

Insights of Financial Risk Management in Times of Pandemics A Scoping Review

Pathiraja, P.M.D.S., Perera, W.T.N.M., and Abeywardhana, D.K.Y.

University of Kelaniya, Sri Lanka

Received: February 13, 2025 Revised: October 14, 2025 Accepted: December 09, 2025

Abstract

The global economic disruption caused by pandemics presents significant and unique financial risks to organizations. This scoping review synthesizes existing literature to map the landscape of financial risk management during pandemics. Following the PRISMA-ScR guidelines, we analyzed thirty-six (36) peer-reviewed articles from five databases (1990-2024). Our analysis reveals those pandemics, notably COVID-19, acutely stress credit, market, and liquidity risks across sectors. The findings indicate that financial risks are not uniform, with variation observed by sector, firm size, and individual income levels. We identify a suite of management strategies employed, including government interventions (e.g., loan guarantees), crisis management planning, remote working technologies, and advanced analytics. A significant finding is the overwhelming focus of extant literature on the COVID-19 pandemic, highlighting a critical gap in comparative research on earlier pandemics. To our knowledge, this is among the first reviews to synthesize financial risk management insights across multiple pandemics, providing a foundational framework for future research and practice. The study underscores the necessity for robust, adaptable financial contingency planning to enhance organizational resilience against future pandemic-induced shocks.

Keywords: COVID-19, Financial risk, Meta-synthesis, Pandemics, Risk management, Scoping review.

1. Introduction

The prominence of financial risk management has grown substantially since the 1990s, driven by stringent regulatory requirements and technological advancements, particularly within financial institutions (Aven, 2016; Dionne, 2013) as legal and regulatory requirements have been more stringent, as well as technological improvements, particularly inside financial companies. In recent years, intriguing research has focused on risk management as a crucial organizational activity, as

Corresponding email: ghananjayap@kln.ac.lk

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a set of proactive practices that vary across organizations. The importance of financial risk management cannot be overstated. Without effective risk management strategies in place, organizations are exposed to financial losses, reputational damage, and regulatory penalties. Risk management is crucial for ensuring the survival of a business and creating sustainable value (Verbano & Venturini,2013).

Financial risk management is crucial in times of pandemics because pandemics can create significant financial risks for businesses, including increased credit and market risks, liquidity challenges, and operational disruptions (Hudelcu,2020; Craighead et al., 2020; Dexu,2021,p.218; Blair,2022; Sneddon, 2021; Xie et al., 2023). These risks can lead to severe financial losses and even bankruptcy if not managed effectively. As businesses face decreased revenues and profitability during pandemics, they may struggle to meet their debt obligations, leading to a higher probability of default (Wang et al., 2021). Many recent studies have found that credit risk has increased during past pandemics (Colak & Oztekin,2021; Gong et al.,2021; Bystrom, 2021). Similarly, pandemics can lead to increased market risk for businesses too. As stock markets react to news of pandemics, businesses may face losses due to market movements such as changes in interest rates, exchange rates, or asset prices. This suggestion is backed up by evidence Liu et al., (2022), through which the author concludes that the risk of the pandemic spreading to international stock markets can last for about six (06) to eight (08) months. Another financial risk that pandemics pose is liquidity challenges for businesses. As businesses face decreased revenues and profitability, they may struggle to meet their short-term obligations, leading to liquidity challenges. It has been experimentally demonstrated that even in big economies like the United States, the corporate sector tries to neutralize the liquidity issues of cash flow shocks during COVID-19 by increasing cash reserves through the issuance of long-term loans (Almeida, 2021).

The outbreak of pandemics, including but not limited to COVID-19, has led to unprecedented financial risks for businesses, governments, and individuals. Past literature provides evidence of the financial impact of pandemics on the global economy. Kim et al. (2013) highlighted that the 2009 H1N1 influenza pandemic had a significant impact on the global economy, with losses estimated at \$1.09 billion. Similarly, another study by McKibbin and Sidorenko (2006) showed that the economic impact of a severe pandemic could result in a 5% reduction in global GDP. Despite the well-documented macroeconomic impacts, a comprehensive synthesis of the micro-

level financial risks faced by firms and the practical risk management strategies they employ during pandemics is absent from the literature. The existing body of knowledge is fragmented across different pandemics, sectors, and risk types. Therefore, a scoping review is necessary to systematically consolidate this dispersed evidence, identify dominant themes and gaps, and provide a clear agenda for future research to develop evidence-based financial risk management frameworks for pandemic contexts.

