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# Scientometric Analysis of Global Financial Risk Management Based on VOSviewer

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**ABSTRACT**

This study conducts a scientometric analysis of global financial risk management research to map its intellectual structure, thematic trends, and collaboration networks over the period 2000–2025. Data were retrieved from the Scopus database using a comprehensive search strategy and analyzed with VOSviewer to visualize co-authorship patterns, country collaborations, keyword co-occurrences, thematic clusters, and temporal developments. The results indicate that *risk management*, *risk assessment*, and *financial markets* remain the most influential and frequently studied topics, while emerging themes such as *sustainability*, *decentralized finance*, *cryptocurrency*, and *supply chain resilience* reflect the field's adaptation to evolving technological, economic, and environmental challenges. Collaboration analysis highlights the dominance of countries such as China, the United Kingdom, and India, alongside increasing participation from emerging economies. The study offers practical implications for policymakers and financial practitioners to align strategies with current research priorities, and theoretical contributions by identifying conceptual linkages and emerging research fronts. Limitations include reliance on a single database and the inherent biases of citation-based analysis.



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## 1. INTRODUCTION

Over the past two decades, the global financial landscape has been characterized by unprecedented volatility, driven by factors such as technological innovation, rapid globalization, and recurring economic crises [1]. Financial risk management has thus emerged as a crucial discipline for mitigating threats related to credit risk, market fluctuations, liquidity constraints, and operational uncertainties [2], [3]. The 2008 global financial crisis, the European sovereign debt crisis, and the recent disruptions caused by the COVID-19 pandemic have underscored the need for robust, adaptive, and data-driven risk management strategies [4]. These events not only reshaped regulatory frameworks, such as Basel III, but also triggered an expansion in academic research, aiming to enhance the theoretical and practical tools available for managing risks in dynamic economic environments.

The proliferation of academic publications in the field of financial risk management reflects its growing importance

in both scholarly discourse and industry practice. Researchers have explored a wide range of topics, from quantitative risk modeling and stress testing to qualitative approaches that integrate behavioral finance and governance considerations [5]. Furthermore, the increasing complexity of financial products, cross-border transactions, and interconnected markets has created an urgent demand for interdisciplinary studies that blend finance, economics, information technology, and policy analysis. These converging disciplines contribute to a deeper understanding of how risk emerges, propagates, and can be effectively mitigated at both the micro and macro levels [6], [7].

Scientometric analysis has become a valuable method for mapping the intellectual structure, research trends, and thematic evolution of scholarly work in financial risk management. Unlike traditional literature reviews, which may be limited in scope, scientometric approaches employ bibliometric data and visualization tools to reveal hidden patterns in authorship networks, country collaborations, keyword co-occurrences, and citation impacts. The advent of powerful tools such as VOSviewer allows for comprehensive and systematic exploration of global research output, offering insights into influential studies, emerging themes, and collaborative linkages among institutions and nations.

In recent years, global research in financial risk management has also been shaped by emerging challenges such as climate-related financial risks, cybersecurity threats, and the growing adoption of artificial intelligence in financial decision-making. These developments have not only expanded the scope of the field but have also created new intersections between traditional finance literature and sustainability, technology, and regulatory innovation. Such a broadening of thematic coverage makes scientometric analysis an especially useful approach to track the changing dynamics and to identify gaps in the literature that merit further exploration.

The growing emphasis on evidence-based policymaking further underscores the relevance of scientometric studies [8], [9], [10]. By mapping the global research landscape, policymakers, academics, and practitioners can better understand how scientific knowledge is distributed, which areas receive the most scholarly attention, and where new initiatives or collaborations may be needed. For the financial sector, where rapid and informed decision-making is vital, such evidence can guide strategic planning, regulatory reforms, and capacity building, ensuring that risk management practices remain aligned with global best standards.

Despite the growing volume of literature on financial risk management, there remains a lack of comprehensive, data-driven mapping of the field's global intellectual structure. Previous studies have often been limited to narrative reviews or region-specific analyses, providing only fragmented insights into the evolution of themes, the most influential works, and the extent of international collaboration. Without a scientometric overview, stakeholders may overlook emerging trends, underexplored areas, or potential opportunities for cross-border research that could strengthen the collective ability to manage global financial risks. This study aims to conduct a scientometric analysis of global financial risk management research using VOSviewer, with the goal of identifying key research trends, thematic clusters, influential publications, and collaboration networks among authors, institutions, and countries.

