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A Bibliometric Analysis on ESG Risk and Financial Stability

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ABSTRACT

This study presents a bibliometric analysis of the intersection between Environmental, Social, and Governance (ESG) risk and financial stability, mapping the growth and development of research in this field. Utilizing data from Scopus, the analysis identifies key trends, influential publications, and emerging technologies within the ESG and finance domains. The study highlights the increasing recognition of ESG factors as essential to maintaining financial stability, with growing scholarly interest in integrating ESG risk into financial systems. Despite the global expansion of ESG research, certain regions, such as Turkey, Mexico, and Russia, exhibit less integration into the global network. This research aims to provide a comprehensive overview of the intellectual structure of ESG-related financial stability studies, offering insights into research gaps and future directions for policymakers, financial practitioners, and academics.

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1. INTRODUCTION

Environmental, Social, and Governance (ESG) criteria have emerged as essential dimensions for evaluating corporate performance beyond traditional financial metrics. Initially rooted in corporate social responsibility (CSR) discourse, ESG has evolved into a formalized framework that investors, regulators, and stakeholders use to assess long-term sustainability and ethical conduct of businesses [1], [2]. The increasing prominence of ESG considerations reflects a broader shift in global capital markets where non-financial risks—such as climate change, labor practices, and board diversity—are perceived as fundamentally interlinked with financial outcomes [3]. Firms that strategically integrate ESG practices are often viewed as better positioned to withstand systemic and idiosyncratic shocks, highlighting the growing importance of ESG as a risk management tool [4], [5].

The 'Environmental' component considers how companies manage natural resources, environmental impacts, and regulatory compliance, which over recent decades have gained urgency amid accelerated climate change and resource

scarcity [6]. Corporate environmental risk factors include greenhouse gas emissions, energy efficiency, waste management, and vulnerability to environmental litigation. Investors are increasingly scrutinizing these factors, recognizing that environmental risks can translate into significant financial liabilities if left unmanaged [7], [8]. Indeed, extreme weather events, carbon pricing policies, and reputational risks associated with environmental damage have underscored the financial implications of environmental factors for firms across sectors [9].

Social factors emphasize a firm's relationships with its employees, customers, suppliers, and communities. This dimension captures issues such as labor standards, workplace safety, human rights policies, and community engagement. Research indicates that positive social performance may enhance employee productivity, customer loyalty, and brand reputation [10], [11]. Conversely, social failings—such as discrimination, poor labor practices, or supply chain abuses—can trigger protests, legal actions, and larger societal backlash that damage corporate value. As such, social risk considerations have become integral to comprehensive risk assessment frameworks that aim to capture the broader ethical footprint of corporate behavior [12].

Governance refers to the internal systems and practices that guide corporate decision-making, including board composition, executive compensation, transparency, and shareholder rights. Strong governance is widely accepted as a cornerstone of sustainable business operations, as it determines how effectively a firm manages risk, enforces accountability, and responds to evolving stakeholder expectations [13], [14]. Weak governance structures have been linked to financial scandals, regulatory sanctions, and shareholder disputes, leading to amplified risk premiums and deteriorated investor confidence. Consequently, governance has become a critical factor in evaluating firm stability, particularly in contexts where regulatory environments are rapidly shifting [15].

Financial stability, traditionally measured through indicators such as liquidity, solvency, and market volatility, is increasingly viewed through the lens of ESG risk integration. While financial stability has historically been analyzed in terms of macroeconomic cycles and firm-specific financial ratios, a wealth of recent scholarship suggests that non-financial risks including ESG-related exposures play a substantive role in shaping financial resilience [16]. For instance, firms with robust ESG performance might experience more resilient stock price behavior during periods of economic stress, potentially due to stronger stakeholder trust and adaptive management practices. Conversely, firms with high ESG risk exposure may be more susceptible to rapid devaluation in crisis conditions, thereby exerting systemic pressure on financial markets [17].

