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MONETARY JEOPARDY (MJ) AND NIGERIA'S DEPOSIT MONEY BANK PERFORMANCE (DMBP) RELATIONSHIP: ARDL APPROACH

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ABSTRACT

This study examined monetary jeopardy (MJ) and Nigeria's deposit money bank performance (DMBP) relationship, for the periods of 1996-2021 (26years). Specifically, the study examined measures of MJ; Credit Risks (CR), Liquidity Risks (LR), Operational Risks (OR), Market Risks (MR) on DMBsP [Return on Equity (ROE)]. The study made use of aggregate secondary data and was analyzed with Autoregressive distributed lag model having established that the model exhibited mixed integration. Meanwhile, the Multicollinearity test and Heteroskedasticity test clearly revealed no multicollinearity problem and that it is Homoskedastic signaling fitness for prediction. The results showed that CR has a significant effect on ROE in the short run but an insignificant effect on ROE in the long run; LR also has an insignificant effect on ROE in both the short and long runs; and MR has a significant negative impact on the ROE of DMBs in Nigeria in both the short and long runs. Hence, the study concluded that financial risk does not have significant effect on performance of DMBs in Nigeria. The recommended that the DMBs in Nigeria should ensure that all the conditions required before granting loans to their customers should be met to avoid default in order to enhance their profitability.

Keywords: Monetary Jeopardy, Performance, Operational, Liquidity and Market Risks.

INTRODUCTION

A country's economic progress is significantly influenced by the Deposit Money Banks' (DMBs') financial performance (FP) as they have to manage huge volume of transactions (Olaoye, Ogbemor and Okusami, 2020). Accordingly, investors, capital market participants and other stakeholders need to understand the FP of DMBs: granting credit facilities and other financial services (Chukwunulu, Ezeabasili and Igbodika, 2019). Naturally, for DMBs to meet their existing financial obligations, operating efficiency and their financial performances are associated with some MJ. MJ, in the opinion of Muriithi and Muigai (2018), poses a threat to the financial sector's performance and stability. MJ is defined as any risks that could cause volatility in a bank's reserves, costs, and business value. Abubakar, Garba, and Sulaiman (2020); Ehiedu and Imoagwu, (2022). showed how failing to handle MJ in a systematic manner can have disastrous systemic repercussions, uneven performance and earnings for the stakeholders, and an influence on bank revenues and net value. The financial system is somewhat vulnerable following banks' incapacity to fulfill their commitments for intermediation. In fact, some studies have revealed that poor management of these vulnerabilities could ignite a sovereign financial crisis (Fadun and Oye, 2020; Ehiedu and Imoagwu, (2022).

Banking is about taking and handling the risk, rather than preventing it. Though risk taking is an integral part of banking, albeit, bank management should balance its risk and return to make adequate profit and remain a going concern, else, the bank, financial system and the economy at large may be adversely impacted (Fadun, et al, 2020).

Monetary and non-monetary hazards are risk types that affect banks. CR, MR, and LR are three financial hazards that arise from bank business operations and transactions. On the other hand, non-monetary jeopardy has a negative effect on performance due to poor management, rivalry, outside causes, etc. Operational risk, strategic risk, and compliance risk are the key non-monetary hazards (Patel, 2018).

Among the threats faced by the banks, however, credit risk is considered to be the most critical risk because large sums of bank earnings come from credit as a result of interest paid on credit (Isedu and Erhabor, 2021). When consumers' fail to pay back their loans or the money they owe to the bank on time and in full, credit risk arises, (Anetoh, Nwadiolor, Anetoh and Okeke, 2021). Banking Supervision by the Basel Committee (BC) emphasized the main influences contributing to credit risk are the lenders' stringent credit standard. In the 90s CBN established a monitoring and evaluation team that checks non-performing loans of banks monthly. Additionally, DMBs without capital adequacy ratio (CAR) will shut down or merge. This has assisted banks in managing credit risk (LiMei, Takyi, Ofori and Abraham, 2020).

The Basel Banking Supervision Committee (BCBS) describes operating risk as loss arising from entities, insufficient or ineffective internal processes, programs, or external actions. Achimugu, Ocheni, Adah, Adediran and Abdullahi (2021), reported that until the Basel II policy changes to banking supervision, operational risk was partially a remaining category for risks and doubts and not treated seriously. Operating risk has been implicated in a number of significant losses in the financial sector. More clients will patronise banks with effective reliability, which will support the nation's economic situation. Since 1990, every major loss—including the crisis of 2007–2008—has been operational errors. Most often, however, fraud involves actions carried out independently by third parties, external to the institution but fraud

detection systems have been used to great effect in the mitigation of operational risk (Achimugu, et al, 2021).

Due to its expanding liabilities, an illiquid bank faces a liquidity risk when it cannot match reductions in liabilities or fund capital increases (Sathyamoorthi, Mogotsinyana, Mphoeng and Mashoko, 2019). Presently, liquidity is a foremost player in global monetary crisis. Customers inappropriately withdraw of capital from banks, causes substantial liquidity risk. Additionally, liquidity analysis is calculated through the balance sheet. Make the required calculations for your liquidity management plans using the liquidity ratios. As co-contributor security, banks continue to hold the positive balance of their loans in a central bank account that is only utilized to jointly settle interbank obligations (Edem, 2018). It means that when currency sources surpass currency consumption, the treasury becomes liquid, and when cash usage exceeds money sources, liquidity shortages result. As a result, a bank might become unable to reduce debt or accumulate reserves for capital development.

