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# A Bibliometric Analysis of Environmental, Social, Governance (ESG) Imperatives of Sustainable Finance

**Thangjam Roopesh Singh [1], Dr. Thokchom Heeraj Anand [2], Dr. Haorongbam Soni Devi [3] Prof. Memcha Loitongbam [4]**

[1].Research Scholar, Manipur Institute of Management Studies, MIMS, Manipur University-795003
[2]. Faculty, Manipur Institute of Management Studies, MIMS, Manipur University-795003
[3]. Assistant Professor, National Institute of Technology, NIT Manipur-795004
[4]. Professor, Manipur Institute of Management Studies, MIMS, Manipur University-795003

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**Abstract:**
Unlike conventional finance, sustainable finance aims to integrate social, environmental, and climate change considerations into the business strategies of financial institutions. The financial system's capacity to effectively respond to the demands of the sustainability transition relies on a comprehensive transformation that encompasses regulatory, political, structural, theoretical, and relational shifts. Our bibliometric performance analysis of 377 publications reveals that the United Kingdom, China, the United States, Switzerland, and Japan, China are the leading centers of research excellence in sustainable finance. These countries are the most productive and host the most relevant institutions. Furthermore, the dominance of trans disciplinary journals over traditional finance and economics sources is evident. Conversely, our network map analysis highlights the significant relevance of sustainable and green banks' involvement in sustainable development. However, the relatively low density of this network underscores the existence of important research gaps. Therefore, we conduct an analysis of the literature on this specific topic to derive its conceptual structure and gain a deeper understanding of the crucial role banks play in the sustainability transition. Key research themes in this context include the relationship between sustainability performance and banks' profitability, the risk profiles of sustainable banks, the factors influencing banks' willingness to incorporate sustainability criteria into their business strategies, customers' responsiveness to banks' sustainability performance, and the relevant macro prudential regulations, monetary policies, and supervisory guidelines that facilitate the sustainability transition.Consequently, this paper conducts a qualitative-quantitative analysis that combines bibliometric methods to examine the trends in sustainable finance literature within the Web of Science database and to identify potential directions for future research.

Keywords: *Sustainable finance; sustainable banking; environmental, social, and governance (ESG) criteria; sustainable development; sustainability transition.*

## Introduction

The global financial landscape is witnessing a paradigm shift towards sustainable finance, driven by the need to address environmental degradation, social inequalities, and governance failures. At the heart of this shift lies the integration of Environmental, Social, and Governance (ESG) criteria into financial decision-making processes (Naidoo, 2019). ESG considerations are now recognized as essential factors for assessing both the risk and value of financial investments, shaping the future of finance toward a more responsible, inclusive, and resilient framework (Migliorelli, 2021). In India, where rapid economic growth is juxtaposed with complex social challenges and environmental vulnerabilities, the adoption of ESG practices in the financial sector is particularly critical.

Fankhauser et al., (2016)opines that India's journey toward sustainable finance is not only imperative for aligning with international sustainability goals, such as the United Nations Sustainable Development Goals (SDGs), but also for addressing pressing national issues such as climate resilience, social inclusion, and ethical governance. However, the incorporation of ESG practices within Indian financial institutions faces multiple challenges

(D'Orazio& Popoyan, 2019). Limited awareness among stakeholders, regulatory complexities, and lack of standardization in ESG measurement frameworks hinder effective implementation. (Campiglio, 2016).Additionally, the financial sector in India, which includes banks, asset managers, and investment firms, is at varying stages of ESG integration, resulting in inconsistent practices and outcomes across the industry. Thus, it is essential to have a thorough framework that helps determine the direction of the financial sector's structures, markets, and facilitators' transformation and ensure that they are in line with the requirements of the sustainability transition(Hafner et al, 2020).

Consequently, the literature on sustainable finance and related ESG requirements is reviewed in this study. In order to do this review consistently, we use a bibliometric analysis method. This paper's contribution is significant since it is necessary to comprehend the topic's tendencies, as well as its conceptual and intellectual frameworks, and to critically assess the current state of the field.

A bibliometric approach was recently used by a number of research to examine the literature on sustainable finance. They pay attention to a variety of concerns in Sustainable Finance, regardless of their shared trend from the descriptive perspective i.e. most important research constituents such as most influential countries, institutions, publications, authors, etc Bhatnagar& Sharma, (2022); Monasterolo, Roventini& Foxon (2019) concentrate more on identifying a systematic set of sustainable or green finance enablers, whereas Gao et al., (2021) discuss the effects of ESG disclosure on corporate governance (CG) structures, investment practices, investor behaviour, companies' capital structure, environmental risk management, and product innovation.Nobanee et al., (2021)contended that the growth of green and SF may be aided by a favorable macroeconomic climate, political stability, thorough and pertinent regulatory frameworks, policies, and structures, technological advancement, financial instrument diversification, strong institutional commitment, and efficient capital markets. Luo et al., (2022); Naeem et al., (2022)employ the co-citationanalysis method to investigate global evolution and pinpoint possible future research topics in sustainable finance. They identify the main areas of study in this area as climate finance, sustainable or impacting business models, green bonds, green credit policy, responsible investment, and green finance, talk about its aspects, and offer pertinent suggestions for the growth of this industry. In light of this, our analysis adds to the literature and aims to supplement earlier bibliometric and systematic reviews.

The paper consists of five sections in addition to the introductory one. Section 2 describes the study's methodology and the brief description of the methods used. Section 3 underlines the Bibiliometric Performance Analysis of the area of the study. Section 4 showcases the Network Analysis of the area using methods such as Co-occurrence and Co-authorship analysis. Finally, Section 5 discusses and concludes the study.

**Methodology**

Two steps make up the methodical procedure that our bibliometric study follows:

Stage 1: Set the search process to:

Find the bibliographic database and create a logical search statement using the relevant terms.

To reduce the amount of literature covered and obtain the final dataset for our review, introduce the pertinent inclusion and exclusion criteria.

Stage 2: Conduct the bibliometric analysis

Carry out a bibliometric performance analysis (BPA) and bibiliometric network analysis (BNA) to determine the most important research constituents of sustainable finance with ESG imperatives literature. In order to achieve this, citation analysis method is implemented available on VOSviewer.

Set the Search Process

To generate our bibliometric data, we followed a methodical approach of first selecting a database and then identifying, specifying, and incorporating the most relevant sustainable finance terms into a logical search statement. Web of Science is a reliable source for our bibliometric data, as it is "the largest curated abstract and citation database, with extensive global and regional coverage of scientific journals" (Secinaro et al., (2020) (p.377). Furthermore, the inclusion of publications in the database "undergoes rigorous content selection and ongoing re-assessment processes" (Baas et al., 2020).

