

Bibliometric Analysis of ESG in Banking: What are the Key Directions and Collaborations Behind the Research?

Claudia GHERȚESCU¹, Alina Georgiana MANTA², Roxana Maria BĂDÎRCEA³, Alia Gabriela DUȚĂ⁴, Alexandra Lucia ZAHARIA⁵

^{1,2,3} University of Craiova, Faculty of Economics and Business Administration

⁴ University of Craiova, Faculty of Law

⁵ University of Craiova, Faculty of Sciences

claudiagherțescu@gmail.com, alina.manta@edu.ucv.ro, roxana.badircea@edu.ucv.ro, alia_gabriela@yahoo.com, alexandra.zaharia@edu.ucv.ro

Abstract. *This study explores the trends and limitations of ESG research as applied to the banking sector, using a bibliometric analysis based on Scopus data. Using co-citation maps and collaborative networks between authors and institutions, the study highlights a fragmented literature with high thematic specialization and a low degree of interconnectedness between researchers, which limits the development of a coherent and integrated framework. The institutional analysis points to the existence of regional clusters, such as those in Spain, and an international group of prestigious but loosely interlinked institutions, indicating geographical isolation and a lack of comparative studies at a global level. Also, the differences in pace between recent and older research, accompanied by time lags, suggest a slow adaptation of some institutions to the new ESG paradigms, but also a continued evolution of academic collaborations. Despite these limitations, the maps highlight the importance of central institutions in updating research and integrating new ESG directions in banking. The study suggests the need for more extensive interdisciplinary and international research to overcome the barriers of specialization and isolation and to support a more comprehensive and integrated research framework.*

Keywords: ESG, banking, bibliometric analysis

JEL Classification: Q01, Q56

1. Introduction

Environmental, social, and governance (ESG) factors provide a framework for evaluating the non-financial performance of companies (Galbreath, 2013). These factors have gained significant prominence in investment strategies, particularly during periods of economic and social uncertainty (Diaz et al., 2021). Furthermore, their integration into the United Nations Global Compact highlights their role as a key strategy for advancing sustainable development (Lee and Kim, 2022).

The Figure 1, illustrates the conceptual structure of ESG, detailing the main dimensions and their associated initiatives. The Environmental dimension includes initiatives such as green finance, carbon reduction and sustainable investments, which reflect efforts to protect the environment and reduce climate impacts (Brogi, and Lagasio, 2019). The Social dimension focuses on financial inclusion, community involvement and employee well-being, emphasizing the importance of social relations and equity (Steblianskaia et al., 2023). In parallel, the Governance dimension addresses issues such as regulatory compliance, transparency and ethical practices, promoting sound and responsible corporate governance. This framework highlights how ESG integrates interconnected priorities to guide sustainable business strategies.



Figure 1. The Conceptual Structure of ESG

Source: own processing

Exploring the scientific evolution of the ESG concept is key to understanding its impact in the current context. ESG imposes strategic demands on companies, emphasizing three major dimensions: environmental responsibility, social responsibility and corporate governance. This framework has become an internationally recognized indicator for measuring corporate sustainability within the green development model (Jesus Munoz-Torres et al., 2019; Iamandi et al., 2019; Wang and Sun, 2022). The growing interest in ESG is reflected by the numerous scientific studies dedicated to this field (Friede et al., 2015; Garcia et al., 2017; Leins, 2020; Gillan et al., 2021).

Recently, the ESG paradigm has also become a central topic for the banking and finance industry from several relevant perspectives. First, investors are showing a growing interest in integrating ESG criteria into their decision-making processes, amid estimates that ESG-risked assets under management could reach USD 33.9 trillion by 2026 (PwC, 2022). Second, ESG risks represent a significant challenge for the financial sector (Weber et al., 2008; Kalfaoglou, 2021) and have been highlighted by regulators and supervisors at the international level (FSB, 2017; ECB, 2020; EDF, 2022).

Third, high ESG scores correlate with reduced risk-taking by banks (Galletta et al., 2023), contributing to a more stable banking system based on long-term profitability, efficient risk management and a greater ability to attract investors aware of the impact of ESG risks. Fourth, at the macroeconomic level, ESG practices play an important role in enhancing the stability of banking institutions in times of financial turmoil, highlighting the fundamental contribution of ESG factors to strengthen the resilience of the banking system to better cope with endogenous and exogenous shocks (Chiaramonte et al., 2021; Aevoae et al., 2022). ESG can also be considered as a significant determinant of banks' solvency risk, with ESG indicators being useful in forecasting banks' financial vulnerabilities (Citterio and King, 2023).