Market risks are dangers that are out of the banks' control and are determined by elements that influence the entire economy (Aruwa & Musa, 2018). Market risks, then, are extrinsic variables that have an impact on the internal workings of banks. Three smaller hazards are typically included in market risk: stock price risk, interest rate risk, and foreign currency risk (Abubakar, Garba and Sulaiman, 2020). In this study, MR is calculated using the net interest margin (NIM), which distinguishes interest revenue and expense. While the term "capital adequacy ratio" refers to the amount of equity and other reserves held by a company against its risky assets, these reserves are preserved to shield depositors from any unforeseen losses (Rajkumar & Hanitha, 2018). CAR, or capital to total risk weighted assets, determines bank's capital sufficiency in relation to its risk (Muriithi, 2018). According to research by Abubakar, Sulaiman, Usman, and Mohammed from 2019, (CBN)wants banks to maintain a minimum CAR of 10% for national banks and 15% for foreign banks.

A nation's progress and development are greatly influenced by the FP of DMBs. This is due to the overwhelming volume of transactions they must oversee. Subsequently, stakeholders such as investors and capital market participants must comprehend the FP of DMBs, which includes providing financial services and credit facilities. Naturally, there are some financial risks related to DMBs' capacity to meet their current financial obligations, operational effectiveness, and FP. Abdullahi (2021) said DMBs are thought to benefit from several financial performance evaluation measures, such as those that measure profitability, ROAs, and economic value added. Ehiedu, Agbogun, and Onuorah, (2022).said that performance and financial stability are threatened by FR. FR is defined as any risks that could cause volatility in a bank's reserves, costs, and business value. If FR is not treated methodically, it may lead to uneven performance and earnings for the stakeholders and may have undesirable outcome on bank revenues and net worth, sometimes with devastating systemic implications, (Ongore & Kusa, 2019)

Pinto, Hawaldar, Rahiman, Rajesha, and Sarea (2018) stressed that the FP of DMBs are fundamentally necessary in the formulation of economic policy and a tool in the analysis of a firm's policies' outcomes, performance, efficiency, and effectiveness in monetary terms of the country where they operate. FP evaluation is essentially a subjective tool used to evaluate how a corporation uses its resources in the course of doing its principal business and producing income. Performance also involves an assessment of how effectively banks use their assets and other resources to create revenue, which affects the firm's overall financial situation over the course of a certain period and can be used to compare one industry to another. Finance and

its functions are crucial factors in deciding firm profitability and stability, (Hawaldar, Rajesha, Lokesha & Kumar, 2018; Pinto et al. 2018).

Financial performance (FP) is the measurement of a bank's policies and activities in monetary terms. Abdullahi (2021) said it also illustrates a bank's overall financial healthiness over-time and facilitates simultaneous comparisons among banking institutions. The most widely used accounting indicators of financial success are ROA and ROE. Ongore & Kusa, (2019) defined ROE as a company's profit as total amount percentage of the invested shareholder equity. A study on the MJ and FP of DMBs in Nigeria is therefore urgently needed in light of the rising level of non-performing loans, expansion of banking operations, and corresponding increase in risk portfolio with Basel II adoption and Basel III adoption preparations.

Evolving an effective MJ management system is a source of constant challenge to DMBs. The fact that DMBs are in the risk business accentuates the importance of a strong and sustainable system for identifying, measuring, monitoring and controlling the spectrum of DMBs risks.

From the perspective of the Nigerian DMBs, there are studies on banking sectors and associated risks. For example, the studies by (Isedu and Erhabor, 2021; Anetoh, Nwadiolor, Anetoh and Okeke, 2021; Achimugu, Ocheni, Adah, Adediran, and Abdullahi, 2021; Abdullahi, Sabari, Sabo, and Mohammed, 2021) use their findings to demonstrate how MJ affects FP. In particular, Achimugu, Ocheni, Adah, Adediran, and Abdullahi (2021) believed that the majority of DMBs operating in Nigeria got involved in multiple risks like CR, LR; underfunding in an effort to perform, leading to operating with below \$10 million capitalization. The capital base of even the biggest bank is only roughly US \$240 million, as opposed to US \$526 million for the smallest bank in Malaysia. Despite these studies, DMB profitability and performance continue to plummet to the extent that Nigerian DMBs have recently recorded losses at an alarming pace (Kanu & Isu, 2018). The amount of non-performing loans in Nigerian DMBs and the consistency of FR issues are exceptional. Bank executives routinely participate in shady business dealings at investors' expense and potential bank negative repercussions, are regrettable because they do not appear to care as long as their sub-optimality syndrome and individual concerns are satisfied (Abdullahi, 2021)

Olalere, Aminu, Yusoff, and Shamsuddin's (2018) opinion that MJ in DMBs is actually somewhat challenging and different from other risks facing banks lends credence to this. They argue that this is because it's both systemic in nature and asymmetric, reducing banks' financial and nonfinancial performances and resulting in significant losses as well as a loss of confidence in both investors and depositors. Large amounts of non-performing loans, internal fraud and impropriety among management plague DMBs. Additionally; the board's oversight of these issues is insufficient and falls short of best practises for corporate governance among the executive and non-executive directors (Oyerogba, Ogungbade & Idode, 2018). In light of these issues, this study moves forward to suggest solutions to the problems of FP of DMBs by examining risk management and FP using the recognized explanatory variables of FR.

