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Effect of Operational Risk on the Financial Performance of Listed Deposit Money Banks in Nigeria

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Abstract

This study investigates the effect of operational risk on the performance of listed deposit money banks in Nigeria. The research adopts ex post facto research design. The target population comprised of the 13 deposit money banks listed on the Nigeria Exchange Limited (NGX) between 2006 - 2021. Secondary data was utilized. The study measures operational risk using the cost-income ratio (CIR), operating cost ratio (OPR), and net interest margin to operating cost ratio (NOR). The study measured financial performance using return on equity (ROE) while the panel data analysis technique and GMM method were used to analyse the data with the aid of STATA Version 15. The result of the study revealed that NOR exerted significant negative effect on the financial performance of listed deposit money banks in Nigeria. The study recommended that management should institutionalize employees regular training and retraining on operational risk awareness to proactively mitigate operational risks

Keywords: *Cost-income ratio, operating cost ratio, net interest margin to operating cost ratio, operational risk, return on equity, and financial performance*

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Background to the Study

Banks play an essential role in the development of any economy by facilitating businesses, and trade, and ensuring judicious allocation of idle funds. Banks are also pivotal in the implementation of government monetary policies. However, the inability of banks to meet their intermediation obligations introduces some vulnerability in the financial system (Fadun & Oye, 2020). Operational risk is among the numerous financial risks that are inherent to banking activity. Its uniqueness comes not only from the fact that it follows every banking transaction from the beginning to the end, but also due to its fluid form and interconnections with other risks (Knežević, 2013). The increase in losses borne by banks as a result of inadequate operational risk management practices and the adverse impact on banks' financial performance has been a major concern to bank management and regulators (Knežević, 2013).

Globally, the sophistication of operational risk in the banking sector is on the rise which is recurrent as a result of institutional and environmental factors. The quantum of frauds and forgeries in recent years dictated that banks strengthened their operational risk management framework in the areas of internal control and security systems to reduce the incidence of fraud. The challenges popping up from various advancements in operations and services are overwhelming, as technology explodes, so does the sophistication of operational risk (Olalere et al, 2018). Several significant operational risk events from the past decade, including fraudulent actions such as those of Lloyds Banking Group and Barclays in 2006 that created €5.9 billion and €4 billion losses, respectively; those of Bernard L. Madoff Investment Securities and Société Générale in 2008 resulting in a loss of almost $17 billion and €6.3 billion, which was largely due to absence of internal controls and unmanaged operational risks (Pakhchanyan, 2016).

More than ever, regulators are now stricter with financial institutions who flout their regulations on operational risk management as can be seen in the Aviva and Wells Fargo cases of 2016 where they both paid £8.2 million and $187.5 million respectively in penalties for failure to maintain adequate internal controls and manage their operational risks (Olalere et al, 2018). These sanctions ultimately impacted their financial performance for those periods. Despite regulatory involvement through the issuance of various policy frameworks and supervision, public world data still suggests improper operational risk management practices as evidenced by the huge operational losses recorded by some organizations presumed to have a robust risk management system. For instance, major operational losses of $175.5m and $22m were recorded by Bank of America and Citigroup respectively in 2012 as well as $1b and €252m by Rabobank and Fondiaria-SIA in 2013 (Olalere et al, 2018).

The Nigerian Banking industry is also not exempted as it still battles with weak risk management practices resulting from a lack of elemental control which is ordinarily within their internal sphere of influence (CBN, 2014). The report of NDIC (2010) argued that bank owners and managers have compounded the problem of weak management because of unprofessional behaviour. Therefore, many distressed banks experience a high incidence of fraud because inexperienced staff are relatively saddled with the management of some banks. This has been reflected in the bank's high rate of labour turnover, inadequate internal control,

and poor credit quality (Olalere et al, 2018). Fraud is one of the major causes of bank failure and the number of frauds that occurs in Nigeria's banks is so alarming with the overall effect on banks financial performance. The cases of fraud and forgeries increased to 9,929 at the end of December 2016 from 9, 164 reported at the end of June 2016. While the actual loss was N1.003 billion in 2016, the total amount lost to fraud was to the tune of about N4.12 billion. Therefore, the objective of this study is to examine the effect of operational risk on the financial performance of commercial banks in Nigeria (Olalere et al, 2018).

With a surge in the usage of payment systems, there has been a rise in the incidence of fraud in the Nigerian payments landscape. Of the nearly 44 trillion Naira in payments made across Nigeria in 2014, over 7 billion Naira was reported as the value of "attempted" fraud and 6.22 billion Naira was the actual loss value reported. The Nigeria Inter-Bank Settlement System Plc (NIBSS) report also shows that in the same year, Automated Teller Machine (ATM) fraud was the most attempted with 491 incidents and Internet Banking recorded the highest fraud value of 3.2 billion Naira. The volume of fraud reported in 2016 compared to previous years attests to the fact that fraudsters do not grow weary (Ibanichuka & Oko, 2019).

Banking fraud is a problem to various stakeholders (shareholders, employees, customers and family members), etc. Precisely, it diminishes the financial performance of the banks leading to low dividend payments to shareholders. In the extreme case, it may threaten the going concern of the deposit money bank and this may impact negatively on shareholder wealth. Fraud in banks shakes the foundation and credibility of most banks in Nigeria, resulting to some of the banks being distressed as a result of hug financial losses. This continuous increase in electronic fraudulent attacks has negatively reduced customer's trust in the ability of banks to protect them. Bank customers/depositors and other stakeholders are now worried about the safety of their money and information and are expecting the bank to find a solution that can protect them and the economy as a whole (Ibanichuka & Oko, 2019).
The importance of operational risk management cannot be overemphasized as it will help to promptly identify prohibited activities, reduce future risk exposure, and ultimately lead to a decrease in operational losses (Olalere et al, 2018). Furthermore, the study aims to keep the management of listed deposit money banks in Nigeria abreast with the nature of operational risk exposure to their daily operations and how to mitigate its effect to actualize their overall performance objectives. The hypotheses that would be tested in this study are stated in their null forms:

$H0_1$: Cost-income ratio has no significant effect on the financial performance of listed deposit money banks in Nigeria