. A scoping review is, therefore, necessary to provide a systematic analysis of the existing literature on financial risk management during pandemics. Such a review can help identify the current best practices and potential gaps in knowledge, as well as key areas for future research to improve financial risk management strategies during pandemics. The findings from this review can help inform effective financial risk management strategies during pandemics, thus safeguarding the financial stability of institutions and individuals.

1.1 Objectives of the study

In the guise of a Scoping Review, this research explores insights into financial risk management during pandemics. To achieve that, researchers developed three (03) main objectives in this study as follows.

1. To identify and categorize the types and levels of financial risks evidenced during past pandemics.
2. To examine the financial risk management models and frameworks utilized by firms during past pandemics.
3. To assess the novel challenges in financial risk management and future readiness posed by the COVID-19 outbreak.

2. Methods

2.1 Approach

Preliminary review revealed no comprehensive synthesis of financial risk management during pandemics. Given heterogeneous findings and complexity, a systematic review is unsuitable (Arksey & O'Malley, 2005). This study employs a scoping review to map literature, identify concepts, theories, evidence, and gaps. Scoping reviews have grown significantly since 2012, driving research agendas (Tricco et al., 2016). This approach is particularly suited for exploring

broad, complex questions where the literature is diverse and emerging, allowing for the mapping of key concepts and the identification of evidence gaps (Munn, et al., 2018).

2.2 Scoping review questions

In light of the results of the preliminary research, the following research questions were developed for the scoping review:

RQ01: What types and levels of financial risks were identified and categorized during the past pandemics?

RQ02: What are the financial risk management models or frameworks that used during past pandemics?

RQ03: Is the COVID-19 outbreak still making new challenges in financial risk management and future readiness next normal?

2.3 Searching

2.3.1 Eligibility criteria

To focus on relevant documents, inclusion and exclusion criteria were established. Inclusion criteria: (i) studies on financial risk management during pandemics, (ii) English-language articles, (iii) publications from 1990 to 2024. The review aimed to explore research questions from the 1918 Spanish Flu pandemic (Morens et al., 2009), but digital database availability limited the scope to post-1990 studies. Only peer-reviewed journal articles were included, ensuring quality and reliability, as they are considered the most relevant source for scoping reviews (Tricco et al., 2018). Exclusion criteria: (i) non-research formats (e.g., letters, editorials, news), (ii) articles without abstracts, full texts, citations, or references, (iii) non-English articles, (iv) unclear or inconclusive studies, (v) poorly designed studies, (vi) non-financial risk studies, and (vii) studies not addressing the research objectives. While the research aim was conceptually broad, the practical scope of the review was constrained to literature from 1990 onwards due to the limited digital availability of peer-reviewed articles on earlier pandemics. This temporal limitation is formally acknowledged in the study's limitations section.

2.3.2 Information sources and search strategy

Five databases (Scopus, EBSCO Host, Emerald, JSTOR, Taylor & Francis) were searched from 1990 to 2024 using consistent search techniques. Keywords were identified through brainstorming, and Boolean operators created the search algorithm. Search strings were applied to title and abstract fields, with searches repeated twice. Relevant sources and keywords were refined from initial results.

Table I. Summary of thematic analysis

Main Theme	Sub Themes	Example Quotes from Articles
Competition, Profitability and Financial Risk	Risk-taking behaviors	"This study examines the relationship between competition, capital growth, and risk-taking of banks in emerging markets, especially in the context of the COVID-19 pandemic." (Mateev et al., 2021) "In the case of the Romanian banking system, the impact of risk exposure and competition on profitability during the COVID-19 pandemic was analyzed." (Dinu & Bunea, 2022)
Financial Risk Management models, frameworks and strategies	Financial market response	"This paper investigates the effects of COVID-19 on the Chinese stock market using high-frequency data." (Wang et al., 2021) "The study examines the impact of epidemics on Chinese firms' stock returns, particularly in the context of COVID-19." (Nguyen et al., 2021)
	Anti-crisis measures	"This paper explores the financial risks of agro-industrial complex enterprises during the pandemic and examines the implementation of anti-crisis measures to reduce the risks." (Yanyshyn et al., 2020)
	Financial stability and pre-risk management/ control	"This paper analyzes the effect of ex-ante risk management practices on financial stability during the COVID-19 pandemic in Vietnamese firms." (Nguyen & Dinh, 2021)
	Financial effects	"This paper investigates the financial effects of highly pathogenic avian influenza outbreaks on Turkish broiler producers." (Aral et al., 2010) "The study examines the

