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Research Article

Effect of Financial Metrics on Risk Indicators in Nigeria Listed Deposit Money Banks

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Abstract

This study investigates the effect of financial metrics on risk indicators in Nigerian deposit money banks. The analysis employs yearly time series data spanning from 2007 to 2022, acquired from the Exchange Group PLC. Descriptive statistics, panel unit root tests, Hausman tests, and Panel Ordinary Least Squares (OLS) procedures were used at a 95% confidence interval. The study utilized secondary data sourced from the Exchange Group PLC database. The R-squared (0.564390) and Adjusted R-squared (0.540629) values indicate that the models have strong explanatory power. The results show that all variables are stationary at their levels (I(0)). The primary financial metrics influencing risk indicators among deposit money banks in Nigeria are revenue growth, net interest margin, and earnings per share. It was recommended that banks should implement effective risk management systems that can handle increased complexity and scale of operations, and regularly update them, leveraging blockchain technology for decentralized risk management as it relates to revenue growth rate of banks. Maintain a healthy net interest margin through effective risk management practices and internal controls, and utilize this strength to invest in risk mitigation measures, introducing incentive programs to encourage employee involvement in risk management. Conduct regular financial reviews and audits to ensure accurate earnings reporting and risk identification, utilizing AI-powered tools for earnings analysis to identify anomalies and potential risks. Prioritize prudent lending practices and effective risk management to maintain financial stability, implementing dynamic adjustments to the debt-to-equity ratio in response to changes in risk detection needs.

Keywords

Financial Metrics, Risk Indicators, Deposit Money Banks, Risk Management, Nigeria

1. Introduction

Risk indicators have emerged as a significant concern for financial institutions globally, with substantial effect on economies and stakeholders [22]. The intricate nature of financial risks, coupled with sophisticated in financial technologies, has made the detection and prevention of risks a complicated task for regulators and banks [12]. Worldwide, the need for robust system to identify and manage risks has never been more necessary, as the financial industry continues to contend with sophisticated risk factors [36]. In the African situation, the financial sector presents great challenges and opportunities in the struggle against financial risks. The African banking sector, characterized by fast growth and evolving regulatory contingencies, is notably vulnerable to risks [6]. With a huge portion of the people depending on deposit money banks for their financial transactions, the sanctity of these firms is paramount [40]. The African banking industry is prone to risk underscores

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the need for effective detection through various indicators serving as mechanisms that can safeguard stakeholders' investments and sustain financial stability [42]. In Nigeria, one of Africa's biggest economies and financial hubs, the increase of risk matters in deposit money banks has raised serious concerns among regulators, investors, and the entire public [4, 20]. The Nigerian Economic and Financial Crimes Commission (EFCC) announced that the banking sector is accountable for 70% of financial risks in the country. A number of instances cited are the fall of Assurance Bank Nigeria Limited, City Express Bank Limited, African Express Bank Plc, Lead Bank Plc, Trade Bank Plc, Metropolitan Bank Limited, Societe Generale Bank of Nigeria Plc, Gulf Bank of Nigeria Plc, Hallmark Bank Plc, Intercontinental Bank Plc, Oceanic Bank Ltd, and Bank PHB, the sum total of which have had their licenses upturned by the Central Bank of Nigeria [51]. Banks in Nigerian play an important role in the country's economic growth, have encountered various incidence of risk, affecting their validity and financial health [56]. Subsequently, there is a serious need to source creative and impactful models to identify and prevent risks within these banks [65]. This study investigates the role of financial metrics as tools for detecting risk indicators in Nigerian deposit money banks. Financial metrics, extracted from the banks' financial statements, unveils critical details into their systems and financial status [47]. Particularly, this study concentrates on how certain financial metrics, Revenue Growth Rate (RGR), Net Interest Margin (NIM), Earnings Per Share (EPS), and Debt-to-Equity Ratio (DER) can be engaged to identify potential drivers of risks indicator [45]. Financial metrics provide a statistical methods to monitoring banks' progress and financial credibility [13]. By examining these metrics, it is able to identify anomalies and outliers that can indicate risks [29]. For example, an uncommon spike in Revenue Growth Rate or a sudden drop in Net Interest Margin can pinpoint discrepancies that need intensive investigation [47]. Equally too, inconsistencies in Earnings Per Share and unusual trend in the Debt-to-Equity Ratio can be a pointer to manipulative activities targeted at misdirecting stakeholders [45]. Nevertheless, the occurrence of risk issues in banks yearly, the capacity to detect each activity early using financial metrics is important [33]. This research demonstrates how these metrics can became reds flags, instigating concentrated forensic investigations into the banks' operations [59]. By sporting these anomalies, stockholders and bank management can take quick steps to avoid and mitigate the extent of risks, seeing to the stability and viability of the financial operations [63].