$H0_2$: Operating cost ratio has no significant effect on the financial performance of listed deposit money banks in Nigeria

$H0_3$: Net interest margin to operating cost ratio has no significant effect on the financial performance of listed deposit money banks in Nigeria

Literature Review

Concept of Operational Risk

The Basel Accord (2011) defines operational risk as the risk of direct or indirect loss resulting from inadequate, non-performance or failed internal processes, people and systems or from external events. These risks arise from human error and fraud, model risk, business and system disruptions, inadequate controls, failure or malfunctions of information systems, reporting systems, internal risk monitoring rules and internal procedures designed to implement timely corrective actions, or the compliance with the internal risk policy rules. Operational risk was conceived as a composite term for a wide variety of organizational and behavioural risk issues that were traditionally excluded from formal definitions of market and credit risk. Operational risks, therefore, appear at different levels, such as human errors, processes, and technical and information technology (Bessis, 2010).

Operational risk is the risk that stems from the failure of people and processes within an organization. It arises as a result of the breakdown of internal procedures, people, policies, and systems. In other words, operational risk could result from insufficient or botched systems, processes, and people as well as from external developments. It is a consequential risk – that is, it arises when another, specific risk develops. These specific risks include human error; system failure or the possible breakdown of computer system; lack of backup or disaster recovery plan and external events. Examples of operational risk include frauds related to ATM and internet frauds, etc. Operational risk is difficult to measure and is often seen as a "residual" risk after all the other risks have been identified. It is a source of worry for both banks and monetary authorities. For instance, scams, weak IT infrastructure, and corporate governance, among others, constitute serious challenges to DMBs in Nigeria (CBN, 2014).

Basel Committee (2003) define operational risk as the loss resulting from inadequate or failed internal processes, people and systems or from external events. The explanation focused on four operational risk event causes, which are external events, systems, processes, and people. Operational risks are of two types. The first type is related to the risk of loss caused by the operating system (i.e., investment or transaction failure) either caused by legal considerations or caused by an error (or in the back office) (Olalere et al, 2018). The second type is related to the risk of a loss caused by incentives, which include both mismanagement and fraud; this represents an agency cost that occurs because of the separation of a company's management and ownership. These two types of operational risk losses transpire with recurrent regularity, and they might be minor or disastrous. Therefore, managing operational risk encompasses an array of approaches and methods that fundamentally work for two purposes, which are, prevention of catastrophic losses and reducing average losses (Olalere et al, 2018).

The occurrence of operational risk in financial institutions is often linked to small losses in operations that might become increasingly high (Olalere et al, 2018). Operational risk may materialize directly, for instance in electronic fund transfer (transfer of funds to the wrong person) or could result indirectly as a credit or market loss. Since there is a close linkage of operational risk with other types of risks, it is very important for every institution to first have a clear understanding of the concept of operational risk before designing the appropriate

operational risk measurement and management framework (Epetimehin & Fatoki, 2015). Goldmann and Kaufman (2009) explained that research shows that internal fraud is committed by both employees and management and accounts for 50-80% of frauds committed in organizations. Employees have access to information, processes, systems and assets, making it easier for them to device ways of committing fraud without being detected.

Ghosh (2012) stated that the bank needs to treat its operational risk management as a separate and independent risk management function for identifying, assessing, monitoring, controlling, and mitigating the operational risk faced by banks. The operational risk management framework depends on the size and complexity of banking business. It should also be in line with the risk appetite, working environment and targeted capital level. The operational risk management framework should include the design of the reporting and communication lines that will help to promote understanding of operational risk within staff and will facilitate risk awareness and control culture within the organisation. It should also explain the role of different business lines; describe guidelines for responsibilities and accountability.

In addition, the operational risk framework should at least state the following aspects in defining its framework: The bank needs to present policies, processes and procedures in regard to operational risk management into a document and they should communicate this document to staff, who are involved in day to day activities (BCBS, 2011). Furthermore, operational risk management's document should reveal strategies for implementation of policies, and it should define risk tolerance limits and reporting levels in case of breach of said limits; the bank should decide on the process related to identification and assessment of operational risk considering the potential and the historical record of events. Banks should track operational risk loss data and categorise it based on severity and frequency and should map them on the basis of priority of remedial action; banks should develop an effective process for monitoring and detection of deficiencies in the operational risk management system and procedures. They should also identify early warning indicators to identify potential costly operational hazards; banks should map out the products and activities within the business lines for managing operational risks; and banks should develop policies, procedure, and processes to control and mitigate material operational risks. They should review the effectiveness of operational risk strategies on a timely basis and revisions should be made in case of deficiencies (BCBS, 2011).

If operational risk is not addressed systematically it can result in inconsistent performance and earnings surprises for the stakeholders. Thus, operational risk exposures can have an impact on banks' revenues and net worth. Operational risk, thus, generates operational losses and the losses generated are a cost to the bank. Hence, the pricing and the consequent measurement of the operational risk capital charge has to be adequate to cover for these losses. Operational risk includes both strategic risk and legal risk:

Strategic Risk

Bromiley et al. (2015) define strategic risk as the array of external events and trends that can devastate a company's growth trajectory and shareholder value. It is the risk of management implications of many corporate strategies and the external market and industry uncertainties. While these authors consider strategic risk as a sole consequence of external occurrences, other authors look at strategic risk as the current and prospective impact on earnings and/or capital arising from internal business activities such as adverse business decisions, improper implementation of decisions, or lack of responsiveness to industry changes. They therefore consider strategic risk as a function of the compatibility of an organisation's strategic goals, the business strategies developed to achieve those goals, the resources deployed towards these goals, and the quality of implementation (Asare-Bekoeoctober, 2010).

Generally, strategic risk encompasses a variety of uncertainties which are not financial in nature, but rather credit or operational related caused by macro-economic factors, industry trends or lapses in a firm's strategic choices which affects the firm's earnings and shareholders' value adversely. Strategic risks often constitute some of a firm's biggest exposures and therefore can be a more serious cause of value destruction (Asare-Bekoeoctober, 2010). Unfortunately, as strategic risks are often highly unpredictable and of different forms, managers have also not yet been able to systematically develop tools and techniques to address them. This is because the more formalised risk management approaches often remain focused on identifiable exposures and thus less suitable to deal with many of the unexpected economic and strategic events that characterise contemporary business environment in which strategic risks are embedded.