Bibliometric analysis, a quantitative method for evaluating research outputs and trends, has become indispensable for mapping the evolution of academic inquiry within a domain. This approach leverages large-scale datasets of publications, citations, and co-authorship networks to identify knowledge structures, research frontiers, and intellectual contributions over time [18]. Bibliometric studies on ESG and finance have provided insights into publication growth patterns, influential authors and institutions, thematic clusters, and research gaps. However, despite the proliferation of ESG research, there remains a fragmented understanding of how ESG risk and financial stability intersect at the global research level, necessitating a comprehensive bibliometric review to synthesize existing scholarship and illuminate future directions.

Despite the rapid expansion of literature connecting ESG risk factors with financial performance and stability, there is an evident gap in systematic assessments that comprehensively synthesize how these research streams converge and evolve over time. Previous reviews have largely focused on isolated aspects of ESG—such as environmental impacts on firm value or governance practices in specific markets—but

few have undertaken a holistic bibliometric exploration that identifies macro-level patterns, influential contributors, and emergent thematic clusters across the entire ESG–financial stability nexus [19], [20]. As a result, stakeholders including academics, policymakers, and financial practitioners lack a clear, data-driven overview of the intellectual structure of this field, hindering effective knowledge integration and future research prioritization (Patel & Barrios, 2021). This fragmentation poses a significant challenge for the development of coherent theoretical frameworks and practical applications that align ESG risk considerations with financial stability objectives in both corporate governance and regulatory contexts. The objective of this study is to conduct a rigorous bibliometric analysis of global research on ESG risk and financial stability, with the aim of mapping publication trends, identifying influential authors and institutions, and revealing thematic patterns and future research directions.

2. METHODS

This study employs a bibliometric research design to systematically analyze the scholarly literature on ESG risk and financial stability. Bibliometric analysis is a quantitative approach that examines patterns in academic publications using statistical and network-based techniques to evaluate research productivity, influence, and thematic evolution [18]. This method is particularly suitable for capturing the intellectual structure of an interdisciplinary field such as ESG and finance, as it enables the identification of publication trends, citation relationships, and collaborative networks over time. By applying bibliometric techniques, this study provides an objective and replicable overview of how ESG risk and financial stability have been examined within the academic literature.

The data for this study were collected from Scopus. A structured search strategy was employed using a combination of keywords related to ESG risk (e.g., "ESG risk," "environmental risk," "social responsibility," and "corporate governance") and financial stability (e.g., "financial resilience," "systemic risk," and "financial stability"). To ensure relevance and consistency, only journal articles and review papers published in English were included, while conference proceedings, editorials, and non-scholarly documents were excluded. The final dataset was screened to remove duplicates and irrelevant records, resulting in a refined corpus suitable for bibliometric analysis.

Analytical procedures were conducted using VOSviewer that facilitate descriptive, performance, and science-mapping analyses. Additionally, science-mapping techniques including co-authorship, co-citation, and keyword co-occurrence analyses were used to visualize collaboration networks and thematic clusters within the literature. These techniques allowed for the identification of dominant research themes as well as emerging topics, providing a comprehensive understanding of the development and structure of ESG risk and financial stability research.