The aim of this paper is to analyze how ESG (environmental, social, governance) principles are integrated in the banking sector using a bibliometric approach. The study aims to highlight emerging trends in ESG-related research in banking and to identify gaps in the literature, such as the lack of practical examples and regional comparative analysis. The relevance of this research stems from the importance of the banking sector in promoting sustainable development and creating a more responsible financial system. Through bibliometric analysis, the paper provides insight into how ESG factors influence banking strategies, contributing to financial stability, risk mitigation and alignment with sustainability goals.

2. Materials and methods

Using the specialized software VOSviewer (version 1.6.18), we will conduct a bibliometric analysis. VOSviewer is a computer program designed for creating, visualizing, and exploring maps based on network data. According to the VOSviewer Manual, this software enables the construction of maps directly from a network's adjacency matrix or by utilizing co-authorship, co-occurrence, citation, bibliographic coupling, or co-citation networks. These maps can represent scientific publications, journals, researchers, organizations, countries, or keywords, with data extracted from sources such as Web of Science, Scopus, PubMed, or RIS files.

This approach allows for the analysis of keywords, authors, institutions, and countries, aiding in the identification of the most frequently used keywords, the most cited authors, and leading research centers (Gherțescu and Manta, 2023). Additionally, bibliometric analysis provides insights into a publication's popularity among specialists and evaluates the reputation of its authors (Ball and Tunger, 2005). As Zupic and Čater (2015) emphasize, this method facilitates systematic literature reviews, guiding researchers to influential studies and enabling the objective mapping of a research field.

The bibliometric analysis begins with a search for the keyword "ESG in banking" within the Scopus database, identifying 343 relevant documents (Figure 2). The second step involves applying specific filters, focusing on "subject areas" related to the economic and financial domains. Subsequently, the filtered data is downloaded and imported, narrowing the dataset to 247 documents. Finally, the analysis proceeds with the creation and interpretation of bibliometric maps to extract meaningful insights.



Figure 2. Methodological steps in bibliometric analysis

Source: own processing

This analysis will include the examination of the following maps, each providing valuable insights into the research domain of ESG in banking:

1. Co-occurrence Network Map of Keywords

- Highlights the central topics within the ESG in banking literature.

- Analyses the thematic connections between various concepts related to environmental, social, and governance factors in the banking sector.
- Contributes to identifying the main research directions in the context of sustainable finance and banking practices.

2. Authors' Co-citation Network Map

- Identifies influential authors and fundamental works in the field of ESG in banking.
- Provides a solid foundation for exploring relevant literature and understanding key contributions to the topic.
- Reflects the academic impact of leading research in sustainable banking practices.

3. Collaborative Institutional Network Map of Co-authors

- Analyses the level of cooperation between different institutions in the field of ESG in banking.
- Identifies academic centres of excellence and research partnerships in sustainable finance.
- Highlights the geographical distribution of academic collaborations related to ESG practices in the banking sector.

3. Results and discussions

The data (Figure 3) presented reveals a significant increase in the number of publications on ESG in banking over the years in Scopus database. From 2012 to 2015, there were very few publications (with a peak of 3 in 2015), suggesting that the topic was not widely explored in the early stages. The years 2016 to 2017 show no publications, indicating a lack of focus on this area during that period.

However, from 2018 onward, there is a noticeable upward trend in the number of publications, starting with 2 in 2018 and escalating rapidly. The most significant increase occurred in 2020, with 11 publications, followed by a surge in 2021 (13 publications), and a remarkable jump in 2022 with 44 publications. This surge can likely be attributed to the growing global focus on sustainability, the increasing importance of Environmental, Social, and Governance (ESG) factors in business practices, and the heightened awareness of these issues in the financial sector

