applicability and generalisation of the study.

Oniovosa and Godsdays (2023) reviewed the association between risk management and performance measured by firm's value of listed banks in Africa through a sample of twenty-seven commercial banks drawn from Nigeria, Kenya and south Africa. The review adopted Tobin's Q as a proxy for firm's value while banks management size, independence and disclosures were used as variables for risk management. Secondary data extracted from the published annual report of the twenty-seven, sampled banks over a period of 2012 to 2021 was analysed using random and fixed effect panel data regression analysis. The findings show that independence and management disclosures produced a positive and significant effect on the firm's value while management size had a negative and insignificant effect on the value of the organisations. Despite the fact that this study was very recent and relevant, the area of gap lies in the nature of variables adopted as proxy for risk management which differs from the four risk management attributes being considered in the current study.

*Chukwu et al (2023) postulated that inadequate and ineffective risk management practices were offshoot of unethical practices, liquidity mismanagement and unnecessary government interferences which had resulted into poor performance as measured with market value of the banks. The study used ex-post facto research design and content analysis of a sample of twelve banks that were quoted on the Nigeria stock exchange spanning a period of 2007 to 2021. Result from the study shows that risk management produces a significant effect on the Tobin Q used as proxy for the financial performance of the Nigerian banks. Their study also differs from the current study in the risks management elements adopted.*

Again Odigbo et al (2022) studied the effect of risk management on the financial performance of commercial banks operating in Nigeria using Tobin Q as one of its dependent variables to proxy market value with firm size, and leverage as independent variables for ERM. The secondary data sourced from a sample of five commercial banks listed on the NSE covering a period of six years from 2015 to 2020 was tested using multiple regression analysis and the study reported a positive and significant relationship between risk management and financial performance measured with Tobin's Q. Nevertheless, the proxy of leverage adopted for risk management did not consider any of the four risks being considered under the current study.

Anetoh et al (2021) investigated the effect of risk management proxied by capital adequacy risk and liquidity risk on the financial performance measured by market value of DMBs by adopting PBV and Tobin Q as proxies for market values. Secondary data sourced from the published annual statement of the banks

covering a period of 2010 and 2019 was tested using the partial least squares structural equation modelling bootstrapping method for testing the hypothesis as a 5% level of significance. The result of the review shows that risk management proxied with capital adequacy ratio had a significant and positive effect on the performance of the reviewed banks measured with market value while Liquidity risk also had a positive but insignificant effect on the market values of the Nigeria DMBs. The fact that this study adopted only two risk management variables seems to limit the level of applicability and adaptability of the study. From the foregoing it is of note that while some scholars reported positive relationship between risk management and performance others reported negative relationship revealing a mixed outcome denoting that studies in this field is still inconclusive.

## METHODOLOGY

The population of the study is derived from the fourteen (14) listed on the NGX as at 31<sup>st</sup> December 2022 and after employing three-point filters which are: (i) Bank must be a Nigerian bank. (ii) Banks must have been operational and listed on the NGX as at 2013 and remained listed till 31st December 2022. (iii) Based on the CBN classification, the bank must be at the minimum with national authorisation because of the specific risks common to the banks. This filtration when applied produced twelve (12) banks (as in Table 2) from which secondary data was collected using content analysis of the selected banks’ annual reports.

Table 2 Sample Size: Listed DMBs with Minimum of National Authorisation.

| S/N  | BANK NAME      | YEAR OF INCORPORATION | YEAR OF LISTING | SAMPLE SELECTION |
|------|----------------|-----------------------|-----------------|------------------|
| i    | Access Bank    | 1989                  | 1998            | √                |
| ii   | Eco Bank       | 1985                  | 2006            | not selected     |
| iii  | Fidelity Bank  | 1987                  | 2005            | √                |
| iv   | FCMB           | 1982                  | 2004            | √                |
| v    | First Bank     | 1894                  | 1971            | √                |
| vi   | Guaranty Trust | 1990                  | 1996            | √                |
| vii  | Jaiz Bank      | 2003                  | 2017            | not selected     |
| viii | Stanbic IBTC   | 1989                  | 2005            | √                |
| ix   | Sterling Bank  | 1960                  | 1993            | √                |
| x    | UBN            | 1969                  | 2012            | √                |
| xi   | UBA            | 1961                  | 1970            | √                |
| xii  | Unity Bank     | 1987                  | 2005            | √                |
| xiii | Wema bank      | 1945                  | 1991            | √                |
| xiv  | Zenith bank    | 1990                  | 2004            | √                |

Note: Generated by the author from CBN and NGX on 31st August. (2023).

