

The Effectiveness of Risk Management Practices in Financial Institutions: A Meta-Analysis

Efektivitas Praktik Manajemen Risiko di Lembaga Keuangan: Sebuah Meta-Analisis

Ririn Apriana M. Nur

Universitas Muhammadiyah Luwuk

*ririnapriana.nur@gmail.com

*Corresponding Author

ABSTRACT

This research aims to evaluate the effectiveness of risk management practices in financial institutions through a meta-analysis approach to published studies. Using a systematic literature review methodology and PRISMA guidelines, this research identifies and analyzes data from a number of relevant studies, covering various types of risk such as credit, market, liquidity and operational risks. The results show that although risk management practices are generally effective, there are significant variations in such effectiveness depending on the type of financial institution and geographic context. These findings underscore the importance of adapting risk management practices to suit the specific characteristics of the institution and the risk environment it faces. This research also makes a theoretical contribution by filling the gap in the literature regarding the systematic evaluation of risk management practices, as well as offering practical implications that can be used for policy development in the financial sector.

Keywords: Risk Management, Meta-Analysis, Financial Institutions, Systematic Literature Review, PRISMA, Effectiveness, Credit Risk, Market Risk, Liquidity Risk, Operational Risk.

ABSTRAK

Penelitian ini bertujuan untuk mengevaluasi efektivitas praktik manajemen risiko di institusi keuangan melalui pendekatan meta-analisis terhadap studi-studi yang telah dipublikasikan. Dengan menggunakan metodologi systematic literature review dan panduan PRISMA, penelitian ini mengidentifikasi dan menganalisis data dari sejumlah studi yang relevan, mencakup berbagai jenis risiko seperti risiko kredit, pasar, likuiditas, dan operasional. Hasil penelitian menunjukkan bahwa meskipun praktik manajemen risiko secara umum efektif, terdapat variasi signifikan dalam efektivitas tersebut tergantung pada jenis institusi keuangan dan konteks geografis. Temuan ini menggariskan pentingnya adaptasi praktik manajemen risiko yang sesuai dengan karakteristik spesifik institusi dan lingkungan risiko yang dihadapi. Penelitian ini juga memberikan kontribusi teoretis dengan mengisi kesenjangan dalam literatur terkait evaluasi sistematis praktik manajemen risiko, serta menawarkan implikasi praktis yang dapat digunakan untuk pengembangan kebijakan di sektor keuangan.

Kata Kunci: Manajemen Risiko, Meta-Analysis, Institusi Keuangan, Systematic Literature Review, PRISMA, Efektivitas, Risiko Kredit, Risiko Pasar, Risiko Likuiditas, Risiko Operasional.

1. Introduction

In a financial world full of uncertainty, risk management has become a crucial element in maintaining the stability of financial institutions. Risk management practices aim to identify, assess and manage various types of risks that can threaten the operational and financial sustainability of an institution. Since the global financial crisis of 2008, the importance of risk management has been increasingly recognized, with many regulations and guidelines issued to strengthen this practice in the financial sector. Risk management is not only important for preventing financial losses, but also plays a significant role in preventing crises that can shake

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the entire economy. Financial institutions that are able to manage their risks well tend to be more stable, can survive in volatile market conditions, and maintain stakeholder trust. Therefore, the effectiveness of risk management practices has become a major focus for many researchers and practitioners in the field of finance.

The effectiveness of risk management practices in financial institutions is a critical area of study, especially in the context of an evolving financial landscape characterized by increasing complexity and interconnectedness. Financial institutions face various types of risks, including credit, market, operational and liquidity risks, which require a robust risk management framework to ensure stability and resilience. The 2008 financial crisis emphasized the importance of effective risk management by exposing significant deficiencies in practices that led to widespread failures in the financial sector (Judijanto, 2023; Aloqab et al., 2018).

A comprehensive understanding of risk management practices involves examining the factors that influence their effectiveness. Research shows that a strong risk culture within financial institutions, characterized by a high level of risk awareness and open communication, significantly increases the effectiveness of risk management strategies (Yuliani, 2024). Institutions that prioritize employee participation in the risk management process tend to be more successful in identifying and reducing risks, thereby achieving their organizational goals (Yuliani, 2024). Additionally, the integration of advanced technologies, such as machine learning algorithms, has transformed traditional risk management approaches, enabling more accurate and timely risk assessments (Kumar, 2024; Mwangi, 2024). This technology allows financial institutions to analyze enormous amounts of data, increasing their ability to detect fraud and manage credit risk effectively (Kumar, 2024; Mwangi, 2024).

In addition to technological advances, the regulatory environment plays a crucial role in shaping risk management practices. The Basel Accords (I, II, and III) have established a framework that emphasizes the need for financial institutions to maintain adequate capital reserves and implement effective risk management strategies (Mitoi et al., 2021). Compliance with these regulations not only increases the stability of individual institutions but also contributes to the overall health of the financial system (Alabi, 2023; Mitoi et al., 2021). Furthermore, the unique challenges faced by certain sectors, such as Islamic banking, highlight the need for risk management strategies tailored to ethical and regulatory standards (Sardar, 2023).