		financial effects of HPAI H5N1 cases on backyard poultry in the Kızılırmak Delta." (Senturk & Guler, 2014)
	Connectedness across financial markets	"This paper examines the connectedness across financial markets during the COVID-19 pandemic." (Naeem et al., 2021)
	Big data analytics for COVID-19 containment and control	"This paper examines the role of big data analytics in containing and controlling COVID-19 in South Korea." (Ahn & Wickramasinghe, 2021)
	Crisis management	"This paper discusses the lessons learned by businesses from the SARS outbreak in crisis management and the implications for future pandemics." (Day et al., 2004)
	Bayesian Network Model	"This paper proposes a Bayesian network model for China's financial risk under COVID-19 based on grey clustering." (Yan et al., 2022)

2.3.3 Search Strings for Research Questions

RQ01: (Financial OR Finance* OR Monetary) AND (risk OR uncertainty*) AND (Type* OR Category* OR Form*) AND (Degree* OR Level*) AND (types* OR classification* OR category*) AND (pandemics* OR epidemics*) NOT clinical*

RQ02: (Financial OR Finance* OR Monetary) AND (risk OR failure* OR error*) AND (management*) AND (Model* OR framework* OR Structure) AND (pandemics* OR epidemics*) NOT clinical*

RQ03: (Financial OR Finance* OR Monetary) AND (risk OR uncertainty*) AND (management*) AND (COVID-19 OR Corona) AND (Challenges) AND (Future) AND (Readiness OR Expectations OR Aspects)

2.4 Study selection process

The sample selection process followed the PRISMA-ScR guidelines (Tricco et al., 2018), ensuring systematic rigor. Five databases (Scopus, EBSCO Host, Emerald, JSTOR, Taylor & Francis) were

searched using keywords related to financial risk management during pandemics. Initial searches yielded 2,429 papers, screened by title, keywords, and abstract. Two reviewers independently assessed titles and abstracts, applying inclusion/exclusion criteria. 193 full-text papers underwent secondary screening, with discrepancies resolved through discussion. Finally, 36 studies meeting inclusion criteria were selected. The process was documented in a PRISMA flowchart, and results were exported to Zotero for de-duplication and further screening.