1.1. Statement of Problem

Risk remains a significant issue, with the banking institutions being vulnerable to various risk issues [35]. The banking industry has experienced stages in risk-related issues; despite efforts to manage risks, Nigerian deposit money banks continue to face challenges in identifying and mitigating risk [48]. The correlation between financial metrics and risk indicators

in Nigerian deposit money banks remains underexplored in current literature post-COVID-19. Despite the significant impact Revenue Growth Rate (RGR), Net Interest Margin (NIM), Earnings Per Share (EPS), and Debt-to-Equity Ratio (DER) have on risk indicators, a comprehensive analyses of their influence are scarce. There is a pressing need for a more nuanced understanding of the determinants of risk indicators, specifically through the development of a model that captures the complex interplay between these variables. This issue is widely echoed by institutions such as the International Monetary Fund [31], African Development Bank [5], and the Central Bank of Nigeria [11], which have all identified the same problem.

The aim of this study is to develop a nuanced understanding of the determinants of risk indicators that captures the complex interplay between various financial metrics. This will help identify key factors contributing to risk and inform effective prevention and mitigation strategies, ultimately reducing financial losses and enhancing organizational integrity.

1.2. Study Objective

This research aims to assess the effect of financial metrics on risk indicators in Nigerian deposit money banks. Specifically, it seeks to:

1. Examine the relationship between Revenue Growth Rate (RGR) and risk indicators.
2. Investigate the correlation between Net Interest Margin (NIM) and risk indicators.
3. Analyze the effect of Earnings Per Share (EPS) on risk indicators.
4. Explore the association between Debt-to-Equity Ratio (DER) and risk indicators.

1.3. Research Hypotheses

Based on the objectives of the study stated above, the null hypotheses for this study are stated as follows:

1. H01: There is no significant relationship between Revenue Growth Rate (RGR) and risk indicators.
2. H02: There is no significant relationship between Net Interest Margin (NIM) and risk indicators.
3. H03: There is no significant relationship between Earnings Per Share (EPS) and risk indicators.
4. H04: There is no significant relationship between Debt-to-Equity Ratio (DER) and risk indicators.

2. Literature Review

2.1. Conceptual Framework

The objective of this study is to investigate the relationship between financial metrics and risk indicators of listed Nigerian banking. It focuses on the impact of financial metrics in

identifying risk indicators [10]. The conceptual framework is guided by the following variables and relationships: specifically, it examines the relationship between four financial ratios Revenue Growth Rate, Net Interest Margin, Earnings Per Share, and Debt-to-Equity Ratio and risk indicators using z-scores [21, 50]. Analyzing data from seven major banks (Access Bank PLC, Guaranty Trust Holding Company PLC, First Bank of Nigeria Limited, Zenith Bank PLC, United Bank for Africa PLC, Stanbic IBTC Holdings PLC, and Ecobank Transnational Incorporated) in Nigeria over a 16-year period (2007-2022), this research targets to determine which financial metrics are most influential in identifying risk indicators [3].

Revenue Growth Rate (RGR): The percentage increase in a bank's total revenue over a specific period, typically annually, which indicates the bank's ability to generate more income through its operations. RGR measures the percentage change in revenue over a period [46]. In the Nigerian banking sector, significant anomalies or outliers in RGR data, such as unusual spikes or declines, can indicate potential risk indicators like revenue recognition issues or accounting manipulation [30]. This can be seen when banks improperly report revenues to appear financially healthier than they are.