The breadth of coverage in bibliometric studies depends on the logical integration of relevant keywords into effective search statements. The wide array of pertinent keywords that can define the role of sustainable finance with ESG imperatives forces us to formulate our search statement as follows: "sustainable finance ESG". This approach yields a primary sample of 377 articles.

To establish the scope and validity of our bibliometric review results, we strictly limit our analysis to articles retrieved exclusively from academic journals. Finally, to ensure a multi-perspective comparability across

publications, we restrict our review to articles published in English. Consequently, our final sample of bibliometric data comprises 377 publications.

2.2. Bibliometric Analysis

Bibliometric analysis is a robust quantitative method that enables researchers to explore and examine extensive sources of scientific data. It has the potential to introduce a systematic, transparent, and reproducible review process based on the statistical measurement of science, scientists, or scientific activity (Aria & Cuccurullo, 2017) (p. 959). This method comprises specific techniques designed to scrutinize and delineate the social, intellectual, and conceptual structures within a particular field of study as represented in the existing literature. It highlights the most significant research components, provides an effective overview of the research topic, identifies relevant research gaps, fosters innovative research ideas for exploration, and positions researchers' contributions within their respective disciplines (Donthu et al., 2021).

The primary bibliometric analysis techniques are objective in nature, focusing on metrics such as the number of publications, citations, and occurrences of keywords (Aria & Cuccurullo, 2017). However, interpretations often require subjective assessments, particularly when incorporating qualitative methods like thematic analysis.

Our bibliometric analysis consists of two main components: bibliometric performance analysis (or bibliometric descriptive analysis) and bibliometric network analysis (Aria & Cuccurullo, 2017). The former aims to identify the key research elements within the sustainable finance literature, such as leading countries, institutions, journals, authors, and articles. In contrast, the latter allows us to explore the intellectual structure (e.g., co-citation analysis) the social structure or network of research collaborations (e.g., co-authorship analysis) (Van Eck & Waltman, 2022).

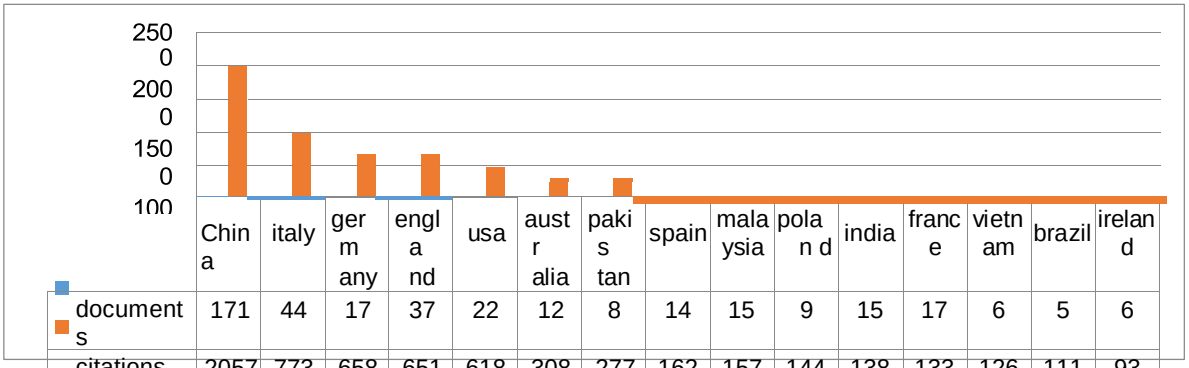
To conduct our bibliometric review, we utilize VOSviewer. VOSviewer offer essential functions and options for performing bibliometric network analysis (BNA), as they facilitate the construction, visualization, and examination of various bibliometric network maps. For bibliometric performance analysis (BPA), we employ Microsoft Excel.

## 3. Bibliometric Performance Analysis (BPA)

3.1. Most Influential Countries and Institution

Establishing and implementing inclusive and strategic transformation procedures that allow financial and non-financial firms to integrate sustainability criteria into their business strategy is mandatory for nations and institutions. As such,

We examine the geographical distribution of the academic work on ESG sustainable finance and identify the most influential countries and institutions to explore and derive in sustainable finance research.




| | China | italy | germany | england | usa | australia | pakistan | spain | malaysia | poland | india | france | vietnam | brazil | ireland |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| documents | 171 | 44 | 17 | 37 | 22 | 12 | 8 | 14 | 15 | 9 | 15 | 17 | 6 | 5 | 6 |
| citations | 2057 | 773 | 658 | 651 | 618 | 308 | 277 | 162 | 157 | 144 | 138 | 133 | 126 | 111 | 93 |

**Fig 1- Most influential countries from the number of publications and their citations**

The above figure displays the top 15 most influential countries in ESG sustainable finance research from the number of publications and the number of citations perspectives.

| Selected | Country | Documents | Citations | Total link strength |
|---|---|---|---|---|
| ☑ | peoples r china | 171 | 2057 | 149 |
| ☑ | italy | 44 | 773 | 89 |
| ☑ | usa | 22 | 618 | 53 |
| ☑ | germany | 17 | 658 | 50 |
| ☑ | england | 37 | 651 | 46 |
| ☑ | india | 15 | 138 | 33 |
| ☑ | malaysia | 15 | 157 | 29 |
| ☑ | australia | 12 | 308 | 27 |
| ☑ | spain | 14 | 162 | 25 |
| ☑ | france | 17 | 133 | 21 |

**Table 1: Countries and their Documents along with the Citations (VOSViewer Output)**

We can see from the table that China is the most productive country, followed by Italy, USA, Germany and England.

