

An Overview of Literature on ESG Performance Using Bibliometric Analysis

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Abstract

The research on Environmental, Social, and Governance (ESG) performance has increased in the past two decades, however, overview of this topic is still insufficient. This paper aims at identifying the most influential journals, articles, authors, countries, and themes surrounding ESG performance to provide future research directions. This paper analysed 478 articles published in Scopus database using bibliometric tools such as Biblioshiny and VOSviewer. Findings reveal a rising trend of articles production from year 2011 to 20 March 2024, which can be categorised into three stages: The initial Phase (2011-2018); the Gradual Development Phase (2019-2022); and the Rapid Development Phase (2023-March 20, 2024). Three-word clouds of the author's keywords also match with the three stages where different keywords were used at different stages, contributing to the trends of ESG performance. In addition, considering the network visualisation of the author's keywords, ESG performance can be subdivided into four themes which are ESG integration and corporate performance evaluation; ESG practice and ESG performance; corporate governance and ESG performance by pillars; and ESG drive innovation amidst external pressures. Lastly, future research directions for ESG research are proposed.

Keywords: ESG, ESG Performance, Bibliometric Analysis, Cluster Analysis, Research Trends

Introduction

ESG performance, encompasses Environmental, Social, and Governance (ESG) factors, has gained considerable attention due to its influence on several aspects of corporate operations and financial outcomes. ESG factors have a significant impact on financial performance, risk mitigation, sustainability, stakeholder relationships, and investment decisions (de Souza Barbosa et al., 2023; Kurniawan & Rokhim, 2023; Pistolesi & Teti, 2024). Integrating ESG factors into investment strategies aims not only to achieve financial returns but also to create a positive impact on society and the environment. Research indicates that companies with strong ESG performance tend to outperform their peers in various aspects (Luo et al., 2023). For instance, ESG leaders have demonstrated better access to capital, lower interest rates,

and higher market capitalisation compared to average companies and laggards (Eliwa et al., 2021).

Moreover, ESG performance is not just about financial gains but also about creating a sustainable future. Companies that focus on ESG factors are better positioned to navigate challenges such as economic uncertainties, regulatory changes, and stakeholder demands (Shakil et al., 2020). By integrating ESG principles into their corporate strategy, organisations can drive innovation, improve operational efficiency, and build resilience against external shocks (Ng et al., 2023).

This study aimed to perform a bibliometric analysis to map research on ESG performance. Analyses encompassed the growth of ESG performance research publications from 2011 to March 20, 2024, the productivity of journals, countries, and authors in ESG performance research, highly cited documents, three-word clouds analysis, themes of author's keywords, and future research directions. This study focuses on the following research questions: RQ1: What are the current publication trends in ESG performance, and how have they evolved? RQ2: Who are the most productive authors in ESG performance, and how about the networks by authors? RQ3: Which countries are the most active in ESG performance research? RQ4: What are the most highly cited documents in ESG performance research, and what is the trend that they address? RQ5: What are the crucial author's keywords and themes in ESG performance research, and what are the potential future directions within this field?

The structure of this paper proceeds as outlined below: Section 2 provides an overview of the literature followed by methodology and discusses the results. Lastly, it offers conclusions, discusses limitations, highlights contributions, and suggests future research directions.

Literature Review

In recent years, numerous literature reviews have employed bibliometric analysis to explore various dimensions of ESG. Scopus and Web of Science are the primary data sources for bibliometric analysis. They often concentrate on specific themes, including the influence of ESG on firm performance (Khan, 2022), ESG investing (Jain & Tripathi, 2023), FinTech and ESG (Trotta et al., 2024), and ESG risks (Gallucci et al., 2022). Only two articles focus on ESG performance. One article, written by Galletta et al. (2022), analyses ESG performance within the banking industry. The other study focuses on the factors that influence ESG performance (Khaw et al., 2024). Unlike these two articles, our study does not limit itself to a particular industry and instead examines the current contributions and future research directions of ESG performance.