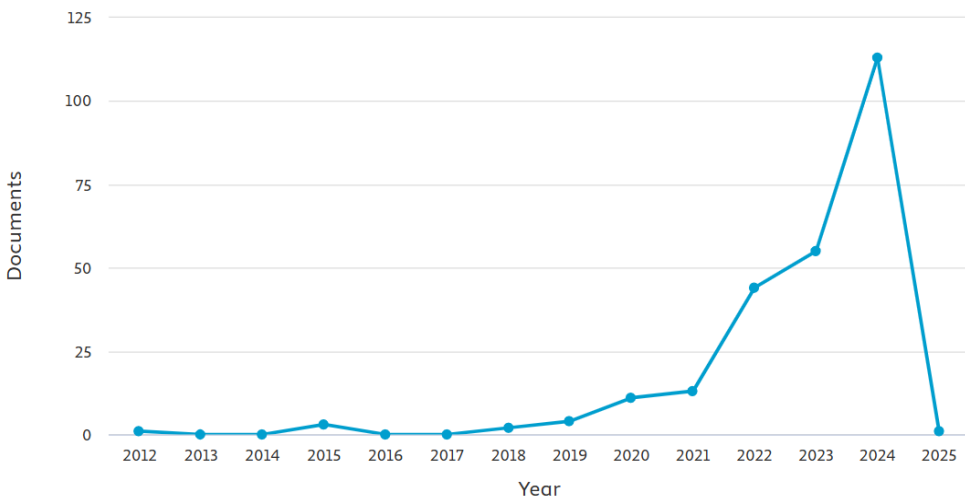


Figure 3. Publications on efficiency in banking

Source: Scopus, 2024

The year 2023 shows 55 publications, further confirming that ESG in banking is gaining traction as an essential research topic, and 2024 demonstrates the peak of this trend with 113 publications. This steady rise reflects the increasing relevance of ESG factors in the banking industry, driven by both regulatory pressures and the demand for sustainable financial practices.

Overall, this data illustrates the growing importance of ESG considerations in the banking sector and signals that research in this area is likely to continue expanding in response to global challenges related to sustainability and corporate responsibility.

The data (Figure 4) regarding the types of documents published on the topic of ESG in banking reflects a significant diversity of knowledge sources. The majority of publications are articles (180), indicating a major interest in original research in this field. In parallel, there is a considerable number of book chapters (36), suggesting a broader and interdisciplinary approach to the ESG topic. Conference papers (11) highlight emerging trends and rapid changes in the field, while books (7) provide detailed and comprehensive analysis. Reviews (6) and conference reviews (4) help assess the current state of research, while retracted works (1), errata (1), and notes (1) reflect corrections or clarifications in the literature.

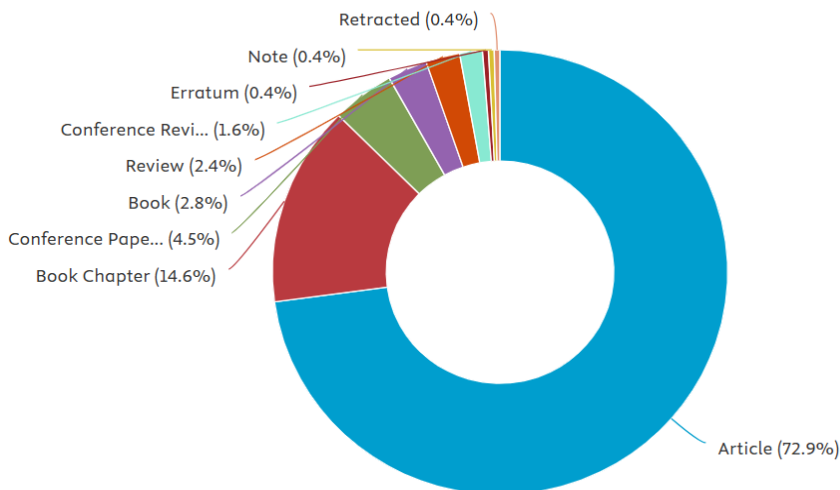


Figure 4. Documents by type

Source: Scopus, 2024

3.1. Co-occurrence Network Map of Keywords

This analysis aims to highlight the most persistent keywords by understanding their simultaneous occurrence in the same article. It is important to stress that the keywords considered in this analysis are exclusively those mentioned by the authors in the abstract part of the articles. By means of this graphical representation, we are able to deduce which keywords are most frequently used by authors in the field of financial technology. The method used also allows us to identify not only the frequency of keywords used by the author, but also the relationships between these words.

The map (Figure 5) represents the relationships between the main keywords used in the academic literature on ESG and banking, grouped into 13 distinct thematic clusters. The most prominent nodes are ESG, banking and sustainability, highlighting that these are the central concepts of the field. The connections between them are dense, signaling a well-connected literature in which various sub-themes are

interrelated.

The bibliometric analysis revealed 13 clusters that group keywords according to their common thematic focus, providing a clear picture of the main research directions. A first set of clusters reflects concerns related to corporate governance, ESG performance and social responsibility (light blue). Terms such as corporate governance, social responsibility and environmental performance highlight how organizations integrate ESG principles into their strategies, with a strong focus on the impact on financial performance.