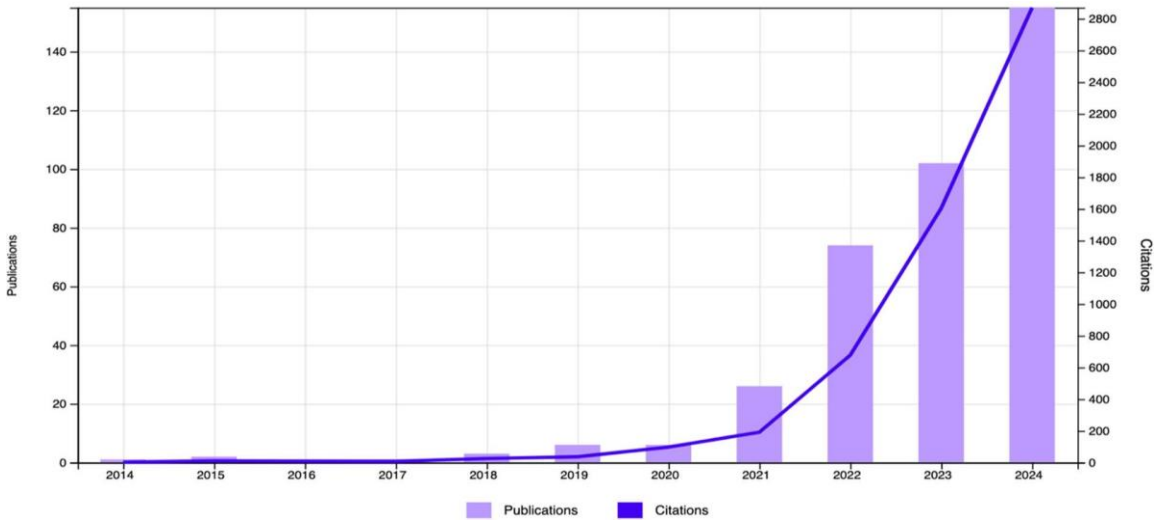



**Fig 2: Timeline of the Publications and Citations**

From 2014 to 2024, a total of 377 papers were produced in the field of sustainability finance with ESG imperatives. The articles were cited a total of 5543 times with 14.66 citations per item. The H-index is calculated to be 37.

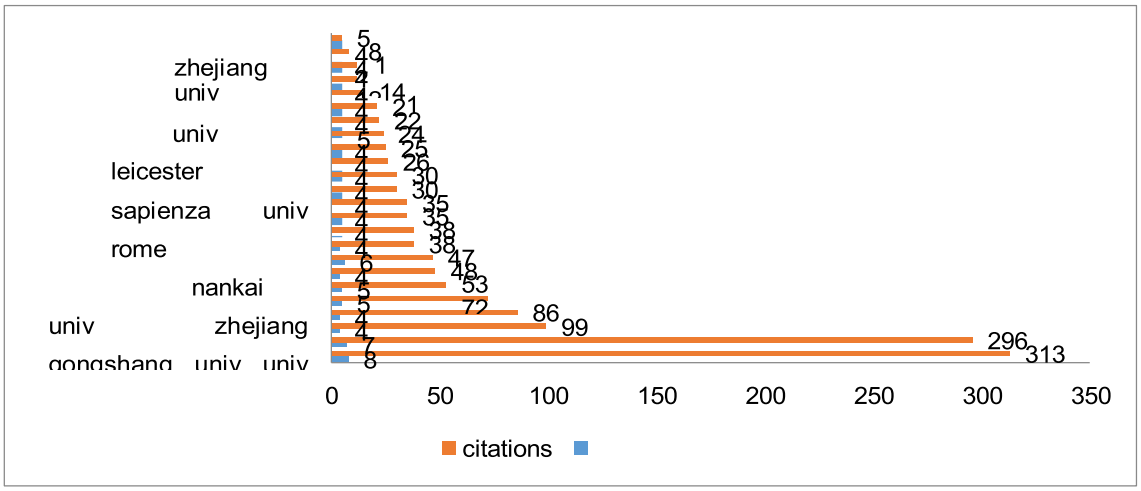



**Fig 3: Institutional Performance**

Figure 3 shows the performance of the institutions. Capital University of Economics and Business of China, Oxford University of UK and Beijing Jiaotong University, also of China are the top three performing institutions, generating the most number of documents and citations.

3.2 Most Cited Authors:

The following table shows the 15 most cited papers in the area, including the source title and the total citations.

| Sl.no. | Authors | Sources | Citations |
|---|---|---|---|
| 1 | Drempetic, Samuel; Klein, Christian; Zwergel, Bernhard | JOURNAL OF BUSINESS ETHICS | 495 |
| 2 | Zhou, Guangyou; Liu, Lian; Luo, Sumei | BUSINESS STRATEGY AND THE ENVIRONMENT | 218 |
| 3 | Raimo, Nicola; Caragnano, Alessandra; Zito, Marianna; Vitolla, Filippo; Mariani, Massimo | CORPORATE SOCIAL RESPONSIBILITY AND ENVIRONMENTAL MANAGEMENT | 197 |
| 4 | Khan, Muhammad Arif | RESEARCH IN INTERNATIONAL BUSINESS AND FINANCE | 163 |
| 5 | Tolliver, Clarence; Fujii, Hidemichi; Keeley, Alexander Ryota; Managi, Shunsuke | ASIAN ECONOMIC POLICY REVIEW | 150 |
| 6 | Adams, Carol A. | ACCOUNTING AUDITING & ACCOUNTABILITY JOURNAL | 140 |
| 7 | Adams, Carol A. A.; Abhayawansa, Subhash | CRITICAL PERSPECTIVES ON ACCOUNTING | 135 |
| 8 | Bhutta, Umair Saeed; Tariq, Adeel; Farrukh, Muhammad; Raza, Ali; Iqbal, Muhammad Khalid | TECHNOLOGICAL FORECASTING AND SOCIAL CHANGE | 133 |
| 9 | Yang, Qin; Du, Qiang; Razzaq, Asif; Shang, Yunfeng | RESOURCES POLICY | 113 |
| 10 | Singal, Manisha | CORNELL HOSPITALITY QUARTERLY | 103 |
| 11 | Chen, Simin; Song, Yu; Gao, Peng | JOURNAL OF ENVIRONMENTAL MANAGEMENT | 92 |
| 12 | Zhai, Yuming; Cai, Zhenghuan; Lin, Han; Yuan, Ming; Mao, Ye; Yu, Mingchuan | CORPORATE SOCIAL RESPONSIBILITY AND ENVIRONMENTAL MANAGEMENT | 92 |
| 13 | Zhang, Dongyang; Lucey, Brian M. | ECONOMIC ANALYSIS AND POLICY | 82 |
| 14 | Jesus Munoz-Torres, Maria; Angeles Fernandez-Izquierdo, Maria; Rivera-Lirio, Juana M.; Escrig-Olmedo, Elena | CORPORATE SOCIAL RESPONSIBILITY AND ENVIRONMENTAL MANAGEMENT | 82 |
| 15 | Fogliano de Souza Cunha, Felipe Arias; Meira, Erick; Orsato, Renato J. | BUSINESS STRATEGY AND THE ENVIRONMENT | 81 |