3. RESULTS AND DISCUSSION

3.1 Keyword Co-Occurrence Network

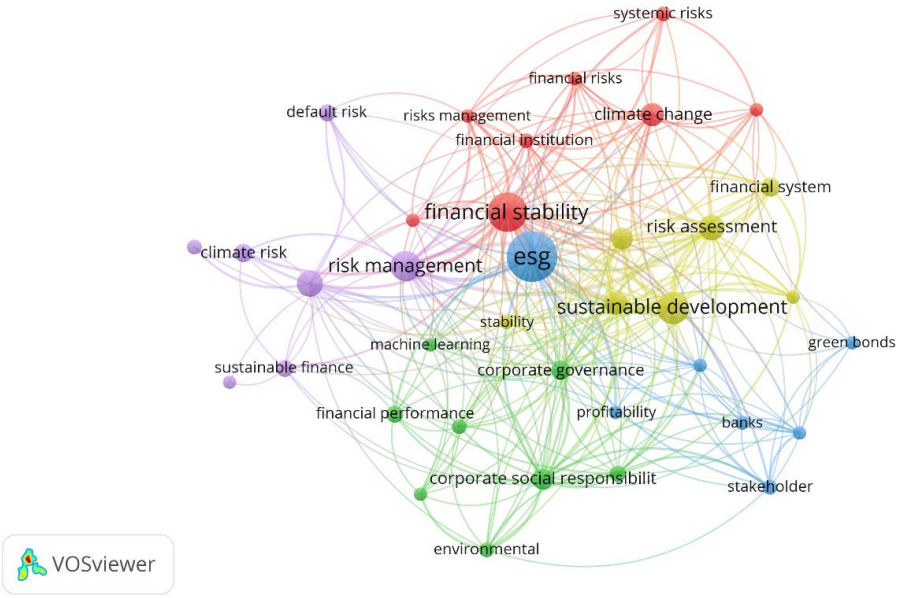

Figure 1. Network Visualization
Source: Data Analysis Result, 2026

Figure 1 presents a VOSviewer-based bibliometric analysis map that highlights the relationships and thematic clusters in the context of Environmental, Social, and Governance (ESG) risk and financial stability. The map is visualized through network analysis, where different colors represent thematic clusters, each corresponding to different concepts within ESG, risk management, and financial stability.

The central node labeled "ESG" is surrounded by a dense network of related topics, indicating the core focus of this study. The relationships between ESG and concepts such as "financial stability," "risk management," and "sustainable development" are clearly depicted through their overlapping connections. The proximity of these terms to ESG demonstrates their central role in the current research landscape on ESG risk. The inclusion of "financial stability" suggests that the research is focused on understanding how ESG risks influence the overall stability of financial systems and institutions.

Additionally, the map also highlights the role of climate-related risks such as "climate risk," "climate change," and "systemic risks" within ESG research. These terms form a strong cluster that suggests that climate-related factors are major contributors to the overall risk profile of businesses and financial systems. Their prominence on the map reflects the increasing importance of addressing environmental risks in ESG frameworks, particularly in terms of how such risks impact financial stability.

The presence of "corporate governance," "corporate social responsibility," and "sustainable development" in the green cluster further emphasizes the integration of social and governance factors within the ESG domain. These factors are key to understanding how companies can manage ESG risks through their operational, governance, and social strategies to ensure long-term sustainability and profitability. The emphasis on "sustainable finance" and "green bonds" also points to the growing focus on financial instruments and strategies aimed at promoting sustainable development while maintaining financial stability.

The map also reveals the interconnectedness of different topics, such as "machine learning," "financial performance," and "profitability," with the broader ESG theme. These terms suggest that advanced technologies like machine learning are being explored as tools for assessing and managing ESG risks, particularly in relation to financial

performance and risk assessment. The integration of these technologies reflects the evolving landscape of ESG research, where financial analysis is increasingly supported by data-driven methods.