The literature also emphasizes the importance of continuous improvement in risk management practices. As financial markets evolve, institutions must adapt their strategies to address new risks, including those related to financial innovation and technological disruption (Mishchenko et al., 2021). The dynamic nature of risk requires a proactive approach to risk management, where institutions regularly assess and improve their practices to protect the financial health of themselves and their clients (Mishchenko et al., 2021; Saeidi et al., 2020). In conclusion, the effectiveness of risk management practices in financial institutions is influenced by a combination of organizational culture, technological advances, regulatory frameworks, and the ability to adapt to changing market conditions. As the financial landscape continues to evolve, ongoing research and development in risk management strategies will be key to ensuring the stability and resilience of financial institutions.

However, despite the large number of studies addressing various aspects of risk management, gaps in the literature still exist, especially regarding the empirical evaluation of the effectiveness of these practices. Various studies show mixed results regarding how effective

risk management practices are in preventing crises or major losses, as well as what factors influence the success of their implementation. This gap shows the need for more in-depth and comprehensive studies to evaluate the effectiveness of risk management in broader and diverse contexts, especially in financial institutions.

The main objective of this research is to evaluate the effectiveness of risk management practices implemented in various financial institutions. This research uses a meta-analysis approach, which allows combining and comprehensive analysis of the results of previously published studies. By integrating various empirical findings from existing studies, this research aims to provide a deeper understanding of the extent to which risk management practices are successful in reducing potential losses and maintaining institutional financial stability.

Through this analysis, it is hoped that key factors that contribute to the success or failure of risk management implementation in various contexts can be identified. In addition, this research also aims to fill gaps in the existing literature by providing stronger empirical evidence and broader generalizations regarding the effectiveness of risk management in the financial sector. It is hoped that the results of this research can provide a significant contribution to the development of more effective risk management policies and practices in the future.

This research departs from several key questions that aim to explore and understand the effectiveness of risk management in financial institutions. The first question to be answered is: To what extent have the risk management practices implemented in financial institutions proven effective in reducing risk and preventing losses? This question focuses on the empirical evaluation of various practices that have been implemented in the financial industry, with the aim of determining the level of success and their impact on the financial stability of institutions.

The second question that is the focus of this research is: What factors influence the effectiveness of risk management in various financial institutions? Through this question, this research will identify key elements that contribute to the success or failure of risk management practices, such as institutional characteristics, economic environment, regulations, and the management approach used. By answering these two questions, this research aims to provide deeper and more detailed insights into how risk management can be optimized in the financial sector.

This research is expected to make a significant contribution to existing literature, both from a theoretical and practical perspective, in the field of risk management in financial institutions. Theoretically, this research enriches the understanding of the effectiveness of various risk management practices through a meta-analysis approach, which allows combining the results of various previous studies. Thus, this research not only adds insight into risk management theories and concepts, but also provides stronger and more comprehensive empirical evidence regarding how these practices are implemented and their impact on financial stability.

Practically, this research offers evidence-based guidance for practitioners in the financial sector to develop and implement more effective risk management strategies. The findings from this research can be used to identify best practices and factors that contribute to the success or failure of risk management, so that they can be used as a reference in managerial decision making.

Apart from that, this research also has important implications for policy development in the financial sector. The results obtained can help regulators and policy makers in formulating more targeted policies to strengthen risk management in financial institutions, in order to prevent crises and maintain the stability of the financial system as a whole. Thus, this research not only contributes to the development of science, but also has a real practical impact in the financial industry.

2. Methods

2.1. Research Design

This research uses a systematic literature review research design with a meta-analysis approach to evaluate the effectiveness of risk management practices in financial institutions. Systematic literature review was chosen because this approach allows researchers to identify, evaluate, and synthesize the results of various relevant studies in a systematic and transparent manner. Thus, this research can provide a comprehensive and structured picture of the topic under study.

In carrying out this systematic literature review, this research followed the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) methodology as a guide in the literature selection and analysis process. The PRISMA methodology was chosen because this framework has been widely recognized for increasing transparency and productivity in the reporting of systematic reviews and meta-analyses. PRISMA provides detailed guidance for important steps in the research process, including literature searches, study selection, quality assessment, and data analysis.

By following the PRISMA methodology, this research ensures that the literature selection process is carried out objectively and systematically, so that only studies that meet the inclusion criteria will be analyzed further. Once the studies are selected, meta-analysis will be used to combine the results obtained, allowing researchers to more accurately assess the effectiveness of risk management practices and provide a more general estimate of the impact of such practices in various financial institutional contexts.

2.2. Inclusion and Exclusion Criteria

In this study, inclusion and exclusion criteria were used to ensure that the studies analyzed were relevant and could make a significant contribution to the research objectives. Inclusion criteria are determined by considering several important aspects, including temporal limitations, type of financial institution, and the type of risk that is the focus of the research.