**Table 2: Most influential Authors, Sources and the Total Citations**

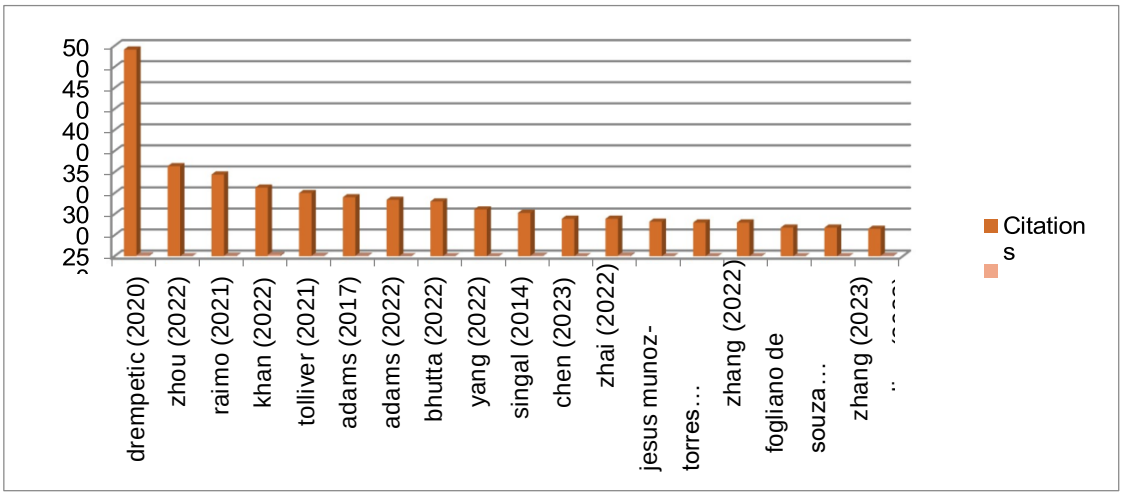



**Fig 4: Top 18 Most Cited Documents**

Figure 4 shows the most cited documents in a graphical format indicating the citations and the timeline of the publications.

4. Bibliometric Network Map Analysis (BNA)

The significant growth in the market of sustainable finance in response to several global initiatives, task forces or special network guidelines, and country institutional frameworks has resulted in an exponential increase of sustainable finance literature over the last decade. As a result, it is critical to investigate the intellectual structure, network of research collaborations, and the major areas of knowledge of sustainable finance research.

4.1 CoCitation Analysis

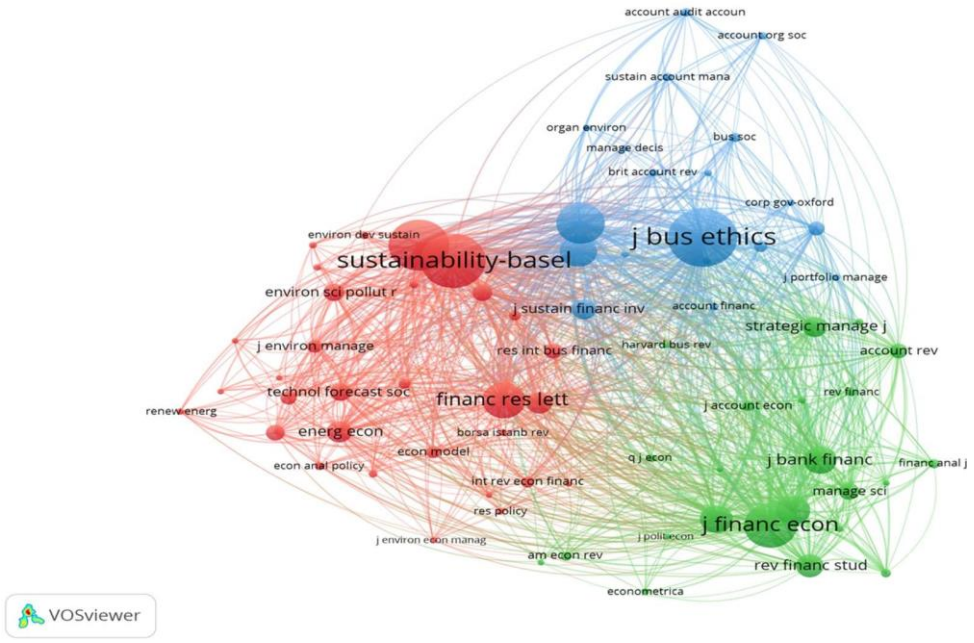



**Fig 5: CoCitation of Sources (VOSViewer Output)**

Co-citation of publications uses representative journals as units of analysis. Its primary goal is to investigate journal-journal interrelatedness in order to assess the importation and exportation of citations across all pairs of journals. In other words, it is designed to identify the most commonly cited journals and their linkages.

According to this general rule, journals are more substantial or significant in their relatedness—or, more precisely, their co-citation links—the more closely they align with one another. Furthermore, lines connecting journals provide an additional indicator of the strength of the co-citation links. The general closeness of the five clusters in Figure indicates that journals that at least exceed the 50 citation criterion have a propensity to quote related references. Consequently, they have quite strong co-citation associations.

In line with our analysis of the most influential journals, the co-citation links of sustainability and basel norms are comparatively stronger than journal of business ethics and mainstream finance and economics counterparts.

4.2 Co-Authorship Analysis:

The social and professional networks of authors are systematically documented using a co-authorship study. It aids in examining their characteristics and determining the degree of cohesion or research cooperation within the field of expertise. Furthermore, it is a rather accurate stand-in for determining which author groups in that network are the most influential or productive.

To thoroughly investigate the authors' networks in sustainable finance, we conduct a co-authorship analysis of authors for the purposes of our review and limit the threshold of authors' inclusion to two publications only.