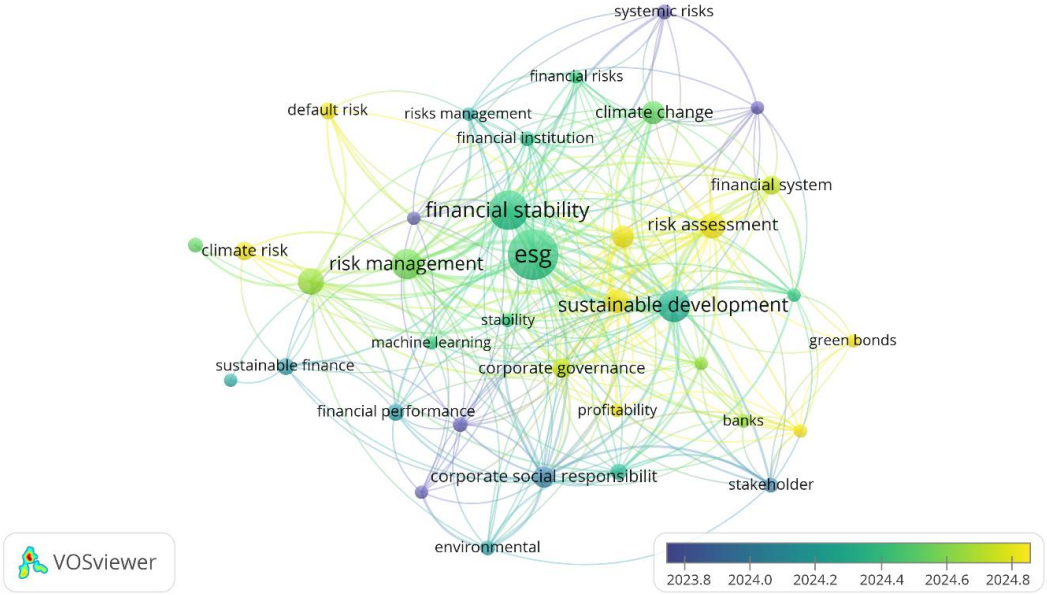

Figure 2. Overlay Visualization
Source: Data Analysis Result, 2026

Figure 2 illustrates the evolution of research themes related to ESG (Environmental, Social, and Governance) risk and financial stability over time. The color gradient in the image indicates the publication years of related studies, with earlier publications represented in a cooler color (blue) and more recent publications in a warmer color (yellow-green). The central cluster remains ESG-related concepts such as "financial stability," "risk management," and "sustainable development," reflecting the centrality of ESG as a research topic in the evolving field of finance and governance.

The map shows a notable shift in the focus of ESG research, as indicated by the color distribution around the clusters. For instance, terms like "climate risk" and "climate change" show up with a more recent emphasis, evident in their proximity to the yellow-green color spectrum. This suggests an increasing focus on environmental risks and their integration into financial risk management and stability, which has become more prominent in the last few years. Additionally, terms like "green bonds" and "sustainable finance" have emerged as important keywords in recent publications, pointing to the growing importance of financial mechanisms designed to promote sustainability.

There is also a clear emphasis on "corporate governance" and "corporate social responsibility," which are found in the green cluster associated with sustainable development. These terms have gained more attention in recent years as companies are increasingly held accountable for their environmental and social impacts. The increasing number of studies related to these topics, along with "stakeholder" and "financial performance," suggests that ESG issues are being integrated into broader financial and organizational strategies. The rising interest in "machine learning" further indicates the role of advanced technology in analyzing ESG risks and financial stability, aligning with modern data-driven approaches to finance.