There are two reasons to indicate bibliometric analysis within this field is still insufficient. Firstly, prior reviews have often featured a limited number of articles. For example, Khaw et al. (2024) examined 64 articles, Khan (2022) included 199 articles, and Galletta et al. (2022) analysed 271 articles. Secondly, there has been a notable surge in journal articles related to ESG performance observed in 2023 and early 2024. Therefore, incorporating the latest data is imperative. Finally, conducting a bibliometric analysis of ESG performance is crucial for uncovering current research trends and future directions.

Methodology

The Scopus database is employed in this research as a trustworthy and authentic source for performing bibliometric analysis. We follow the search term authored by Zhang et al. (2024), adding the keywords “performance” to make sure the article title contains ESG and performance. Thus, article title= (“environment* social* and govern*” OR “environment* social* govern*” OR “environment* social* corporate govern*” OR “environment* social* and corporate govern*” OR “ESG”) AND (“performance”)) was found to be the search term for this study. The original result is 848 articles on 20 March 2024.

Following the research process outlined in Figure 1, this study limited the document type article and review, excluding 62 articles. After limiting the document type, the result was 786 articles, then limited language English excluded 10 articles. Therefore, 776 articles were assessed for eligibility. Among these, 298 articles were eliminated from the analysis section as they did not primarily focus on ESG performance. As a result, 478 documents were retained for subsequent bibliometric analysis.

We use OpenRefine to clean the data (Ahmi, 2023). The reason for cleaning the data is to make sure to get good output from bibliometric tools. Using OpenRefine to clean the data would result in fewer errors and more efficiency than manually. The bibliometric study in this article was carried out using Biblioshiny, VOSviewer, and Microsoft Excel. Word clouds were created using Biblioshiny (Aria & Cuccurullo, 2017), and network visualisation mapping was done with VOSviewer (Van Eck & Waltman, 2010) for co-authorship and co-occurrence analysis. Microsoft Excel was also used for computations and more thorough analysis in the table.

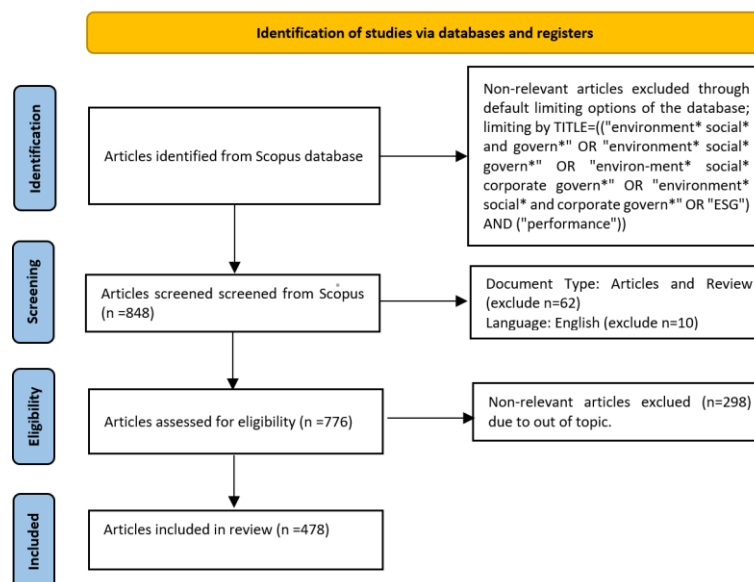


Figure 1. PRISMA Flow Diagram

Results and Discussion

Documents Profiles

Table 1 illustrates 470 journal articles and 8 review articles within the field of ESG performance. Journal articles constitute 98.33% of the document type. Figure 2 displays the twenty most productive journals on the subject of ESG performance, with Sustainability

(Switzerland) being the foremost publisher, having published 61 articles on ESG performance. This can be due to the strong connection between ESG themes and the journal’s specific focus on ESG issues.