The dependent variable financial performance (FP) is proxied by CAR and PER while the independent variables are proxied with SGR, OPR, RPR, and LCR while the control variables are BKZ and BKD. Using the multivariate model:  $FP = f(y_1, y_2)$ , where  $y_1, y_2 = \beta_0 + \beta_1x_1 + \beta_2x_2 + \dots + \beta_nx_n + \epsilon$ , Where  $y_1 = CAR$  and  $y_2 = PER$ . Therefore, the adapted model can be fully represented as in model (1) and (2).

$$*CAR_{it} = \beta_{0it} + \beta_1SGR_{it} + \beta_2OPR_{it} + \beta_3RPR_{it} + \beta_4LCR_{it} + \beta_5BKZ_{it} + \beta_6BKD_{it} + \epsilon_{it} \dots \dots \dots (1)$$

$$*PER_{it} = \beta_{0it} + \beta_1SGR_{it} + \beta_2OPR_{it} + \beta_3RPR_{it} + \beta_4LCR_{it} + \beta_5BKZ_{it} + \beta_6BKD_{it} + \epsilon_{it} \dots \dots \dots (2)$$

\*Where: Capital Adequacy Ratio (CAR) and Price Earnings Ratio (PER) are dependent variables. While Strategic Risk (SGR), legal/ Compliance Risks (LCR), Operational Risks (OPR) and Reputational Risk (RPR) are dependent variables, with Bank Size (BKZ) measured as weighted average log of the year-end total assets and Bank Deposit (BKD), measured as a log of the year-end total deposit are control variables. (i)stands for bank holding identifier while (t) is the year. ( $\beta$ ) represents the Beta coefficient and ( $\epsilon$ ) is a constant error term needed to satisfy the first assumption of the Classical Linear Regression Model that the expected value of the errors must be zero)

$$\text{Risk Weighted Asset Ratio (CAR)} = \frac{\text{Total qualifying capital (TQC)}}{\text{Total risk weighted asset (TRWA)}} \times 100$$

\*\*The total qualifying capital is arrived at as: (Total 1<sup>st</sup> Tier capital + Total 2<sup>nd</sup> Tier capital) less investment in unconsolidated subsidiaries and associates (CBN, 2009).

$$\text{Price Earnings Ratio (PER)}^{***} = \frac{\text{Mkt Value Per Share (MVPS)}}{\text{Earnings per share (EPS)}} \times 100\%$$

\*\*\*A low PER indicates a low share price (SP) compared to the earnings capacity of the bank while a high PER indicates a share price that is higher than the earning capacity of the banks (Jason, 2024).

Table 2 presents the summary variables measurement proxies and their codes.

Table 2 Summary of Variables Measurement, Proxies and their Codes

| VARIABLES (CODES)                      | PROXY   | MEASUREMENT   | SOURCE                               |
|--|---|---|--------------------------------------|
| Capital Adequacy Ratio (CAR)           | Risk weighted asset ratio                                       | (TQC)/ TRWA*100   | (CBN, 2009)                          |
| Market Value                           | Price earnings ratio  | (MVPS)/ EPS*100   | (Jason, 2024)                        |
| Strategic Risk (SGR)                   | Leverage Ratio  | Total Liability to total net asset (TL)/TNA=(E+D+N)/TNA | (Sagara et al., 2019).               |
| Operational Risk (OPR)                 | Operating efficiency Ratio                                      | Operating Cost to Net profit (OC/NP)                    | (Yvonne, 2013).                      |
| Reputational Risk (RPR)                | Negative media, disclosure of antitrust issue and fraud losses  | $\frac{f(NM+ TI+ FL)}{3}$                               | (Murphy et al., 2004).               |
| Legal/Compliance/Regulatory Risk (LCR) | Litigation, non-compliances and regulatory sanctions disclosure | $\frac{f(LI+ NC+ RS)}{3}$                               | (Deloitte, 2015; Malm et al., 2023). |
| Control Variable 1                     | Bank Size (BKZ)   | Weighted Ave Log of Total asset                         | Modified (Cornett et al., 2006)      |
| Control Variable 2                     | Bank Deposit (BKD)  | Log of Bank Deposit                                     | (Hassan, 2011)                       |

Source: Author’s literature review

## DATA PRESENTATION ANALYSIS AND INTERPRETATION

Table 3 is the descriptive statistics of the study.