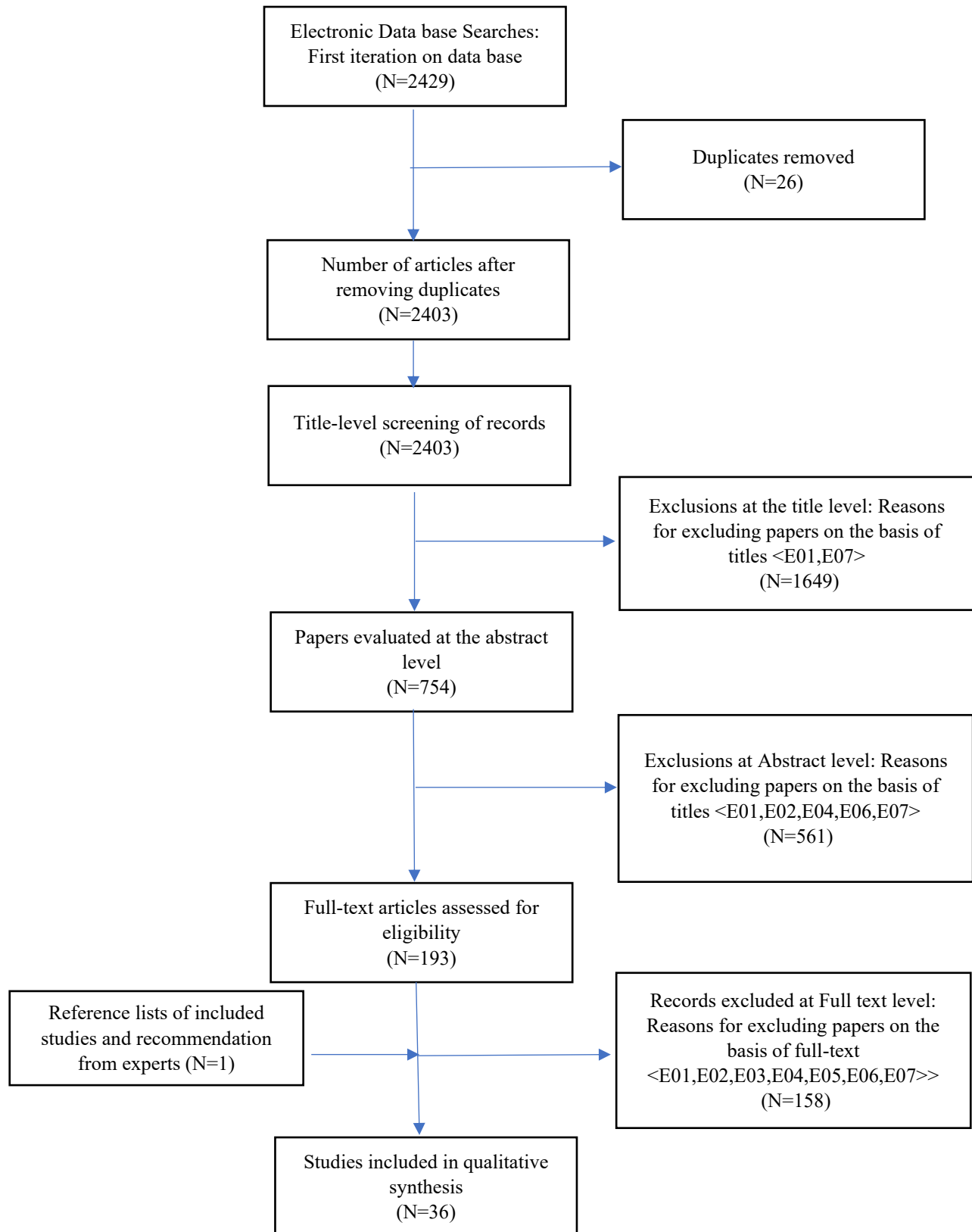


Figure 1. The Flow Diagram for the database search of publications for scoping review

2.5 Data items and data collection process

Systematic and standard data extraction is essential in scoping reviews to ensure consistent and accurate evaluation of relevant data (Peters et al., 2015). A standardized data extraction form, developed a priori, was used to extract data from selected studies, including categories such as author(s), study design, setting, population, financial risks, management models, challenges, and recommendations. A pilot test on ten studies ensured consistency, and adjustments were made based on feedback. The final dataset was compiled in Microsoft Excel for analysis.

2.6 Synthesis

Meta-synthesis is a suitable method for synthesizing scoping review results, offering a comprehensive understanding of research questions by integrating multiple studies. It involves in-depth questioning and analysis, particularly in qualitative investigations (Walsh & Downe, 2005). This study employs systematic qualitative data analysis techniques, such as thematic and content analysis. Thematic analysis, described by Braun and Clarke (2006), is flexible, simple, and adaptable to various research questions, often combined with methods like content or narrative analysis for deeper insights. Content analysis identifies and quantifies patterns in texts, and when paired with thematic analysis, provides a nuanced understanding of data (Elo & Kyngas, 2008).

3. Results

3.1 Literature Search

This scoping review paper utilized a comprehensive literature search strategy to identify relevant studies (Figure 1). Initially, a total of 2,429 articles were retrieved and eventually, 36 papers were selected for the final study.

3.2 Study characteristics

This study analyses 36 articles between years 2004 and 2024. Figure 2 shows the trend of research studies on financial risk management during pandemics throughout the period. The year 2024 cannot be regarded as a full year in terms of the number of papers released due to the times of the search delivery. The overwhelming focus on COVID-19 (29 out of 36 studies) presents a potential bias in the scoping review. While it provides deep insights into the most recent and severe pandemic, it may limit the generalizability of findings across different pandemic contexts, which can vary in their transmission mechanisms, mortality rates, and consequent economic policies. This skew in the literature underscores a significant gap: a comparative lack of empirical research

on financial risk management during other major pandemics. Consequently, the findings of this review are most directly applicable to contexts resembling the COVID-19 crisis and highlight the urgent need for more research into past and potential future pandemics to build a more robust and generalizable knowledge base.