Bromiley et al. (2015) attempted to identify significant events which contribute to strategic risk and categorised them into seven main classes. These include industry margin squeeze, threat of technology shift which has the possibility of driving some products and services out of the market, brand erosion, emergence of one-of-a-kind competitor to seize the lion share of value in the market, customer priority shift, new project failure and market stagnation. The idea was to provide a framework for assessing a company's strategic risks and develop counter measures to address them. The authors intimate that the key to surviving strategic risks is; knowing how to assess and respond to them and therefore devoting resources to it. They also advice management to adjust their capital allocation decisions by applying a higher cost of capital to riskier projects and to build greater flexibility into their capital structure when faced with riskier competitive environments. How these risks can be managed is determined by the organisational characteristics – the strengths and weaknesses. They include communication channels, operating systems, delivery networks, and managerial capacities and capabilities (Bromiley et al., 2015).

The organization 's internal characteristics must be evaluated against the impact of economic, technological, competitive, regulatory, and other environmental changes. An effective strategic risk management approach should embrace both the upside and downside of risk. It should seek to counter all losses, both from accidents and from unfortunate business judgments, and seize opportunities for gains through organisational innovation and growth.

Seizing upside risk involves searching for opportunities and developing plans to act on these opportunities when the future presents them. Countering downside risk on the other hand is done by reducing the possibility of occurring (probability) and scope (magnitude) of losses; and financing recovery from these losses (Asare-Bekoeoctober, 2010). The first step in strategic risk management is finding a way to systematically evaluate a company's strategic business risk. Thus, strategic risk management begins by identifying and evaluating how a wide range of possible events and scenarios will impact a business's strategy execution, including the ultimate impact on the valuation of the company (Asare-Bekoeoctober, 2010). Asare-Bekoeoctober (2010) argues that due to the complexity of the concept of strategic risk, no single quantitative measure will prove satisfactory in all strategic situations. Because of the distinctiveness of the set of strategic risk faced by every financial institution, regulators have not been able to develop general guidelines for all the institutions for managing strategic risk. Some consultants and scholars have come out with some recommendations and guidelines for managing strategic risk. One such guide is by Bromiley et al. (2015). Building a thorough strategic risk management framework requires an institution to revise both its internal practices and its external envirnment, and to understand how closely the two are connected.

Legal Risk

One of the sources of operational risk to the DMBs is legal risk. This refer to losses that could arise as a result of violating the laws and regulations that govern deposit money bank business operations. DMBs need to be aware of relevant legislation that guides its business which includes consumer protection, banking guidelines, customers' confidentiality among others. Banks must ensure that all rules, ethics and regulations are followed before and during any transactions which if otherwise, they may be sued and pay compensation from their profit (Pakhchanyan, 2016). Legal risks stem from the contractual agreements that financial services firms undertake. These consist of the risk that loan agreement may not be enforceable under the relevant law and that the nature of the product/service may render the financial service company exposed to litigation. This risk could also emanate when governments suddenly amend laws in a way that negatively affects an investor's position. Legal risk could also occur through lawsuits or adverse court judgments that can disrupt or negatively affect the conditions of the business entity (CBN, 2014).

Basel II classified legal risk as a subset of operational risk. Legal risk is the risk of financial or reputational loss that can result from lack of awareness or misunderstanding of, ambiguity in, or reckless indifference to, the way law and regulation apply to your business, its relationships, processes, products and services. BCBS, (2011) sees legal risk as the risk of loss to an institution which is primarily caused by a defective transaction; or a claim (including a defence to a claim or a counterclaim) being made or some other event occurring which results in a liability for the institution or other loss (for example, as a result of the termination of a contract) or; failing to take appropriate measures to protect assets (for example, intellectual property) owned by the institution; or change in law.

The risk of loss to an institution which is primarily caused by a defective transaction includes: entering into a transaction which does not allocate rights and obligations and associated risks

in the manner intended; entering into a transaction which is or may be determined to be void or unenforceable in whole or with respect to a material part (for whatever reason); entering into a transaction on the basis of representations or investigations which are shown to be misleading or false or which fail to disclose material facts or circumstances; misunderstanding the effect of one or more transactions (for example, believing that a right of set-off exists when it does not or that certain rights will be available on the insolvency of a party when they will not); entering into a contract which does not, or may not, have an effective or fair dispute resolution procedure (or procedures for enforcement of judgements/arbitral decisions) applicable to it; entering into a contract inadvertently; security arrangements that are, or may be, defective (for whatever reason) (BCBS, (2011).

Management of legal risk is not a precise science and subjective to the situation of the institution, and primarily caused by the lack of proper communication channel, undefined institutional objectives (such as the lack of policies and regulations), unclarified information flow between different personnel and department, lack of delegation of power to specify task on mitigation of risks (BCBS, 2011). Because operational risk is an event risk, in the absence of an efficient tracking and reporting of risks, some important risks will be ignored, and there will be no trigger for corrective action and this can result in disastrous consequences. Developments in modern banking environment, such as increased reliance on sophisticated technology, expanding retail operations, growing e-commerce, outsourcing of functions, and greater use of structured derivative techniques that claim to reduce credit and market risk have contributed to higher levels of operational risk in deposit money banks (BCBS, 2011).

The recognition of the above-mentioned contributory factor in operational risk has led to an increased attention on the development of sound operational risk management systems by banks with the initiative being taken by the Basel Committee on Banking Supervision. The Committee addressed operational risk in its core principles for effective banking supervision by requiring supervisors to ensure that banks have risk management policies and processes to identify, assess, monitor, and control or mitigate operational risk. Additionally, the Basel II Accord requires a capital allocation for operational risks. Despite all these efforts by the regulators at addressing operational risk, practical challenges exist when it comes to its management. In the first place, it is difficult to establish universally applicable causes or risk factors which can be used to develop standard tools and systems of its management since the events are largely internal to individual DMBs. Moreover, the magnitude of potential losses from specific risk factors is often not easy to project (BCBS, 2011).

