

A Bibliometric Review of the Relationship between Sustainability Accounting and Financial Risk

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ABSTRACT

This study conducts a comprehensive bibliometric analysis of the field of sustainability accounting and financial risk management, examining thematic clusters, research trends, research opportunities, and author collaborations from 1990 to 2024. Through an extensive review of literature and citation data, key thematic areas such as integrated reporting, environmental risk, and the financial impact of ESG factors were identified. Temporal trend analysis revealed an increasing focus on transparency in sustainability disclosures and the integration of corporate social responsibility into corporate risk management. Opportunities for further research were highlighted in underexplored areas including green accounting and the incorporation of non-financial risks into financial sustainability frameworks. Additionally, an examination of author networks provided insight into the collaborative dynamics among leading scholars, identifying core research groups and potential areas for new interdisciplinary studies. This study provides a structured overview of the scholarly landscape, identifying pivotal trends and gaps, thereby setting a foundation for future academic inquiries and practical applications in sustainability and financial risk management.

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1. INTRODUCTION

Sustainability accounting has emerged as a pivotal field that integrates environmental and social governance (ESG) factors into traditional financial reporting [1], [2]. The growing global concern over sustainable development has pressured organizations to become more transparent about their environmental impacts and sustainability practices [3]. This shift has led

to an increased demand for accountability in sustainability initiatives, necessitating a robust mechanism to measure, report, and analyze sustainability-related data [4]. Furthermore, as investors and stakeholders increasingly consider ESG criteria in their decision-making processes, the role of sustainability accounting in financial risk management has become more pronounced [5].

In the realm of financial risk management, sustainability accounting plays a crucial role by identifying potential financial risks associated with environmental and social issues [6], [7]. Companies face various risks—regulatory, reputational, and operational—that can significantly impact their financial status [8]. By integrating ESG factors into their risk assessment models, companies can foresee potential risks and opportunities, leading to more informed decision-making [9]. This proactive approach helps in mitigating risks before they escalate into financial losses, thereby stabilizing the company's economic position in the volatile market [10].

However, the intersection of sustainability accounting and financial risk is complex and multifaceted, involving various stakeholders with different priorities and expectations [11]. The literature on this subject is expansive yet dispersed, with studies focusing on diverse aspects and outcomes of integrating sustainability into financial risk management [12]–[15]. A bibliometric review of this literature can provide a comprehensive understanding of the field's development, key themes, and research gaps. Such an analysis is instrumental in synthesizing existing knowledge, identifying trends, and setting directions for future research.

Despite the critical importance of sustainability accounting in financial risk management, there remains a substantial gap in understanding the comprehensive landscape of existing research. Studies often address narrow facets of the relationship, lacking a holistic view that encompasses various dimensions such as regulatory frameworks, market responses, and strategic management implications. This fragmented approach hinders the development of integrated strategies that leverage sustainability accounting to enhance financial risk management effectively. Therefore, there is a need for a bibliometric review that maps the existing research, identifies prevalent themes and methodologies, and highlights the most influential works and gaps in the literature.

The primary objective of this research is to conduct a bibliometric review of the literature on the relationship between sustainability accounting and financial risk. This review aims to catalog and analyze the existing studies to identify major research trends, methodological approaches, and theoretical frameworks used in this field. By doing so, the study seeks to provide a structured overview of the scholarly landscape, highlight the evolution of key concepts, and suggest areas for further investigation.

This research holds significant practical and theoretical implications. Practically, it will aid policymakers, corporate leaders, and stakeholders in understanding the critical role of sustainability accounting in mitigating financial risks. Theoretically, it will contribute to the academic literature by clarifying the relationship between sustainability practices and financial performance, thus enriching the discourse in sustainability studies. Additionally, by identifying gaps in the current research, this study will pave the way for future investigations, promoting more innovative approaches to integrating sustainability in financial risk management. This is crucial for developing resilient strategies that safeguard both environmental integrity and economic stability.