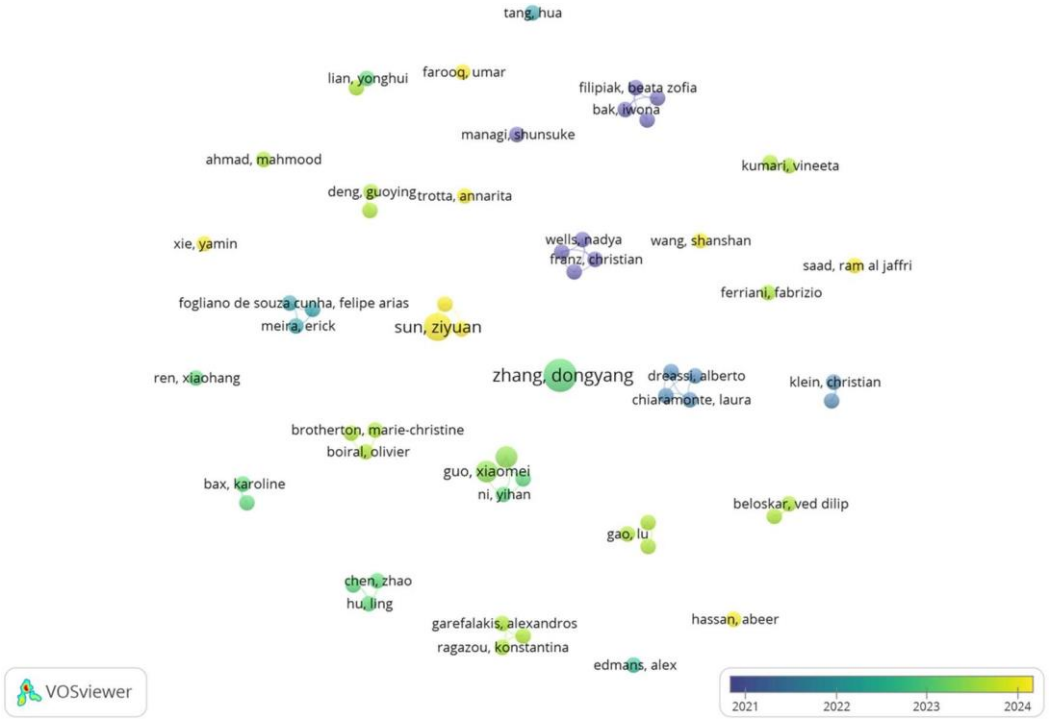



**Fig6 : Co-authorship Analysis (VOSViewer Output)**

The co-authorship network consists of 59 authors divided into 29 clusters. This author's networks together with the analysis of the most relevant publications indicates that Zhang dongyang, Ziyuan, Christian Klien and Xiaomei Guo are the most influential authors' network. To illustrate, Christian Klien, Bernhard and Dongyang generates the most citations in this area (Table ).

4.3 : Cooccurence Analysis

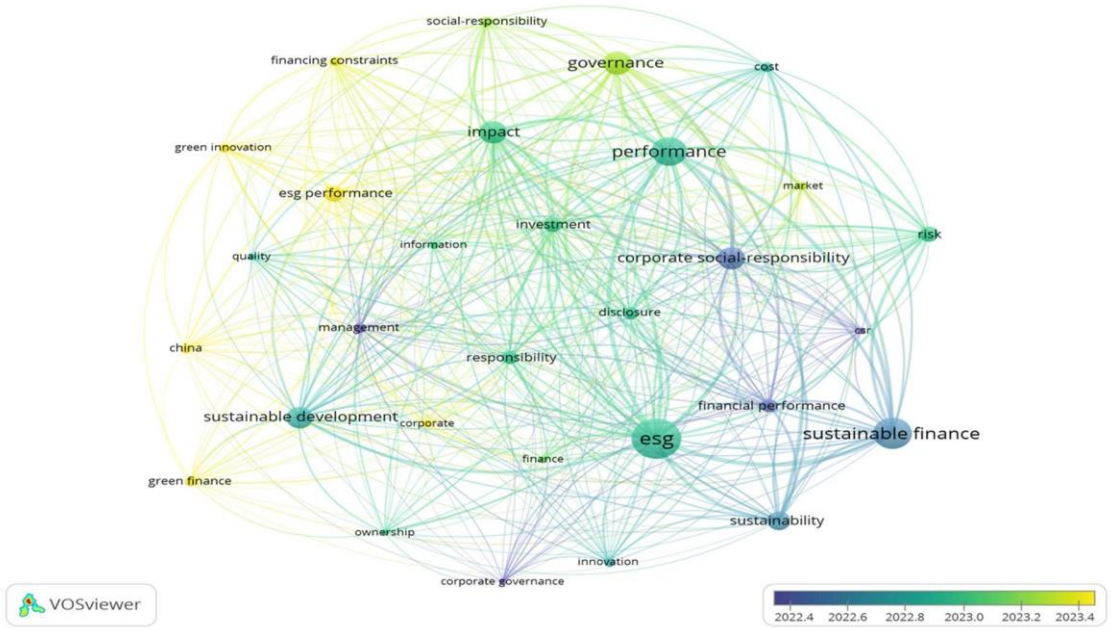



**Fig 7 : Co-occurrence Analysis (VOSViewer Output)**

We conducted a co-occurrence analysis of keywords of publication of selected authors in the same time span. Using keywords, the occurrences attribute shows the number of documents in which a keyword occurs, or the combinations of keywords that appear most frequently in the selected publication. The minimum number of

occurrences of a keyword that was considered is five. The network map provides a visualisation of the keywords' co-occurrence.
This map uses colour to indicate places with varying levels of research intensity. The average publication year, from 2014 to 2024, is represented by research intensity; places with earlier publication years are shown in blue, and places with more intense research in recent years are shown in yellow.
From this perspective, it emerges that the most relevant themes considered are ESG performance, green innovation, green finance and China.

**Discussion and Conclusion**

The bibliometric analysis of ESG imperatives within sustainable finance reveals significant trends and research gaps. First, the increasing interest in sustainable finance underscores the importance of ESG factors in investment and decision-making processes across the global financial landscape. The analysis identifies a rising trend in ESG-focused publications, indicating a heightened awareness of sustainable finance in both academia and industry. This trend corresponds with the global shift toward responsible investment practices, driven by regulatory pressures, stakeholder demands, and the acknowledgment of ESG factors as essential for long-term financial performance.

The analysis of keywords and thematic clusters reveals the diverse dimensions of ESG (Environmental, Social, and Governance) research. Environmental themes dominate the discourse, with significant emphasis placed on climate risk management, carbon footprint reduction, and sustainable investment strategies. While social and governance aspects are becoming increasingly important, they receive comparatively less attention. However, recent studies indicate a growing interest in the social impact of investments, focusing on issues such as workforce diversity, labor rights, and community engagement. This trend underscores the holistic nature of sustainability considerations in finance. Governance, which includes topics like corporate governance, transparency, and ethical business practices, is emerging as a critical area of focus, particularly in relation to regulatory compliance and investor expectations.

Author and journal analyses indicate that a small number of scholars and journals dominate the field, suggesting a concentrated knowledge base and a limited number of influential researchers in ESG (Environmental, Social, and Governance) and sustainable finance. Prominent journals such as Sustainable Finance and Investment, the Journal of Environmental Management, and Business Strategy and the Environment play a crucial role in advancing the discourse, particularly by publishing interdisciplinary and empirical studies. However, this centralization may limit diversity in perspectives and methodologies, highlighting the need for increased research contributions from emerging economies that face unique ESG challenges.

Geographical patterns in the literature reveal disparities in ESG research contributions across different regions. Developed economies, particularly the United States, Europe, and certain Asian countries such as Japan and South Korea, dominate in terms of publications. In contrast, developing nations, despite encountering significant ESG challenges, remain underrepresented. This discrepancy highlights both funding and infrastructural limitations, underscoring the necessity for global collaboration to promote more equitable contributions, especially as emerging economies assume an increasingly vital role in global sustainability efforts.