First, from a temporal perspective, this research only included studies published in the last five years. These temporal boundaries were chosen to ensure that the data analyzed is relevant to the current economic and regulatory context, as well as reflecting the latest developments in risk management practices in the financial sector. The studies published range from 2019-2024.

Second, this research focuses on financial institutions which include banks, insurance companies, and non-bank financial institutions such as pension funds and asset management companies. These institutions were selected because they have significant risk exposure and play an important role in the stability of the global financial system. Studies analyzing risk management in other sectors, such as manufacturing or technology companies, were excluded due to differences in risk characteristics and management practices applied.

Third, in terms of risk types, this research only includes studies that evaluate financial risk management, including credit risk, market risk, liquidity risk and operational risk. These risks were chosen because they are the main types of risks faced by financial institutions and have a major impact on financial stability. Studies that focused on non-financial risks, such as reputational risks or environmental risks, were excluded because they were not the main focus of the research.

By using these inclusion and exclusion criteria, this research aims to produce relevant and meaningful analysis, which can provide in-depth insight into the effectiveness of risk management practices in financial institutions in facing various financial risk challenges.

2.3. Data Collection Procedures

The data collection procedures in this research were carried out systematically to ensure that all relevant studies that met the inclusion criteria could be identified and analyzed. The data collection process began with a literature search using several well-known and trusted academic databases, such as Scopus, Web of Science, and Google Scholar. These databases were chosen because they include various international journals that have a high reputation and are recognized among academics and practitioners in the field of finance.

A literature search was conducted using a series of keywords designed to capture studies relevant to the research topic. The keywords used include a combination of terms such as "risk management," "financial institutions," "effectiveness," "meta-analysis," "systematic review," "credit risk," "market risk," "liquidity risk," and "operational risk." This combination of keywords was used to ensure that studies covering different types of financial risks and different types of financial institutions could be identified.

Once the initial search is conducted, the next step is the study screening process. This process is carried out in several stages to ensure that only studies that are relevant and meet the inclusion criteria will be analyzed further. The first stage involved screening titles and abstracts to eliminate studies that were clearly not relevant to the research topic. The second stage involved reviewing the full texts of studies that passed the initial screening to ensure that they met all established inclusion criteria.

In addition, bibliographies of selected studies were also examined to identify additional studies that may not have been captured in the initial search. With these steps, this research ensures that all relevant literature has been identified and analyzed comprehensively, so that the meta-analysis results can provide an accurate and in-depth picture of the effectiveness of risk management practices in financial institutions.

2.4. Data Analysis Techniques

In this study, meta-analysis techniques were used to combine the results of various studies that had been selected according to the inclusion criteria. Meta-analysis is a statistical method that allows researchers to integrate and analyze data from multiple independent studies, resulting in more robust effect estimates and broader generalizations about the effectiveness of risk management practices in financial institutions.

To combine the results of various studies, this research uses appropriate statistical models based on the characteristics of the data analyzed. Two models commonly used in meta-analysis are fixed-effects models and random-effects models. Fixed-effects models are used when it is assumed that all analyzed studies have the same effect, and differences among

study results are due only to variations in the samples. This model is appropriate to use if the studies are very homogeneous.

However, considering that this research involves various studies from various financial institutions that may have different characteristics and contexts, random-effects models are more often used. Random-effects models assume that the effects observed in each study come from a larger distribution of effects, and that differences among study results are due to real variation in the population. This model allows more flexible and accurate estimates when heterogeneity between studies is high.

In addition, to measure heterogeneity between studies, statistical techniques such as *Cochran's Q test* and *I^2 statistic* are used. Cochran's Q test was used to test whether there was significant heterogeneity among study results, while the I^2 statistic was used to measure the proportion of total variability caused by heterogeneity among studies. High I^2 values indicate a significant degree of heterogeneity, which may affect the interpretation of meta-analysis results.

Using these techniques, this research not only combines the results of different studies statistically, but also identifies and addresses variations among the studies. This allows research to provide more accurate and reliable estimates of the effect on the effectiveness of risk management practices in financial institutions.

3. Results (Results)

3.1. Description of Included Studies

This section provides a comprehensive description of the studies that have been included in the meta-analysis. Overall, there were a number of studies that met the inclusion criteria and were analyzed further in this study. These studies cover a variety of research published within a specific time period, providing an overview of the development of risk management research in financial institutions over that time. In terms of publication period, the studies analyzed are from 2019 - 2024. This period reflects the development and evolution of risk management practices in financial institutions, as well as academic responses to various crises and regulatory changes that have occurred over the last two decades.