Net Interest Margin (NIM): Measures the difference between interest income generated and interest expenses incurred, relative to total earning assets. In Nigerian banks, a high NIM indicates efficient profitability from lending and investment activities. NIM measures the difference between interest income and interest expense, expressed as a percentage [61]. Anomalies and outliers in NIM data, such as an unusual increase or decrease, can indicate risk indicators like interest income manipulation or accounting issues [16].

Earnings Per Share (EPS): The portion of a bank's profit allocated to each outstanding share of common stock, which measures the profitability of the bank on a per-share basis and is an important metric for investors. EPS measures a company's profitability on a per-share basis [55]. In the context of Nigerian banking, anomalies and outliers in EPS data, such as unexpected increases or decreases, can indicate risk indicators like earnings manipulation or accounting issues [27]. Banks might engage in practices like overstating profits or concealing losses to mislead investors and maintain stock prices.

Debt-to-Equity Ratio (DER): A financial leverage ratio that compares a bank's total debt to its shareholders' equity, indicating the level of financial risk and leverage used by the bank to finance its operations and investments. DER measures a company's level of indebtedness [54]. In Nigerian banks, unusual changes or outliers in DER data can signal risk indicators such as accounting manipulation or fraudulent financial reporting [16]. For example, banks might underreport their liabilities or overstate their equity to appear more financially stable and attract more investments.

Risk Indicators (dependent variable): Risk indicators refer to the identification of risk-related activities, such as accounting manipulation, earnings management, or asset mis-

appropriation [34]. This study examines anomalies and outliers in the empirical data of each variable for each year, using the z-score calculation to identify significant deviations from the mean. The z-score formula calculates the number of standard deviations away from the mean a data point is, facilitating the detection of anomalies and outliers. According to the rule, if the absolute value of the z-score exceeds 2, it indicates a substantial deviation from the mean, triggering a red flag for potential risk presence (1) and otherwise indicating absence (0) in a binary classification [37].

The formula for calculating z-scores is:

$$z = (X - \mu) / \sigma$$

Where:
z is the z-score
X is the data point (ratio value in this case)
μ is the mean of the data set (average ratio value)
σ is the standard deviation of the data set (variability of ratio values)

2.2. Theoretical Reviews

Signaling Theory, and Agency Theory provide theoretical understanding for this research. However, Agency Theory most effectively explains the variable relationships in this study.

Signaling Theory focuses on how companies use signals, such as financial metrics, to mitigate information asymmetry between parties. Signaling Theory [60] partially explains the relationship between risk indicators and financial metrics (Revenue Growth Rate, Net Interest Margin, Earnings Per Share, Debt-to-Equity Ratio), but it has limitations. The theory suggests that companies send signals through financial metrics, and investors interpret these signals to make decisions [62]. However, it fails to account for the possibility that companies might manipulate financial metrics to send misleading signals, thus affecting the perception of risk.

Agency Theory

The principal-agent theory, also known as the agency dilemma, is a widely recognized concept in economics and management that was first introduced in the 1970s [32]. This theory explores the relationship between principals (shareholders) and agents (company executives), addressing issues that arise when the goals of the principals and agents diverge, and the agents have more information than the principals (information asymmetry) [58]. This theory explains how managers might manipulate financial metrics to meet certain targets or personal incentives, leading to increased financial risk [23].

a. Revenue Growth Rate and Risk Indicators: The principal-agent problem can lead executives to manipulate financial metrics such as Revenue Growth Rate to present a more favorable financial position or achieve performance-based bonuses [32]. Monitoring unusual spikes or inconsistencies in

Revenue Growth Rate can help in detecting risk indicators [26]. Sudden increases in Revenue Growth Rate might mask underlying risks related to aggressive growth strategies or revenue recognition practices.

b. Net Interest Margin and Risk Indicators: Net Interest Margin (NIM) can be manipulated by agents to appear more favorable, impacting investors' perception of the company's profitability and financial health [28]. Closely monitoring NIM can reveal discrepancies indicative of fraudulent activities and potential financial risk [32]. Anomalies in NIM may signal unsustainable interest income practices or risk-laden investment decisions.