Table 3 Descriptive Statistics

| <i>Variables</i> | <i>Obs</i> | <i>Mean</i> | <i>Std. Dev</i> | <i>Min</i> | <i>Max</i> |
|------------------|------------|-------------|-----------------|------------|------------|
| <b>CAR</b>       | 120        | 0.1848      | 0.0400          | 0.0955     | 0.2830     |
| <b>PER</b>       | 120        | 0.5050      | 0.2110          | 0.1452     | 0.9963     |
| <b>SGR</b>       | 120        | 0.0952      | 0.0220          | 0.0684     | 0.1951     |
| <b>OPR</b>       | 120        | 0.0705      | 0.0580          | 0.0082     | 0.2947     |
| <b>RPR</b>       | 120        | 0.0478      | 0.0260          | 0.0042     | 0.1000     |
| <b>LCR</b>       | 120        | 0.2757      | 0.2440          | 0.0001     | 0.6668     |
| <b>BKZ</b>       | 120        | 0.0930      | 0.0195          | 0.0956     | 0.1048     |
| <b>BKD</b>       | 120        | 0.0910      | 0.0042          | 0.0834     | 0.9973     |

Source: output of data analysis STATA 15

The independent variables revealed that strategic risk (SGR) has a mean of 10%, operational risk (OPR) has a mean of 7%. Reputational risk (RPR) is 5% and Legal and compliance Risk has a mean of 28% The control variables of bank size (BKZ) and bank deposit (BKD) however stands at 9% respectively.

### Diagnostic Tests

Diagnostic test of Shapiro –Wilk W test shows evidence that some of the variables are not normally distributed as the P-values are significant at 1%: i.e  $P < 0.01$ . Thus the Null hypothesis for the variables assuming data is normally distributed is rejected and non-normality is assumed however this is not expected to affect the output of the regression analysis. The VIF and TV diagnostic test shows that all the variables are within the acceptable values with mean VIF of 1.19. The highest VIF is 1.30 and the lowest is 1.11. Similarly, the lowest TV is 0.77 and the highest is 0.90. which means that the variables are all within the acceptable value also indicating no significant multicollinearity. Furthermore, the IM- white test and the Cameron and Trivedi’s decomposition test for CAR did not show the presence of significant heteroscedasticity as the  $\text{Chi}^2(27) = 38.79$  while the Breusch and Pagan Lagrangian multiplier test for appropriate regression technique for adoption shows a  $\text{Prob} > \text{chibar}^2 = 0.0663$  which revealed no evidence of panel effect hence, the pooled OLS is more appropriate.

Similarly, for PER the IM- white test and the Cameron & Trivedi’s decomposition test for did not show the presence of significant heteroscedasticity as the  $\text{Chi}^2(27) = 28.61$ , also the Breusch and Pagan Lagrangian multiplier test for appropriate regression technique for adoption revealed that the multivariate panel data random effect is more appropriate as the test revealed insignificant evidence of fixed effect on the variables with  $\text{Prob} > \text{chibar}^2 = 0.2602$ .

### Multivariate Regression Analysis

The  $R^2$  of the multivariate regression analysis is approximately 29% for CAR and 14% for PER as shown in Table 4, while the regression result from the model 1 and 2 is represented in the models for CAR and PER.

$$\text{CAR} = 0.48 - 0.17\text{SGR} - 0.20\text{OPR} + 0.12\text{RPR} + 0.05\text{LCR} - 0.36\text{BKZ} + 0.01\text{BKD}$$



$$PER = 0.85 + 0.13SGR + 0.40OPR - 0.56RPR - 0.11LCR - 1.90BKZ + 0.17BKD$$

TABLE 4 Summary of (Random Effect) Panel Regression Result

|                        | CAR     |       |       |     | PER    |       |       |     |
|------------------------|---------|-------|-------|-----|--------|-------|-------|-----|
|                        | Coef    | t     | P> t  | Sig | Coef.  | t     | P> t  | Sig |
| SGR                    | -0.172  | -1.12 | 0.266 |     | 0.167  | 0.19  | 0.881 |     |
| OPR                    | -0.200  | -3.45 | 0.001 | *** | 0.386  | 1.14  | 0.232 |     |
| RPR                    | 0.115   | 0.87  | 0.387 |     | -0.516 | -0.67 | 0.460 |     |
| LCR                    | 0.045   | 3.19  | 0.002 | *** | -0.116 | -1.41 | 0.169 |     |
| BKZ                    | -0.355  | -1.99 | 0.049 | **  | -1.859 | -1.78 | 0.080 | *   |
| BKD                    | 0.008   | 0.93  | 0.355 |     | 0.166  | 3.30  | 0.010 | **  |
| _cons                  | 0.479   | 2.91  | 0.004 |     | 0.861  | 0.89  | 0.363 |     |
| Number of observations | 120     |       |       |     | 120    |       |       |     |
| F(6, 113)              | 7.87    |       |       |     | 3.18   |       |       |     |
| Prob> F                | 0.000   |       |       |     | 0.0064 |       |       |     |
| R- Squared             | 0.2946  |       |       |     | 0.1444 |       |       |     |
| Root MSE               | 0.03432 |       |       |     | 0.2265 |       |       |     |

Source: output of data analysis STATA 15

\*\*\*, \*\* & \* = probability significance at 1%, 5% & 10% respectively.