There have not been enough studies on FR and FP of DMBs since the banking industry's consolidation in 2005 and Nigeria's acceptance of Basel II and III. FR and FP of DMBs must therefore be examined. Furthermore, this study is distinct from other research in that it is less concerned in individual bank proxies than aggregate effects. This is so that we may concentrate on the changes taking place in banking division following aggregate outcomes. From the above perceived gaps, it examined the FR (proxied with credit risks, liquidity risks, operational risks and market risks) and FP (proxied with ROE) of DMBs using aggregate

outcomes. Hence, the attempt to fill the identified gaps and contribute to literature on the subject in Nigeria.

Monetary Jeopardy (MJ)

Monetary jeopardy (MJ) is any risk connected to financing and investing. For banks, it is usually crippling and frequently involves not only money losses but also a reputational problem. Frequently, it is taken to mean just negative risk (Abdullahi, Sabari, Sabo & Mohammed, 2021). Ideally, the idea of MJ is the risk involved in DMBs' regular activity. One of the most difficult and traditional hazards that DMBs may encounter when performing their legal operating responsibilities is presumably (Mostafa, Mahmoud, Jalal & Elahe, 2017). There are many reasons why MJ events occur, including loan repayment defaults resulting to nonperforming loans (NPL) or credit risk (CR), liquidity risk (LIQR), insolvency risk (INSRK), and market risk (MKTR). Others are Interest rate risk, Currency risk, and Business risk that may arise in a financial transaction (Abdullahi, et al, 2021).

Shafiq and Nasr (2018) define MJ as an identification, assessment, and prioritization of risks followed by coordinated and economical application of resources to minimize, monitor and control the probability and impact of unfortunate events. Uncertainties related to loan defaults, liquidity management, fluctuations, etc, in currency exchange prices all contribute to MJ. Therefore, decisions concerning financial institution activities involve a certain amount of risk, which has an impact on the entire performance and worth of the company (Schonborn, 2018).

Shafiq and Nasr (2018) define FR as an additional risk borne by the shareholders due to the substitution of debt for common stock. This study defined FR as any fluctuation in the cash flows, financial results and the company's value due to the influence of different types of factors; mainly market ones, such as: liquidity, credit default, exchange rates among others.

Bank Financial Performance (FP)

The FP is a measurement of how well an organization's policies are achieving the targeted financial goal in monetary terms. According to Adina (2018), a company's FP is a gauge of its managers' effective, efficient and performance abilities. In terms of size, capitalization, and staff strength, the FP of DMBs might be used as a benchmark to compare other DMBs in the same category that are active in the same industry (Abdolazim, 2017).

Basically, the FP of a DMB can reflect trends in the bank's return on assets, profitability, economic value added, ROE, liquidity, solvency, riskiness of the bank, and many other factors, such as how quickly it can resolve a loan facility request and its capacity to manage loan facilities, (Ehiedu, Agbogun, and Onuorah, 2022). Financial performance, according to a study by LiMei, Takyi, Ofori, and Abraham in 2020 gauges company's use of resources to generate income. This term compares similar businesses both within the same industry and across all industries as a whole, and it serves as a general indicator of a firm's overall financial soundness during a specific time period. Aiming to maximize an organization's returns as reported in financial statements, FP measures are focused on examining how well a corporation uses its resources. Similar to this, according to, Ehiedu, Agbogun, and Onuorah, (2022), financial planning (FP) of a firm enables managers and decision-makers evaluate the success of corporate strategies and initiatives in unbiased and objective monetary terms. This makes it easier to analyses a company's total liquidity and to compare it to similar enterprises in the same industry.

The two accounting metrics of financial success that are most frequently employed are ROA and ROE. ROE is defined as a company's profit as a percentage of the total amount of

invested shareholder equity (Isedu and Erhabor 2021). The most well-known FP measure by far is ROE, (Ehiedu, Agbogun, and Onuorah, 2022).

Uncertainty Theory

Uncertainty Theory serves as the study's foundation is built on set-functions; it is broadly analogous to probability theory. It varies from the latter in that it employs two dual set functions (the need and possibility measurements) as opposed to just one. Additionally, it is not additive and is consistent with ordinal structures (Isedu and Erhabor 2021). Ehiedu, (2022) claim that possibility theory sits at the nexus of fuzzy sets, probability, and non-monotonic reasoning. Both an ordinal FR and a numerical setting can be used to express possibility theory.

Contrary to the theory proponents, Bayem, Ehiedu, Agbogun, and Onuorah, (2022). found flaws. The authors explained that forecasting FR making a suitable decision may not necessarily be a way of overcoming the challenges posed by such options requiring modeling of such investment decisions under uncertainty through possibility theory. MJ and every other risk are interlinked with uncertainties. DMBs' FP hangs on the balance of insolvency and uncertainties and this could create unstable environment for present and potential investors and bank customers in Nigeria. Consequently, this theory is considered appropriate and suitable for this research.

Empirical Review

DMBs' MJ and FP in Nigeria was examined by Isedu and Erhabor (2021). The relative shock of CR, LR, MR, OR, and bank size was taken into consideration when examining changes in FP. The empirical analysis used fixed effects, which had best relationships. The study's conclusions showed that the combined effects of FR have no detrimental effects on banks' financial performance. More specifically, the results of the empirical analysis showed that there is no meaningful correlation between the financial risk proxy of credit risk and the FP of DMBs in Nigeria. A significant factor affecting DMBs FP in Nigeria during the investigational period is liquidity risk. The impact of market risk, interest rate risk, and operational risk had no discernible impact on bank FP in Nigeria.