Lastly, it is difficult designing an effective mechanism for systematic reporting of trends in a bank's operational risks because very large operational losses are rare or isolated. Because of the data and methodological challenges raised by operational risk, the first stage of developing an effective framework to manage it is to set up a common classification of loss events that should serve as a receptacle for data gathering process on event frequency and costs. The data gathered is then analysed (risk mapping) with various statistical techniques such as graphical representation of the probability and severity of risks. This helps to find the links between various operational risks. The process then ends with some estimates of worst-case losses due

to events risks. Modelling of loss distributions due to operational risks will enable the right capital charges to be made for operational risk as required by current regulations (Bessis, 2010). In order for the objectives of setting up an operational risk management framework to be accomplished, it may require a change in the behaviour and culture of the firm. Management must also not only ensure compliance with the operational risk policies established by the board, but also report regularly to senior executives. A certain amount of self-assessment of the controls in place to manage and mitigate operational risk will be helpful (BCBS, 2011).

In this study, operational risk in deposit money banks is measured by cost income ratio (CIR), operating cost ratio, and net interest margin to operating cost ratio

(a) Cost Income Ratio (CIR)

Cost income ratio (CIR) is the ratio of operating cost to income. It is also known as efficiency ratio. A reduction in cost for a given level of income is expected to increase profits and vice versa. Cost income ratio is measured by the ratio of operating expenses to net interest income (Isedu & Erhabor, 2021). The cost to income ratio components of the ratio are cost and income and, hence, the measure is indirectly related to bank profitability. A reduction in costs for a given level of income will reflect increased profits and vice versa. Increased profits, in turn, will result in improved return on equity and share prices of the bank which is of great interest to investors. Further, most bank costs have been reducing in response to margin squeezes, thus lowering both costs and income. Hence, volatility in a bank's cost to income ratio might be a better measure of volatility in a bank's cost performance. The cost to income ratio is the ratio of non-interest (operating) costs excluding bad and doubtful debt to the net interest income plus non-interest income of the bank. Non-interest costs are perceived as those costs which are most amenable to management decisions and considered to be that part of a bank's costs which can be controlled. The use of the net interest income term in the denominator will reduce the volatility that could arise from fluctuations in the general level of interest rates (Isedu & Erhabor, 2021).

(b) Operating Cost Ratio (OPR)

Operating cost ratio is also an indicative of operational risk variable. It is measured by the ratio of operating expenses to total assets. It is expected that when a bank has higher operating expenses per Naira assets, the profitability of the bank declines. On the other hand, when the operating expenses are directed for loans recovery, loans defaults, and asset management, it is quite possible that the higher the operating cost ratio, the higher the profitability of a bank (Isedu & Erhabor, 2021).

(c) Net Interest Margin Ratio (NOR)

The net interest margin to operational cost ratio is an operational risk variable. The index measures net interest margin (NIM) as a percentage of total operating expenses. The NIM is estimated by interest income minus interest expenses. It is generally expected that an efficient bank has a higher NIM to operational-cost ratio than an inefficient bank (Isedu & Erhabor, 2021).

Empirical Review

Kimani (2011) assessed fraud risk for Barclays Bank of Kenya. Primary and secondary data were used for this study. These include; interview, questionnaire, fraud statistics in the bank, existing controls and resolution guidelines followed by the bank upon detection of fraud. The dependent variable was fraud risk management. The independent variables are identity theft, use of lost or stolen documents, use of counterfeit cards, bribery and conflicts of interest, misuse of company assets, theft of confidential information, cheque and fund transfer fraud, travel and entertainment fraud and money laundering. Findings revealed that, the frequency of internal fraud is increasing drastically and has by far inflicted the most significant losses to the bank. This is because some dishonest employees and managers have found ways to override systems and or collude with outsiders to defraud the bank. According to the bank's fraud unit, management fraud occurs less frequently but accounts for the greatest financial losses. Position equals power: managers and executives, having more access to more information and assets than regular employees and can commit fraud relatively easier without being noticed. Kimani's study employed primary data that could be subjective. However, this study used secondary variables to assess the effect of liquidity risk on ROE of listed deposit money banks in Nigeria.

Epetimehin and Fatoki (2015) studied operational risk management and the financial sector development: An overview. A Survey design with quantitative analysis to examine the variable interaction in the model was adopted. Using judgmental sampling, a well-structured questionnaire was administered to 150 Nigeria employees from different finance companies such as banks, insurance, stockbrokers and microfinance companies. Convenience method was employed to collect respondents' perspectives on the impact of operational risk management on the development and economic growth in the Nigeria finance companies. Descriptive statistics analysis of variance (ANOVA) was used to analyse data and test the hypothesis. Respondent's analysis was through the use of SPSS. The result showed that operational risk management have positive effects on the financial performance in the financial sector.

Taiwo and Agwu (2017) examined the role of e-banking on operational efficiency of banks in Nigeria. Their study investigated the roles that e-banking adoption has played in the performance of organizations using a case study of commercial banks in Nigeria. Primary data were obtained by administering questionnaires to staff of four purposively selected banks (Ecobank, UBA, GTB and First bank). A total of 100 questionnaires were administered to the selected four banks, out of which 82 were properly completed and returned. Analysis of response from respondents was also presented in tables, charts, and percentages. Pearson correlation was used to analyse the results obtained using SPSS. Findings indicated that banks' operational efficiency in Nigeria since the adoption of electronic banking has improved compared to the era of traditional banking. This improvement was noticed in the strength of banks, revenue, and capital bases, as well as in customers' loyalty. They concluded that the introduction of new channels into their e-banking operations drastically increased bank performances, since the more active customers are the more profitable it is for the banks.

Arora and Kaur (2018) evaluated perceived risk dimensions and its impact on intention to use e-banking services: A conceptual study. Their study explores the diverse literature available on perceived risk factors in e-banking by using interpretative approach based on other studies. Their approach has meaningful implications for managing operational risk in the e-banking sector. Their findings show that perceived risk, information risk and opportunity risk dimensions have a significant negative influence on intention to use e-banking services except social and psychological risk which come out to be insignificant. And that trust acts as a moderator between perceived risk and intention to use e-banking services. They recommended that banks should put more emphasis on implementing e-banking risk management practices to increase usage of e-banking services among consumers. Various risk management strategies should be adopted to reduce risk perception.