2. LITERATURE REVIEW

2.1 *Sustainability Accounting and ESG Integration*

Sustainability accounting has evolved significantly over the past few decades, driven by increasing awareness of environmental, social, and governance (ESG) issues. [16] highlight that sustainability accounting is not just about adding environmental and social data to financial reports but involves a strategic approach to integrating ESG factors into core business operations. This integration aids in identifying and managing risks that could have

severe financial implications. Moreover, Amran et al. (2014) [17] emphasize the role of sustainability accounting in enhancing transparency and accountability, which are crucial for stakeholder trust and investment decisions. These studies suggest that robust sustainability accounting practices are essential for comprehensive risk management and long-term value creation.

2.2 Financial Risk Management and Sustainability

The linkage between sustainability practices and financial risk management is becoming increasingly evident. Recent research by [18] demonstrated that companies with higher ESG ratings often exhibit lower volatility and are better positioned to mitigate financial risks. This correlation is attributed to the proactive management of regulatory, reputational, and operational risks. Furthermore, [19] found that firms that actively disclose sustainability information tend to perform better in managing financial uncertainties, which can be seen in their superior risk-adjusted returns compared to their peers. These findings underscore the financial implications of sustainability and suggest that ESG factors are becoming critical in the strategic management of corporate risks.

2.3 Bibliometric Analyses in Sustainability and Financial Risk Literature

Bibliometric reviews have been extensively used to map the knowledge domains within various academic fields, including sustainability and financial risk. [20] conducted a comprehensive bibliometric analysis on sustainability accounting and revealed a growing interest in topics related to climate

change and carbon footprinting. Their study highlighted the dynamic nature of the field and the increasing complexity of issues addressed over time. In the context of financial risk, [21] utilized bibliometric methods to explore the evolution of research on financial markets' reactions to sustainability issues. They found significant shifts in thematic focus and methodology over the last two decades, reflecting broader changes in the regulatory and economic environments.

2.4 Gaps in Existing Research

Despite the extensive body of literature on sustainability accounting and financial risk management, several gaps remain. One major issue is the lack of empirical studies that link specific sustainability practices with quantifiable impacts on financial risk. Most studies are either theoretical or focus on case studies, which limits the generalizability of the findings. Additionally, there is a need for more research on how different industries might differ in their approach to sustainability accounting and the resultant financial risks. This industry-specific understanding could tailor strategies that are more effective in managing unique risks associated with particular sectors.

3. METHODS

This study employs a bibliometric analysis to systematically review and synthesize the existing literature on the relationship between sustainability accounting and financial risk. We sourced relevant academic papers Google Scholar, using keywords such as "sustainability accounting," "financial risk," "ESG integration," and "risk management." The search was restricted to articles published between 1990 and 2024 to capture the most recent and relevant studies. Using VOSviewer

software, we analyzed these articles to identify the most frequently occurring keywords, citation patterns, and the co-authorship networks. This methodological approach allows for a comprehensive mapping of the intellectual landscape, highlighting the predominant research themes, influential authors, and seminal works in the field. The analysis also aims to

uncover the evolution of topics over time and to detect emerging trends and gaps in the current body of knowledge, providing a foundation for future research directions.

4. RESULTS AND DISCUSSION

4.1 Research Data Metrics

Table 1. Data Citation Metrics

Publication years	1990-2024
Citation years	34 (1990-2024)
Paper	980
Citations	103031
Cites/year	3030.32
Cites/paper	105.13
Cites/author	58116.22
Papers/author	530.85
Author/paper	2.39
h-index	157
g-index	306
hI,norm	119
hI,annual	3.50
hA-index	58
Papers with ACC	: 1,2,5,10,20:798,703,512,350,203