Table 1
Document Type

Document Type	Total Publications	Ratio (%)
Journal Article	470	98.33%
Review Article	8	1.67%
Total	478	100.00

Source: By authors.



Figure 2. Top 20 Most Productive Journals of ESG Performance

Publication Trends

Figure 3 demonstrates the publication trend in the area of ESG performance from 2011 till March 20, 2024. Though we did not set a time constraint, the earliest two articles in this domain were published in 2011. We can divide this period into three stages: Initial Phase (2011-2018); Gradual Development Phase (2019-2022); and Rapid Development Phase (2023-March 20, 2024). During the Initial Phase, the number of published articles was fewer than ten articles published annually until 2019, when it reached ten articles, marking the transition into the Gradual Development Phase. The number of publications increased in the Gradual Development Phase, but remained below one hundred articles until 2022, with 81 articles published. However, there was a significant surge in 2023, with the number of published articles dramatically increasing to 223. This marked the onset of the Rapid Development Phase, which continued until the data cutoff date of March 20, 2024. Looking ahead, the forecast for 2024 is expected to surpass 2023, as indicated by the 118 articles published in the first three months of 2024.

As depicted in Figure 3, the initial peak in citations occurred in the years 2017 and 2018, with four journal articles published separately in the two years. Notably, all articles from 2017 and 2018 rank among the top ten citations (refer to Table 4), indicating their significant impact on the field. Although there was a decline in paper citations in 2019, the ongoing rise in the quantity of papers highlights the lasting significance of ESG performance in academia to some extent. Based on the trend observed in 2024, we can anticipate another peak in the near future.