Kamau et al. (2018) analysed the effect of operational risk management on financial performance of commercial banks: A case of tier 2 and 3 commercial banks in Kenya. The population of the study comprised of 36 Tier 2 and 3 licensed commercial banks in Kenya. The study used Secondary data for 9-years period from 2008 to 2017 from audited financial statements of commercial banks in Kenya. The causal research design was used for this study. The data was organized, and financial ratios were computed with MS-Excel. Regression equations was used to analyse the unbalanced panel data collected using E-views statistical tool. The financial performance was measured by return on equity (ROE) and return on assets (ROA). Operation risk was proxied by the cost to income ratio (CIR), which is measured by the ratio of operating expenses to net operating income; and the bank size (SIZE) which was measured by the natural logarithm of total assets. The findings indicate that operational risk has a significant negative effect on the financial performance of tier 2 and 3 banks. The study also concluded that tier 3 banks are not able to mitigate operational risks as well as tier 2 banks. Banks are therefore encouraged to develop effective risk management and measurements techniques to avoid huge operational losses that negatively affect their financial health. Kamau et al. (2018) findings agrees with existing studies. In this study, the same operational risk variable on a wider scope is used with panel data as the tool for analysis to further evaluate the effect of operational risk on ROE of listed deposit money banks in Nigeria.

Olalere et al. (2018) examined an investigation into operational risk in commercial banks: Empirical evidence from Nigeria. Secondary data was obtained from the audited financial reports of selected sixteen (16) commercial banks over the period of 2009 to 2015. Panel data approach was employed in the study for the analytical model. The firm performance was proxied by net interest margin (NIM) which is measured by the net interest income divided average interest earning assets. While operational risk was proxied by the bank efficiency ratio (ER) which can be derived through ratio of operating expenses to gross earnings, and the total operating expenses ratio (cost to income ratio) and total operating expenses to total assets ratio (OR). The controlled variables used in this study include bank size and GDP growth rate. Based on the random effect analysis in the model, bank efficiency ratio (ER) has a negative significant effect on performance, suggesting that the lower cost to income ratio, is the better the bank performance in terms of net interest margin. Operating expenses ratio has a positive significant effect on performance. This study contributed to the understanding of the dynamic

nature of operational risk. It serves as a basis to further assess its effect on ROE of listed deposit money banks in Nigeria.

Okeke et al. (2018) studied operational risk management and organizational performance of banks in Edo State. Survey research design was adopted. The population of study was 1967, comprising fifteen banks out of the 22 commercial banks in Edo State, Nigeria. The sample size was 386. The primary sources of data include the questionnaire and personal interview. The study used descriptive statistics, correlation multiple regression analysis. The performance variable used was organizational performance. While the operational risk variable are external risk, system and technology risk, process risk and people risk. Compilation tool used for the study was SPSS version 21. The findings indicated that, operational risk management has a negative significant effect on organizational performance of the banks in Edo State. They recommended that, banks should take the issue of process risk variables very seriously and should put in place, appropriate checks and balances to ensure that process risk variables are made in accordance with banks' policies.

Osadahun (2018) examined operational risk management in the Nigerian banking sector. The research employed a qualitative study in the form of administering interviews with the executives from chosen banks. A generic qualitative inquiry approach was used for this study. QSR NVivo qualitative conversational analysis software was used to assist with the text analysis of the data. The themes for the research questionnaire are performance of the banks and operational risk management, occurrence of operational risk, the nature of fraudulent activities, techniques to manage risks, impregnation of operational risk management strategies, challenges in implementing operational risk management, regulatory initiatives by the government and policies. The findings indicated that, the most common fraud within the bank operations in Nigeria are utilization of trickery, disobedience of standards, bank cheating, official, outside trade, household operations, compromise, currency business sector and treasury, hazard possessions, data engineering, budgetary control, clearing, trust exchange, teller operations. It was recommended that; innovative based technology should be incorporated into the governing system in order to improve the service delivery of the system.

Imagbe et al. (2019) appraised fraud diamond and financial crimes in Nigerian banking industries. This study used primary data from 14 quoted commercial banks in Nigeria as at 31st December, 2018. The study utilized ordinary least square regression model. The dependent variable is financial crimes (FIC). While the independent variables are pressure (PRE), opportunity (OPP), rationalization (RAT), and capability (CAP). The OLS result indicated that PRE, OPP, RAT, CAP have significant positive relationship with FIC. This indicated that the existence of pressure, opportunity, rationalization, and capacity are the major factors that determines financial crimes in Nigeria banking industries. This indicates that an increase in the existence of all these variables will increase financial crimes in Nigeria banking sector. The study recommended the elimination of opportunities to commit fraud and creating expectations that fraud will be punished; providing a hotline (whistleblowing system) for anonymous tips and creating an expectation of punishment; and conducting proactive auditing.

Ibanichuka and Oko (2019) examined electronic fraud and financial performance of quoted commercial banks in Nigeria. Point of sale fraud (POSF) was electronic fraud proxy while return on investment (ROI) was the proxy of financial performance. The researchers adopted expost-facto research design for the study. Secondary data was obtained from Nigerian Electronic Fraud Forum, Nigeria Deposit Insurance Corporation, and Central Bank of Nigeria over a 5-year period from 2013 to 2017. The data were analysed with Pearson product moment correlation and multivariate regression in a panel data. E-view 9 was used as the statistical tool. The results showed negative and insignificant relationship between electronic fraud channels and financial performance. Hence, there is no significant relationship between the electronic fraud and financial performance of quoted commercial banks. They recommended improved collaborations between banks and CBN through Nigerian Electronic Fraud Forum (NEFF) to tackle frauds and leverage on the Bank Verification Number (BVN) platform to improve security of transactions on electronic banking channels through biometric authentication.