Source: Publish or Perish Output, 2024

Table 1 presents a comprehensive set of bibliometric indicators derived from Publish or Perish for the period 1990 to 2024, encapsulating the impact of 980 published papers. Over these 34 years, the papers have amassed a total of 103,031 citations, averaging 3030.32 citations per year, which underscores the significant influence and ongoing relevance of the work in this field. Each paper, on average, received 105.13 citations, indicating robust engagement and recognition from the academic community. The high citation per author ratio of 58,116.22 reflects a substantial individual contribution to the literature, whereas the papers per author ratio of 530.85 suggests prolific authorship. The average number of authors per paper is approximately 2.39, indicative of

collaborative research efforts. Notably, the h-index of 157 and g-index of 306 emphasize the depth and breadth of impactful contributions, with the h-index reflecting that 157 papers have each received at least 157 citations. The normalized and annualized h-index values (hI,norm and hI,annual) are 119 and 3.50, respectively, highlighting consistent high-impact research output over the years. The hA-index at 58 further suggests that a significant number of articles have achieved sustained attention. The distribution of papers with accumulated citation counts (ACC) at various thresholds (1, 2, 5, 10, 20) illustrates that the majority of the works have been cited multiple times, confirming the enduring relevance and utility of the research in this scholarly area.

Table 2. Top Cited Research

Citations	Authors and year	Title
2695	[22]	Making sustainability work: Best practices in managing and measuring corporate social, environmental and economic impacts
1798	[23]	Is accounting for sustainability actually accounting for sustainability... and how would we know? An exploration of narratives of organisations and the planet
1699	[24]	Analysis for financial management
1691	[25]	One report: Integrated reporting for a sustainable strategy
1666	[26]	Assurance on sustainability reports: An international comparison
1433	[27]	Sustainability in action: Identifying and measuring the key performance drivers
1404	[28]	Corporate social performance and firm risk: A meta-analytic review
1378	[29]	Corporate social reporting and reputation risk management
1209	[30]	Corporate sustainability and innovation in SMEs: Evidence of themes and activities in practice
1196	[31]	Integrated Reporting: Insights, gaps and an agenda for future research

Source: *Publish or Perish Output, 2024*

Table 2 lists the top-cited research in the field of sustainability and financial management, as indexed by the Publish or Perish database up to 2024. The table is led by MJ Epstein's work, "Making sustainability work: Best practices in managing and measuring corporate social, environmental, and economic impacts," which has garnered 2695 citations, reflecting its pivotal role in guiding corporate sustainability practices. This is followed by R Gray's critical examination of sustainability accounting, which has received 1798 citations, highlighting its influence in challenging and refining sustainability narratives within corporate reporting. Higgins' textbook on financial analysis, despite its broad focus, has achieved 1699 citations, underscoring its

foundational importance in financial management education. Other notable entries include works by Eccles and Krzus, and Simnett et al., which discuss integrated reporting and assurance on sustainability reports, respectively, each attracting considerable academic and professional attention. The list also features studies that link sustainability with corporate social performance, innovation in SMEs, and reputation risk management, indicating a diverse range of impactful research themes that have shaped discussions and practices around sustainability in corporate contexts. Collectively, these works not only advance academic understanding but also influence practical approaches to integrating sustainability into corporate strategies.