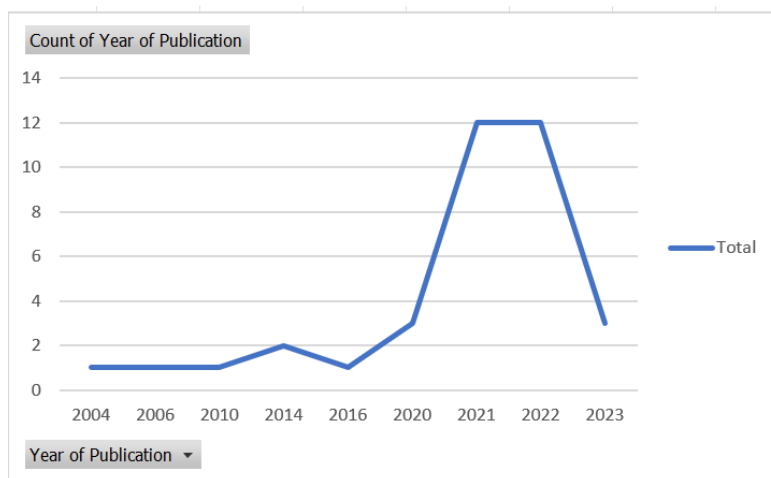


Figure 2. Annual Distribution of Included Studies (2004-2023)

When considering the types of pandemics for the current study, it appears that the majority of studies (29 out of 36) focused on the COVID-19 pandemic. This is not surprising given the ongoing worldwide repercussions of COVID-19 and the critical need for comprehension of its effects on various aspects of society, including financial risk management. It is worth noting that only one paper was dedicated to Ebola, SARS, and HPAI H5N1, respectively. Although these pandemics are not as recent as COVID-19, they have had significant impacts on global health and the economy, and there is still much to be learned from studying their effects on financial risk management. One paper included a comparative analysis of multiple pandemics, considering all major pandemics of SARS, H5N1, H7N9, and COVID-19. This study could potentially provide valuable insights into how different pandemics impact financial risk management. It would be interesting to examine the similarities and differences between these pandemics in this regard. Overall, the summary of the pandemics covered in the scoping review suggests that the majority of studies focus on COVID-19.

Figure 3 depicts the frequency analysis of the research papers in terms of research questions, and it seems that RQ01 is the most addressed research question among the three (03). This suggests that a significant emphasis has been placed on identifying and categorizing the types and levels of

financial risks that have been observed during past pandemics. On the other hand, RQ02 and RQ03 are comparatively less addressed, with 14 and 19 papers, respectively. This could suggest that there is limited research available on financial risk management models or frameworks that have been used during pandemics, as well as the ongoing challenges posed by the COVID-19 outbreak with the aspect of financial risk management and future-readiness next normal. However, it is important to note that the limited number of papers addressing RQ02 and RQ03 does not necessarily mean that these research questions are less important or relevant. Moreover, eight (08) papers address both RQ01 and RQ03, which suggests that some researchers have focused on the specific challenges posed by the COVID-19 outbreak with the grounds of financial risk management.

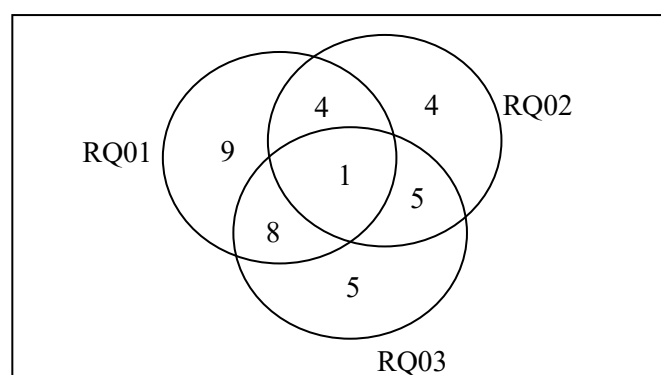


Figure 3. Coverage of Research Questions (RQs) across Included Studies.

4. Discussion

This scoping review synthesized thirty-six studies to examine the landscape of financial risk management during pandemics. The analysis, structured around the three research questions, reveals a complex interplay of heightened financial risks and the evolving strategies employed to mitigate them. The following discussion synthesizes these findings thematically.