c. Earnings Per Share and Risk Indicators: Earnings Per Share (EPS) is a critical metric often targeted for manipulation by executives to meet market expectations or enhance their compensation tied to financial performance [58]. Detecting unusual patterns or inconsistencies in EPS can signal potential fraud and associated financial risks [23]. Variability in EPS may reflect earnings management tactics that obscure true financial health, increasing investment risk.

d. Debt-to-Equity Ratio and Risk Indicators: A high Debt-to-Equity Ratio may signal financial distress, which can create an environment where internal controls are bypassed, allowing executives to engage in fraudulent activities to mask the company's true financial state [26]. Monitoring the Debt-to-Equity Ratio for significant changes can help identify potential fraud and risk [28]. Elevated Debt-to-Equity ratios could indicate excessive leverage and heightened default risk.

Principals can incentivize agents to act in their best interests and reduce agency costs [23]. Agency Theory is superior in explaining the relationship between financial metrics and risk indicators because it directly addresses the motivations and behaviors of executives (agents) who manipulate these metrics to align with their personal incentives, despite diverging from shareholder (principal) interests [32].

2.3. Empirical Reviews

Financial Metrics Effect on Risk Indicators

Okafor and Okeke [49] found that financial metrics such as return on equity and return on assets are significantly influenced by risk indicators, as effective risk management practices prevent financial losses and maintain investor confidence. Conversely, Olajide and Onwumere [52] observed that poor risk indicators might negatively impact these metrics due to increased costs and reduced profitability, leading to a short-term decline. Nwosu and Uzochukwu 44 highlighted that sound financial metrics positively affect risk indicators like earnings per share and net interest margin, aiding in preventing financial losses and boosting investor confidence. However, Adebayo et al. [2] reported that these measures could incur additional costs and reduce profitability, causing a temporary drop in financial metrics.

Financial Metrics Effect on Revenue Growth Rate: Chukwuma and Nnamdi [14] identified a significant positive correlation between financial metrics and revenue growth rate, attributing it to the prevention of financial losses and enhanced investor confidence. Conversely, Adebayo et al. [2] noted that while financial metrics can increase costs and reduce profitability, they may temporarily decrease revenue growth rates.

Financial Metrics Effect on Net Interest Margin: Olajide and Onwumere [53] found that financial metrics positively affect net interest margin by safeguarding against financial losses and sustaining investor confidence. On the contrary, Nwosu and Uzochukwu [44] argued that the costs associated with managing risk indicators might reduce profitability and cause a short-term decline in net interest margin.

Financial Metrics Effect on Earnings Per Share: Okeke and Okafor [49] demonstrated a positive relationship between financial metrics and earnings per share, emphasizing the role of fraud prevention in maintaining investor confidence. In contrast, Onwumere and Olajide [57] highlighted the potential negative impact of increased costs due to risk management, which could lead to a temporary decrease in earnings per share.

Financial Metrics Effect on Debt-to-Equity Ratio: Uzochukwu and Nwosu [65] showed that financial metrics positively impact the debt-to-equity ratio by preventing financial losses and maintaining investor confidence. Conversely, Adebayo et al. [2] noted that the implementation of risk management measures might increase costs, potentially leading to a short-term rise in the debt-to-equity ratio.

3. Methodology

This study utilizes the ex post facto research design methodology. The data used in this study were obtained from concluded events, hence restricting the researcher's capacity to alter it. Analyzing seven out of fourteen deposit money banks as at July 23, 2024 CBN annual report. The study utilized secondary data, analysis employs yearly time series data spanning 2007 to 2022, acquired from the Nigeria Exchange Ltd [43]. The study employed descriptive statistics, panel unit root test, Hausman test, and Panel Ordinary Least Square procedures at the 95% confidence interval. To efficiently achieve our objectives, our model transforms into:

$$RI = \beta 0 + \beta 1 RGR + \beta 2 NIM + \beta 3 EPS + \beta 4 DER + \varepsilon$$

Where:
Revenue Growth Rate (RGR)
Net Interest Margin (NIM)
Earnings Per-Share (EPS)
Adjusted Debt to Equity Ratio (DER)
Risk Indicator (RI) is a binary variable indicating the presence (1) or absence (0) of fraudulent activities using z-score calculations.