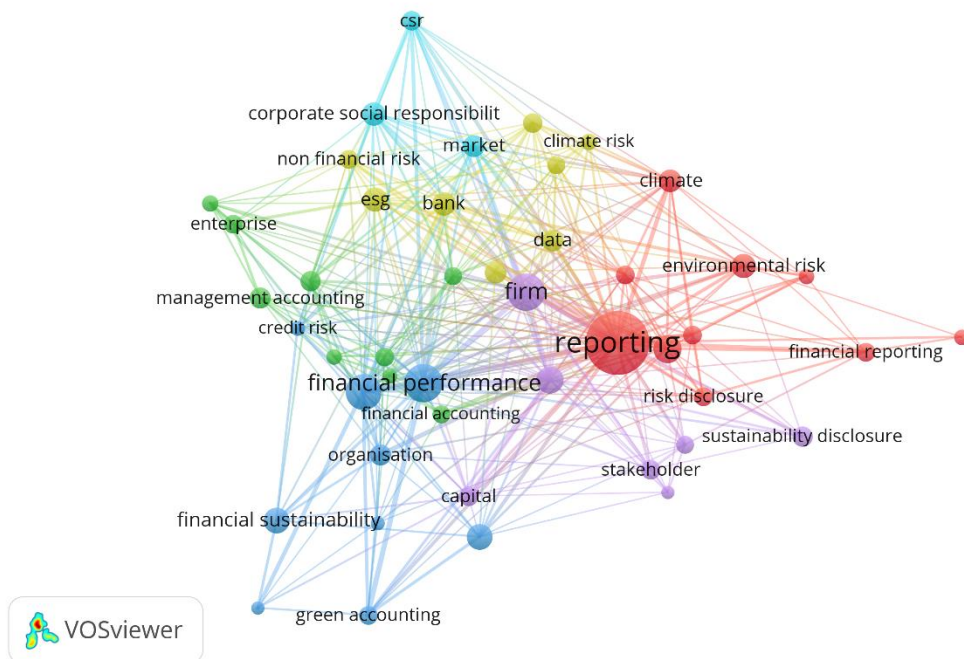


Figure 1. Network Visualization

Source: Data Analysis Result, 2024

The first figure shows a network analysis of keywords related to sustainability accounting and financial risk management, displaying the interconnectedness and thematic clusters within the field. Several clusters can be identified:

1. Green and Blue Clusters (Financial and Management Accounting) consist keywords such as: management accounting, financial performance, financial accounting, enterprise, credit risk, financial sustainability. This cluster focuses on the traditional aspects of accounting and its evolution into sustainability practices. It explores how financial and management accounting incorporate sustainability metrics and the impacts of these practices on financial sustainability and credit risk management.
2. Red Cluster (Reporting and Disclosure) consist of keywords such as: reporting, financial reporting, risk disclosure, sustainability disclosure, environmental risk. Central to this cluster are the practices and impacts of reporting—specifically how firms disclose environmental and sustainability risks. This cluster likely examines the effectiveness of these disclosures in terms of stakeholder engagement and the management of environmental risks.
3. Yellow Cluster (Corporate Social Responsibility and Market Response), consist of keywords such as: corporate social responsibility, market, climate risk, data, bank. This cluster deals with the broader market and institutional responses to corporate social responsibility initiatives, particularly focusing on how banks and other financial institutions manage data related

to climate risks and their market implications.

4. Purple Cluster (Strategic and Stakeholder Considerations) consist of keywords such as: firm, organisation, capital, stakeholder. This cluster examines the strategic management aspects within organizations concerning sustainability. It highlights the importance of capital allocation decisions and stakeholder management in fostering or hindering sustainability efforts.

The visualization suggests that these clusters, while distinct, are interconnected, indicating that issues of financial and environmental risk management, corporate responsibility, and reporting practices are not isolated but interrelated in complex ways. The nodes and their links depict how deeply integrated sustainability is within the various facets of financial and organizational management, influencing everything from corporate strategy to external reporting and stakeholder engagement.