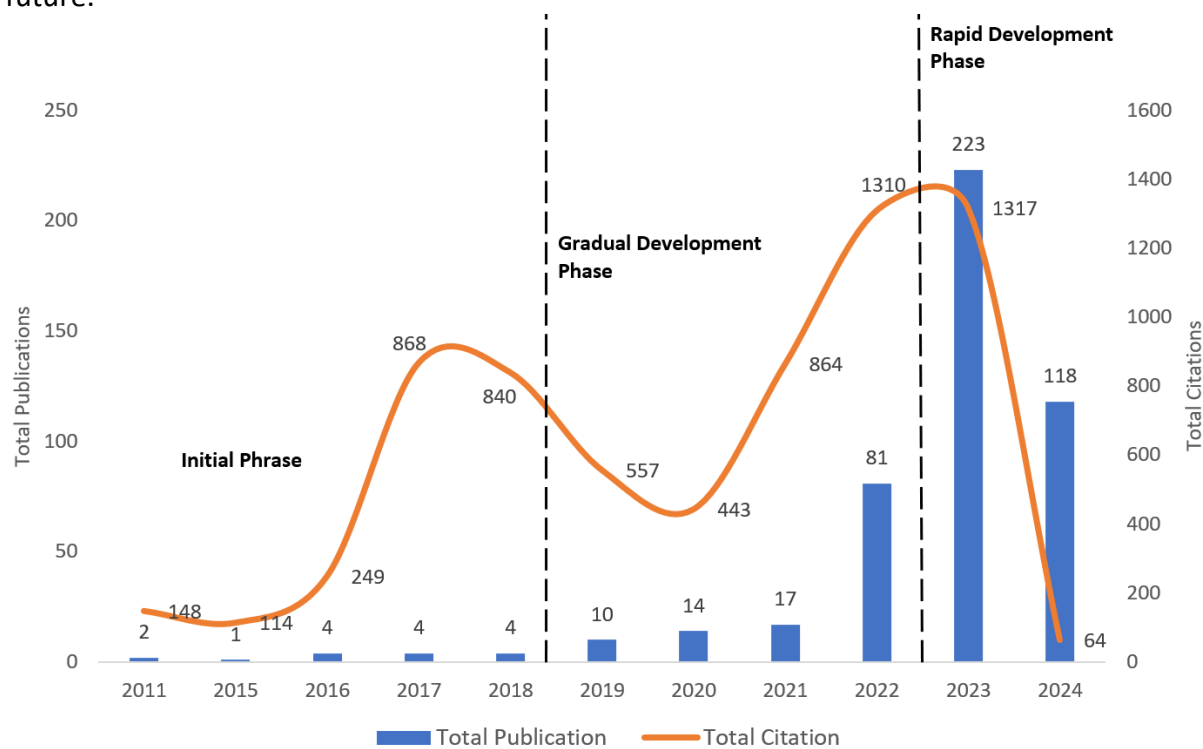


Figure 3. Number of publications and citations per year

Publications by Authors

Table 2 outlines a list of the ten authors who have demonstrated the highest level of productivity in the field of ESG performance. It is evident that Khatib and Hamzeh lead the list with seven published papers each. Upon closer examination of the data, it becomes apparent that TP, NCP, TC, C/P, and C/CP exhibit identical figures for the top two authors. This is because the top two authors have collaborated on seven published articles. Notably, Patrick Velte has published six papers with an average citation count of 85.83, making him the author in the top ten with the most citations. The presence of five authors from China underscores the significant interest in ESG performance among Chinese academia. It is worth mentioning that two of the authors pursued their doctoral or postdoctoral studies at universities in China.

Using VOSviewer (version 1.6.20), a bibliographic map was generated based on the available data, which includes a total of 1253 authors. Upon setting the minimum publications limitation to one, all authors meet this threshold. However, most authors have minimal connections. Figure 4 illustrates the 20 largest connected authors. Figure 4 reveals four distinct clusters, each represented by a different colour. In the red cluster, Qureshi, Muhammad Azeem, emerges as a key author with three published articles in this field. Notably, Maqsood, Umer Sahil, and Zahid, R. M. Ammar, highlighted in green, are co-authors of four articles focusing on ESG performance, as detailed in Table 2. Similarly, Akbar, Minhas,

represented in yellow, has two articles, while Nazir, Marina, in blue, also contributed two articles to this field. The limited co-authorships depicted in the figure suggest a need for enhanced collaboration among authors with shared interests to foster future connections.

Table 2
Top 10 Most Productive Authors

Author's Full Name	Country	TP	NCP	TC	C/P	C/CP
Khatib, Saleh F. A.	Malaysia	7	7	78	11.14	11.14
Al Amosh, Hamzeh	Qatar	7	7	78	11.14	11.14
Velte, Patrick	Germany	6	6	515	85.83	85.83
Chang, Chun-Ping	China	5	5	101	20.20	20.20
Feng, Genfu	China	5	4	98	19.60	24.50
Shakil, Mohammad Hassan	Malaysia	4	4	277	69.25	69.25
Zahid, R. M. Ammar	China	4	2	26	6.50	13.00
Maqsood, Umer Sahil	China	4	2	26	6.50	13.00
He, Feng	China	4	4	156	39.00	39.00
Jin, Shanyue	South Korea	3	2	5	1.67	2.50

Notes: TP represents the total number of publications; NCP represents the number of cited publications; TC represents the total number of citations; C/P represents the average citations per publication; C/CP represents the average citations per cited publication.

Source: By authors.