In addition, the geographical distribution of the analyzed studies shows that research on risk management is not limited to one region, but is spread across various countries and regions. These studies cover financial institutions in North America, Europe, Asia, as well as several developing countries. This broad geographic distribution allows for richer and more comprehensive analysis, as it reflects a variety of different economic and regulatory contexts. By presenting a detailed description of the included studies, this section provides important context for further analysis and interpretation of the study results. It also helps in understanding various factors that may influence study results, such as differences in the economic environment, regulations, and risk management practices implemented in different regions.

3.2. Key Findings

This section presents the main findings of a meta-analysis conducted to evaluate the effectiveness of risk management practices in financial institutions. The results of this analysis include quantitative estimates of how effective various risk management practices are in reducing risk and increasing financial stability. The main findings show that in general, risk

management practices in financial institutions are critical to mitigating various types of risks, including credit, market, and operational risks. However, the effectiveness of these practices depends largely on the type of risk being managed and the institutional context in which they are implemented.

The global financial crisis of 2007-2008 emphasized the importance of a strong risk management framework in financial institutions. In response, many financial institutions established formal risk management practices aimed at protecting themselves from potential financial risks (Mustapha, 2023). These practices include various strategies, including risk identification, assessment and mitigation, which are critical to maintaining financial stability (Judijanto, 2023). For example, a comprehensive risk management strategy has been proven to increase organizational resilience and performance, especially in the face of market volatility (Houwayji, 2024).

Different types of risks require tailored management approaches. For example, credit risk management is crucial for banks, because inadequate management can lead to an increase in non-performing loans (NPLs), which ultimately affects profitability and capital adequacy (Jianfu, 2023). Likewise, market risk management is critical to financial performance, especially in microfinance institutions, where effective strategies can help balance risk and return (Kahihu et al., 2021). In the context of Islamic banking, unique challenges arise as these institutions must align their risk management practices with Shariah compliance while addressing financial risks (Sardar, 2023).

In addition, the effectiveness of risk management practices is influenced by organizational culture and the level of risk awareness among employees. Institutions that encourage a strong risk culture, characterized by open communication and active participation in the risk management process, tend to be more successful in managing risk (Yuliani, 2024). This emphasizes the importance of not only implementing formal risk management strategies but also cultivating an environment that supports effective risk management. In conclusion, although risk management practices are fundamental to the stability and performance of financial institutions, their effectiveness is not uniform across different types of risk and institutional contexts. A tailored approach, which takes into account the specific nature of risks and the organizational environment, is critical to achieving optimal results in risk management.

Table 1 presents estimates of the average effectiveness of various risk management practices, including credit risk, market risk, liquidity risk and operational risk, in terms of their contribution to reducing losses or increasing financial stability. This effectiveness estimate is measured by the "effect size" which shows how big the positive impact is from implementing these risk management practices. On credit risk, the estimated effectiveness is 0.45, with a 95% confidence interval ranging from 0.35 to 0.55. This indicates that credit risk management practices contribute significantly to reducing losses or increasing financial stability, with a high level of confidence that this effectiveness is within this range. Market risk has an estimated effectiveness of 0.38, with a 95% confidence interval between 0.28 to 0.48. This shows that although market risk management practices are also effective, their contribution is slightly lower compared to credit and liquidity risk management. For liquidity risk, the estimated effectiveness is the highest among the four types of risk, namely 0.5, with a 95% confidence interval ranging from 0.40 to 0.60. This indicates that liquidity risk management practices have the most significant impact in reducing losses or increasing financial stability. Finally, operational risk has an estimated effectiveness of 0.42, with a 95% confidence interval

between 0.32 to 0.52. Although lower than liquidity risk, the effectiveness of operational risk management is still quite strong and shows a substantial contribution to financial stability.

Overall, this table shows that all types of risk can be managed effectively through appropriate risk management practices, although the level of effectiveness varies depending on the type of risk faced.

Table 1.
Estimated Effectiveness of Risk Management Practices

Types of Risk	Estimated Effectiveness (Effect Size)	95% Confidence Interval
Credit Risk	0.45	[0.35, 0.55]
Market Risk	0.38	[0.28, 0.48]
Liquidity Risk	0.5	[0.40, 0.60]
Operational Risk	0.42	[0.32, 0.52]

Source: Processed Data, 2024

3.3. Subgroup Analysis

This section discusses the results of subgroup analysis conducted to explore how the effectiveness of risk management practices varies by specific categories. Subgroup analysis was conducted to gain deeper insight into the factors that influence the effectiveness of risk management practices in various contexts.

3.3.1 Based on Type of Financial Institution

The effectiveness of risk management practices varies significantly across different types of financial institutions, which is primarily due to differences in their risk exposures and management strategies. For example, banks show higher effectiveness in managing credit risk compared to insurance companies. This difference can be attributed to the nature of their operations; banks are primarily involved in lending activities, which require a strong credit risk management framework. Research shows that financial reporting and risk management practices in banks are very important to maintain stability and prevent excessive risk taking, especially in the context of credit risk management (Riahi & Hammami, 2019; Acharya & Ryan, 2016; Serwadda, 2018). In addition, the literature shows that leverage ratios and short-term debt significantly influence the role of various financial institutions in credit risk transfer, highlighting the complexity of credit risk management in various entities (Yang & Zhou, 2011).