In another direction, research on green finance and sustainable finance highlights the integration of environmental considerations and climate risks into financial strategies. Terms such as climate risk and environment emphasize the importance of sustainability in the banking sector, addressing its contribution to the ecological transition. The analysis also highlighted specific concerns regarding Islamic banks (orange), where concepts such as Islamic banking and decision making suggest a quantitative and decision-making modeling approach to the application of ESG principles in this context.

Another central issue identified in the literature is the link between risk management and financial stability (red). Terms such as risk management, financial stability and climate transition risk indicate that ESG-related risks play an important role in maintaining global financial stability. This is of interest to both financial institutions and regulators, especially in the context of climate transition.

Finally, recent global crises such as the COVID-19 (purple) pandemic have drawn attention to the link between disruptive events and the behavior of banking institutions. Terms such as COVID-19, bank risk-taking and bank stability emphasize the impact of these crises on bank stability, calling into question the need to integrate ESG principles into risk management under uncertainty.

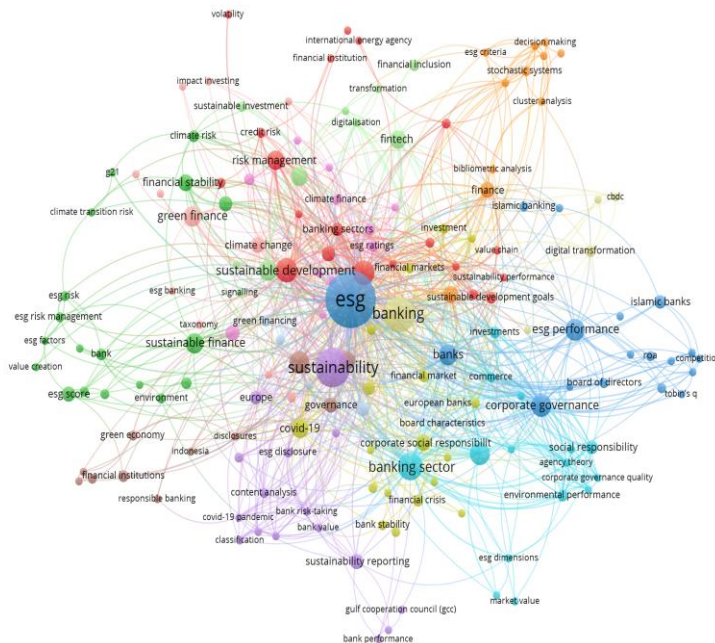


Figure 5. Co-author network of authors' keywords

Source: own processing in VOSviewer

The literature review highlights the term ESG as a focal point, with 85 occurrences and 250 links, underlining its centrality in discussions on sustainability and corporate governance. Other key terms revolve around this concept, such as sustainability, which appears 41 times and is connected by 151 links. This suggests a strong focus on sustainable development as a main theme within the literature.

Likewise, the term banking, with 33 occurrences and 176 links, reflects the importance of the banking sector in implementing ESG principles, indicating its crucial role in promoting the transition towards a more sustainable economy. In addition, corporate governance, with 68 links, highlights the close connections between ESG and corporate governance, underlining the importance of the decision-making framework in integrating environmental, social and governance considerations into organizational strategies. Thus, this network of concepts illustrates a complex picture of how sustainability is interconnected with various aspects of management and economics.

3.2. Authors' Co-citation Network Map

The bibliometric map highlights a significant fragmentation of the ESG and banking literature, which emphasizes the need for collaboration between authors to develop a more coherent research network. The fact that each cluster represents a single author indicates a low degree of interconnectedness of published work, which may suggest either a geographical or institutional isolation of researchers or a highly specialized approach to topics. This lack of collaboration may limit the exchange of ideas and the development of synergies between different perspectives or methodologies.

Another important aspect observed in the map (Figure 6) is the existence of a few central authors, such as Menicucci E. and Paolucci G. (3 papers, 57 citations), who, although they have highly cited papers, are not directly connected to each other. Chiaramonte L., Dreassi A. and Girardone C. (2 papers, 119 citations) have contributed to papers with considerable impact, suggesting that the topics covered are highly relevant to the field. Also, Ivleva E. and Sistsova E. (2 papers) are less cited authors, but with a significant presence in the literature. This indicates that they have likely contributed to specific niches within ESG and banking, but without developing direct collaborations with the other impact authors. This provides opportunities for future exploration by linking different sub-domains into interdisciplinary studies.