Fadun and Oye (2020) studied impacts of operational risk management on financial performance: A case of commercial banks in Nigeria. Their study consists of 20 licensed commercial banks over 10-years period from 2008 to 2017. Secondary data was extracted from audited financial statements of selected commercial banks. The study employed longitudinal (panel) research design. The data was analysed using the linear multiple regression model. This study utilized balanced panel datasets to measures operational risk, credit risk, market and liquidity. The study used ROA as a measure of financial performance. The independent variables are cost to income ratio (CIR) as proxy of operational risk, non-performing loan ratio (NPLR) as proxy of credit risk, net interest margin (NIM) as proxy of market risk, lliquidity ratio (LQR) and loan to deposit ratio (LTDR) as proxy of liquidity risk. Findings showed that there is a positive relationship between operational risk management and the financial performance of banks. They recommended that banks' management should deploy adequate resources towards understanding operational risk to ensure sound operational risk management and improved financial performance of banks. Fadun and Oye's findings are in concurrence with previous studies. Howwever, this study used income ratio (CIR) and a combination of financial risk variables to examine the effect on ROE of listed deposit money banks in Nigeria.

Hasan et al. (2020) examined analysis of the impact of operational risk on the banking liquidity and growth using BIA method: Trade Bank of Iraq was adopted as a sample among the Iraqi banks, while Abu Dhabi Trade Bank was adopted as a sample of the UAE banks. The financial data included financial statements from 2013 to 2018, but the observations were adopted quarterly. The sample consisted of 24 observations. Correlation and regression analysis were used to analyse and estimate the results. In line with Basel II, their study adopted basic index approach in deriving operational risk. They used capital requirements to meet the operational risk in accordance with the basic indicator (BIA) method. The dependent variables are banking liquidity index proxied by ratio of total liquid assets to total liabilities and banking growth index proxied by growth rate of assets. The findings of the study showed that in the banks of both countries, there is a strong negative correlation between operational

risk and banking liquidity, which indicates the size and importance of operational risk in banks operating within the financial sector. In the banks of both countries, there was a significant significance of operational risk in banking liquidity. Hasan et al. (2020) findings reinforce the decisions of Basel II and Basel III on the importance of operational risk on the performance of banking and banking indicators in general. This current study is aimed at further corroborating or refuting their findings using ROE as the performance variable of listed deposit money banks in Nigeria.

Theoretical Framework

The relevant theories on which the study is anchored in establishing relationships between operational risk and financial performance include:

(i) Agency theory, and
(ii) Stakeholder theory

Agency Theory

Ross and Mitnick (1973) originally propounded the Agency Theory to establish the conflict of interest between agents and their principal. Over the years, different researchers have used agency theory in their studies to provide theoretical base for financial risk exposure (Smith & Stulz, 1985; Fite & Pfleiderer, 1995; Tufano, 1998; Fatemi & Luft, 2002). This theory helps to examine a social phenomenon from a principal-agent (investor-manager) perspective. Jensen and Meckling (1976) describe this agency relationship as, a contract under which one or more persons (the principals) engage another person (the agent) to perform some service on their behalf which involves delegating some decision-making authority to the agent. According to Jensen and Meckling (1976), this theory has two fundamental assumptions. Firstly, the principal as well as agent aim at maximising their own interest. Secondly, the interest of agent may diverge from the interest of the principle as the agent is not likely to perform in the best interest of the principal. Hence, a conflict of interests may emerge between principal and agent.

Smith and Stulz (1985) have applied agency issues in corporate financial risk management and indicate the managers (agents) attitudes toward risk taking and hedging. Afterwards, Fite and Pfleiderer (1995) have also applied agency theory and describe the significance of hedging policies on firm value. Tufano (1998) has also made an argument for financial risk management based on agency theory. He argues that managers go for hedging as much as they can without considering the interest of their shareholders. The rationale behind such conduct is the difference between the levels of risk aversion of managers and shareholders. The level of managerial risk aversion is generally more advanced than the risk aversion level of the shareholders as managers have more exposure to the market threats (Tufano, 1998). However, the proponents of agency theory consider that wealth of shareholders transfers to managers because of much extensive hedging and oppose such financial risk management practices (Fatemi & Luft, 2002). Tufano (1998) states that the financial risk management in firms somewhat enhances agency problems and costs between its managers and shareholders. The agency theory provides the rationale into operational risk management in deposit money banks.

Stakeholder Theory

The stakeholder theory propounded by Freeman (1984) focuses clearly on the symmetry of stakeholders' interests as the foremost determinant of the corporate policy. The most important contribution towards the financial risk management is an addition of implicit contracts theory from employment to other contracts (Cornell & Shapiro, 1987; Klimczak, 2007). In certain businesses, mainly services and high-tech industries, customer confidence on firms is very important to carry on offering their services in the future and can considerably contribute to firms' values. On the other hand, the value of such implied claims is extremely sensitive to estimated costs of bankruptcy and financial distress. Since the financial risk management practices in a company result in a reduction in these estimated costs, its value increases (Klimczak, 2007).

Methodology

This study adopted the ex-post facto research design. The population of this study comprised of all the thirteen (13) DMBs listed on the floor of the Nigerian Exchange Limited (NGX) as of December 31, 2021 (CBN, 2022). These thirteen (13) DMBs are currently trading on the floors of the NGX. The data obtained covered the period of 16 years from 2006 to 2021 post consolidation period. Hence, the expected financial year observation is 208 (i.e., 13 x 16 = 208). This study employed secondary data which were sourced from the audited annual financial statement and reports of the listed DMBs and Nigerian Exchange Limited (NGX). The Panel data was employed because it helps to study the behaviour of each bank over time and across space (Gil-García & Puron-Cid, 2013). The balanced panel data collected was analysed quantitatively using panel data analysis technique. The specified static panel regression model is essentially estimated using the pooled regression method, fixed effects (FE) method or random effects (RE) method using the Hausman specification test to decide the appropriateness between fixed and random effects that best fits the panel regression data. The short run model was estimated using Generalized Method of Moments (GMM) estimator to check the dynamism and how the performance of the immediate previous period affects the current period performance. The formulated model was then estimated using the ordinary least squares (OLS) and panel data analysis technique. The statistical tool for analysis was done using STATA Version 15 software.