## 2. METHODS

This study employs a scientometric approach to systematically analyze the global research landscape in financial risk management. Scientometric analysis was selected because it enables quantitative mapping of scholarly output, revealing the structure, trends, and patterns of research in a given field. The data source for this study is the **Scopus** database, chosen for its extensive coverage of peer-reviewed journals, conference proceedings, and other academic publications across multiple disciplines. The search query was designed to capture publications related to "financial risk

management," incorporating variations and synonyms such as "risk assessment in finance," "credit risk management," "market risk," and "liquidity risk." Boolean operators (AND, OR) and field-specific filters (title, abstract, keywords) were applied to ensure both relevance and comprehensiveness. The time frame of analysis covers publications from **2000 to 2025**, enabling the identification of long-term trends and recent thematic shifts.

Following data retrieval, the bibliographic records, including authors, publication titles, abstracts, keywords, affiliations, and citation counts, were exported in a format compatible with VOSviewer (.csv or .txt). Prior to analysis, the dataset was subjected to cleaning and standardization to remove duplicates, unify author names, and harmonize institutional and country identifiers. This preprocessing step ensured the accuracy of the visual mapping and minimized distortions caused by inconsistencies in metadata

Visualization and network mapping were conducted using **VOSviewer**, a widely used software for bibliometric analysis. The software's capabilities were employed to generate co-authorship maps, keyword co-occurrence networks, and citation-based clustering of research topics. In the keyword analysis, a threshold was set to include only terms appearing a minimum number of times (ten occurrences) to ensure thematic relevance. Clustering techniques in VOSviewer were applied to identify major research themes, their interconnections, and their temporal evolution.

## 3. RESULTS AND DISCUSSION

### *Co-Authorship Analysis*

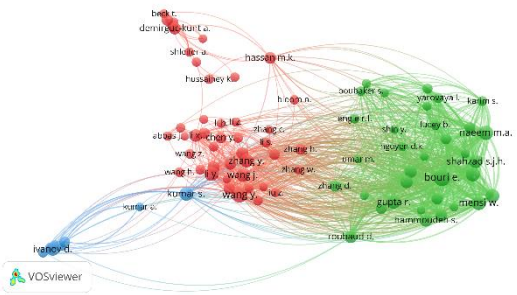


Figure 1. Author Visualization

Source: Data Analysis

Figure 1 illustrates the co-authorship network in global financial risk management research, revealing three distinct clusters of collaborating authors. The **green cluster**, positioned to the right, appears to be the largest and most interconnected, featuring influential authors such as *Bouri E.*, *Yarovaya L.*, and *Naeem M.A.*, indicating strong collaborative ties and a concentration of impactful research themes in this group. The **red cluster** in the center-left is moderately dense, with authors like *Zhang Y.*, *Wang Y.*, and *Bi Q.* forming the core, suggesting an active but somewhat regionally or thematically bounded research network. The **blue cluster** on the far left is relatively smaller, anchored by *Ivanov D.* and *Kumar S.*, showing fewer connections to the other clusters, which may indicate a more specialized or emerging niche in the field.

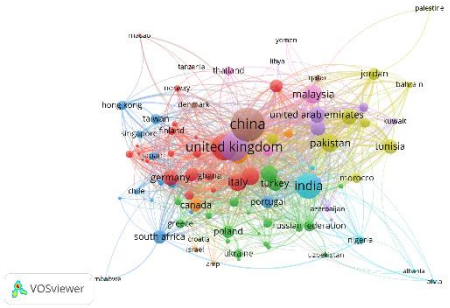


Figure 2. Country Visualization

Source: Data Analysis

Figure 2 depicts the international collaboration network in global financial risk management research, with each node representing a country and the links indicating co-authorship relationships. **China** and the **United Kingdom** emerge as the two most central and influential hubs, evidenced by their large node sizes and extensive connections to countries across all clusters. The **green cluster**, led by **India**, shows strong collaborations with countries such as Pakistan, Tunisia, and Morocco, reflecting regional and thematic alliances. The **red cluster** includes key players like Malaysia, the United Arab Emirates, and several Middle Eastern nations, indicating a focus on finance-related issues in emerging markets and Islamic finance contexts. The **blue cluster**,

anchored by the United States, Canada, and Australia, demonstrates robust ties with Europe and Asia, reflecting a diverse, global engagement.