The map also reflects a global interest in the field, given the diversity of authors' names coming from varied regions. However, the weak links between authors may suggest that the research is strongly influenced by local contexts, such as the ESG policies applied in particular countries or the particularities of the banking sector in a particular region. This diversity can be valuable but may hinder the generalizability of findings without more international comparative studies.

Following the analysis of the most cited authors map (Figure 2), we applied a restriction that authors had to have a minimum of one paper and at least 5 citations, resulting in a total of 72 authors out of the 324 initially identified. These authors are organized into 9 distinct clusters, each reflecting a specific theme and connection to ESG in banking.

The central (orange) cluster, the densest, includes authors such as Menicucci E. and Paolucci G., who are distinguished by high connectivity and significant influence in the network. These authors play a central role, as they are linking points between different groups and topics in the ESG field. Another important cluster is the red cluster, which includes authors such as Liu M. and Guoping W., and is oriented towards the integration of ESG into risk assessment and financial performance. It is well connected but narrower in size.

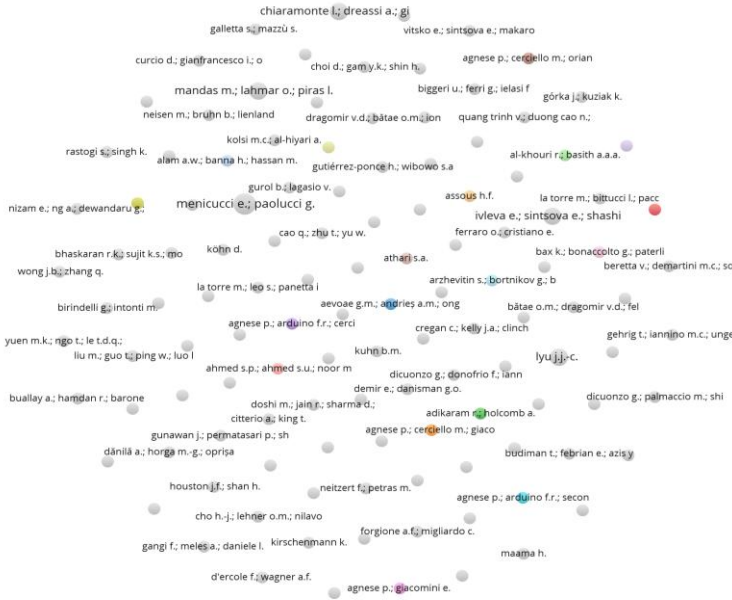


Figure 6. Author co-citation network
 Source: own processing in VOSviewer

The purple cluster groups authors such as Aevogae M.M. and Andrieş A.M., who address specific topics in corporate governance related to ESG, with moderate links to other clusters. The open green cluster, consisting of authors such as Chiaramonte L. and Dressi A., is oriented towards ESG regulations and their impact on the banking sector and is well connected with the core cluster.



Figure 7. Network of Most Cited Authors
 Source: own processing in VOSviewer

In contrast, the lime green cluster includes authors such as Bax K., Bonaccolto G., La Torre M., Leo S. and Panetta I., which focuses on more specialized topics and has weaker links with the core groups. At the edge of the network is the pink cluster, which includes authors such as Bukhari S.A.A., Hashim F. and Amr A., who have weak connections with the rest of the network, suggesting more isolated research. Also, authors Gurol B. and Lagasio V. from the same cluster have moderate connections and are in an intermediate position between the peripheral and central clusters.

As for the fringe clusters, dark green and dark blue, they consist of more isolated subgroups of authors contributing on very specific topics, with low links within the main network.

The most highly cited authors in this set are Nizam E., Ng A. and Dewandaru G., who obtained the most citations (187), indicating significant academic influence. However, authors such as Menicucci E. and Paolucci G. stand out with the highest strength of total links (303), reflecting extensive collaborations and a central role in the network. These differences between citations and connectivity show that, although there are authors highly relevant to the topic, they are not always the most connected within the academic community.

3.3. Collaborative Institutional Network Map of Co-authors

The map of institutions (Figure 8) reflects the network of academic collaborations in the field of ESG in banking, highlighting two distinct clusters, following a restriction that required each institution to have at least one published paper and one citation. These clusters illustrate institutions' connectivity and significant contributions to the literature.

The red cluster, centered around Hispanic institutions such as Universidad Rey Juan Carlos and Universidad Autónoma de Madrid, represents a regional cluster with an important role in research specific to this field. These institutions are central nodes, connecting smaller organizations such as the Facultad de Ciencias Económicas and researchers from ESIC University. Although this cluster has a smaller global impact, the connections between its members are strong, underlining the importance of the research carried out in this region.