This bibliometric analysis illuminates the growth and current landscape of ESG research within sustainable finance, providing insights into research trends, key contributors, and thematic areas. The findings underscore the critical role of environmental concerns within ESG, while also highlighting the increasing significance of social and governance issues. To advance ESG research and practice, it is essential to promote diversity in research perspectives, address regional disparities, and encourage interdisciplinary approaches that integrate insights from both developed and developing economies.

For future research, it is essential to expand beyond environmental metrics to include in-depth studies on social and governance factors, which will provide a more comprehensive understanding of sustainable finance. Collaborative research efforts across various regions, particularly those that include underrepresented voices in ESG literature, can help bridge existing knowledge gaps. Furthermore, there is a need for research methodologies that integrate both quantitative and qualitative analyses to evaluate the practical impact of ESG practices on financial performance and societal well-being.

In conclusion, ESG imperatives represent an evolving field with significant growth potential. Ongoing research in this area will be essential for developing effective sustainable finance practices that align with global sustainability goals and enhance resilience in the face of climate, social, and governance-related challenges.

**References:**

Adams, C. A. (2017). Conceptualising the contemporary corporate value creation process. *Accounting, Auditing & Accountability Journal, 30*(4), 906–931. https://doi.org/10.1108/AAAJ-04-2016-2529

Adams, C. A. A., & Abhayawansa, S. (2022). Connecting the COVID-19 pandemic, environmental, social and governance (ESG) investing and calls for "harmonisation" of sustainability reporting. *Critical Perspectives on Accounting, 82,* Article 102309. https://doi.org/10.1016/j.cpa.2021.102309

Aldowaish, A., Kokuryo, J., Almazyad, O., & Goi, H. C. (2022). Environmental, social, and governance integration into the business model: Literature review and research agenda. *Sustainability, 14*(5), Article 2908. https://doi.org/10.3390/su14052908

Aracil, E., Nájera-Sánchez, J. J., & Forcadell, F. J. (2021). Sustainable banking: A literature review and integrative framework. *Finance Research Letters, 42*, 101932. https://doi.org/10.1016/j.frl.2021.101932

Aria, M., & Cuccurullo, C. (2017). bibliometrix: An R-tool for comprehensive science mapping analysis. *Journal of Informetrics, 11*(4), 959–975.

Baker, M., Bergstresser, D., Serafeim, G., & Wurgler, J. (2022). The pricing and ownership of US green bonds. *Annual Review of Financial Economics, 14,* 201–221. https://doi.org/10.1146/annurev-financial-102920-123202

Baas, J., Schotten, M., Plume, A., Côté, G., & Karimi, R. (2020). Scopus as a curated, high-quality bibliometric data source for academic research in quantitative science studies. *Quantitative Science Studies, 1*(1), 377–386

Baines, J., & Hager, S. B. (2023). From passive owners to planet savers? Asset managers, carbon majors and the limits of sustainable finance. *Competition & Change*, *27*(3), 360-380. https://doi.org/10.1177/10245294231192079

Bhatnagar, S., & Sharma, D. (2022). Evolution of green finance and its enablers: A bibliometric analysis. *Renewable and Sustainable Energy Reviews, 162,* 112405

Bhutta, U. S., Tariq, A., Farrukh, M., Raza, A., & Iqbal, M. K. (2022). Green bonds for sustainable development: Review of literature on development and impact of green bonds. *Technological Forecasting and Social Change, 175, 121405*. https://doi.org/10.1016/j.techfore.2021.121405

Brandstetter, L., & Lehner, O. M. (2015). Opening the market for impact investments: The need for adapted portfolio tools. *Entrepreneurship Research Journal, 5(2),* 111–132. https://doi.org/10.1515/erj-2014-0025

Broadstock, D. C., Managi, S., Matousek, R., & Tzeremes, N. G. (2019). Does doing good always translate into doing well? An eco-efficiency perspective. *Business Strategy and the Environment, 28*(6), 1199–1217. https://doi.org/10.1002/bse.2311

Baas, J., Schotten, M., Plume, A., Côté, G., & Karimi, R. (2020). Scopus as a curated, high-quality bibliometric data source for academic research in quantitative science studies. *Quantitative Science Studies, 1(1),* 377–386.

Baines, J., & Hager, S. B. (2023). From passive owners to planet savers? Asset managers, carbon majors and the limits of sustainable finance. *Competition & Change*, *27*(3), 360-380. https://doi.org/10.1177/10245294231192079

Bhatnagar, S., & Sharma, D. (2022). Evolution of green finance and its enablers: A bibliometric analysis. *Renewable and Sustainable Energy Reviews, 162,* 112405

Bhutta, U. S., Tariq, A., Farrukh, M., Raza, A., & Iqbal, M. K. (2022). Green bonds for sustainable development: Review of literature on development and impact of green bonds. *Technological Forecasting and Social Change, 175,* 121405. https://doi.org/10.1016/j.techfore.2021.121405

Brandstetter, L., & Lehner, O. M. (2015). Opening the market for impact investments: The need for adapted portfolio tools. *Entrepreneurship Research Journal, 5(2),* 111–132. https://doi.org/10.1515/erj-2014-0025

Broadstock, D. C., Managi, S., Matousek, R., & Tzeremes, N. G. (2019). Does doing good always translate into doing well? An eco-efficiency perspective. *Business Strategy and the Environment, 28(6),* 1199–1217. https://doi.org/10.1002/bse.2311

Becker, M. G., Martin, F., & Walter, A. (2022). The power of ESG transparency: The effect of the new SFDR sustainability labels on mutual funds and individual investors. *Finance Research Letters, 47,* 102756. https://doi.org/10.1016/j.frl.2021.102756

Bibliometrix. (2022). Biblioshiny (Version 3) [Web application]. Available online: *https://bibliometrix.org/biblioshiny/biblioshiny3.html* (accessed on December 20, 2022).

Campiglio, E. (2016). Beyond carbon pricing: The role of banking and monetary policy in financing the transition to a low-carbon economy. *Ecological Economics,* 121, 220–230. https://doi.org/10.1016/j.ecolecon.2015.03.020

Ge, G., Xiao, X., Li, Z., & Dai, Q. (2022). Does ESG performance promote high-quality development of enterprises in China? The mediating role of innovation input. *Sustainability, 14(7),* Article 3843. https://doi.org/10.3390/su14073843

Hafner, S., Jones, A., Anger-Kraavi, A., & Pohl, J. (2020). Closing the green finance gap–A systems perspective. *Environmental Innovation and Societal Transitions, 34,* 26–60.