4.1 Types and Levels of Financial Risk

The evidence conclusively demonstrates that pandemics precipitate significant and multifaceted financial risks, with credit risk emerging as the most prominently emphasized across the literature (Telg et al., 2023; Colak & Oztekin, 2021; Gong et al., 2021). The primary driver for this is the

severe disruption to global supply chains and a sharp decline in consumer demand, which cripples firm cash flows and impairs their ability to service debt, thereby increasing default probabilities (Wang et al., 2021; Craighead et al., 2020).

Closely linked are acute liquidity risks. Firms facing decreased revenues struggle to meet short-term obligations, a challenge noted even in large economies where corporations responded by raising cash reserves through long-term debt (Almeida, 2021). This pandemic-induced shock temporarily reduced market liquidity, affecting key metrics like the bid-ask spread (Gofran et al., 2022). The ambiguity and sustainability of liquidity management were particularly pronounced in high-stress sectors like healthcare (Kosmala, 2021).

Furthermore, pandemics exacerbate market risks, leading to increased volatility, spillover effects, and contagion across international financial markets. Liu et al., (2022) found that pandemic-driven risk in international stock markets can persist for six to eight months, while others documented increased connectedness and cross-market spillovers during COVID-19 (Naeem et al., 2021; Xie et al., 2023). Studies on China's financial market provided micro-evidence of this, showing lower stock returns and higher volatility (Wang et al., 2021), a pattern consistent with earlier pandemics like SARS (Loh, 2006).

A critical synthesis finding is that the level of financial risk is not uniform. It varies significantly by sector and economic actor. The banking, agro-industrial, and poultry sectors were found to be highly vulnerable, facing disrupted supply chains and solvency problems (Mateev et al., 2021; Yanyshyn et al., 2020; Aral et al., 2010; Senturk & Guler, 2014). Conversely, some sectors, such as aquaculture and sea freight transport in Turkey, demonstrated notable resilience. Despite high leverage, the aquaculture sector reported lower financial risk exposure (Erol, 2022), and the sea freight sector performed well due to easy access to money markets and a stable working capital structure (Erol, 2023). This suggests that sector-specific characteristics, such as digitization, asset liquidity, and supply chain elasticity, are key determinants of financial risk. At the individual level, financial risk was disproportionately borne by those with lower income and fewer financial resources (Stockemer et al., 2022), highlighting the socio-economic dimension of pandemic financial risk.

4.2 Financial Risk Management Frameworks and Strategies

In response to these heightened risks, the literature identifies a suite of management strategies operating at different levels.

At the macro-governmental level, intervention was a dominant theme. Government support programs, particularly loan guarantees and debt relief, were consistently highlighted as crucial mechanisms for mitigating credit risk and stabilizing corporate finances (Telg et al., 2023; Hudelcu, 2020). These actions were essential in providing the liquidity needed to prevent widespread insolvencies.

At the organizational level, the importance of crisis management planning and preparedness was a key lesson, notably from the SARS outbreak (Day et al., 2004). Firms were advised to develop contingency plans and invest in technologies enabling remote work to maintain operational continuity and mitigate financial and operational risks (Tavares et al., 2021). Furthermore, the cultivation of financial slack was identified as a critical buffer against liquidity shocks (Kosmala, 2021).

The role of technology and data analytics emerged as a powerful tool for management and control. Big data analytics was pivotal in containing the pandemic itself in South Korea, which indirectly mitigated broader economic risks (Ahn & Wickramasinghe, 2021). From a modeling perspective, advanced techniques like Bayesian networks were proposed to predict financial risks under the high uncertainty of COVID-19 (Yan, Feng, et al., 2022), while other studies highlighted the risk-mitigating role of socially responsible investments (SRI) in portfolio diversification (Diaz et al., 2022).

The relationship between competition and risk-taking also informed risk frameworks. In highly competitive environments, such as emerging market banking, firms tended to take on more risk, potentially amplifying systemic financial risks during a crisis (Mateev et al., 2021; Dinu & Bunea, 2022).