Fadun, and Oye, (2020), examined some data utilizing a linear multiple regression model. The findings indicated that operational risk management and bank financial performance are positively correlated. According to the research, good operational risk management techniques have a positive effect on banks' financial performance. We thus advise bank management to devote enough resources to comprehending operational risk in order to ensure sound operational risk management and enhanced FP of banks. The study has a narrow focus, so future research based on a larger sample size might be interesting.

Credit risk, operational risk, and liquidity risk effects on bank profitability were investigated by LiMei, Takyi, Ofori, and Abraham in 2020. The Johannesburg Stock Exchange (JSE) registered banks for the years 2012 to 2018 made up the study sample. To investigate the effect of the dependent variable on the independent variables, smart PLS-SEM was used. According to the study's findings, credit risk (measured by non-performing loan ratio, capital adequacy ratio, and cost per loan) is significantly positively correlated with bank profitability (ROA, ROE, NIM). Similar to credit risk, liquidity risk has a positive and significant relationship with bank profitability (current ratio, acid-test ratio, and cash ratio). However, operational risk (portfolio concentration, bank leverage, legal action, resignation of important directors) suggested a bad relationship with bank profitability. The relationship between the bank-specific risk and the operational, credit, and liquidity risks was positive and significant.

It has a negligible connection to profitability. This study suggests that DMBs manage their operational risk appropriately by diversifying their investments into portfolios that will generate returns, managing their internal and external operations, and lowering their leverage levels.

Ehiedu, Onuorah, and Owonye, (2022); Ehiedu and Olanny (2014), looked at how MJ affected DMBs' financial performance using the identified FR explanatory variables of credit risk, insolvency risk, liquidity risk, and market risk over a 12-year period (2007- 2018). Ex-post facto research design is used in the study's methodology. Nineteen deposit money banks made up the study's population, but only ten (10) DMBs were included in the sample. The panel regression models were estimated using the Unobserved Effects Model (UEM), and the Hausman test result showed that there was a 5% difference between the fixed effect model and the random effect model. According to the study's findings, Credit Risk had a negative and statistically significant impact on the performance of banks that accept deposits. The outcome also demonstrates that Insolvency Risk (INSRK) has negative signs that are statistically insignificant to banks' profitability and Liquidity Risk (LR) is inversely and insignificantly related to banks' profitability. Market Risk's impact on Profitability (NPBIT) is negligible and favourable at the 0.05 level. Additionally, Credit Risk (CR) at Economic Value Added was found to be statistically significant negative. Contrarily, the outcome also demonstrates that Liquidity Risk (LIQR) and Market Risk [$\beta = 0.0369$; $Pval = 0.747$] have favourable signals that are statistically inconsequential to Economic Value Added. Credit Risk (CR) established a negative and severe impact on ROA on its own. Statistically insignificant to ROA are the negative and positive signals of the liquidity risk and insolvency risk.

The impact of FR on bank FP in Nigeria was studied by Ehiedu (2022). Two bank financial performance indicators (ROA and ROE) were utilized as the dependent variables, and credit risk, liquidity risk, operational risk, and capital adequacy risk were employed as the independent factors for unsystematic risk management. NDIC annual reports provided the data for the 23-year study, which ran from 1994 to 2016. OLS regression analysis was carried by utilizing SPSS. The VIF and Durbin Watson statistics' findings on multicollinearity and autocorrelation, respectively, supported the applicability of the models and the accuracy of the findings. According to the coefficient of determination, risk management factors accounted for 41% and 23%, respectively, of changes in ROE and ROA. The investigation came to the conclusion that risk management procedures in Nigerian banks are subpar. In order to prevent a financial crisis and enhance the performance of commercial banks, it was suggested that the CBN and other regulators work to impose risk identification, assessment, measurement, and control methods in accordance with international best practises.

The effect of FR management methods on the FP of DMBs in Botswana was studied by Sathyamoorthi, Mogotsinyana, Mphoeng, and Mashoko (2019). To gauge FP, the study used ROA and ROE. As proxies for financial risk management, loan deposit ratios, inflation, interest rates, total debt to total assets, total debt to total equity, and total equity to total assets were all employed. All 10 DMBs in Botswana made up the research population, and the study's 8-year time frame ran from 2011 to 2018. The Bank of Botswana Financial Statistics database provided the monthly secondary data for this descriptive analysis. Regression, correlation, and descriptive statistics were used to analyze the data. Regression study results revealed that interest rates have a negative and significant influence on return on assets and ROE. The ratio of total debt to total assets, on the other hand, had a negative but minor impact on ROA. However, the ratio of total debt to total assets showed a small but beneficial impact

on ROE. A negative and considerable impact on return on assets and ROE was revealed by the loan deposit ratio. The results show that banks should use suitable market, credit, and liquidity risk management strategies to maintain the safety of their institutions and generate profits in order to maintain a proper balance between FR management methods and FP.