Hughes, A., Urban, M. A., & Wojcik, D. (2021). "Alternative ESG Ratings: How Technological Innovation Is Reshaping Sustainable Investment. *"Sustainability, 13(6),* 3551. https://doi.org/10.3390/su13063551

Nobanee, H., Al Hamadi, F. Y., Abdulaziz, F. A., Abukarsh, L. S., Alqahtani, A. F., AlSubaey, S. K., Alqahtani, S. M., &Almansoori, H. A. (2021). A bibliometric analysis of sustainability and risk management. *Sustainability, 13(3277).* https://doi.org/10.3390/su1306327

Fogliano de Souza Cunha, F. A., Meira, E., & Orsato, R. J. (2021). Sustainable finance and investment: Review and research agenda. *Business Strategy and the Environment, 30(8), 3784–3800*. https://doi.org/10.1002/bse.2932

. In, S. Y., Rook, D., & Monk, A. (2019). Integrating alternative data (also known as ESG data) in investment decision making. *Global Economic Review, 48(3), 237–260*. https://doi.org/10.1080/1226508X.2019.1640164

. Lian, Y., Ye, T., Zhang, Y., & Zhang, L. (2023). How does corporate ESG performance affect bond credit spreads: Empirical evidence from China. *International Review of Economics & Finance, 85, 259–272*. https://doi.org/10.1016/j.iref.2023.02.006

. Tang, H. (2022). The effect of ESG performance on corporate innovation in China: The mediating role of financial constraints and agency cost. *Sustainability, 14(7),* 4136. https://doi.org/10.3390/su14074136

Cardillo, G., Bendinelli, E., &Torluccio, G. (2023). COVID-19, ESG investing, and the resilience of more sustainable stocks: Evidence from European firms. *Business Strategy and the Environment, 32(1), 602–623*. https://doi.org/10.1002/bse.3163

Chen, S., Song, Y., & Gao, P. (2023). Environmental, social, and governance (ESG) performance and financial outcomes: Analyzing the impact of ESG on financial performance. *Journal of Environmental Management, 345, Article 118692*. https://doi.org/10.1016/j.jenvman.2023.118692

Chen, Y. P. (V.), Zhuo, Z., Huang, Z., & Li, W. (2022). Environmental regulation and ESG of SMEs in China: Porter hypothesis re-tested. *Science of the Total Environment, 850, Article 157967*. https://doi.org/10.1016/j.scitotenv.2022.157967

Chen, Z., Hu, L., He, X., Liu, Z., Chen, D., & Wang, W. (2022). Green financial reform and corporate ESG performance in China: Empirical evidence from the Green Financial Reform and Innovation Pilot Zone. *International Journal of Environmental Research and Public Health, 19(22), 15177*. https://doi.org/10.3390/ijerph192215177

Cheng, X., Chen, K., & Su, Y. (2023). Green innovation in oil and gas exploration and production for meeting the sustainability goals. *Resources Policy, 87, 103055*. https://doi.org/10.1016/j.resourpol.2023.103055

D'Orazio, P., &Popoyan, L. (2019). Fostering green investments and tackling climate-related financial risks: Which role for macroprudential policies? *Ecological Economics, 160, 25–37.* https://doi.org/10.1016/j.ecolecon.2019.01.029

Dmuchowski, P., Dmuchowski, W., Baczewska-Dabrowska, A. H., & Gworek, B. (2023). Environmental, social, and governance (ESG) model; impacts and sustainable investment—Global trends and Poland's perspective. *Journal of Environmental Management*, 329, Article 115032. https://doi.org/10.1016/j.jenvman.2023.115032

Donthu, N., Kumar, S., Mukherjee, D., Pandey, N., & Lim, W. M. (2021). How to conduct a bibliometric analysis: An overview and guidelines. *Journal of Business Research, 133, 285–296*. https://doi.org/10.1016/j.jbusres.2021.04.070

Drempetic, S., Klein, C., &Zwergel, B. (2020). The influence of firm size on the ESG score: Corporate sustainability ratings under review. *Journal of Business Ethics, 167(2), 333–356*. https://doi.org/10.1007/s10551-019-04158-9

Fankhauser, S., Sahni, A., Savvas, A., & Ward, J. (2016). Where are the gaps in climate finance *? Climate and Development*, 8(3), 203–206. https://doi.org/10.1080/17565529.2015.1064811

Gao, S., Meng, F., Gu, Z., Liu, Z., & Farrukh, M. (2021). Mapping and clustering analysis on environmental, social and governance field: A bibliometric analysis using Scopus. *Sustainability, 13(7304).* https://doi.org/10.3390/su13137304

Gigante, G., &Manglaviti, D. (2022). The ESG effect on the cost of debt financing: A sharp RD analysis. *International Review of Financial Analysis, 84, 102368*. https://doi.org/10.1016/j.irfa.2022.102368

Hassan, M. K., Chiaramonte, L., Dreassi, A., Paltrinieri, A., &Pisera, S. (2021). The crossroads of ESG and religious screening on firm risk. *Research in International Business and Finance, 58, 101515.* https://doi.org/10.1016/j.ribaf.2021.101515

Khan, M. A. (2022). ESG disclosure and firm performance: A bibliometric and meta-analysis. *Research in International Business and Finance, 61, Article 101610*. https://doi.org/10.1016/j.ribaf.2022.101610

Liang, H., Sun, L., & Teo, M. (2022). *Responsible hedge funds. Review of Finance, 26(6), 1311–1340.* https://doi.org/10.1093/rof/rfab053

Luo, W., Tian, Z., Zhong, S., Lyu, Q., & Deng, M. (2022). Global evolution of research on sustainable finance from 2000 to 2021: A bibliometric analysis on WoS database. *Sustainability, 14(15), 9435*. https://doi.org/10.3390/su14159435

Mansouri, S., & Momtaz, P. P. (2022). Financing sustainable entrepreneurship: ESG measurement, valuation, and performance. *Journal of Business Venturing, 37(6),* Article 106224. https://doi.org/10.1016/j.jbusvent.2022.106224

Mejia-Escobar, J. C., Gonzalez-Ruiz, J. D., & Duque-Grisales, E. (2020). Sustainable financial products in the Latin America banking industry: *Current status and insights. Sustainability, 12(14), 5730.* https://doi.org/10.3390/su12145730

Meline, T. (2006). Selecting studies for systematic review: Inclusion and exclusion criteria. *Contemporary Issues in Communication Science and Disorders, 33, 21–27.* https://doi.org/

Migliorelli, M. (2021). What do we mean by sustainable finance? *Assessing existing frameworks and policy risks. Sustainability, 13(975).* https://doi.org/10.3390/su13020975