ε is the error term, representing the random variation in the model.

The coefficients (β0, β1, β2, β3, β4) represent the change in the RiskIndicator for a one-unit change in the respective independent variable, while controlling for the other variables in the model.

This study's model, RI = β0 + β1RGR + β2NIM + β3EPS + β4DER + ε, was adapted by combining elements from two existing models. The first model, Risk Indicator (RI) = β0 + β1RGR + β2NIM + ε [32], examined the impact of Revenue Growth Rate (RGR) and Net Interest Margin (NIM) on Risk detection in the banking industry. The second model, Risk Indicator (RI) = β0 + β1EPS + β2DER + ε [58], investigated the role of Earnings Per Share (EPS) and Debt-to-Equity Ratio (DER) in identifying fraudulent activities in financial statements. By incorporating all these variables, our model aims to provide a more comprehensive approach to Risk detection, building on the insights from these two previous studies.

4. Results and Discussions

4.1. Data Analysis

Table 1. Descriptive Statistics.

	RI	RGR	NIM	EPS	DER
Mean	0.250000	0.060536	0.328036	2.245536	0.117946
Median	0.000000	0.060000	0.325000	2.050000	0.100000
Maximum	1.000000	0.150000	0.420000	4.400000	1.400000
Minimum	0.000000	-0.020000	0.220000	0.950000	0.010000
Std. Dev.	0.434959	0.045675	0.052347	0.800072	0.133829
Skewness	1.154701	0.026195	-0.078653	0.716990	7.927810
Kurtosis	2.333333	1.911285	1.861259	2.859206	76.61770
Jarque-Bera	26.96296	5.544214	6.166889	9.688575	26464.51
Probability	0.000001	0.062530	0.045801	0.007873	0.000000
Sum	28.00000	6.780000	36.74000	251.5000	13.21000
Sum Sq. Dev.	21.00000	0.231568	0.304168	71.05277	1.988028
Observations	112	112	112	112	112

Source: E-views 10 Output

The yearly mean values for Revenue Growth Rate (RGR), Net Interest Margin (NIM), Earnings Per-Share (EPS), Adjusted Debt to Equity Ratio (DER), and Risk Indicator (RI) are 0.060536, 0.328036, 2.245536, 0.117946, and 0.250000, respectively. These selected commercial banks exhibit a mild level of risk as evidenced by their low revenue growth rate, moderate net interest margin, high earnings per share, and low adjusted debt to equity ratio. The values, listed in ascending order, range from -0.020 to 0.150 for RGR, 0.220 to 0.420 for NIM, 0.950 to 4.40 for EPS, 0.010 to 1.40 for DER, and 0.0 to 1.0 for RI.

The standard deviations of RGR, NIM, EPS, DER, and RI from their respective means are 0.045675, 0.052347, 0.800072, 0.133829, and 0.434959, respectively. All variables, except for NIM, exhibit positive skewness. The skewness values for the variables are as follows: RGR (0.026195), EPS (0.716990), DER (7.927810), and RI (1.154701). NIM, on the other hand, is skewed to the left with a value of -0.078653. The kurtosis values for RGR and NIM are below 3, making them platykurtic. The kurtosis value for EPS is approximately 3, classifying it as mesokurtic, while DER has a kurtosis value above 3, indicating that it is leptokurtic.

The Jarque-Bera p-values for NIM, EPS, DER, and RI are 0.045801, 0.007873, 0.000000, and 0.000001, respectively, indicating that these variables are not normally distributed. On the other hand, RGR has a Jarque-Bera p-value of 0.062530, suggesting that it is normally distributed.

4.2. Stationarity Test

Table 2. Levin, Lin & Chu (LLU) Stationarity Test.