4.3 COVID-19 Specific Challenges and Future Readiness

The COVID-19 pandemic underscored and amplified existing challenges while creating new ones for financial risk management. Its impact was truly global, testing the stability of banking sectors in emerging markets (Liu, Xu, & Jiang, 2021) and affecting connectedness across all major financial markets (Naeem et al., 2021). The pandemic forced a reevaluation of future readiness,

emphasizing the need for robust ex-ante risk management practices. Vietnamese firms with such practices in place were found to have enjoyed greater financial stability during the crisis (Nguyen & Dinh, 2021).

The crisis also spurred innovation and adaptability. Firms were observed to become more entrepreneurial despite pandemic-related barriers (Namatovu & Larsen, 2021), and high-quality auditing was identified as a mechanism to inhibit crisis-induced earnings management (Yan, Liu, et al., 2022). The pandemic revealed critical vulnerabilities in global systems, such as the international supply chain, prompting the development of new risk evaluation indices to estimate and reduce exposure in supply chain finance (Huo et al., 2022; Jana, 2022). Ultimately, the findings suggest that future readiness requires a comprehensive, multi-layered, and adaptive approach that accounts for the interconnectedness of global finance and the evolving nature of pandemic risks.

4.4 Towards an Integrative Framework for Pandemic Financial Risk Management

Synthesizing the findings from this review, we propose a conceptual framework for understanding financial risk management during pandemics. This framework operates at three levels:

Level 01: Macro (Governmental) Level: The primary role is to provide stability through fiscal and monetary policies (e.g., loan guarantees, liquidity injections) to mitigate systemic credit and liquidity risks.

Level 02: Meso (Organizational) Level: Firms must engage in ex-ante preparedness through crisis management planning, financial contingency funds (slack), and digital transformation to enable operational resilience. During a pandemic, this shifts to active management using real-time data analytics and adaptive strategies.

Level 03: Micro (Individual/Investor) Level: Risk exposure is highly uneven, dictated by income and sector. Strategies here include personal financial planning and, for investors, portfolio diversification into assets proven to be resilient (e.g., SRI during COVID-19).

This multi-level framework highlights that effective financial risk mitigation during a global health crisis is not the responsibility of a single entity but requires a coordinated effort across the economic ecosystem, informed by continuous learning from past events.

5. Limitations

This scoping review has several limitations. First, the inclusion of only English-language publications may have introduced language bias, potentially omitting relevant studies in other languages. Second, as previously noted, the practical scope was limited to literature from 1990 onwards, excluding historical analyses of earlier pandemics like the 1918 Spanish Flu. Third, the heavy reliance on COVID-19 literature may affect the balance and generalizability of the findings. Finally, by focusing solely on peer-reviewed journal articles, the review may have excluded valuable insights from grey literature, such as industry reports, which could provide more practical, real-world perspectives.

6. Conclusion

In conclusion, the summarized articles in this study highlight the diverse and complex nature of financial risks during pandemics and suggest that effective risk management strategies and anti-crisis measures are essential for minimizing the financial risks faced by different sectors of the economy. The articles also emphasize the importance of data analytics, crisis management planning, and preparedness in managing and controlling pandemics and their financial risks. Further, this scoping review emphasizes the insights into different financial risk management frameworks for different sectors during pandemics. The articles highlight the importance of risk categorization, ex-ante risk management, crisis management frameworks, and big data analytics in controlling financial risks during pandemics. Some articles also suggest that competition and risk-taking affect financial risks. However, some articles are limited to specific sectors or regions and may not be generalizable to other sectors or regions. Additionally, some articles lack empirical evidence to support their frameworks or models. Future research should prioritize empirical and comparative studies to test the effectiveness of the identified risk management strategies (e.g., big data analytics, government support programs) across different sectors and pandemic contexts. Specifically, there is a need for: 1) longitudinal studies on the long-term financial resilience of firms that employed specific strategies during COVID-19; 2) comparative case study analysis of financial risk management during non-COVID-19 pandemics; and 3) the development and validation of quantitative models for predicting sector-specific financial vulnerability during health crises. In conclusion, the reviewed articles provide a diverse range of insights into the effect of the COVID-19 pandemic on financial risk management and future readiness. Some of the key

themes that emerge from these articles include the value of risk management practices, the need to consider the interconnectedness of financial markets, the impact of the pandemic on different sectors and regions, and the role of policy in mitigating financial risks. Overall, the findings suggest that the pandemic continues to pose significant challenges to financial risk management and that future readiness requires a comprehensive and adaptive approach that accounts for the evolving nature of the pandemic.

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