



## Regular Article

## A trend analysis of research on environmental, social, and governance (ESG) performance: A bibliometric analysis

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## ABSTRACT

Environmental, Social, and Governance (ESG) performance has become a critical area of focus in both academic research and corporate practice due to its significance in promoting sustainable development and responsible investment. This current study report presents a bibliometric analysis of the literature on Environmental, Social, and Governance (ESG) performance from 2013 to 2023. The study encompasses a dataset of 225 documents sourced from 112 academic journals and other materials in the Scopus database. Using R-Studio and VOSviewer in the document analysis, the study reveals a strong annual growth rate of 26.81 %, with increasing global collaboration (22.22 % international co-authorship) and significant contributions from institutions in China, Italy, and Germany. Thematic analysis identified key areas of focus, including governance approaches and sustainable development as motor themes, alongside emerging themes like decision-making and environmental impacts. The findings highlight the practical importance of ESG in driving corporate governance, enhancing investment strategies, and shaping policy decisions. This study underscores the need for interdisciplinary collaboration and standardized ESG metrics to bridge research gaps and promote actionable insights for businesses and policymakers. By mapping the intellectual landscape of ESG research, this paper offers a valuable resource for academics, practitioners, and decision-makers seeking to advance sustainability practices and align them with organizational goals.

## 1. Introduction

The performance of companies regarding Environmental, Social, and Governance (ESG) criteria has emerged as a crucial metric for evaluating their non-financial performance which has reflected a growing acknowledgment of the interdependencies between sustainable practices and financial viability. A body of literature (such as Kiesel & Lücke, 2019; Sandberg et al., 2022) have indicated that external organizations and rating agencies, such as MSCI, Refinitiv, and Bloomberg, increasingly use ESG performance as an important evaluation tool in the corporate contexts. More specifically, investors prioritize ESG ratings in their decision-making processes, underscoring the relevance of these metrics as essential components of long-term financial health, rather than merely indicators of compliance (Eccles et al., 2017; Trisnowati et al., 2022).

The body of literature also reinforces a robust correlation between effective ESG performance and improved financial outcomes, with studies indicating that firms that actively engage in sustainable practices

typically experience enhanced financial resilience (Landi & Sciarelli, 2019). For instance, research indicates that the ESG scores, which reflect a company's performance across environmental, social, and governance dimensions, have significantly influenced investment decisions, as investors recognize these metrics as crucial indicators of corporate longevity and risk management (Bariz et al., 2021; Sandberg et al., 2022). Moreover, organizations often encounter pressure to reassess their practices, as stakeholder expectations rise concerning corporate accountability and ethical conduct. In this context, ESG criteria have shifted from being a niche concern to becoming central to corporate strategy, as evidenced by the recent surge in sustainable finance initiatives aimed at fostering responsible investment practices (World Bank, 2021).

Despite the extensive research on ESG, there remain significant gaps in the literature, particularly in the application of bibliometric methodologies to analyze ESG performance comprehensively. Prior studies have predominantly focused on certain geographic regions, notably European contexts, and have overlooked emerging markets, where

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unique challenges and opportunities exist (Kimbrough et al., 2022; Lee & Isa, 2022; Nekhili, 2021a). This current study endeavors to bridge the gap by conducting a bibliometric and network analysis of ESG literature to illuminate trends, identify influential works, and explore the intellectual structure of this evolving field.

Bibliometric study is one among quantitative approaches that employs mathematical and statistical techniques to examine the relationships and impacts of publications, authors, institutions, and countries within a particular research domain (Donthu et al., 2021). By extracting and analyzing publication metrics such as authorship, institutional affiliations, geographical origins, and keywords, this kind of study identifies developmental trends and potential future research pathways. To this end, we systematically investigate the landscape of ESG research by analyzing 225 articles published in peer-reviewed journals from 2013 to 2023 across 590 scholarly contributors. Through mapping networks of authors, documents, and countries, we aim to discern growth patterns within ESG performance literature, identifying leading journals and seminal articles while examining collaborative dynamics within the research community. We also highlight emerging thematic clusters that could guide future research directions. To facilitate this bibliometric analysis, we pose the following research questions.

- (1) What are the publication trends within ESG performance research between year 2013 and 2023?
- (2) What key thematic clusters emerge in ESG performance research from 2013 to 2023 in term of future research direction?

## 2. Literature review

The ESG framework was originated in the 1960s against a backdrop of socio-economic transformation following World War II and since then, it has undergone considerable evolution over the decades. ESG itself was developed from the concept of Socially Responsible Investment (SRI). SRI has been defined as “a strategy and practice to incorporate environmental, social and governance (ESG) factors in investment decisions and active ownership” (PRI35) (Martini, 2021). Some authors perceive ESG as a strategy adopted by investors to evaluate a firm’s collective efforts for environmental, social, and governance factors (Zhu et al., 2023). Within this context, ESG is employed as an indicator of financial and non-financial performance. In the earlier, Monteiro et al. (2021) suggest that ESG might have an impact of companies’ financial performance and thus, it can be utilized gain insight into the companies’ long-term performance and sustainability.