Variables	LLC Statistics	P-value	Remark
RI	-5.26263	0.0000	I(0)
RGR..	-4.89488	0.0000	I(0)
NIM…	-4.57178	0.0000	I(0)
EPS…	-8.26811	0.0000	I(0)
DER..	4.48079	0.0000	I(0)

Source: E-views 10 Output

Table 2 shows that all the variables were integrated at level I(0) with a 95% confidence interval. Therefore, we employ Panel Ordinary Least Square methods to examine the correlation between the variables. Prior to proceeding, we employ the Hausman test to evaluate the appropriateness of using either Fixed or Random effect.

According to the findings of the Hausman Test in table 3, it can be inferred that the random effect model is more appropriate than the fixed effect model. This is due to the Chi-square p-value of 0.7638, which does not reach statistical significance at the 0.05 level. Therefore, this study employs

Table 3. Results of Hausman Test.

Correlated Random Effects - Hausman Test			
Equation: Untitled			
Test period random effects			
Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Period random	1.847240	4	0.7638

Period random effects test comparisons:				
Variable	Fixed	Random	Var (Diff.)	Prob.
RG	-9.356177	-9.662520	0.807947	0.7332
NIM	13.890147	13.827139	0.369822	0.9175
EPS	-0.476919	-0.456282	0.000373	0.2853
DER	-0.184511	-0.127815	0.010160	0.5738

Source: E-views 10 Output

Table 4. Random Effect Panel OLS.

Dependent Variable: RI				
Method: Panel EGLS (Period random effects)				
Date: 06/23/24 Time: 22:51				
Sample: 2007 2022				
Periods included: 16				
Cross-sections included: 7				
Total panel (balanced) observations: 112				
Swamy and Arora estimator of component variances				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
RG	-9.662520	3.404383	-2.838259	0.0054
NIM	-13.82714	2.824741	-4.895010	0.0000
EPS	-0.456282	0.081414	-5.604439	0.0000
DER	-0.127815	0.268498	-0.476036	0.6350
C	-2.661196	0.741997	-3.586530	0.0005
	Effects Specification			
		S.D.	Rho	

Dependent Variable: RI				
Period random			0.000000	0.0000
Idiosyncratic random			0.371605	1.0000
	Weighted Statistics			
R-squared	0.564390	Mean dependent var		0.250000
Adjusted R-squared	0.540629	S.D. dependent var		0.434959
S.E. of regression	0.353194	Sum squared resid		13.34781
F-statistic	15.33555	Durbin-Watson stat		2.327058
Prob (F-statistic)	0.000000			
	Unweighted Statistics			
R-squared	0.564390	Mean dependent var		0.250000
Sum squared resid	13.34781	Durbin-Watson stat		2.327058

Source: E-views 10 Output

Revenue Growth Rate (RGR) is negative (-9.662520) and significant (0.0054) to the risk indicator (RI). This indicates that a 1% increase in revenue growth will result in a corresponding decline in the risk indicator by 9.662520%. The impact of Net Interest Margin (NIM) on the risk indicator is positive (13.82714) and significant (0.0000). This means that increasing the net interest margin by one unit will result in a corresponding increase of 13.82714 units in the risk indicator of banks in Nigeria. The effect of Earnings Per-Share (EPS) on the risk indicator is negative (-0.456282) and significant (0.0000). This implies that a one-unit increase in the earnings per share of banks will result in a corresponding decrease of 0.456282 units in the risk indicator among banks in Nigeria. The Adjusted Debt to Equity Ratio (DER) is negative (-0.127815) and insignificant (0.6350) to the risk indicator in Nigeria. This implies that a one-unit increase in the debt-equity ratio of banks will result in a corresponding decrease of 0.127815 units in the risk indicator among banks in Nigeria.

The Adjusted R-square value of 0.540629 indicates that the explanatory variables explained 54.1% of the variations in the risk indicator, while the remaining 45.9% can be attributed to other factors not considered in this study. The F-statistic p-value of 0.000000 indicates that the model is of good fit. In addition, the Durbin-Watson statistic of 2.327058 indicates that the model does not exhibit first-order autocorrelation.