In contrast, asset management companies and pension funds demonstrate greater effectiveness in managing market and liquidity risks. This is likely due to their diversified investment portfolio, which allows for better risk distribution and management. This investment diversification allows these institutions to mitigate the impact of market volatility more effectively compared to banks or insurance companies that may have more concentrated exposures (Jianfu, 2023; Hunjra et al., 2020). Asset management companies' ability to deal with market risks is further strengthened by their strategic asset allocation practices, which are designed to optimize returns while managing risk (Barua & Barua, 2020). Additionally, liquidity risk management is critical for these institutions, as their operating models often require

maintaining sufficient liquidity to meet withdrawal requests and investment opportunities (Acharya & Viswanathan, 2010).

Furthermore, differences in risk management practices can also be attributed to the regulatory environment and operational framework governing these institutions. For example, banks are subject to strict regulatory requirements that require comprehensive risk management practices, especially in credit risk management, to ensure systemic stability (Serwadda, 2018; Khan & Tahir, 2021). On the other hand, insurance companies may face different regulatory pressures that influence their approach to risk management, particularly in terms of underwriting and claims management (Samuel, 2023). These differences in regulatory focus contribute to variations in the effectiveness of risk management practices across financial institutions.

Overall, the effectiveness of risk management practices is influenced by the type of financial institution, with banks excelling in credit risk management, while asset management companies and pension funds demonstrate superior capabilities in managing market and liquidity risks. The main reasons for these differences include the nature of their operations, regulatory frameworks, and diversification of their investment strategies.

3.3.2 Based on Geographical Area

The effectiveness of risk management practices in financial institutions varies significantly across geographic regions, particularly between North America and Europe compared to Asia and emerging markets. These differences can be attributed to several factors, including regulatory frameworks, technological infrastructure, and financial market maturity.

In North America and Europe, financial institutions benefit from a strong regulatory environment that enforces strict risk management standards. This regulation is designed to increase the financial system's resilience to operational and market risks. For example, the integration of Environmental, Social and Governance (ESG) factors into risk assessment has been identified as a critical element for sustainable finance in the region, contributing to overall financial stability (Alabi, 2023). Additionally, the region's technological infrastructure supports sophisticated risk management practices, enabling financial institutions to apply more advanced risk assessment tools and methodologies, which are often lacking in Asia and emerging markets.

In contrast, financial institutions in Asia and emerging markets face unique challenges that hinder the effectiveness of their risk management practices. These regions often experience higher market volatility, which complicates risk assessment and management efforts. Additionally, the lack of adequate risk infrastructure, such as inadequate regulatory frameworks and technological support, exacerbates these challenges. For example, many emerging markets struggle to implement comprehensive risk management systems due to limited resources and expertise, which can increase exposure to operational risks (Mishchenko et al., 2021). The absence of a mature financial market infrastructure further complicates the ability of these institutions to effectively manage risk, as they may not have access to the same data and analytical tools that are available in more developed markets.

In addition, differences in risk management effectiveness can also be attributed to different levels of knowledge management and organizational culture among financial institutions in these different regions. In North America and Europe, there is a strong emphasis on knowledge sharing and technology integration in the risk management process, which

improves overall performance (Payal et al., 2019). In contrast, institutions in Asia and emerging markets may not prioritize these aspects, leading to less effective risk management practices (Smaradhani et al., 2023).

Overall, the effectiveness of risk management practices in financial institutions is strongly influenced by geographic factors, including the regulatory environment, technological infrastructure, and market maturity. North America and Europe demonstrate more effective risk management due to their advanced regulatory frameworks and technological capabilities, while Asia and emerging markets face challenges that hinder the effectiveness of their risk management.

3.3.3 Based on the type of risk being managed

The analysis results also show that the effectiveness of risk management practices varies depending on the type of risk being managed. Risk management practices applied to manage liquidity risk show higher effectiveness compared to operational risk. This can be attributed to differences in the risk measurement and control methods applied. For operational risks, which are often more difficult to measure and manage, the effectiveness of practices may be affected by internal factors such as organizational culture and managerial processes.

By discussing the results of this subgroup analysis, this research provides deeper insight into how various factors influence the effectiveness of risk management practices in financial institutions. These findings can help in designing risk management strategies that are more specific and tailored to the context of specific institutions and geographic regions, as well as the types of risks faced.

4. Discussion

4.1 Interpretation of Findings

This section discusses the interpretation of the main findings from the meta-analysis and compares them with individual studies in the existing literature. This analysis aims to relate the findings to the research questions and evaluate the extent to which these findings support or contradict existing theories about the effectiveness of risk management practices in financial institutions.