Onyefulu, Okoye, and Orjinta (2019) used a sample of twenty (20) DMBs to determine the link between FR and FP of DMBs listed on Stock Exchanges of two particular West African countries. From 2009 to 2018, we studied a ten-year period. In order to accomplish the goals of the study, an ex-post facto research design was used while secondary data were gathered, subjected to multiple regression and correlation analysis, and finally analyzed. Descriptive statistics, Pearson correlation analysis, and panel regression analysis were used to evaluate and assess three (3) particular aims and hypotheses. The dependent variable, FP, was measured by ROA and ROE, whereas the independent variable, FR, was measured by liquidity risk, operational risk, and interest rate risk. Our findings indicated that, using the ROA model, which was statistically significant at the 1% level of significance, liquidity risk has a negative and significant impact on bank performance in both Ghana and Nigeria, while the ROE model found that the negative impact of credit risk on bank performance was statistically insignificant. While liquidity risk was shown to have a small impact in both Ghanaian and Nigerian banks, operational risk was found to have a positive and significant impact on the performance of banks in West Africa. The Banks and Other Financial Institutions Act (1999) as modified and the Prudential Guidelines should be followed by DMBs in Nigeria and Ghana, among other recommendations made by this study. DMBs should also have adequate capital in relation to the size of their loan portfolio and regulatory requirements in order to protect themselves against the loss from non-performing loans.

In addition, Simamora and Oswari (2019) examined the impact of credit risk, operational risk, and liquidity risk on the financial performance of banks listed on the Indonesian stock exchange. Out of the 43 licenced banks in Ethiopia between 2009 and 2017, the study employed secondary data that was taken from the financial reports of five (5) sampled banks. The predictors employed were operational risk, credit risk (measured by the non-performing loan percentage), and liquidity risk (measured by the loan to deposit ratio) (measured by operational cost to operational income). FP served as the dependent variable, whereas ROA served as the gauge. A multiple linear regression analysis of the data revealed that operational risk and liquidity risk had a strong detrimental impact on FP. However, it was discovered that FP was unaffected by credit risk.

For the years 2011–2016, Lasisi, Lateef, Irom, and Bulus (2018) looked at the impact of corporate board size and risk management on the financial performance of listed DMBs in Nigeria. A sample of fourteen (14) of the study's population of fifteen (15) identified DMBs in Nigeria was used due to the accessibility and availability of the data. The numbers of directors on the corporate board as well as the management of risk were employed as proxies for the independent variables, while the FP was represented by the ROE and EPS. The annual report and accounts of the banks for the study period served as a secondary source for the data collection, which was then subjected to multiple panel regression analysis. The results show that board size, credit risk, and operating risk all have a sizable detrimental impact on ROE and EPS, respectively. The research also demonstrates that liquidity risk has a detrimental and negligible impact on the ROE and EPS of the sample institutions in Nigeria. As non-performing loans have been shown experimentally to lower the quality of the firm's FP, it is

advised among other things that banks monitor their risk management procedures and make sure they limit them. For better performance, they should also cut their operating expenses. Using a sample of 13 Jordanian DMBs during the time period, Ehiedu (2022); Ehiedu, Onuorah, and Osakwe, (2022); Ahmad (2018) conducted a study to investigate the effect of risk management methods on the profitability of Jordanian DMBs (2010-2015). The study's annual financial accounts were used to gather information about variables. Bank profitability was reflected in ROA, while liquidity, operational, credit, and market risks were managed as risks. Each category of risk in the study was represented by one of two ratios. To test the theory, the fixed-effect and random-effect ordinary least squares approach was employed. According to the study, risk management procedures as a whole account for a sizable portion of the difference in banks' profitability. The findings also demonstrated that only financial risk management techniques had a substantial impact on profitability, while effects of liquidity, credit, and market risks were negligible. The implications of the findings suggested that Jordanian DMBs (JCB) had successfully managed liquidity, credit, operating revenue, and market risks throughout the study period, but had failed to do so when it came to managing financial risk reflected in overheads, (Ehiedu and Obi, 2022).

RESEARCH METHODOLOGY

The estimation tools used in this study are unit root test, Auto-regressive Distributed Lag (ARDL) Bound Co-integration test, and ARDL Co-integrating and Long form. Furthermore, before running the regression, the model was first subjected to series robustness (diagnostic) check vis-à-vis descriptive statistical and trend analysis (to check the behaviour of study variables), correlation analysis (to check the collinearity of study variables), and Variance Inflation factor (to check for the severity of collinearity of the regressors).

The Ehiedu, and Odita, (2014); Ehiedu, Onuorah, and Mbagwu (2022); Isedu and Erhabor (2021) empirical model in equation (2), though is regression model, will be modified to ARDL. Therefore, this study includes; Credit Risks (CR), Liquidity Risks (LR), Operational Risks (OR), and Market Risks (MR) as measures of FR affecting FP of DMBs {ROE}. The modified model will be subjected to ARDL is in order to suit the feature of stationarity of the study variables. The ARDL was specified as:

$$\Delta ROE = \partial_0 + \partial_1 ROE + \partial_2 CR_{t-1} + \partial_3 LR_{t-1} + \partial_4 OR_{t-1} + \partial_5 MR_{t-1} + \sum_{i=1}^k \gamma_1 i \Delta ROE_{t-1} + \sum_{i=1}^k \gamma_2 i \Delta CR_{t-1} + \sum_{i=1}^k \gamma_3 i \Delta LR_{t-1} + \sum_{i=1}^k \gamma_4 i \Delta OR_{t-1} + \sum_{i=1}^k \gamma_5 i \Delta MR_{t-1} + \varepsilon_t \dots 3$$

K = lag length for the Unrestricted Error-Correction Model (UECM)

Δ = first differencing operator

ε = white noise or disturbance error term

The modified model will be subjected to ARDL in order to suit the feature of stationarity of the study variables. The co-integrating long-run relationship will estimated using the specification below:

$$\Delta ROE = \partial_0 + \partial_1 ROE_{t-1} + \partial_2 CR_{t-1} + \partial_3 LR_{t-1} + \partial_4 OR_{t-1} + \partial_5 MR_{t-1} + \varepsilon_t \dots 4$$