4.3. Discussion of Findings

The significant negative relationship between the Revenue Growth Rate (RGR) and the risk indicator [7, 39] indicates that as banks' revenue grows, their ability to manage risk diminishes. This could stem from the increased complexity and scale of operations, which can overwhelm existing risk management systems [64]. Larger banks with higher transaction volumes face more challenges in scrutinizing every transaction, leading to potential lapses in risk management [1]. The significant positive relationship between Net Interest Margin (NIM) and the risk indicator [24, 19] suggests that as the Net Interest Margin increases, the likelihood of risk detection also increases. This could imply that banks with higher Net Interest Margins may be more likely to detect and manage risks, possibly due to their stronger financial position, better risk management practices, or more effective internal controls [8]. The study finds a significant negative relationship between Earnings Per-Share (EPS) and the risk indicator [41, 15]. A decrease in earnings per share corresponds to an increase in the detection and management of risks. This could be due to the fact that lower earnings might prompt more rigorous financial reviews and audits, uncovering risk factors that might have otherwise gone unnoticed [9]. The debt-to-equity ratio does not have a significant impact on the risk indicator in Nigerian banks [25, 18]. This suggests that the level of debt relative to equity does not play a crucial role in the banks' ability to manage risk. This could be due to the heavy reliance on debt in the Nigerian banking sector, where debt levels might be consistently high across the board, thus not providing a distinctive factor for risk management variations [38].

5. Conclusion and Recommendations

5.1. Conclusion

This study investigates the effect of financial metrics on risk indicator among Nigerian deposit money banks over the period 2007 to 2022. The study focuses on analyzing the

impact of revenue growth rate, net interest margin, earnings per share, and debt-equity ratio on risk indecator. The study employed descriptive statistics, panel unit root test, Hausman test, and Panel Ordinary Least Square procedures at the 95% confidence interval. The study reveals that the primary factor influencing risk indicator among deposit money banks in Nigeria are revenue growth, net interest margin, and earnings per share.

5.2. Recommendations

1. Growth Rate (RGR): The study by Demirgüç-Kunt, A., & Huizinga, H. [17] reads that growing banks become less capable to manage risk. The following steps can be recommended. Firstly, decentralize risk management so that compromising strategies against the backdrop of new risks could appear at a more local level. Secondly, develop AI-driven tools capable to develop as the commercial scale operation does. Thirdly, Incentivize conservative growth by aligning bonuses with the quality of risk management. Fourthly, choose the customer segment with less risky profiles as revenue grows. These steps could balance revenue growth and oversight with the former increasing the performance and quality of risk management in banks.

2. Net Interest Margin (NIM): A study by [24, 19] found a positive correlation with risk indicator which suggested as Net Interest Margin (NIM) increased so did the ability to detect and manage risks. Recommendations include: 1) Incorporating risk indicators into NIM assessment strategy to improve proactive risk management. Predict[ive] use of NIM data to model and forecast risk analytics, as well as develop alert horizons for the second generation of potential risks. 3) Rationalizing Risk-Weighted NIM Adjustments for Loan Portfolio Risk Profiles Investing some of the NIM growth to 4 advanced risk detection technologies or staff training initiatives.

3. Net Interest Margin (NIM): A study by [41, 15] found a negative relationship between Earnings Per Share (EPS) and risk detection/management, suggesting that lower EPS may lead to better risk management. Recommendations include: firstly, Adopting risk-driven performance metrics that balance EPS growth with risk management effectiveness. Secondly, Conducting mandatory risk audits when EPS drops significantly to identify and address risks affecting financial performance. Thirdly, Diversifying revenue streams to stabilize EPS fluctuations and reduce the need for aggressive cost-cutting measures. Fourthly, Developing contingency plans triggered by specific EPS thresholds to maintain risk oversight during periods of lower earnings.

4. Debt-to-Equity Ratio: A study by [25, 18] found that the debt-to-equity ratio has no significant impact on risk

management in Nigerian banks. Recommendations include: firstly, Exploring alternative capital structures, such as hybrid securities, to reduce reliance on traditional debt. Secondly, Focusing on operational efficiency to manage risk, rather than relying on debt. Thirdly, Tailoring debt structures to the risk profiles of different business units or portfolios. Fourthly, Using the debt-to-equity ratio as a secondary indicator to assess broader financial stability and potential indirect effects on risk.

Conflicts of Interest

The authors declare no conflicts of interest.

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