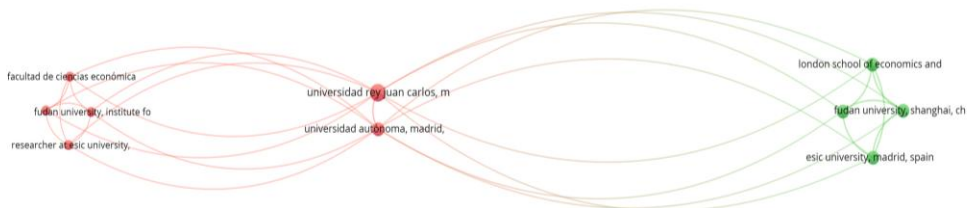


Figure 8. Institutional co-author network

Source: own processing in VOSviewer

The Green Cluster includes prestigious international institutions such as the London School of Economics, Fudan University Shanghai and ESIC University Madrid, which are better connected to the global network and have a broad influence due to their relevant contributions to the ESG field. Fudan University plays a key role as a linking point between Asian and European research, facilitating transnational collaborations. The relationship between these two clusters is mediated by Spanish institutions, which act as bridges between local and international research. Although there is a clear demarcation between the clusters, the links between them emphasize the complementarity of approaches in the regions represented, which makes ESG topics treated from diverse but interconnected perspectives.

By adding a temporal dimension (Figure 9), the map becomes more complex, highlighting the dynamics of ESG research in banking and the positioning of institutions based on their recent contributions. In the green cluster, institutions such as the London School of Economics, Fudan University Shanghai and ESIC University Madrid have published recent papers since 2024, suggesting active engagement in contemporary research. These institutions are likely leaders in adopting new ESG paradigms and reflect a rapid adaptation to changes in global ESG regulations and practices.

In contrast, institutions in the red cluster, such as Facultad de Ciencias Económicas, Fudan University, Institute FO and Researcher at ESIC University, have published papers from 2022. They suggest a consolidated activity, but with a slower pace of research updates. These institutions have been pioneers in ESG, but their pace of publication may reflect a more conservative approach or a focus on complementary areas.

The Spanish institutions, Universidad Rey Juan Carlos and Universidad Autónoma de Madrid, which published papers in 2023, play an intermediary role between 2022 and 2024 research. These institutions are important for integrating new themes and directions into the network, which makes them essential in the continuous updating of research.



Figure 9. Institutional Co-Author Network - Density Map
 Source: own processing in VOSviewer

Thus, the temporal stratification emphasizes an implicit hierarchy within the map. Institutions in the green cluster, with recent papers, have a dominant position in current research, while those in the red cluster contribute a solid base of older literature. The central institutions, with recent contributions, play an intermediary role, both in time and thematic focus, facilitating the link between older research and the newest directions of ESG research in banking. This temporal dynamic suggests a continuing evolution of academic collaborations, with more recent institutions likely to attract more attention and resources in the future.

4. Conclusions

The trend analysis underlines a significant complexity in the ESG approach, highlighting the interdependencies between sustainability, corporate governance and environmental and social considerations. These linkages contribute to a vast and diverse field in which the integration of ESG principles into financial strategies is becoming essential. Within this framework, banks play a important role, having a direct influence on economic and financial processes. The close link between the terms banking, sustainable finance and corporate governance indicates that banks are fundamental elements in promoting the transition towards a more sustainable economy.

In addition to these themes, the global impact of the pandemic has raised new concerns, which are reflected in the linkages between COVID-19, bank stability and the behavior of financial institutions in crisis conditions. These linkages suggest the need for an in-depth analysis of the effects of global crises on the stability of the financial sector, particularly in the context of ESG mainstreaming. In addition, the inclusion of climate risks in financial decisions is becoming a clear trend, highlighted by terms such as climate risk and green finance. This underlines the importance of a proactive approach by financial institutions to effectively manage the green transition and mitigate climate change risks.

The authors' map highlights a significant fragmentation in the ESG and banking literature, suggesting a lack of collaboration between researchers and a rather specialized approach to the topics. Weak connections between authors indicate possible geographical or institutional isolation, which limits the exchange of ideas and the development of synergies between different perspectives. However, there are a few central authors, such as Menicucci E. and Paolucci G., who play a key role in connecting different groups and sub-domains in the ESG field. Despite this, many researches remain isolated or have weaker links to the main network, suggesting opportunities for inter-disciplinary exploration. Overall, the review suggests that the literature is influenced by local contexts, but also that it would be beneficial to conduct international comparative studies to strengthen the global relevance of the research.