The functional form of the model for the study is presented below:

The fourth hypothesis seeks to establish whether operational risk affects the financial performance of deposit money banks in Nigeria. The study assumed that the independent variable and the dependent variable have a general multiplicative Cobb-Douglas functional relationship shown in equation (3.1).

$$FPERF = f(CIR, OPR, NOR) \quad (1)$$

Upon linearization and parametization, the panel model for the functional form (3.1) was specified as:

$$FPERF_{it} = \lambda_0 + \lambda_1 CIR_{i,t} + \lambda_2 OPR_{i,t} + \lambda_3 NOR_{i,t} + \theta_i + \varepsilon_{i,t} \quad (2)$$

In which $FPERF_{it}$ represents the performance of bank i at time t, λ_0 stands for the model constant or intercept, λ_1 - λ_3 stands for the coefficients of the independent variables. $CIR_{i,t}$ is the cost-to-income ratio of bank i at time t, $OPR_{i,t}$ is the operating cost ratio of bank i at time t, $NOR_{i,t}$ is the net interest margin to operating cost ratio of bank i at time t. θ_i is the bank specific effect that is assumed to be normally distributed with a constant variance. $\varepsilon_{i,t}$ is the error term which is assumed to have a normal distribution.

The confidence levels for this research have been set at 95% with a margin of error of +/-5%. Consequently, the statistically significance levels are 5%. These levels indicate the strength of the significance with 5% being the strength of reliability for inference (Muriithi, 2016; Muriithi & Waweru, 2017; Madhuwanthi & Morawakage, 2019). At these confidence and statistical significance levels, the variables are expected to produce statistically significant values that can be relied upon to explain the effect of financial risk on the financial performance of listed deposit money banks in Nigeria. The panel data regression of the independent variables on the dependent variable is said to be statistically significant if the corresponding ρ-value is less than the critical values. That is, $\rho < 0.05$ for the critical values.

Table 1: Measurement of Variables

Variable	Proxy	Measurement	Source	Study replicate
Financial performance	Return on equity (FPERF)	Net income / Total equity capital	DMBs Annual financial reports	Muriithi (2016), Iyinomen et al. (2020), Siriba (2020).
Operational risk	Cost income ratio (CIR)	Operating costs / Net interest income	DMBs Annual financial reports	Ahmadu et al. (2019), Fadun and Oye, (2020).
	Operating cost ratio (OPR)	Operating expenses / Total assets	DMBs Annual financial reports	Ahmadu et al. (2019), Isedu and Erhabor (2021).
	NIM to operating cost ratio (NOR)	Net interest margin / Operating expenses	DMBs Annual financial reports	Ahmadu et al. (2019), Isedu and Erhabor (2021).

Source: Author's Compilation, 2024.

Results and Discussions

This section presents the results of the various statistical analyses carried out to achieve the purpose of this study. While descriptive statistics reveal mean, standard deviation, minimum, and maximum values of all variables of the study, the correlation analysis and unit root test seek to find the nature of the relationship of the variables. The panel data, OLS and GMM analyses depict the impact of each of the explanatory variables on DMBs' financial performance (Measured by return on assets ROE) in Nigeria.

Descriptive Statistics

Descriptive statistics is the term given for the analysis of data that helps describe, show or summarize data in a meaningful way such that, for example, patterns might emerge from the data. The result of the descriptive statistics for this study is presented in Table 2. This summarizes the data used, mean as a measure of central tendency and standard deviation, minimum and maximum as a measure of variability.

Table 2: Descriptive Statistics

Variables	Mean	Std. Dev.	Min.	Max.
ROE	8.52	39.36	-358.57	122.19
CIR	0.72	1.51	-3.29	14.58
OPR	3.28	4.08	-8.56	14.48
NOR	0.99	2.64	-2.52	25.23

Source: Author's computation (2024).

From the outcomes, all the observations fall within their minimum and maximum. The mean value of Return on Equity (ROE) is 8.52. This show on the average the Return on Equity value of the firms used. The maximum value is 122.19 and the minimum value is -358.57. This suggests that the value for Return on Equity varies across the firms with a standard deviation figure of 39.36.

From the standard deviation which measure the dispersion of the data relative to its mean, shows that larger number of variables have low deviation from their mean while only few have high deviation from their mean. Also, the minimum and maximum of each variable are summarized, and their essence is to tell the lowest and the highest values of an observation.

Pairwise Correlation between Operational Risk Components and Performance of DMBs
This section on correlation discussed the degree of association between the financial performance (ROE) of the deposit money banks and each of the operations risk components examined, namely, the cost-to-income ratio (CIR), operating cost ratio (OPR), and the net interest margin to operating cost ratio (NOR).

The correlation between these dimensions themselves and return on equity is shown in Table 3 below.

Table 3: Correlation Matrix

	ROE	CIR	OPR	NOR
ROE	1			
CIR	0.0113	1		
OPR	0.0144	0.6391	1	
NOR	-0.3955	0.0724	0.1382	1

Source: Author's Computation using STATA (2024)

Table 3 indicates that operational risk factors consist of Cost-Income Ratio (CIR), Operating Cost Ratio (OPR), and NIM to Operating Cost Ratio (NOR). The analysis indicates that ROE is insignificantly positively correlated with NIM to Operating Cost Ratio (NOR) and insignificantly negatively correlated with both CIR and OPR. There is a significant positive correlation between CIR and OPR (correlation coefficient of 0.639), suggesting that these two operational cost-related ratios are closely related. However, CIR shows an insignificant positive correlation with NIM to Operating Cost Ratio (NOR), while OPR displays a

significant positive correlation with NOR (correlation coefficient of 0.138). Finally, the correlation analysis provides valuable insights into the relationships between operations risk variables and their influence on ROE. These findings are essential for understanding the dynamics of Cost-Income Ratio (CIR), Operating Cost Ratio (OPR), and NIM to Operating Cost Ratio (NOR) within Nigerian deposit money banks, ultimately guiding strategic decision-making and operations risk management practices in the banking sector.