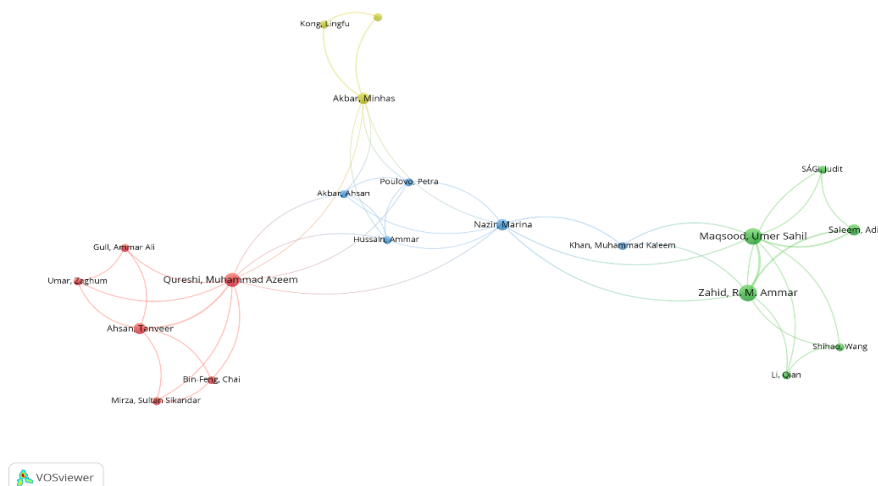


Figure 4. Co-authorship Network Visualisation Map

Publications by Countries

The top ten countries that contribute to this field are depicted in Table 3. China demonstrates the highest research production, having published a total of 270 publications. Malaysia and the United States follow, with 37 and 27 articles, respectively. It is worth mentioning that Germany holds the largest average citations per publication (C/P) at 102.33, largely attributed

to the contributions of Patrick Velte. This indicates that despite their relatively lower publication output in ESG performance, Germany holds considerable influence in the domain. However, the impact is expected to increase significantly due to the growing number of publications in China, driven by policymakers' growing interest in achieving ESG performance.

Table 3
Top 10 Countries Contributed to the Publications

Country	TP	NCP	TC	C/P	C/CP
China	270	2100	144	7.78	14.58
Malaysia	37	474	25	12.81	18.96
United States	27	876	18	32.44	48.67
South Korea	22	251	14	11.41	17.93
Italy	21	493	16	23.48	30.81
United Kingdom	19	141	13	7.42	10.85
Australia	17	145	11	8.53	13.18
India	16	195	11	12.19	17.73
Germany	12	1228	12	102.33	102.33
Tunisia	11	42	6	3.82	7.00

Notes: TP represents the total number of publications; NCP represents the number of cited publications; TC represents the total number of citations; C/P represents the average citations per publication; C/CP represents the average citations per cited publication.

Source: By authors.

Highly Cited Documents

Table 4 presents the top ten highly cited articles on ESG performance, distinguished by their significant impact as evidenced by their considerable citation counts. Particularly, the paper titled "The Role of ESG Performance during times of financial crisis: Evidence from COVID-19 in China," authored by Broadstock et al. (2021), emerges as the most referenced work in the field of ESG performance. With a total of 439 citations and an impressive citation per year rate of 109.75, it stands as the only article exceeding one hundred citations per year. However, a significant proportion of the highly cited articles were published in 2017 and 2018, totalling eight articles (refer to Figure 3), all which feature among the top ten highly cited articles. This underscores their substantial impact on the field. These eight articles encompass a diverse range of topics related to ESG performance, exploring its influence on firm value, financial performance, and market valuation. Notably, the highest-cited article, authored by Broadstock et al. (2021), investigates the impact of ESG performance during the economic downturn induced by the COVID-19 pandemic in China, offering beneficial information into a chance advantages of ESG practices in enhancing firms' resilience and mitigating financial risks during crises. With a multitude of journal articles exploring ESG performance and COVID-19, researchers are expanding their focus beyond firm value to encompass aspects such as policy uncertainty, environmental sensitivity, and evolving social dynamics in future studies.

Table 4
Top 10 Highly Cited Articles

Author(s) and Year	Title	TC	C/Y
Broadstock et al. (2021)	The role of ESG performance during times of financial crisis: Evidence from COVID-19 in China	439	109.75
Fatemi et al. (2018)	ESG performance and firm value: The moderating role of disclosure	421	60.14
Garcia et al. (2017)	Sensitive industries produce better ESG performance: Evidence from emerging markets	314	39.25
Velte (2017)	Does ESG performance have an impact on financial performance? Evidence from Germany	256	32.00
Yoon et al. (2018)	Does ESG performance enhance firm value? Evidence from Korea	168	24.00
Mervelskemper et al. (2017)	Enhancing Market Valuation of ESG Performance: Is Integrated Reporting Keeping its Promise?	160	20.00
Husted et al. (2017)	The impact of sustainability governance, country stakeholder orientation, and country risk on environmental, social, and governance performance	138	17.25
Birindelli et al. (2018)	Composition and activity of the board of directors: Impact on ESG performance in the banking system	138	19.71
Ortas et al. (2015)	The impact of institutional and social context on corporate environmental, social, and governance performance of companies committed to voluntary corporate social responsibility initiatives	114	11.40
Miralles-Quirós et al. (2018)	The value relevance of environmental, social, and governance performance: The Brazilian case	113	16.14