Furthermore, the analysis shows that most authors are focused on specific topics and are organized in clusters that reflect very detailed topics with limited links between them. This specialization can deepen the understanding of each theme, but at the same time restricts the interaction between different areas of ESG and banking research. Also, authors with a large number of citations, such as Nizam E., Ng A. and Dewandaru G., have significant academic influence, but are not necessarily the most networked, suggesting a difference between the individual impact of their work and collaborations within the academic community. These findings emphasize the need for stronger links between different groups of researchers to strengthen coherence and knowledge integration in the ESG field.

The institutional map highlights a network of significant academic collaborations in the field of applied ESG in the banking sector, with two distinct clusters reflecting both regional and international contributions. The red cluster, dominated by institutions

in Spain such as Universidad Rey Juan Carlos and Universidad Autónoma de Madrid, plays a central role in regional research, with strong links between smaller organizations. Although the overall impact of this cluster is smaller, strong internal connections underline the importance of research in this area.

The green cluster includes prestigious international institutions such as the London School of Economics and Fudan University Shanghai, which are well connected to the global network and have a broad influence in the ESG field. These institutions are leaders in the adoption of new ESG paradigms and contribute significantly to current global ESG regulations and practices. The relationships between the two clusters are mediated by Spanish institutions, which facilitate the link between local and international research, playing an important role in the integration of emerging themes.

The addition of a temporal dimension emphasizes the ongoing dynamics of ESG research, with institutions in the green cluster publishing recent papers and having a dominant role in current research. In contrast, institutions in the red cluster have a more consolidated activity, but with a slower pace of research updates. Thus, the institutional map reflects not only the core contributions of older institutions, but also their role in integrating new research directions. This temporal dynamism suggests a continued evolution of academic collaborations, with newer institutions having an increased potential to attract attention and resources in the future.

The limitations of ESG research applied to the banking sector are manifold and reflect the complexity and diversity of the topics in this area. First, the bibliometric analysis revealed a significant fragmentation of the literature, with a lack of collaboration between researchers and a highly specialized approach to topics. This may limit the exchange of ideas between the various sub-domains and reduce the synergies needed to develop a unified and comprehensive theoretical framework. Weak connections between researchers suggest geographical or institutional isolation, which may hinder the integration of approaches from different regions and limit the generalizability of results.

Another important aspect is related to the time limits of research. Many of the older institutions are well-established but slower to adapt to new changes in the field, which can create a mismatch between traditional and recent research. This time lag may lead to a more conservative approach to the ESG theme, without reflecting recent changes and innovations in practice and regulation quickly enough.

Finally, it can be noted that the field of ESG in banking is constantly evolving and the lack of international comparative studies and insufficient integration of emerging topics such as climate risks and the impact of global crises is a significant limitation. Thus, to gain a more complete understanding of the field, more interdisciplinary and global research is needed, linking the various sub-domains and cutting across national or regional boundaries.

References

- Aevoae, G. M., Andries, A. M., Ongena, S., and Sprincean, N., 2022. ESG and Systemic Risk. *Swiss Finance Institute Research Paper*, 22–25.
- Ball, R., and Tunger D., 2005. Bibliometric Analysis Data, Facts and Basic Methodological Knowledge Bibliometrics for Scientists, Science Managers, Research Institutions and Universities. *Julich: Research Center Julich*, vol. 12.
- Brogi, M., and Lagasio, V., 2019. Environmental, social, and governance and company profitability: are financial intermediaries different? *Corporate Social Responsibility and Environmental Management*, 26(3):576–587.