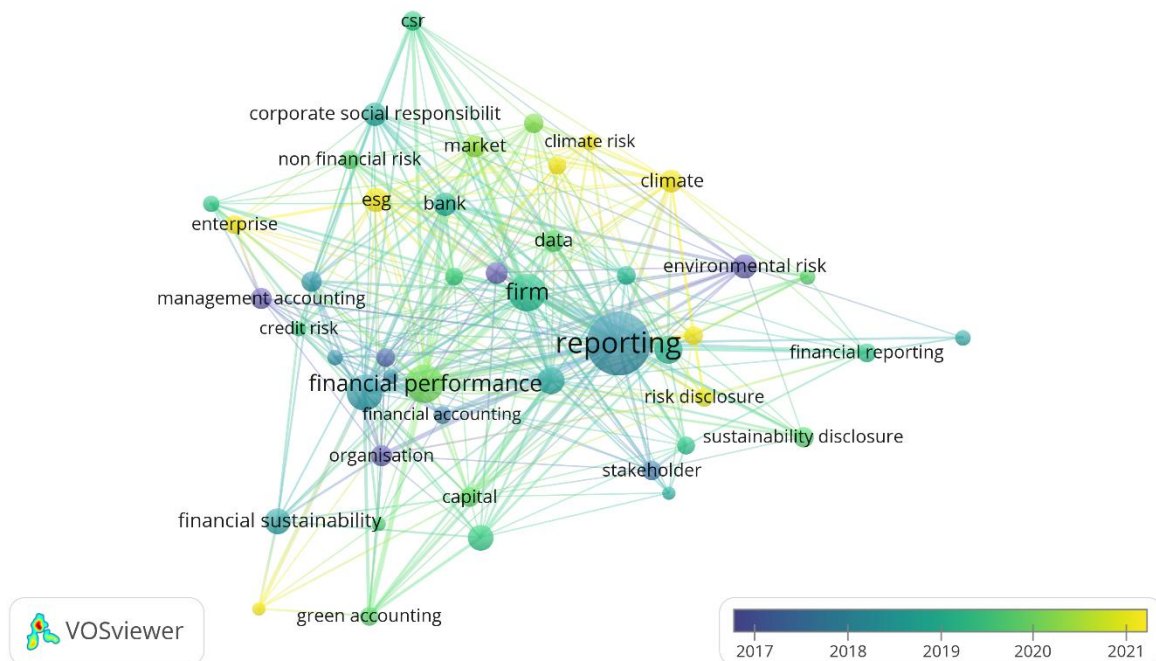


Figure 2. Overlay Visualization
 Source: Data Analysis Result, 2024

This second VOSviewer visualization with a temporal component provides insights into the research trends over time within the field of sustainability and financial management, particularly from 2017 to 2021. This map incorporates a color gradient to represent the evolution of research interests and the focus areas within the keywords over the specified years.

1. Growth in Integrated Reporting (2017-2021), keywords like "reporting," "financial reporting," and "risk disclosure" show a transition from lighter to darker hues, indicating a growing emphasis over the years. This suggests that there has been an increasing focus on how companies report their financial and sustainability risks,

reflecting the global trend towards transparency and accountability in corporate governance.

2. Sustainability and Environmental Risk (2017-2021), the consistent presence and intensification of colours around "environmental risk" and "sustainability disclosure" highlight the escalating concern and scholarly focus on environmental challenges. This trend aligns with the global increase in environmental awareness and the push for sustainable development goals, urging companies to disclose more about their sustainability practices and the associated risks.
3. Stable Interest in Financial Aspects and ESG (Entire Period), keywords like "financial performance," "ESG," and "financial sustainability" maintain a stable presence throughout the timeline, indicating sustained interest in the financial implications of

sustainability practices. This trend underscores the continuous scrutiny of how ESG factors influence financial outcomes, a key concern for investors and stakeholders.

4. Integration of CSR in Business Practices (Mid to Late Period Focus), the shifting focus towards "corporate social responsibility" (CSR) and related market responses towards the later years suggest an increased integration of CSR into core business strategies. This shift likely reflects a broader acknowledgment of the role of CSR in enhancing brand value and stakeholder trust.

The keywords "firm," "enterprise," and "organisation" are linked throughout the period, indicating a consistent emphasis on the application of sustainability and financial risk management at the organizational level. This ongoing focus points to a deepening interest in how different business models and industries adopt and adapt to sustainability standards and financial risk frameworks.