The short-run dynamic model is specify thus:

$$\Delta ROE = \sum_{i=1}^k \gamma_1 i \Delta ROE_{t-1} + \sum_{i=1}^k \gamma_2 i \Delta CR_{t-1} + \sum_{i=1}^k \gamma_3 i \Delta LR_{t-1} + \sum_{i=1}^k \gamma_4 i \Delta OR_{t-1} + \sum_{i=1}^k \gamma_5 i \Delta MR_{t-1} + \varepsilon_{Ct} \text{ --- -- -- -- -- 5}$$

Where;

ε_{Ct-1} = the error correction term lagged for one period

γ = the coefficient for measuring speed of adjustment in equation (5)

Result and Discussions

Table 1
Summary of Statistics

	ROE	CR	LR	OR	MR
Mean	19.98231	17.02423	26.43188	20.85265	8.933668
Median	21.47000	12.56000	24.43074	15.67260	5.870931
Maximum	57.65000	83.48000	65.71478	59.22720	55.59280
Minimum	-60.07000	2.810000	3.008866	2.110000	0.004397
Std. Dev.	20.25172	19.90405	12.91683	14.34821	12.85511
Observations	26	26	26	25	26

Source: Econometric Views Version 9.0 Output (2022)

The evidence provided in Table 1 show significant variations in the variables given the large differences between the maximum and minimum values of the series. The summary statistics evidenced that the study variables covered a study period of 26 years (1996 to 2021). Again, ROE reported an average and standard deviation value of 19.98231 and 60.07000 suggesting that ROE deviate much away from the mean value. Meanwhile, ROE reported had a minimum and maximum value of -60.07000 and 83.48000 respectively throughout the study periods. Further, CR reported an average and standard deviation value of 17.02423 and 19.90405 suggesting that CR did not deviate much away from the mean value. Meanwhile, CR reported had a minimum and maximum value of 2.810000 and 22.60000 respectively throughout the study periods. LR reported an average and standard deviation value of 20.85265 and 12.91683 suggesting that LR did not deviate much away from the mean value. Meanwhile, LR reported had a minimum and maximum value of 3.008866 and 65.71478 respectively throughout the study periods. OR reported an average and standard deviation value of 20.85265 and 14.34821 suggesting that OR did not deviate much away from the mean value. Meanwhile, OR reported had a minimum and maximum value of 2.110000 and 59.22720 respectively throughout the study periods. Lastly, evidenced that MR reported an average and standard deviation value of 8.933668 and 12.85511 suggesting that standard deviation is greater the mean value. Meanwhile, MR reported had a minimum and maximum value of 0.004397 and 55.59280 respectively throughout the study periods.

Table 2
Correlation Matrix

	ROE	CR	LR	OR	MR
ROE	1.000000				
CR	-0.162414	1.000000			
LR	0.063334	0.505283	1.000000		
OR	0.090492	0.394295	0.366649	1.000000	
MR	-0.056781	0.405203	0.483399	0.396508	1.000000

Source: Econometric Views Version 9.0 Output (2022)

The correlation matrix reported in table 2 above revealed that CR and MR exerted negative correlation with ROE of DMBs in Nigeria while LR and OR, exerted positive correlation with

ROE of DMBs in Nigeria. Furthermore, CR reported a coefficient value of -0.162414 suggesting that the correlation between CR and ROE and is high, though is negative. Meanwhile, the rest study variable reported low correlation. Generally, the result from the table shows that problem of multi-collinearity is not anticipated. Though, a further test will be carried out to ascertain this condition.

Table 3

Multi-Collinearity Test

Variables	Variance Inflation Factor	Tolerance Value
CR	0.076430	1.572499
LR	0.166952	2.206495
OR	0.087175	1.193913
MR	0.275013	1.700197

Source: Econometric Views Version 9.0 Output (2022)

From the above table, the tolerance level of CR is 0.076430 that of LR is 0.166952; OR is 0.087175, MR for 0.275013; which indicates that about 7.64%, 16.70%, 8.72% and 27.50% variance in the predictor variables is not predicted by other predictors' variable. This is because their tolerance values are higher than 0.10 meanwhile the Variance inflation factor are less than 10. This shows the absence of multi-collinearity problem.

Table 4

*Data Validity Test***Breusch-Godfrey Serial Correlation LM Test:**

F-statistic	0.598093	Prob. F(2,16)	0.5617
Obs*R-squared	1.669467	Prob. Chi-Square(2)	0.4340

Source: E-VIEW, 9.0 Outputs, 2022.

Prior to estimating the models, residuals of the variables were ascertained to check for the presence of serial correlation. This was done using the serial correlation LM test. The serial correlation LM test in Table 4 details that there is no element of serial correlation in the models owing to the fact that the p-values of the f-statistics are insignificant at 5% level of significance.

Table 5

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	2.924535	Prob. F(5,18)	0.0619
Obs*R-squared	10.75768	Prob. Chi-Square(5)	0.0764
Scaled explained SS	14.16797	Prob. Chi-Square(5)	0.0646

Source: E-VIEW, 9.0 Outputs, 2022.