***Keyword Co-Occurrence Analysis***

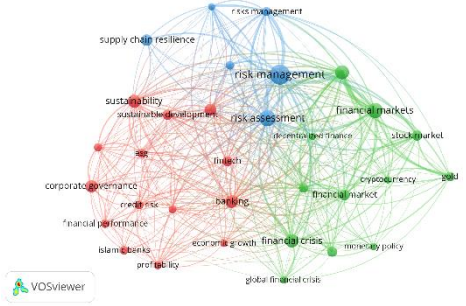


Figure 3. Network Visualization
Source: Data Analysis

Figure 3 presents three major thematic clusters in the global financial risk management literature, each representing interconnected research topics. The **blue cluster**, centered around the terms *risk management* and *risk assessment*, reflects the core conceptual and methodological foundations of the field. This cluster also includes topics like *supply chain resilience*, indicating that risk management research has expanded beyond financial institutions into broader operational and logistical contexts. The strong interconnections among these keywords suggest a focus on the practical application of risk assessment techniques and frameworks across industries, emphasizing resilience, predictive modeling, and proactive risk mitigation.

The **green cluster** focuses on the intersection between financial risk and broader economic and market mechanisms. Core terms like *financial markets*, *stock market*, *monetary policy*, and *cryptocurrency* indicate a concentration on market volatility, asset valuation, and the impacts of monetary interventions on financial stability. The inclusion of terms like *decentralized finance* (DeFi) reflects the growing interest in emerging digital asset ecosystems and their implications for risk management. The strong linkages within this cluster show that research is not only concerned with identifying risks but also with understanding how macroeconomic policies and technological innovations reshape financial risk landscapes.

The **red cluster** encompasses themes closely related to corporate and institutional financial practices, such as *corporate governance*, *credit risk*, *banking*, and *financial performance*. The presence of *Islamic banking* and *sustainability* within this cluster highlights the diversification of research into ethical finance and responsible investment frameworks. Keywords like *economic growth* and *financial crisis* further indicate that this thematic group often deals with the cyclical nature of economies, the role of governance structures in mitigating risk, and the integration of sustainability principles into financial decision-making. The dense network of connections within this cluster suggests that these topics are highly interdependent, often addressed together in multidisciplinary research.

Across the three clusters, there is significant cross-linkage, with *risk assessment* serving as a central bridging term between the blue and green clusters, and *sustainability* connecting the red cluster to the broader discourse on resilience and development. This indicates that while each cluster represents a distinct thematic focus, the field is deeply interconnected, with researchers often drawing from multiple perspectives to address complex financial risk challenges. Such integration reflects the reality of modern financial systems, where risks are multifaceted and cannot be fully understood within isolated silos.

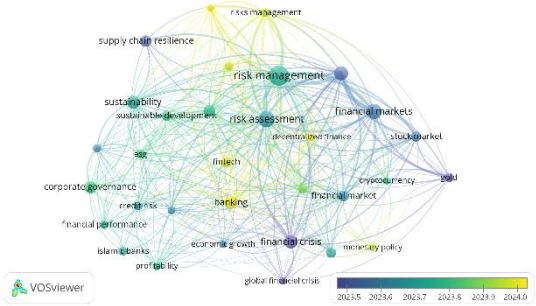


Figure 4. Overlay Visualization
Source: Data Analysis

Figure 4 displays the temporal evolution of research topics in global financial risk management, with colors indicating the

average publication year of keywords. Yellow-shaded terms, such as *risk management*, *risk assessment*, and *supply chain resilience*, represent the most recent research focus areas (2023–2025). This suggests a growing emphasis on developing advanced and adaptive risk management frameworks that address contemporary challenges like operational disruptions and systemic vulnerabilities. The central positioning of these terms highlights their role as the current intellectual core of the field, connecting both traditional financial topics and emerging themes.

Green-toned keywords, including *sustainability*, *sustainable development*, *corporate governance*, and *Islamic banking*, reflect research that gained prominence in the mid-range period (around 2020–2022). These topics indicate a shift toward integrating environmental, social, and governance (ESG) considerations into financial risk management. The positioning of *fintech* within this range shows that while digital financial technologies have been extensively studied in recent years, they continue to influence current discussions, particularly in relation to innovation, inclusion, and regulatory adaptation. These mid-period themes act as a bridge between foundational concepts and newer research priorities.

Blue-colored terms, such as *financial crisis*, *global financial crisis*, *cryptocurrency*, and *monetary policy*, represent earlier focal points in the literature (pre-2020). While these topics are foundational to understanding systemic risk, their color indicates they were more dominant in past research cycles. Nevertheless, their continued connections to newer themes suggest that historical crises, macroeconomic policy frameworks, and the evolution of financial markets remain relevant reference points for addressing modern risk management challenges.