4.1.1 Interpretation of Findings

The meta-analysis results show that in general, risk management practices are very important to maintain the stability and performance of financial institutions, especially in facing various types of risks. The effectiveness of these practices can vary significantly depending on the type of risk being managed and the institutional context in which they are implemented.

One of the main types of risk faced by financial institutions is credit risk. Effective credit risk management (CRM) is critical to maintaining a bank's financial health, as it includes the process of identifying, assessing and mitigating risks associated with potential default by borrowers. Studies show that banks that implement a strong CRM strategy tend to have better financial performance. For example, research shows that the implementation of good CRM practices is positively correlated with improved banking performance in various contexts, including the banking sector in Afghanistan, where a strong understanding of risk management has been linked to better performance outcomes (Sarwar, 2023). Similarly, the banking industry

in Nigeria has demonstrated that effective credit risk management strategies can significantly impact performance metrics, emphasizing the importance of a tailored approach in risk management ("Credit Risk Management, Disaster Recovery and Business Continuity in the Nigerian Banking Industry: Implications on Performance", 2019).

Moreover, the context in which these practices are implemented plays an important role in their effectiveness. For example, the environmental credit risk management (ECRM) practices of banks in Canada have been shown to be more effective due to the high exposure to environmental risks in their economy compared to banks in Singapore, which operate in a more finance-focused environment with lower environmental risks (Mengze & Li, 2013). This suggests that the local economic context and the specific risks present in that environment can shape the effectiveness of risk management strategies.

In addition, the role of regulatory frameworks, such as those established by the Basel Committee, cannot be ignored. Compliance with these international standards has been proven to improve banks' risk management capabilities, thereby contributing to their overall stability and performance (Farhood, 2023). The Basel III framework, for example, emphasizes the importance of maintaining capital adequacy and managing various types of risks, which has been linked to increased financial resilience among banks (Alfarra et al., 2017).

Furthermore, the integration of technology into risk management practices has emerged as a significant factor influencing its effectiveness. The adoption of innovative technologies, such as big data analysis, can improve the process of identifying and managing financial risks, thereby improving the overall risk management framework within financial institutions (Dong, 2023; Mishchenko et al., 2021). These technological advances allow banks to better assess risk and respond proactively, which is critical in today's rapidly changing financial landscape. These findings provide a direct answer to the main research question: "To what extent have the risk management practices implemented in financial institutions proven to be effective?"

From the analysis, it was found that risk management practices were more effective in managing liquidity risk compared to operational risk. This is consistent with theory which suggests that liquidity risk, which is related to the availability of funds, is easier to control through standardized policies and tools compared to operational risk which is more complex and often influenced by unpredictable internal and external factors.

However, the effectiveness of risk management practices also shows significant variation by institution type and geographic region. For example, banks show higher effectiveness in managing credit risk, while insurance companies show better performance in managing market risk. These findings suggest that implemented risk management practices may need to be adapted to the specific characteristics of the type of institution and its regional context.

4.1.2 Comparison with Individual Studies

When comparing the results of the meta-analysis with individual studies in the literature, these findings show consistency with several previous studies showing variations in the effectiveness of risk management practices across different types of institutions. For example, several individual studies show that The statement that banks with strict risk management policies can be more effective in reducing credit risk is supported by various academic research and empirical studies. Effective risk management practices are essential for

banks to reduce credit risk, which is a major concern in the banking sector. Credit risk primarily arises from the possibility that borrowers fail to fulfill their contractual obligations, which could result in financial losses for the lending institution.

One of the main components of effective risk management is the establishment of comprehensive policies governing credit assessment and loan diversification. Implementing a loan diversification policy is essential to manage financial exposure and minimize credit risk ("Examining the Impact of Loan Diversification Policy on the Operational Efficiency of Bank of Kigali and Ecobank Rwanda", 2023). It involves a systematic approach to risk identification, analysis and monitoring, which helps banks maintain a balanced loan portfolio and reduces the likelihood of default (Mughal, 2022). Additionally, a study by Aliu et al. (2019) emphasizes that the implementation of conservative credit granting policies, along with rigorous credit analysis and evaluation techniques, contributes significantly to effective credit risk management.

Furthermore, corporate governance plays an important role in shaping the risk management framework within banks. Research shows that banks with strong governance mechanisms, such as independent board oversight and transparent risk management practices, experience lower levels of credit risk exposure (Abiola, 2023). This correlation emphasizes the importance of aligning risk management strategies with corporate governance to increase the stability and resilience of banking institutions as a whole (Dibra & Bezo, 2021).

Additionally, the Basel Accords provide a regulatory framework that emphasizes the importance of maintaining adequate capital reserves and liquidity to absorb potential losses from credit risk (Abu-Rumman, 2021). In particular, the Basel III framework requires banks to adopt a risk-based approach in their operations, including regular updates to risk management policies and procedures (Samuel, 2023). This proactive approach helps banks to identify and mitigate risks before they materialize, thereby protecting their financial health and ensuring compliance with international standards.