Empirical Findings

The study presents the findings as follows; (1) the model is presented with its post-estimation diagnostics discussed to establish the reliability of the findings, (2) the study presents the Hausman specification test to establish the range where the coefficient of return on equity should lie in the GMM specification (3) the study estimates and presents the GMM specification while presenting the instruments used and discussing the post-estimation diagnostics of the GMM model.

Table 4: Diagnostic Test

Post-estimation test	Coefficient	P-value
Heteroscedasticity (Breusch-Godfrey test) Test	4.74	0.1921
Autocorrelation (Breusch-Godfrey Serial Correlation LM) Test	3.517	0.0853
Normality Test	32.25	0.1965

Heteroskedasticity Test

H_0: Errors are Homoscedastic

H_1: Errors are Heteroscedastic

Breusch-Godfrey test was 4.74 with *p*-value of 0.1921. Hence, the null hypothesis of errors is homoscedastic will be accepted and the alternative hypothesis of errors is heteroscedastic will be rejected.

Autocorrelation Test

H_0: Errors are not autocorrelated.

H_1: Errors are autocorrelated.

Breusch-Godfrey Serial Correlation LM Test was 3.517 with a *p*-value of 0.0853 means that the null hypothesis of errors is not autocorrelated will be rejected and the alternative hypothesis of errors is autocorrelated will be accepted, only at 5% level of significance.

Normality Test

H_0: Joint hypothesis of skewness and kurtosis are zero

H_1: Joint hypothesis of skewness and kurtosis are not zero

The Jarque-Bera was 32.25 with a *p*-value of 0.1965 implies that the null hypothesis should be accepted, which mean that the null hypothesis of the Jarque-Bera test is a joint hypothesis of the skewness being zero and the excess kurtosis being zero, the data are consistent and they are normally distributed.

Hausman Test

Table 5 shows the result of the Hausman test, and the test statistics have a chi statistic of 5.45 with three degrees of freedom and a corresponding *p*-value of 0.042.

Table 5: Hausman Test

Test Statistic Chi2(3)	***p*-value**
5.45	0.042**

Therefore, the null hypothesis that the regressors and individual heterogeneity are strictly exogenous is rejected at a five percent (5%) level of significance. Therefore, the fixed effect is preferred over the random effect. Therefore, the interpretation will be done on fixed effect.

Hansen J Test of Over-Identification Restrictions

The Hansen J statistic is 7.88 with a corresponding *p*-value greater than 0.05. Therefore, the null hypothesis of the validity of the overidentifying restrictions for the instruments is not rejected at a five percent (5%) level of significance. Therefore, the instruments employed by the model are appropriate and lead to precise consistent estimates.

Effect of Operational Risk on the Financial Performance of Listed DMBs

Table 6 shows the fixed effect estimates for the effect of operational risk on the financial performance of listed DMBs in Nigeria.

Table 6: GMM Regression Output

Roe	**Coef.**	**Std.Err**	**Z**	**P>z**	**[95% Conf.Interval]**	
ROE_{L1}	-0.33746	0.082245	-4.1	0.000	-0.49866	-0.17627
CIR	-1.85916	4.634657	-0.4	0.688	-10.9429	7.224604
OPR	2.710678	1.331435	2.04	0.042	0.101114	5.320241
NOR	-7.9345	1.141787	-6.95	0.000	-10.1724	-5.69664
Combined Variable = 0						
(1) cir = 0						
(2) opr = 0						
(3) nor = 0						
chi2(3) = 51.01						
Prob > chi2 = 0.0000						

Source: Extracted from STATA Output

The result of the operations risk model is presented in Table 6 above. The result shows a coefficient value of -1.859 for CIR with a Z-statistics value of -0.40 and a corresponding p-value of 0.688, implying that CIR has an insignificant negative effect on the ROE of listed deposit money banks in Nigeria. On the other hand, OPR has a coefficient value of 2.7107 and a Z-statistics value of 2.04 with a corresponding p-value of 0.042 which implies that there is a significant positive effect of OPR at a five percent (5%) level of significance in determining the financial performance of listed deposit money banks in Nigeria.

The NIM to Operating Cost Ratio (NOR) with a coefficient value of -7.9345 produced a Z-statistics value of -6.95 with a corresponding p-value of 0.000 which implies that there is a profound significant negative effect of NOR at a five percent (5%) level on ROE of listed deposit money banks in Nigeria. For the combined effect, the result shows an F-statistics value of 51.01 and a corresponding operational risk model ρ-value of 0.0000 which is less than 0.05. That is, ($\rho = 0.0000 < 0.05$), which indicated a significant joint effect of the variables on the return on equity of deposit money banks in Nigeria. Therefore, operational risk has a significant effect on the financial performance of listed deposit money banks in Nigeria. The overall effect of the study shows that operational risk has a significantly negative effect on the financial performance of listed deposit money banks in Nigeria. This finding is in consonance with the results of Kamau et al. (2018), Okeke et al. (2018), Olalere et al. (2018), and Hassan et al. (2020). This therefore calls for better management of operational risks in a manner that improves financial performance and boosts depositors' confidence.

Conclusion

The study hypothesis sought to determine whether operational risk significantly influences the financial performance of listed deposit money banks in Nigeria. The study found that operational risk exerted a significantly negative impact on the financial performance of listed deposit money banks in Nigeria. The study indicated that there is the existence of operational risk which is mainly related to costs leading to uncertainty regarding a financial bank's earnings. This may be due to cyber-attacks, human error, misconduct by employees, or risk of loss due to increasing operating expenses. This brings great concern to society, the government, and the listed deposit money bank management. Given the pivotal roles banks play in the nation's economy, it is therefore critical for measures to be taken to prevent the occurrence of operational risks in listed deposit money banks in Nigeria.

Recommendation

(i) The management of deposit money banks in Nigeria should institutionalize training and retraining of all their operations employees on operational risk awareness to identify, avoid, and proactively mitigate operational costs.

(ii) Banks are enjoined to develop viable internal approaches to recognize, control, and mitigate operational risks, which should cover the design, implementation, and review of operational risk methodology. This is in line with the proposal in the new Basel Capital Accord that, listed deposit money banks are required to provide capital against their defined operational risk exposure.

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