Notes: TC represents the total number of citations, while C/Y represents the number of citations per year.

Source: By authors.

Author's Keywords Analysis

Three Stages of Word Cloud Analysis of Author's Keywords: Three stages are clearly outlined in Figure 3: the Initial Phase (2011-2018), the Gradual Development Phase (2019-2022), and the Rapid Development Phase (2023- March 20, 2024). In this section, we utilised the filtering function based on publication year to represent these stages and generated three-word clouds using Biblioshiny. Before creating these word clouds, we excluded the top two author's keywords, "ESG" and "ESG performance," from the word clouds. This decision was made because the size of words in the cloud is determined by their frequency, and including these two keywords would overshadow other keywords.

Figure 5 displays a word cloud that covers the period from 2011 to 2018, which aligns with the Initial Phase observed in the publication trends. After removing the terms "ESG" and "ESG performance," the author's keywords, such as CSR and corporate governance, become more visible. These keywords represent important aspects of ESG, including the social (S) and governance (G) pillars. Figure 3 indicates that a total of 15 articles were published during this period. After analysing the author's keywords, it becomes evident that most of the author's keywords, such as "United Nations global compact," "sustainability performance," and "non-financial performance indicators," only occur once. This means the research of ESG performance is still in its early stages and is primarily focused on exploration. It highlights a wide range of subjects that should be further investigated in this field.

The word cloud in Figure 6 illustrates the Gradual Development Phase spanning from 2019 to 2022. Over these four years, the predominant author’s keyword is "environmental," representing the third pillar of ESG. This phase includes 122 published articles, marking an eightfold increase compared to the previous stage. Several author’s keywords have been widely recognised during this period, including "financial performance," "financing constraints," "sustainability," "sustainable development," and "stakeholder theory." This shift in keyword importance reflects a growing focus on financial considerations, sustainability, and stakeholder engagement within the evolving landscape of ESG research.

Figure 7 depicts the word cloud representing the Rapid Development Phase spanning from 2023 until the data cutoff date of March 20, 2024. In this phase, several new author keywords emerge, including "China," "sustainable development," "digital transformation," "green innovation," "environmental performance," and "green technology innovation." Notably, these keywords appear in similar sizes, indicating that researchers are exploring various aspects of ESG performance. This phase encompasses 341 published articles. China stands out with 234 articles published during this phase. This underscores China’s prominence as a research hotspot from 2023. Future research is likely to explore diverse domains, as evidenced by the emergence of Europe in Figure 7. The increasing focus on “green innovation” and “digital transformation” suggests that researchers actively seek sustainable development solutions.



Figure 5. Stage 1: From the Year 2011 to the Year 2018 Word Cloud by Author’s Keywords



Figure 6. Stage 2: From the Year 2019 to the Year 2022 Word Cloud by Author’s Keywords



Figure 7. Stage 3: The Year 2023 until 20 March 2024 Word Cloud by Author's Keywords

Author's Keywords Co-occurrence Analysis: In VOSviewer, co-occurrence refers to how frequently items appear together in a dataset. Figure 8 displays clusters of the author's keywords, where the size of each node represents the frequency of the keyword. Nodes of greater size indicate keywords that occur more frequently. The measure of co-occurrence is demonstrated by the distance between nodes and line thickness. The colour of each node represents term clusters, indicating interconnected subjects throughout the field. By setting the minimum keyword occurrence to 5, a total of 52 keywords were found that met this requirement. Furthermore, adjusting the minimum cluster size to 9, smaller clusters were merged into larger clusters. Four clusters emerge, organising the 52 author's keywords into four theme categories.