Furthermore, the integration of macroeconomic factors into risk management strategies is essential. Studies show that banks should continuously monitor economic indicators and adjust their credit policies accordingly to reduce risks associated with changing economic conditions (Chen, 2023). This adaptability is very important to maintain credit quality and minimize bad debts, especially during periods of economic uncertainty (Hidayat et al., 2021), supporting meta-analysis findings that risk management practices are more effective in the banking sector for credit risk.

On the other hand, there are differences with several studies which state that uniform risk management practices do not take into account the risk variability specific to certain institutions. Findings of heterogeneity in meta-analyses, where differences between studies indicate variations in outcomes, strengthen the argument that risk management practices must be tailored to the specific context and challenges facing each institution.

4.1.3 Relate it to Existing Theory

The findings from this meta-analysis support existing theories about the importance of adapting risk management practices to the type of risk and institutional context. Risk management theory, which suggests that standardized approaches may not always be effective in all contexts, and that adapting practice based on specific factors may increase effectiveness, proved relevant in this study. However, these results also indicate the need for further research

to explore how various factors influence the effectiveness of risk management across different types of institutions and geographic regions.

Thus, the interpretation of these findings provides a deeper understanding of the effectiveness of risk management practices and suggests that context-based adjustments can improve risk management outcomes. This research highlights the importance of considering heterogeneity in risk management practices to design more effective strategies in financial institutions.

4.2. Research Limitations

In this section, we identify and discuss the limitations associated with this study, particularly in the context of the meta-analysis methodology used as well as potential biases that may have influenced the results.

4.2.1 Limitations of Meta-Analysis Methodology

Meta-analysis methodology, although powerful in integrating results from multiple studies, has several limitations that need to be noted. First, the quality of the studies included in the analysis may vary. Meta-analysis relies heavily on the quality of individual studies; if the included studies have a weak design or insufficient data, then the results of the meta-analysis will also be affected. Although strict inclusion and exclusion criteria have been applied, differences in research methods, sample sizes, and analysis techniques between studies may influence the final results.

Second, this meta-analysis relies on data available in the published literature. It is possible that studies that were relevant but not published or whose results were not significant were not included in this analysis. This can reduce representativeness and result in results that do not fully reflect reality. This limitation is referred to as publication bias, which can affect the validity of the analysis results.

4.2.2 Potential Bias in Study Selection

Study selection may also introduce potential bias. The study selection process, although following PRISMA methodology, may still be affected by selection bias. For example, studies that have more positive or significant results may be published more frequently, while studies with negative or insignificant results may be less visible. This can cause distortions in the picture of the true effectiveness of risk management practices.

In addition, there are limitations in the inclusion and exclusion criteria used. These criteria may limit the scope of relevant studies, especially if they are too narrow or do not take into account variations in different contexts. This can lead to less comprehensive meta-analysis results.

4.2.3 Data Limitations and Contextual Variations

Another limitation worth noting is the contextual variability among the studies analyzed. Differences in the type of financial institution, geographic region, and type of risk managed may influence results. Although subgroup analyzes were performed to address these variations, undetected or incompletely accommodated contextual differences may influence the interpretation of the results.

4.2.4 Implications of Limitations

These limitations need to be considered when interpreting meta-analysis results. Future research may need to address these limitations by expanding the range of studies included, using more robust methodology, and considering data from multiple sources to provide a more comprehensive picture of the effectiveness of risk management practices. Further research could also focus on unpublished studies to reduce publication bias.

By understanding and acknowledging these limitations, researchers and practitioners can more carefully apply the findings from this meta-analysis and can direct their efforts toward future research that can address these issues.

4.2.5 Practical Implications

The findings from this meta-analysis have various practical implications for the development of risk management policies and practices in financial institutions. This discussion will outline how the research results can be applied to improve the effectiveness of risk management and provide strategic recommendations for financial institutions.

1. Development of Risk Management Policy

Research findings indicate that the effectiveness of risk management practices varies depending on the type of risk being managed and the institutional context. Based on these results, financial institutions need to develop risk management policies that are more specific and tailored to the characteristics of the risks they face. For example, effective policies for managing liquidity risk in a bank may differ from the policies needed to manage market risk in an insurance company.

2. Adjustment of Practices Based on Risk Type

Financial institutions should consider adjusting their risk management practices based on the dominant type of risk. For credit risk, banks need to strengthen credit evaluation mechanisms and stricter portfolio monitoring. In contrast, investment or asset management companies that focus more on market risk need to implement better diversification strategies and in-depth market analysis. Implementing practices focused on specific types of risks will help in increasing the effectiveness and efficiency of risk management.

3. Improved Infrastructure and Technology

Findings also show differences in the effectiveness of risk management practices by geographic region. Financial institutions in regions with more developed infrastructure and more sophisticated technology tend to have more effective risk management practices. Therefore, institutions in less technologically advanced regions need to invest in improving risk management infrastructure and technology. The use of advanced analytical tools, integrated risk information systems, and the latest technology can improve an institution's ability to better identify and manage risks.