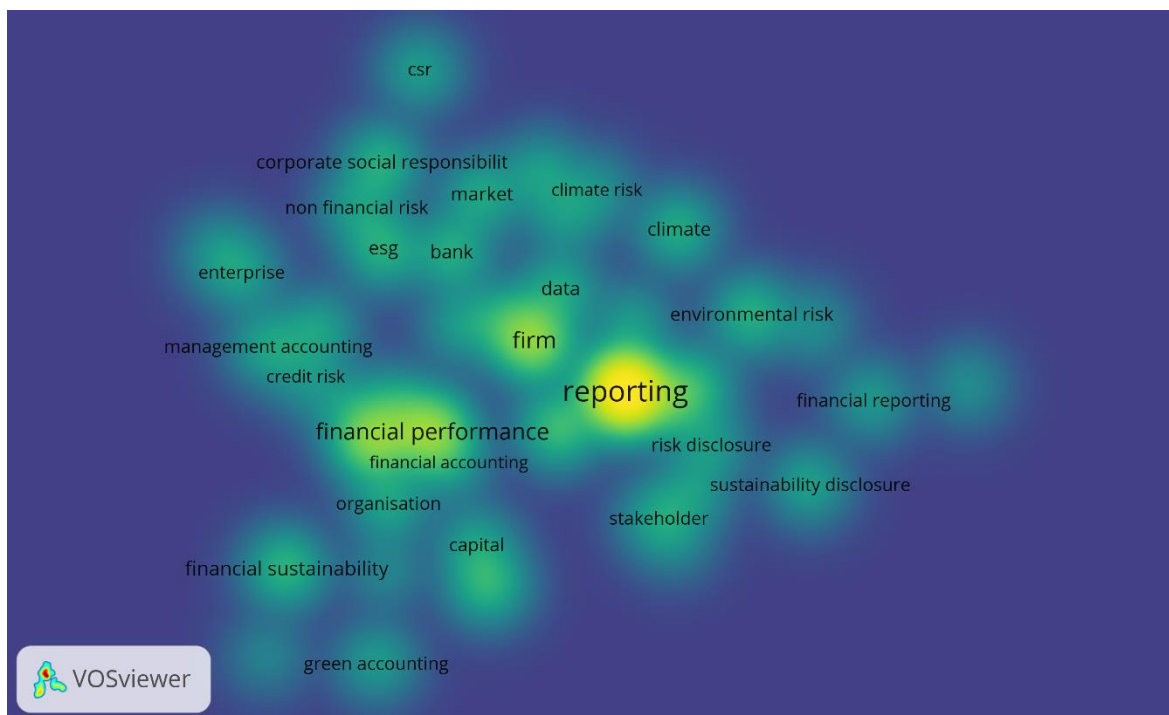


Figure 3. Density Visualization

Source: Data Analysis, 2024

This third figure shows a density map of keywords related to sustainability accounting and financial risk management. The varying intensities of colors from green (less dense) to blue (more dense) indicate the frequency and clustering of research within specific areas. Several areas and subjects can be identified as follows:

1. Green accounting and financial sustainability, in the visualization, the areas around "green accounting" and "financial sustainability" show less brightness compared to core areas like "reporting" and "financial performance". This suggests that while there is substantial research on broader sustainability and financial performance, there might be less exploration into how specifically green accounting practices contribute to the long-term financial sustainability of organizations. Research in this area could focus on developing

models that quantify the impact of green accounting on financial health or explore how green accounting practices can be integrated into traditional financial systems to enhance sustainability.

2. Non-financial risk and credit risk, keywords such as "non-financial risk" and "credit risk" also appear in less dense regions, indicating potential underexplored linkages between non-financial risks, which include social and environmental risks, and their impact on the credit risk profiles of firms. Studies could explore how non-financial risks directly affect credit ratings and lending decisions, or how they are factored into the risk assessments by banks and financial institutions.
3. Integration of CSR with risk management, "Corporate social responsibility" (CSR) shows a

moderate density and appears somewhat isolated from core financial terms like "financial performance" and "risk disclosure". This indicates an opportunity to delve deeper into how CSR initiatives can be integrated into holistic risk management strategies within firms. Research could investigate the efficacy of CSR activities in mitigating operational and reputational risks, or how these activities influence investor perceptions and financial outcomes.

The less bright areas in the visualization suggest that while substantial research has focused on the reporting and performance aspects of sustainability, there are significant opportunities to explore how specific practices like green accounting impact financial sustainability, how non-financial risks are managed in relation to credit risks, and how CSR can be more deeply integrated into risk management frameworks. Addressing these gaps could provide new insights into the complex interrelations between sustainability practices and financial risk management, offering valuable guidance for both academic research and practical applications in business strategy.