Cluster 1 emphasises ESG integration and corporate performance evaluation. This theme explores the incorporation of ESG aspects into sustainability reporting, which encompasses terms such as environmental, CSR, sustainability, social and governance, banking, board of directors, board gender diversity, and sustainability reporting. Furthermore, it investigates corporate performance evaluation using keywords such as firm value, financial performance, social and governance performance, ESG scores, firm performance, market value, and ESG rating. This cluster provides a thorough examination of how ESG concerns affect business performance and sustainability reporting (Maji & Lohia, 2023; Yen-Yen, 2019), putting light on the interdependence of ESG elements with financial and market performance indicators (Tampakoudis & Anagnostopoulou, 2020).

Cluster 2 is centered around ESG practice and ESG performance. This theme explores research on ESG practices, focusing on themes such as China, Europe, analyst coverage, environmental regulation, earnings management, economic policy uncertainty, executive compensation, institutional ownership, and investment efficiency. The keywords underscore the significance of ESG practices in various locations, the consequences of environmental rules, executive remuneration, and factors that affect investment effectiveness. This cluster discusses how ESG performance is measured (Gao & Liu, 2023; Liu et al., 2024), the strategies used by organisations in different areas (Habib, 2023), and the factors that influence ESG implementation and performance (Bilyay-Erdogan et al., 2024).

Cluster 3, represented by the blue colour, focuses on corporate governance and ESG performance by pillars. Corporate governance is at the centre of this cluster, emphasising its significance in driving ESG outcomes. The distinguishing feature of this cluster is its approach of categorising ESG performance by pillars, in contrast to cluster 2, which considers ESG performance as a whole. The objective of this cluster is to offer a comprehension of how corporate governance structures influence and shape ESG performance (Boudawara et al., 2023). The top 5 keywords in this cluster are corporate governance, social, governance,

stakeholder theory, and environmental performance. These keywords suggest a research focus on the connections among corporate governance, ESG performance, and stakeholder theory, highlighting the importance of considering social and environmental factors in corporate governance practices.

Cluster 4 explores how ESG drives innovation amidst external pressures. Keywords such as sustainable development, digital transformation, and green innovation illustrate the role of ESG in promoting innovative practices. Additionally, terms like financing constraints, COVID-19, and environmental uncertainty highlight the challenges influencing innovation. This cluster emphasises the connection between ESG principles and innovation, demonstrating how organisations use sustainability initiatives to drive significant change. By examining the intersection of ESG, innovation, and external factors like financial constraints and global crises (Saharti et al., 2024), cluster 4 aims to comprehend how ESG driven innovation can adapt and succeed in ever-changing environments (Zheng et al., 2023).