The situation in which the variability of a variable is unequal across the range of values of a second variable that predicts it leads to problem of heteroskedasticity. To ensure that there is homoscedasticity in the model estimation, the heteroskedasticity test via the Breusch-Pagan-Godfrey was performed. With the result there is no problem of heteroskedasticity in the models as the p-values of the f-statistics are insignificant at 5% significance level. From the table above, the P-value of the chi-square which stood at 0.0764. This gives us prove that there is absence of Heteroskedasticity in the study, since it is not significant at 5%. Thus, the null hypothesis that states that the residuals have no constant variance and zero mean is rejected. Hence, we conclude that the model is Homoskedastic (i.e. it has equal variance). On this note, we can boldly state the model is reliable and fit for prediction.

Table 6
Ramsey RESET Test

Equation: UNTITLED			
Specification: ROE ROE(-1) CR LR OR MR C			
Omitted Variables: Squares of fitted values			
	Value	Df	Probability
t-statistic	2.242467	17	0.7386
F-statistic	5.028658	(2, 17)	0.6386

Source: Econometric Views Version 9.0 Output (2022)

From the Table 6 above, it confirms that the Durbin Watson stat that our data has no traits of autocorrelation. Indicates that the model is homoskedastic since the probability values of three parameters are greater than 0.05 level of significance. Ramsey test result reveals that our model is correctly specified and is stable.

Table 7
Summary of ADF Test

ADF test at Levels				
Parameter	ADF test statistic	Test critical value @ 5%	Prob.*	Decision
ROE	-6.432308	-2.986225	0.0000	Stationary
CR	-3.925868	-2.986225	0.0063	Stationary
LR	-2.794640	-2.986225	0.0734	Non-stationary
OR	-2.553035	-2.998064	0.1169	Non-stationary
MR	-7.558329	-2.986225	0.0000	Stationary
ADF test at 1st Difference				
Parameter	ADF test statistic	Test critical value @ 5%	Prob.*	Decision
ROE	-6.612580	-2.998064	0.0000	Stationary
CR	-5.462420	-2.991878	0.0002	Stationary
LR	-6.624720	-2.991878	0.0000	Stationary
OR	-7.381508	-3.029970	0.0000	Stationary
MR	-17.03863	-2.991878	0.0001	Stationary

Source: Econometric Views Version 9.0 (2022)

The table above shows the order of integration (stationarity) of the series used for the study. All series were subjected to the ADF test and results indicate that all series except CR, MR and ROE were found to be stationary at levels. However, when subjected further, CR, LR, OR, MR and ROE attained stationarity at first difference. This therefore indicates that all series attained stationarity at level and first differencing. Since our series were found to be stationary at levels (1(0) and first differencing (1(1) justify the need to examine the long run relationship between FR and FP of DMBs in Nigeria.

Table 8
ARDL Bounds Test

Date: 08/28/22 Time: 01:30		
Sample: 1997 2021		
Included observations: 24		
Null Hypothesis: No long-run relationships exist		
Test Statistic	Value	K
F-statistic	9.935005	4
Critical Value Bounds		
Significance	I0 Bound	I1 Bound
10%	2.45	3.52
5%	2.86	4.01
2.5%	3.25	4.49
1%	3.74	5.06

Source: Econometric Views Version 9.0 Output (2022)

From the Table 8 above, it can be observed that the value of the F-statistic 9.935005 is greater than the 5% critical values at I(0) and I(1) bounds; therefore we reject the null hypothesis and conclude that a long run relationship exist amongst the variables. Therefore, long run relationship exists between financial risk and performance of deposit money banks in Nigeria.

Table 9
ARDL Cointegrating And Long Run Form

Dependent Variable: ROE				
Selected Model: ARDL(1, 1, 1, 1, 1)				
Date: 08/28/22 Time: 02:16				
Sample: 1996 2021				
Included observations: 23				
Cointegrating Form				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(CR)	-1.666886	0.411182	-4.053887	0.0014
D(LR)	0.069062	0.427945	0.161380	0.8743
D(OR)	-0.168277	0.407070	-0.413385	0.6861
D(MR)	-2.092047	0.576473	-3.629047	0.0031
CointEq(-1)	-1.371044	0.176395	-7.772583	0.0000
Cointeq = ROE - (-0.2613*CR -0.0819*LR -0.0241*OR01 -1.3164*MR + 31.0406)				
Long Run Coefficients				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
CR	-0.261294	0.209242	-1.248761	0.2338
LR	-0.081919	0.401663	-0.203950	0.8416
OR	-0.024109	0.254516	-0.094726	0.9260
MR	-1.316395	0.496842	-2.649523	0.0200
C	31.040594	8.131352	3.817397	0.0021
R-squared	0.707042	Mean dependent var		17.65609
Adjusted R-squared	0.504225	S.D. dependent var		19.73455
F-statistic	3.486111	Durbin-Watson stat		1.893258
Prob(F-statistic)	0.020659			

Source: Econometric Views Version 9.0 Output (2022)

The Error Correction coefficient (cointEq-1) is estimated at -0.2613; this means that the model corrects its previous periods disequilibrium at a speed of 26.13% estimated annually. In other words, increasing the financial risk variables at a steady state of 26.13% annually, the financial risk variables will improve significantly in the long run. Given the coefficient of determination as 0.707042 which is 70% supported by high value of adjusted R² as 50%, it presumes that the independent variables incorporated into this model have been able to determine the variation of return on equity to 50%. The F Probability statistic also confirms the significant of this model. Again, the Durbin Watson Statistics clearly revealed that the model is not serially correlated since it value is within the accepted region of acceptance.