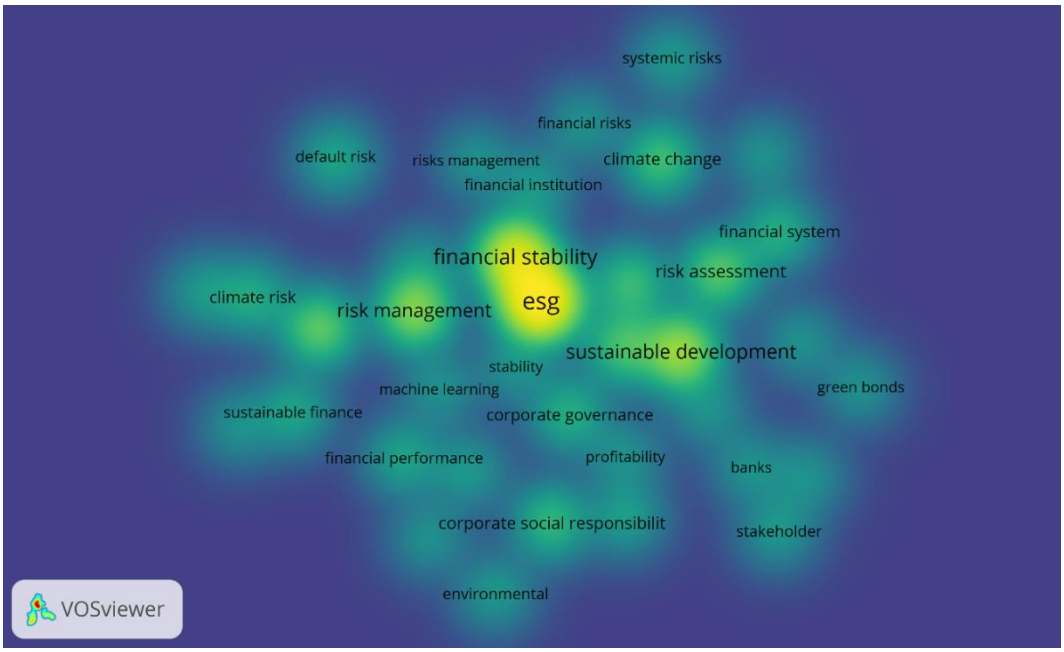

Figure 3. Density Visualization
Source: Data Analysis Result, 2026

Figure 3 provides a clearer representation of the intensity of research themes within ESG risk and financial stability. The central cluster, marked by "ESG" and "financial stability," stands out in bright yellow, indicating that these are the core concepts of the analysis, with extensive research surrounding them. The surrounding areas, marked in green, suggest a high density of connections to topics like "risk management," "sustainable development," and "financial system." The heatmap's intensity highlights the prominence of these themes in the current body of literature, showing that ESG-related financial stability concerns have garnered substantial attention.

In addition, the map reveals clusters of related keywords such as "climate risk," "corporate governance," and "machine learning," which are gradually gaining importance in the discourse. These keywords are less prominent than the core concepts but still hold a significant position in the network, reflected in the green intensity surrounding them. The map underscores the interconnectedness of ESG risk with financial management, climate-related factors, and corporate governance. The growing focus on "green bonds" and "sustainable finance" also points to the increasing use of financial instruments designed to promote sustainability, illustrating how financial markets are adapting to ESG considerations.

3.2 Co-Authorship Network

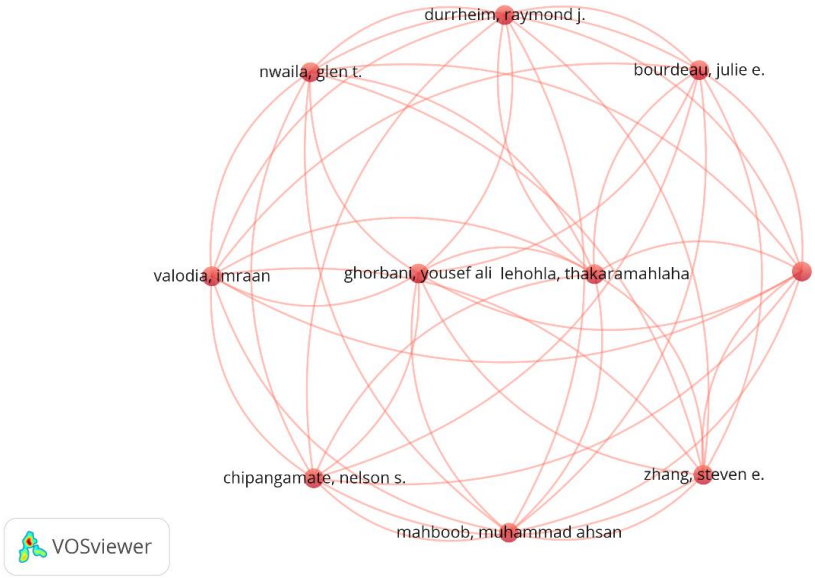

Figure 4. Author Collaboration Visualization
Source: Data Analysis Result, 2026

Figure 4 displays the co-authorship relationships between a group of researchers. Each node represents a researcher, and the connections (edges) between them indicate their collaborative work in published studies. The map shows a highly interconnected group, with many of the researchers co-authoring together on various papers, as evidenced by the dense network of links between nodes. The central position of "ghorbani, yousef ali lehlohla thakaramahlaha" and "zhang, steven e." suggests that these researchers may have been particularly central to this collaboration network, having worked with multiple other authors in the group. The overall clustering of the network suggests a collaborative and cohesive research community with shared interests and frequent joint publications.