Monasterolo, I., Roventini, A., & Foxon, T. J. (2019). Uncertainty of climate policies and implications for economics and finance: *An evolutionary economics approach. Ecological Economics, 163, 177–182.*

https://doi.org/10.1016/j.ecolecon.2019.05.012

Munoz-Torres, J., Fernandez-Izquierdo, M. A., Rivera-Lirio, J. M., &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(2*), 439–452. https://doi.org/10.1002/csr.1695

Naeem, M. A., Karim, S., Rabbani, M. R., Bashar, A., & Kumar, S. (2022). Current state and future directions of green and sustainable finance: A bibliometric analysis. *Qualitative Research in Financial Markets. Advance online publication.* https://doi.org/10.1108/QRFM-11-2021-0172

Naidoo, C. P. (2019). Relating financial systems to sustainability transitions: *Challenges, demands and dimensions (SSRN Paper).* Retrieved from https://ssrn.com/abstract=3443551

Popescu, I.-S., Hitaj, C., & Benetto, E. (2021). Measuring the sustainability of investment funds: A critical review of methods and frameworks in sustainable finance. *Journal of Cleaner Production, 314, 128060*. https://doi.org/10.1016/j.jclepro.2021.128060

Raimo, N., Caragnano, A., Zito, M., Vitolla, F., & Mariani, M. (2021). Extending the benefits of ESG disclosure: *The effect on the cost of debt financing. Corporate Social Responsibility and Environmental Management, 28(4), 1201-1211.* https://doi.org/10.1002/csr.2054

Ren, X., Zeng, G., & Sun, X. (2023). The peer effect of digital transformation and corporate environmental performance: Empirical evidence from listed companies in China. *Economic Modelling, 128,* 105545. https://doi.org/10.1016/j.econmod.2023.105545

Secinaro, S., Calandra, D., Petricean, D., & Chmet, F. (2020). Social finance and banking research as a driver for sustainable development: A bibliometric analysis. *Sustainability, 13(1), 330.* https://doi.org/10.3390/su13010330

Sharma, G. D., Sarker, T., Rao, A., Talan, G., & Jain, M. (2022). Revisiting conventional and green finance spillover in the post-COVID world: Evidence from robust econometric models. *Global Finance Journal, 51,* 100628. https://doi.org/10.1016/j.gfj.2021.100628

Singal, M. (2014). The link between firm financial performance and investment in sustainability initiatives. *Cornell Hospitality Quarterly, 55(1),* 19–30. https://doi.org/10.1177/1938965513500323

Starks, L. T. (2023). Presidential address: Sustainable finance and ESG issues—Value versus Values. *Journal of Finance, 78(4),* 1955–1969. https://doi.org/10.1111/jofi.13251

Sultana, S., Zulkifli, N., & Zainal, D. (2018). Environmental, social and governance (ESG) and investment decision in Bangladesh. *Sustainability, 10(6),* Article 178. https://doi.org/10.3390/su10061788

Tian, H., & Tian, G. (2022). Corporate sustainability and trade credit financing: Evidence from environmental, social, and governance ratings. *Corporate Social Responsibility and Environmental Management, 29(5),* 1896–1908. https://doi.org/10.1002/csr.2335

Tolliver, C., Fujii, H., Keeley, A. R., & Managi, S. (2021). Green innovation and finance in Asia. *Asian Economic Policy Review, 16(1), 67–87*. https://doi.org/10.1111/aepr.12289

Van Eck, N. J., & Waltman, L. (2022). *VOSviewer manual (Vol. 1, pp. 1–53).* Universiteit Leiden.
Wang, Z., Chu, E., & Hao, Y. (2024). Towards sustainable development: How does ESG performance promote corporate green transformation? *International Review of Financial Analysis, 91, 102357*. https://doi.org/10.1016/j.irfa.2023.102357

Yang, Q., Du, Q., Razzaq, A., & Shang, Y. (2022). How volatility in green financing, clean energy, and green economic practices derive sustainable performance through ESG indicators? *A sectoral study of G7 countries. Resources Policy, 75, 102455*. https://doi.org/10.1016/j.resourpol.2021.102455

Yang, Y., & Han, J. (2023). Digital transformation, financing constraints, and corporate environmental, social, and governance performance. *Corporate Social Responsibility and Environmental Management, 30(6),* 3189–

3202. https://doi.org/10.1002/csr.2546

Zhai, Y., Cai, Z., Lin, H., Yuan, M., Mao, Y., & Yu, M. (2022). Does better environmental, social, and governance induce better corporate green innovation: The mediating role of financing constraints. *Corporate Social Responsibility and Environmental Management, 29(5),* 1513–1526. https://doi.org/10.1002/csr.2288

Zhang, D. (2023). Does green finance really inhibit extreme hypocritical ESG risk? A greenwashing perspective *exploration. Energy Economics, 121,* Article 106688. https://doi.org/10.1016/j.eneco.2023.106688

Zhang, D., & Lucey, B. M. (2022). Sustainable behaviors and firm performance: The role of financial constraints' alleviation. *Economic Analysis and Policy, 74,* 286–297. https://doi.org/10.1016/j.eap.2022.04.003

Zhang, D., Meng, L., & Zhang, J. (2023). Environmental subsidy disruption, skill premiums and ESG performance. *International Review of Financial Analysis, 90,* Article 102862. https://doi.org/10.1016/j.irfa.2023.102862

Shobande, O. A., & Enemona, J. O. (2021). A multivariate VAR model for evaluating sustainable finance and natural resource curse in West Africa*:* Evidence from Nigeria and Ghana. *Sustainability, 13(5), 2847*. https://doi.org/10.3390/su13052847

Zhang, D., Zhang, Z., & Managi, S. (2019). A bibliometric analysis on green finance: Current status, development, and future directions. *Finance Research Letters, 29,* 425–430. https://doi.org/10.1016/j.frl.2019.03.007

Zhang, D. (2023). Can digital finance empowerment reduce extreme ESG hypocrisy resistance to improve green innovation? *Energy Economics, 125,* Article 106756. https://doi.org/10.1016/j.eneco.2023.106756

Ziolo, M., Filipiak, B. Z., Bak, I., & Cheba, K. (2019). How to design more sustainable financial systems: The roles of environmental, social, and governance factors in the decision-making process. *Sustainability, 11(20),* 5604. https://doi.org/10.3390/su11205604

Zerbib, O. D. (2022). A sustainable capital asset pricing model (S-CAPM): Evidence from environmental integration and sin stock exclusion. *Review of Finance, 26(6),* 1345–1388. https://doi.org/10.1093/rof/rfac045