The result in table 9 above clearly evidenced that a unit rise in CR will reduce ROE by -1.6669 and -0.2613 (166.69% and 26.13%) on the short and long run respectively. This further revealed that, the more banks are faced with CR due to defaults in loan repayment; it has the likelihood of affecting the ROE of DMBs in Nigeria. In terms of statistical significance, credit risk passed the test of statistical significance only on the short run. This implies that CR is a strong determinant of ROE in the short run but on the long run is not. This finding is in line with the findings of (Isedu and Erhabor, 2021; Abdullahi, Sabari, Sabo and Mohammed 2021; Olaoye, Ogbemor and Okusami 2020; Meteke, Ehiedu, Ndah and Onuorah, 2022).

The study affirmed that LR exerted positive insignificant effect on ROE on the short run but negative insignificant in the long run. The implication of the positive result is that 1% rise in LR will only increase return on equity by 0.0691 (6.91%) but decreases by -0.0819 (8.19%) in long run. Put differently, the more banks are liquid, it may be favourable in the short run but it will have adverse effect in the long run. However, in terms of statistical significant relationship, LR are not significant enough at the moment to influence ROE. Hence, we conclude that LR are only a positive and negative driver of ROE and not a major driver of ROE. This result is in line with the findings of Ehiedu, (2022); LiMei, Takyi, Ofori and Abraham (2020) and Olaoye, Ogbekor and Okusami (2020) but contradicts the findings of Isedu and Erhabor (2021).

The result in table 9 above clearly evidenced that a unit rise in operational risks will reduce ROE by -0.1683 and -0.0241 (16.83% and 2.41%) on the short and long run respectively. This further revealed that, the more banks are faced with operational risks due to challenges of daily operations; it has the likelihood of affecting the ROE of DMBs in Nigeria. In terms of statistical significance, operational risks did not passed the test of statistical significance on the short and long runs. This finding is in line with the findings of Isedu and Erhabor (2021); Obaro, Onuorah, Evesi and Ehiedu, (2022), but contradicts the findings of Fadun and Oye (2020); Agbogun, Ehiedu, Bayem and Onuorah, (2022); and Olaoye, Ogbekor and Okusami (2020); Odit, Ehiedu and Kiford , (2020).

The regression result tested earlier affirmed that MR exerted negative significant effect on ROE of DMBs in Nigeria both on the short and long run. The negative result is in line with the apriori expectation of this study. The implication of the negative result is that 1% rise in market risks will only decrease ROE of DMBs in Nigeria by -2.0920 and -1.3164 respectively. Again, its p-values are lower than 5%. Hence, we conclude that MR in a short and long run will have negative significant effect on ROE of DMBs in Nigeria. This result is in tandem with the findings of Odit and Ehiedu (2015); LiMei, Takyi, Ofori and Abraham (2020) but contradicts the findings of Isedu and Erhabor (2021); Olaoye, Ogbekor and Okusami (2020); Agbogun and Ehiedu, (2022).

Summary of Findings

Following the various findings discovered in earlier section, the followings are the major findings of the study:

1. The regression outcome in table 9 above clearly demonstrated that CR has a detrimental impact on ROE throughout the long and short terms. It has a short-term p-value of 0.2338 and a long-term p-value of 0.0014, both of which indicate statistical significance. This suggests that CR affects ROE significantly in the short term but only somewhat in the long term.
2. According to the regression results in table 9 above, LR has a short-term positive effect on ROE and a long-term negative impact on ROE. It has p-values of 0.8743 and 0.8416 for statistical significance in the short- and long-term, respectively. This suggests that, both in the short and long terms, LR has little impact on ROE.
3. The regression outcome in table 9 above clearly demonstrated that OR has a negative, inconsequential impact on ROE over the short and long terms. Its p-values (0.6861 and 0.9260) are also more than the 5% level of significance. This suggests that OR has little long-term and short-term effects on ROE.
4. The regression outcome in table 9 above clearly demonstrated that MR has a considerable negative impact on ROE of DMBs in Nigeria over the long and short terms. Its p-values (0.0031 and 0.0021) are below the 5% level of significance.

CONCLUSION AND RECOMMENDATIONS

This study explored the association between FR and FP of DMBs in Nigeria, for the periods of 1996-2021 (26years). Specifically, the study examined the effect of measures of FR; CR, LR, OR, MR on the ROE of DMBs in Nigeria. The study made use of aggregate secondary data for all DMBs in Nigeria that will be source from NDIC Annual Reports, CBN Annual Report and CBN Bank Supervisory Annual Report and analyzed with Autoregressive distributed lag model having established that the model exhibited mixed integration. Meanwhile, the Multicollinearity test and Heteroskedasticity test clearly revealed that the model is free from multicollinearity problem and that it is Homoskedastic signaling that the model is fit for prediction. Hence, the study concluded that FR does not have significant effect on FP of DMBs in Nigeria. The following recommendations are made based on the findings of this study: The DMBs in Nigeria should ensure that all the conditions required before granting loans to their customers should be met to avoid default in order to enhance their profitability; The management of DMBs in Nigeria should sustain the management of their interest rate risk to enhance their profitability. The high interest rate will scare away prospective borrowers and should be kept little above the prevailing inflation rate in Nigeria and the banks should manage their liquidity risk by striking a balance between excess cash and cash trapping to enhance the profitability of the DMBs in Nigeria. Holding on to too much cash will reduce banks profitability level while shortage of cash in banks will equally reduce the profitability level, the need to strike a balance to enhance banks profitability level become expedient.

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