- Chiaramonte, L., Dreassi, A., Girardone, C., and Piserà, S., 2021. Do ESG strategies enhance bank stability during financial turmoil? Evidence from Europe. *European Journal of Finance*, 1–39. <https://doi.org/10.1080/1351847X.2021.1964556>
- Citterio, A., and King, T., 2023. The role of environmental, social, and governance (ESG) in predicting bank financial distress. *Finance Research Letters*, 51, Article 103411. <https://doi.org/10.1016/j.frl.2022.103411>
- Díaz, V., Ibrushi, D., and Zhao, J., 2021. Reconsidering systematic factors during the Covid-19 pandemic – the rising importance of ESG. *Finance Research Letters*, 38, Article 101870. <https://doi.org/10.1016/j.frl.2020.101870>
- European Central Bank (ECB), 2020. Guide on climate-related and environmental risks. Available: <https://www.bankingsupervision.europa.eu/ecb/pub/pdf/ssm.202011finalguideonclimate-relatedandenvironmentalrisks~58213f6564.en.pdf>.
- Federal Reserve System (FED), 2022. Principles for Climate-Related Financial Risk Management for Large Financial Institutions. Available: <https://www.federalreserve.gov/newsevents/pressreleases/files/other20221202b1.pdf>.
- Financial Stability Board (FSB), 2017. Recommendations of the Task Force on Climate-related Financial Disclosures. Available at: <https://assets.bbhub.io/company/sites/60/2021/10/FINAL-2017-TCFD-Report.pdf>.
- Friede, G., Busch, T., and Bassen, A., 2015. ESG and financial performance: aggregated evidence from more than 2000 empirical studies. *Journal of Sustainable Finance & Investment*, 5:210–233.
- Galbreath, J., 2013. ESG in Focus: the Australian evidence. *Journal of Business Ethics*, 118:529–541.
- Galletta, S., Goodell, J. W., Mazzù, S., and Paltrinieri, A., 2023. Bank reputation and operational risk: the impact of ESG. *Finance Research Letters*, 51, Article 103494. <https://doi.org/10.1016/j.frl.2022.103494>
- Garcia, A. S., Mendes-Da-Silva, W., and Orsato, R. J., 2017. Sensitive industries produce better ESG performance: evidence from emerging markets. *Journal of Cleaner Production*, 150:135–147.
- Gherțescu, C., and Manta, A. G., 2023. Fintech trends and banking digitalisation: Insights from a bibliometric analysis. *Finance - Challenges of the Future*, XXIII(25):24.
- Gillan, S. L., Koch, A., and Starks, L. T., 2021. Firms and social responsibility: a review of ESG and CSR research in corporate finance. *Journal of Corporate Finance*, 66, Article 101889. <https://doi.org/10.1016/j.jcorpfin.2021.101889>
- Iamandi, I.-E., Constantin, L.-G., Munteanu, S. M., and Cernat-Gruici, B., 2019. Mapping the ESG behavior of European companies. A Holistic Kohonen approach. *Sustainability*, 11:1–41.
- Kalfaoglou, F., 2021. ESG Risks: A New Source of Risks for the Banking Sector. *Bank of Greece Economic Bulletin*.
- Lee, E., and Kim, G., 2022. Analysis of domestic and international green infrastructure research trends from the ESGP perspective in South Korea. *International Journal of Environmental Research and Public Health*, 19:7099. <https://doi.org/10.3390/ijerph19127099>
- Leins, S., 2020. 'Responsible investment': ESG and the post-crisis ethical order. *Economy and Society*, 49(1):71–91. <https://doi.org/10.1080/03085147.2020.1702414>
- Munoz-Torres, M. J., Fernandez-Izquierdo, M. A., Rivera-Lirio, J. M., and Escrig-Olmedo, E., 2019. Can environmental, social, and governance rating agencies favor

business models that promote a more sustainable development? *Corporate Social Responsibility and Environmental Management*, 26:439–452.

PricewaterhouseCoopers (PwC), 2022. PwC report on ESG-focused institutional investment. Available at: <https://www.pwc.com/gx/en/news-room/press-releases/2022/awm-revolution-2022-report.html>.

Steblianskaia, E., Vasiev, M., Denisov, A., Bocharnikov, V., Steblyanskaya, A., and Wang, Q., 2023. Environmental-social-governance concept bibliometric analysis and systematic literature review: Do investors becoming more environmentally conscious? *Environmental and Sustainability Indicators*, 17, Article 100218. <https://doi.org/10.1016/j.indic.2022.100218>

Wang, F., and Sun, Z., 2022. Does the environmental regulation intensity and ESG performance have a substitution effect on the impact of enterprise green innovation: evidence from China. *International Journal of Environmental Research and Public Health*, 19:8558. <https://doi.org/10.3390/ijerph19148558>

Weber, O., Fenchel, M., and Scholz, R. W., 2008. Empirical analysis of the integration of environmental risks into the credit risk management process of European banks. *Business Strategy and the Environment*, 17(3):149–159. <https://doi.org/10.1002/bse.507>

Zupic, I., and Tomaž C., 2015. Bibliometric methods in management and organization. *Organizational Research Methods*, 18:429–72.