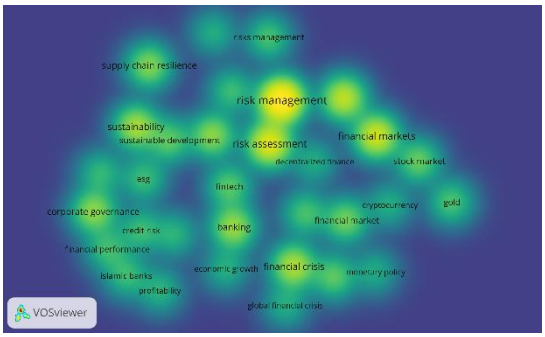


Figure 5. Density Visualization
Source: Data Analysis

Figure 5 highlights the concentration and frequency of keyword occurrences in the global financial risk management literature. Bright yellow areas, such as *risk management*, *risk assessment*, and *financial markets*, indicate the highest density of research activity, suggesting these are the dominant and most frequently studied themes in the field. Their central positioning also reflects their role as core concepts that connect diverse research topics, from market-related risks to operational and sustainability-oriented studies. The moderate-density zones in light green, such as *supply chain resilience*, *sustainable development*, and *decentralized finance*, suggest growing but still developing areas of research interest.

Lower-density areas, shown in darker green, include topics like *Islamic banking*, *corporate governance*, *cryptocurrency*, and *economic growth*. While these keywords appear less frequently than the central themes, their presence indicates niche or specialized research streams that contribute to the overall diversity of the field. The spread of these lower-density topics suggests that financial risk management research is not limited to mainstream economic and market-based risks but also explores alternative finance models, ethical governance, and emerging technological risks. This layered density pattern reveals a balanced mix between well-established research foundations and evolving frontiers in the discipline.

***Citation Analysis***

**Practical Implication**

The findings of this study offer valuable insights for policymakers, financial

institutions, and industry practitioners in shaping more adaptive and data-driven risk management strategies. By identifying the most influential research themes, such as *risk management*, *financial markets*, and *sustainability*, decision-makers can align their policies and corporate strategies with the most current and impactful areas of scholarly discourse. The results also highlight emerging topics like *decentralized finance*, *cryptocurrency*, and *supply chain resilience*, enabling practitioners to anticipate and prepare for disruptive innovations and systemic challenges. Furthermore, the mapping of country-level collaborations can serve as a blueprint for fostering stronger international partnerships, facilitating the exchange of knowledge, and enhancing the global resilience of financial systems.

**Theoretical Contribution**

This study contributes to the academic literature by systematically mapping the intellectual structure and thematic evolution of financial risk management research over the past two decades. Through scientometric analysis using VOSviewer, it advances theoretical understanding of how traditional financial risk concepts have expanded to integrate sustainability, technological innovation, and cross-sectoral resilience. The clustering and network analysis provide an empirical foundation for understanding the interconnections between macroeconomic policies, corporate governance, and market dynamics in risk management theory. Additionally, the study's identification of emerging research fronts offers a theoretical basis for future investigations, bridging gaps between established frameworks and novel, interdisciplinary approaches.

**Limitation**

Despite its comprehensive approach, this study is subject to several limitations. First, the analysis relies solely on the Scopus database, which, while extensive, may omit relevant publications indexed in other databases such as Web of Science or Google Scholar. Second, the search strategy, although designed to be inclusive, may not capture all variations in terminology related to financial risk management, potentially excluding niche studies. Third, scientometric analysis is inherently dependent on citation data, which may favor older, well-established publications over recent but impactful studies. Lastly, the use of VOSviewer visualizations, while effective for identifying trends and clusters, does not directly evaluate the quality or practical applicability of the research content, suggesting the need for complementary qualitative reviews in future studies.

## 4. CONCLUSION

This scientometric analysis of global financial risk management research, conducted using VOSviewer, provides a comprehensive overview of the field's intellectual structure, thematic evolution, and collaboration patterns from 2000 to 2025. The findings reveal that core topics such as *risk management*, *risk assessment*, and *financial markets* remain central to scholarly discourse, while emerging themes like *sustainability*, *decentralized finance*, and *supply chain resilience* reflect the field's adaptation to contemporary economic, technological, and environmental challenges. The mapping of co-authorship and country collaboration networks underscores the highly internationalized nature of the research, with significant contributions from leading economies and growing participation from emerging markets. These insights not only reinforce the theoretical foundations of financial risk management but also highlight practical pathways for policy formulation, strategic planning, and cross-border cooperation. By bridging established concepts with emerging research directions, this study offers a valuable reference point for academics, practitioners, and policymakers seeking to navigate and strengthen global financial resilience in an increasingly complex and interconnected world.

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