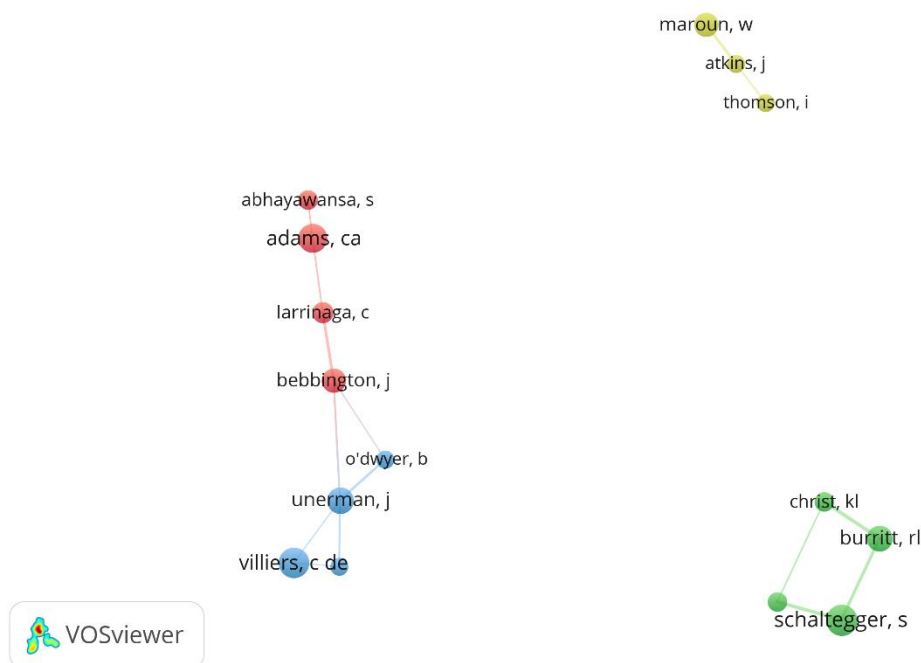


Figure 4. Author Collaboration Visualization

Source: Data Analysis, 2024

The author network visualization illustrates the collaborative relationships among researchers in the field of sustainability accounting and financial management. In the visualization, each node represents an author, and the lines between the nodes represent co-authorship relationships, indicating collaboration on published research.

The central cluster features authors

like Adams, CA, Larrinaga, C, Bebbington, J, O'Dwyer, B, and Unerman, J, suggesting a strong collaborative network. This group likely represents a core of researchers who have extensively collaborated on topics such as sustainability reporting, environmental accounting, and corporate social responsibility. Their proximity and interconnectedness suggest they might be influential in shaping research agendas and

methodologies within these thematic areas.

On the right side, we see a smaller, tightly knit cluster including Schaltegger, S, Burritt, RL, and Christ, KL. These authors are well-known for their contributions to environmental management accounting and sustainability assessments. Their positioning away from the central cluster might indicate a specialized focus that, while related, operates somewhat independently from the mainstream sustainability accounting research, possibly focusing more on theoretical advancements or specific industrial applications.

The presence of links between these clusters and individual authors like Maroun, W, Atkins, J, and Thomson, I, who appear more peripheral, could indicate newer entrants into the field or researchers who bridge multiple sub-disciplines within sustainability and financial studies. Their positioning might also highlight potential areas for new collaborations or emerging research trends that are beginning to gain traction.

5. CONCLUSION

The analyses of thematic clusters, research trends, research opportunities, and author collaborations in the field of sustainability accounting and financial risk

management provide a multifaceted view of the academic landscape. The thematic clusterization reveals a well-defined focus on integrated reporting, environmental risk, and the financial implications of ESG factors, underscoring the complexity and interconnectivity of these issues within corporate contexts. The research trends, highlighted by a temporal analysis, indicate a growing emphasis on transparency in sustainability disclosures and the integration of CSR into risk management, reflecting broader shifts towards sustainable development and responsible business practices. Opportunities for further research were identified in the less dense areas of the thematic maps, particularly around green accounting and the integration of non-financial risks into financial sustainability strategies, suggesting potential gaps in the current literature that could yield valuable insights. Lastly, the author network visualization emphasized a robust collaborative environment among leading scholars, with distinct clusters indicating both core research groups and potential for emerging cross-disciplinary studies. Together, these analyses not only depict the current state of research but also guide future scholarly endeavors by highlighting evolving trends and underserved areas within the field.

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