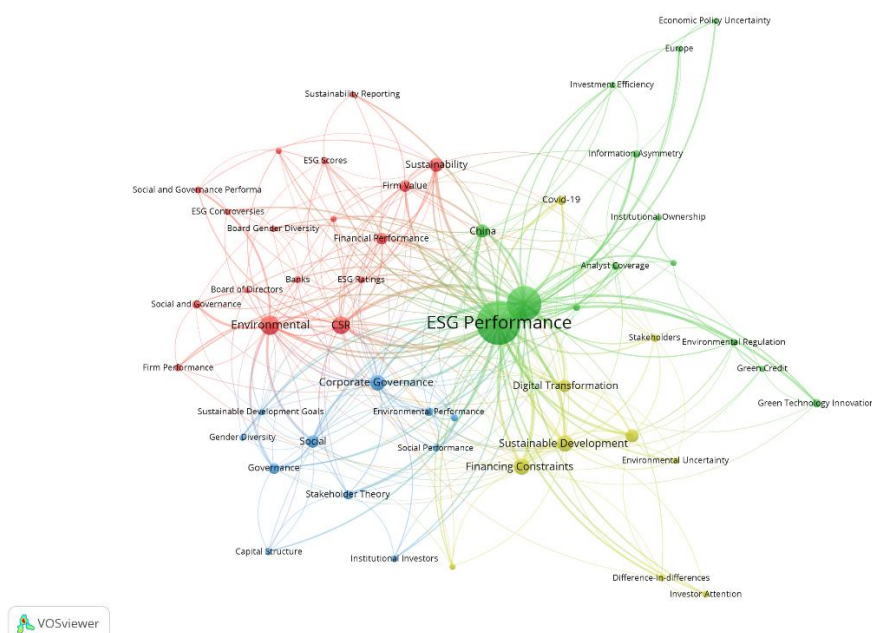


Figure 8. Network Visualisation of the Author's Keywords

Conclusions

The purpose of this research is to perform a bibliometric analysis of ESG performance by utilising the tools of VOSviewer, Biblioshiny, and Microsoft Excel to analyse 478 journal articles obtained from Scopus. We examined five research questions in this regard. A notable finding of this paper is that the analysis of the three-word clouds and the co-occurrence of the authors' keywords inform future research directions.

This review study provides three substantial contributions. Firstly, the analysis of three stages of word clouds and co-occurrence analysis of author's keywords sheds light on current research trends and provides valuable perspectives on future research directions. Secondly, it advocates for policymakers and governmental entities to increase knowledge about sustainability of enterprises, with the goal of promoting sustainable development. Thirdly, it

emphasises that companies embracing sustainability practices can not only mitigate risks but also bolster long-term competitiveness and resilience in the market.

This paper also presents two limitations. Firstly, Scopus database was the only source of data utilised in this study. To further improve the comprehensiveness of bibliographic data extraction, data from other databases, including Web of Science, may be used in the future studies. Secondly, in the co-occurrence analysis of author’s keywords, small clusters were merged into larger ones by setting a minimum cluster size. There is still potential to explore small clusters using alternative methods, such as Biblioshiny or manual analysis. Furthermore, Table 5 provides suggested research possibilities within each sub-theme, acting as a graphical and easily comprehensible tool for researchers to explore specific research directions.

Table 5
Future Research Directions

Research trends	Future research directions	Author(s)/Year
Environmental regulation and ESG performance	To develop the structures that support environmental legislation and ESG approaches to improve business resilience.	Wu and Tham (2023)
	To conduct from the standpoint of financing costs, mandated environmental information disclosure systems, and government environmental legislation influence ESG performance.	Ren et al. (2023)
ESG performance and Corporate governance	To examine the influence of varied regulatory dynamics and strategic approaches on ESG performance.	Khaw et al. (2024)
	To focus on varied attitudes and critical resources held by board members, such as their nationality, background, experience, and abilities, on ESG performance is examined in accordance with resource-dependence theory.	Menicucci and Paolucci (2022)
	To explore the correlation between employee engagement (such as job satisfaction, sense of belonging, and innovation ability) and ESG performance.	Author suggestion
Green innovation and ESG performance	To explore how intelligent manufacturing affects ESG performance from other critical channels, including human capital and executive bonuses.	Sun and Saat (2023)
	To explore the impact of ESG performance on the efficiency and quality of green innovation.	Author suggestion
Investment efficiency and ESG performance	To investigate the effects of additional board characteristics on ESG practices and investment efficiency, such as the affiliation, skill, and education of the directors.	Al-Hiyari et al. (2022)
	To examine the short-term debt affects the relationship between financial leverage and investment efficiency, specifically in terms of over-investment and under-investment.	Poursoleiman et al. (2020)
Digital transformation and ESG performance	To offer comprehensive instructions for companies seeking to enhance their ESG performance through digital transformation, it is crucial to incorporate pertinent case studies.	Wu and Tham (2023)
	To research the impact of digital finance on the financial and operational performance of companies.	Ren et al. (2023)

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