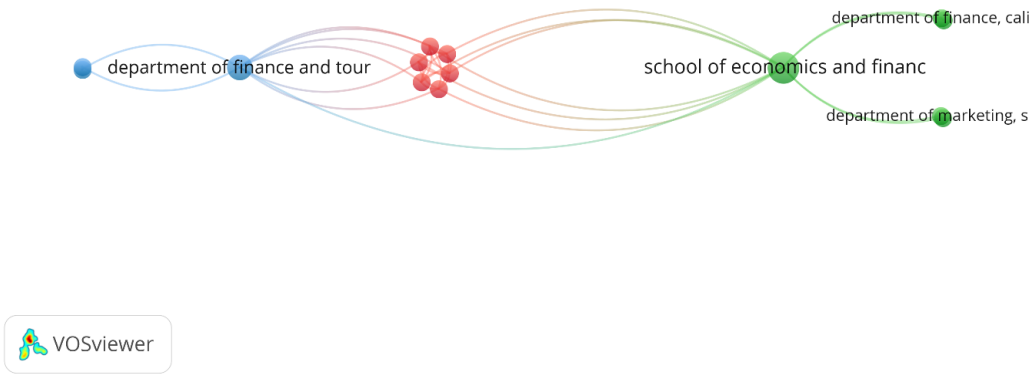

Figure 5. Affiliation Collaboration Visualization
Source: Data Analysis Result, 2026

Figure 5 visualizes the collaboration network between various academic departments within an institution, focusing on their interactions and co-authorship connections. The "Department of Finance and Tour" is positioned on the left side of the map, with several lines connecting it to other departments, particularly within the "School of Economics and Finance," indicating a strong network of collaboration between these entities. On the right side, the "Department of Finance, Call" and the "Department of Marketing" are linked, suggesting their involvement in joint research or academic endeavors. The map illustrates how different academic units, particularly related to finance, economics, and marketing, are interconnected, with a clear flow of collaborative efforts between them, as shown by the colored connections. The overall structure suggests an academic environment where finance-related departments work together frequently, sharing resources and research initiatives.