$$CAR = 0.48 - 0.17SGR - 0.20OPR + 0.12RPR + 0.05LCR - 0.36BKZ + 0.01BKD$$

This result implies that 29% variance of banks' capital adequacy as indicated by  $R^2$  is accounted for by variation in the risk management variables. Since the result gave an overall positive and significant level of 0.00, thus  $P < 0.01$ , therefore Hypothesis  $H_0$  which states that risk management have no significant effect on capital adequacy of DMBs in Nigeria is rejected while we accept the alternative hypothesis  $H_1$ . The study also noted a negative but insignificant association with strategic risk-17%, while operational risk has a negative but significant effect at -20%. Then reputational risk has a positive but insignificant effect of 12% while legal regulatory compliance risk has positive and significant effect of 5% on capital adequacy.

$$PER = 0.85 + 0.13SGR + 0.40OPR - 0.56RPR - 0.11LCR - 1.90BKZ + 0.17BKD$$

This result implies that 14% variance of the banks' market value as measured by PER is accounted for by  $R^2$  for the changes in the risk management variables. Since the result gave an overall positive and significant level of 0.006, thus  $P < 0.01$ , therefore Hypothesis  $H_0$  which states that risk management have no significant effect on market value of DMBs in Nigeria is rejected while we accept the alternative hypothesis  $H_1$ . The study also noted positive but insignificant relationship for SGR and OPR with market value. Similarly, the model yielded a negative but insignificant result for RPR and LCR with market value.

Despite the fact that none of the previous studies reviewed actually concentrated on all the four risk

management variables being measured in this study, yet, their results have some similarity with the result of this study. For example, Tijani and Abdullahi (2021) found a direct relationship between capital adequacy ratio and risk management, likewise Yaaba and Sanusi (2020) found that capital adequacy ratio moderate banks appetite for risk and vice versa. That is risk taking behaviour enhances the capital adequacy ratio of the banks. Obiakor and Adeleke (2016) also recorded a positively and significant effect on capital adequacy. Nevertheless, the result of this study differs from that of Abba et al (2013) who found a significant negative relationship between risk management and capital adequacy ratio of the banks.

Similarly, Previous studies on financial performance proxied by market value produced result similar to outcome of this study, for example Oniovosa and Godsday (2023) found a positive and significant association between risk management and financial performance measured by firms value of the listed banks reviewed. Similarly, Chukwu et al (2023) also found a significant positive relationship between risk management and financial performance proxied with market value of the Nigerian banks reviewed. Again, Odigbo et al (2022) reported a positive and significant relationship between risk management and banks performance proxied by market value, while Anetoh et al (2021) also reported that risk management exert a positive effect on the bank's performance measured with market value of the banks.

## CONCLUSIONS AND RECOMMENDATIONS

This study documents a high compliance level in the adoption of the regulatory risk management strategies variables by the banks with overall positive and significant effect of the independent variables and financial performance measured with capital adequacy and market value showing that the level of risk management strategies imbibed by the banks measured through the four risk management codes of strategic, operational, reputational and regulatory risks had assisted in ensuring that the banks maintained adequate level of capital necessary for their activities within the years under study. This is also similar to the conclusion of previous studies such as Yaaba and Sanusi (2020) which conclude that effective management of these risks taking behaviour enhances the capital adequacy of the banks. Again, the level of compliance adopted by the banks also show an overall positive but insignificant relationship between the risk management codes examined and the market value of the banks. This result also reveals that as the risks inherent in the banking activities are properly and effectively managed, it yielded overall positive improvement on both performance metrics of capital adequacy and market value of the banks.

This study thus concludes that effective management of these risks had improved the performance of the banks. Secondly the fact that management of strategic risk and operational risk both has negative effect individually on capital adequacy reveals that effective management of these risks had led to lowered capital requirement which was the main purpose of Basel II and Basel III accord that focusses more on the capital requirements of the banks relative to their risks appetite. The management of the legal/compliance/regulatory risk which is both positive and significant on capital adequacy shows that judicious management of this risk has assisted the banks to maintain the required level of capital as well as achieve an overall positive improvement in the shareholders' value of their investments.

This study recommends that executive management and the boards of Nigeria DMBs especially those who are involved in the strategy and policy formulation of banks and other financial institution should pay adequate attention to these risk management variables so as to ensure the banks achieve their overall financial performance goals. Further, bodies vested with monitoring and regulatory functions over the DMBs should ensure continuous monitoring of the compliance levels of the DMBs in order to sustain improved level of the bank's performances. Additionally, executive management should also pay attention to those risks elements which do not show significant relationship with capital adequacy and market value for proper management so that they also can have significant effect on the financial performance of the banks. Finally, the study recommends that a future study be conducted on the remaining CBN risk

management codes of credit, market, liquidity, counterparty and solvency risks not covered in this present study.

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