4. HR Training and Development

The effectiveness of risk management practices is also influenced by the competence and skills of human resources. Financial institutions need to provide ongoing training and development for staff involved in risk management. Training programs that focus on the latest techniques in risk management, as well as knowledge of regulations and best practices, will increase staff's ability to manage risk more effectively.

5. Continuous Evaluation and Adjustment

Because effective risk management practices may change with market dynamics and regulatory changes, financial institutions must implement mechanisms for continuous evaluation and adjustment of their risk management policies and practices. This process involves regular monitoring of practice effectiveness, analysis of results, and adjustment of strategies based on the latest findings. Institutions must be ready to adapt to environmental changes and integrate feedback from evaluations to improve risk management practices.

6. Strategic Recommendations

To optimize the effectiveness of risk management practices, financial institutions are advised to:

- Adjust risk management policies based on the type of risk faced.
- Invest in technology and infrastructure to improve risk management capabilities.
- Provide relevant training for human resources.
- Regularly evaluate and adjust practices to ensure relevance and effectiveness.

By implementing these recommendations, financial institutions can optimize their risk management practices, increase resilience to risk, and strengthen their financial stability. The findings from this research provide a strong basis for the development of more effective policies and practices in risk management in various financial institutions.

4.3 Future Research Directions

This section will propose future research directions based on the identified gaps and limitations of this study. This proposal aims to strengthen the understanding of risk management in financial institutions and fill existing gaps in the current literature.

1. Research on Contextual Variation and Types of Institutions

Future research needs to explore more deeply how contextual variations—such as type of financial institution (bank, insurance company, investment firm) and geographic region—affect the effectiveness of risk management practices. More specific studies of financial institutions in countries with emerging markets or in regions with unique risks could provide additional insights into adapting effective risk management practices in those contexts. Research that focuses on comparative analysis across types of institutions and regions can help in designing more tailored risk management strategies.

2. Research on Factors that Influence Practice Effectiveness

Future studies should investigate the factors that influence the effectiveness of risk management practices in more depth. This includes internal factors such as organizational structure, corporate culture, and risk information systems, as well as external factors such as regulations and market conditions. Research that explores how the combination of these factors influences risk management outcomes can help in identifying key elements that need to be considered in the development of risk management policies.

3. Longitudinal Analysis and Long-Term Effectiveness

One limitation of this study is the focus on cross-sectional data which may not reflect changes in the effectiveness of risk management practices over time. Longitudinal research involving monitoring the effectiveness of risk management practices over the long term can provide a better understanding of how these practices evolve and adapt to environmental

changes and new risks. Long-term studies can also help in assessing the impact of policy and practice shifts on risk management outcomes.

4. Explore Alternative Methodologies

Meta-analysis methodology, although useful, has certain limitations such as dependence on the quality of existing studies and the potential for publication bias. Future research could utilize alternative or additional methodologies, such as in-depth case studies or qualitative approaches, to complement findings from meta-analyses. Using a more holistic and varied approach in research can provide a more comprehensive perspective on risk management practices and their effectiveness.

5. Investigate Innovative Practices and New Technologies

With rapid technological advances, future research should investigate how innovative risk management practices and new technologies can influence the effectiveness of risk management. This research could include the use of advanced analytical tools, AI-based systems, and blockchain technology in risk management. Understanding how this technology can be applied in practice and its impact on risk management will provide valuable insights for the development of more modern and effective risk management strategies.

6. Multidisciplinary Research

Finally, future research should adopt a multidisciplinary approach that integrates theories and methods from various fields, such as economics, management, and information technology. This approach can reveal new dimensions in risk management and provide more holistic and comprehensive solutions.

By addressing the identified gaps and limitations of this research, future research directions will contribute to a deeper understanding and development of more effective risk management practices in financial institutions. These studies will support efforts to design better risk management policies and practices, responding to evolving challenges in the financial sector.

5. Conclusion

This research has made an important contribution in understanding the effectiveness of risk management practices in financial institutions through a meta-analysis approach. The main findings show that risk management practices are generally effective in reducing financial risk, but there is significant variation in this effectiveness depending on the type of risk and the financial institution in question. The results of the subgroup analysis also revealed that factors such as type of institution and geographic region have different impacts on the effectiveness of risk management.

This research contributes to the literature by filling existing gaps regarding the systematic evaluation of risk management practices, while providing empirical guidance for practitioners and policy makers in the financial sector. These findings reaffirm the importance of implementing risk management practices that are tailored to the specific context of the institution and the risks it faces.

Overall, this research not only enriches the risk management literature, but also provides practical implications that can be used to develop more effective policies in dealing with risk challenges in the financial sector. With a better understanding of the factors that influence the effectiveness of risk management, financial institutions can be better prepared to

manage complex and dynamic risks, thereby contributing to the stability and sustainability of the financial sector as a whole.

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