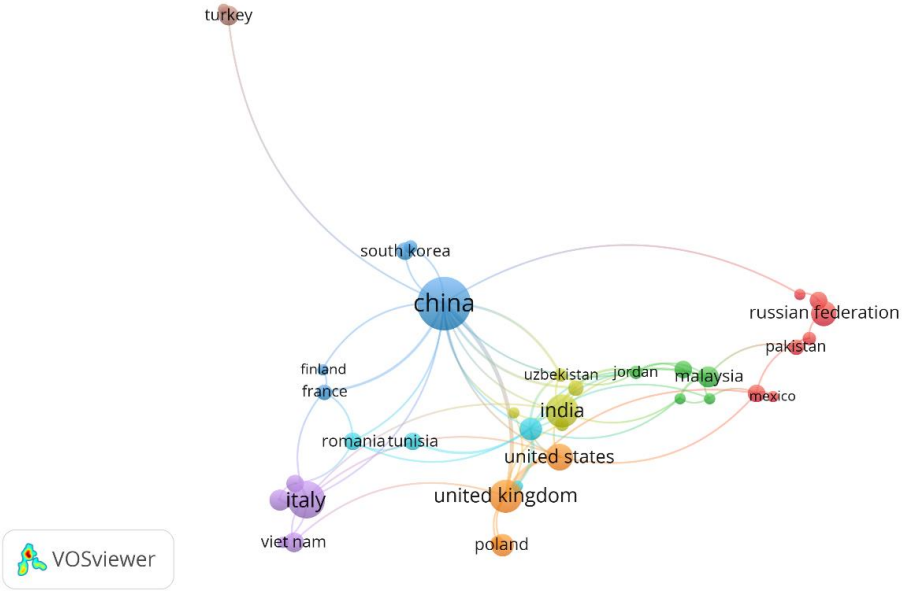

Figure 6. Country Collaboration Visualization
Source: Data Analysis Result, 2026

Figure 6 map visualizes the collaboration network between countries in a particular academic or research context. The central node, "China," is the focal point of the network, with multiple connections to countries like "South Korea," "India," "United States," and "United Kingdom," which indicates strong collaborative ties in the network. The colored edges reflect different regional groupings: countries in Asia (such as China, India, South Korea, and Malaysia) are linked with green and blue lines, while European countries like "Italy," "France," and "Poland" are grouped in purple and orange, showing their connections to other regions. Additionally, the countries on the periphery, such as "Turkey," "Mexico," and "Russian Federation," are less connected, with isolated links indicating more distant or limited collaboration. This structure suggests a global research network with strong regional connections, particularly within Asia and Europe, while other countries have fewer or more distant links.

3.3 Citation Analysis

Table 1. Top Cited Research

Citations	Authors and year	Title
151	[21]	Return and volatility connectedness across global ESG stock indexes: Evidence from the time-frequency domain analysis
144	[22]	How to design more sustainable financial systems: The roles of environmental, social, and governance factors in the decision-making process
76	[23]	The duality of ESG: Impact of ratings and disagreement on stock crash risk in China
69	[20]	ESG and systemic risk
66	[24]	Sustainability and stability: Will ESG investment reduce the return and volatility spillover effects across the Chinese financial market?
57	[25]	ESG disclosures, green innovation, and greenwashing: All for sustainable development?
53	[2]	ESG risks and corporate survival
47	[26]	Environmental, social, and governance (ESG) investing and commodities: dynamic connectedness and risk management strategies
46	[27]	Managerial perspectives on climate change and stock price crash risk
42	[28]	Sustainable investments in volatile times: Nexus of climate change risk, ESG practices, and market volatility

Source: Scopus, 2025

Discussion

The global research network on ESG risk and financial stability, as depicted in the VOSviewer map, highlights the strong collaborative connections between countries, particularly within Asia and Europe. China, positioned at the center, serves as a hub for numerous collaborations, suggesting its pivotal role in driving ESG-related research in financial stability. The high connectivity between China, India, South Korea, and the United States demonstrates the importance of cross-border collaboration in addressing complex global challenges such as climate risks, financial instability, and sustainable development. These connections indicate that major economies are increasingly recognizing the importance of integrating ESG factors into financial systems and are actively collaborating to enhance research and policy frameworks to mitigate related risks.

The regional clustering in the map further reveals the growing importance of specific countries in contributing to ESG-related studies. The strong link between European countries like Italy, France, and the United Kingdom shows the advanced research being conducted in these nations on financial regulation, sustainable finance, and corporate governance. Meanwhile, the presence of countries like Malaysia, Uzbekistan, and Jordan within the Asia and Middle East region suggests a rise in interest and research in these regions as they seek to integrate ESG practices into their financial markets. This growing body of knowledge points to a global shift toward more sustainable and responsible financial practices, with countries working together to share knowledge, expertise, and resources.

However, the isolation of certain countries such as Turkey, Mexico, and the Russian Federation on the map indicates that while they are part of the global conversation on ESG and financial stability, their contributions may be less integrated or still in the early stages. These countries may face unique challenges in aligning their financial systems with global ESG standards, possibly due to political, economic, or regulatory barriers. As the research on ESG risk and financial stability continues to expand, further strengthening collaboration between these isolated nations and more established research hubs could help create a more inclusive global framework for addressing ESG challenges and enhancing financial system resilience across regions.

4. CONCLUSION

The bibliometric analysis of ESG risk and financial stability highlights the growing global focus on integrating ESG factors into financial systems. The network of collaborations, particularly between China, South Korea, India, the United States, and several European nations, underscores the increasing recognition of ESG's critical role in maintaining financial stability and promoting sustainable development. While certain regions show strong interconnectedness, others, such as Turkey, Mexico, and the Russian Federation, remain less integrated in the global research discourse. Moving forward, strengthening international collaboration, especially with countries that are less connected to the global ESG network, will be key to building a more resilient and sustainable financial framework worldwide. This study provides valuable insights into the evolving landscape of ESG research and underscores the importance of collective global efforts in addressing the multifaceted risks that impact financial stability.

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