The historical groundwork of ESG laid by significant events, such as the 2008 financial crisis, has catalyzed organizations to rethink governance structures and prioritize sustainable practices as essential for organizational resilience and competitive advantage (Pisani & Russo, 2021). Companies are now driven not only by compliance but also by the understanding that strong ESG principles contribute to long-term financial sustainability (Rahman et al., 2023). Research suggests that firms with robust ESG performance are better positioned to anticipate regulatory changes, align with shifting consumer preferences towards sustainability, and ultimately enhance their reputation and appeal to investors (Javed, Rashid, & Hussain, 2020; Yu et al., 2018). This recognition underscores the need for integrating effective ESG strategies into corporate practices as a pathway for sustainable growth in today’s complex economic landscape.

As global awareness of environmental issues intensified and many companies have recognized the necessity of sustainable development practices, ESG frameworks have increasingly become integral to corporate operational models. Empirical evidence indicates that over USD 17.5 trillion has been invested in maintaining the sustainability of business activities, highlighting the growing recognition of ESG importance (World Bank, 2021). This structured approach, which emphasizes environmental stewardship (Arvidsson & Dumay, 2022), social responsibility (Choi et al., 2021), and governance standards (Ben Abdallah

& Bahloul, 2021), is crucial for assessing corporate sustainability performance and addressing the evolving expectations of stakeholders.

In the current study, we conducted a bibliometric study to highlight prospective opportunities for exploration of ESG research. Donthu et al. (2021) suggest that bibliometric study is apparently different from traditional narrative reviews which often focus on specific aspects of a field and may be influenced by subjective perspectives. They believe that bibliometric analysis offers an objective, comprehensive, and quantitative summary of a research topic based on the most reliable available data. This approach not only enhances the understanding of existing ESG research landscapes but also facilitates evidence-based decision-making for academics, practitioners, and policymakers in shaping future scholarly directions of ESG application practices.

A rising number of studies are examining the impact of ESG practices on a firm’s risk profile, cost of capital, performance, and value (Wan et al., 2023). Additionally, research is advancing along financial and management pathways as well as through a transdisciplinary lens. Performance analysis sheds light on publication trends, influential journals and authors, and the geographical distribution of impactful research, while science mapping explores thematic developments and keyword co-occurrence patterns. Similarly, co-occurrence analysis identifies four distinct clusters, illustrating the integration of ESG research with other management domains, supported by key insights from co-citation network analysis (Mukhtar et al., 2024). Through bibliometric analysis, the structure of citations is developed to indicate a growing recognition of ESG as a holistic framework for sustainability analysis, with increasing attention directed toward the interconnections among ESG three dimensions (Galletta et al., 2022). The findings from the current bibliometric study thus are expected indicate the evolving interdisciplinary nature of ESG research and its increasing significance in addressing complex challenges across various management and financial domains.

The current bibliometric study highlights themes in ESG performance research by examining the frequency of terms and their co-occurrence. High-frequency terms such as “governance approach,” “sustainable development,” and “responsible investment” dominate the dataset, indicating well-established research areas that have been extensively studied over the last decade. These themes align with key global priorities, such as the integration of sustainability into corporate governance and investment strategies, and reflect the foundational focus of the field. However, the current study also identifies emerging themes through lower-frequency terms that point to novel research directions. For example, topics such as “environmental impact,” “decision-making processes,” and “qualitative analysis” appear less frequently in the dataset but highlight growing interest in areas that have been under-explored. These emerging themes are particularly relevant for addressing evolving challenges in ESG research, such as the role of qualitative methodologies in complementing quantitative studies or the integration of ESG factors into organizational decision-making frameworks.

To better differentiate between established and novel themes, the current bibliometric study emphasizes the use of temporal analysis. By analyzing when certain terms first appeared and their subsequent growth or decline in usage, the study identifies trends that reflect both the maturity of established themes and the potential of emerging ones. For instance, while themes like governance and sustainability are consistent across the timeline, newer themes related to environmental metrics and qualitative decision-making methodologies have gained traction more recently, suggesting areas of future exploration. The current bibliometric approach ensures that the analysis not only provides a comprehensive overview of the ESG research landscape but also highlights opportunities for innovation, offering actionable insights for researchers seeking to contribute to underexplored or evolving areas within the field.

### 3. Method

The current study employed a bibliometric analysis to systematically and objectively examine ongoing trends and synthesize diverse perspectives within the Environmental, Social, and Governance (ESG) literature. The study employs an integrated methodological approach, combining bibliometric and thematic analysis to provide a comprehensive examination of ESG performance research (Alkhamash, 2023). This approach enables a comprehensive exploration of the intellectual structure of ESG research, facilitating insights into the evolution of this critical field. To ensure methodological rigor, our study adheres to the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines established by Moher et al. (2009). This adherence allows for a structured synthesis of varied viewpoints across disciplinary boundaries, promoting transparency and replicability in our research process.

#### 3.1. Data selection method

Our data set includes a comprehensive selection of peer-reviewed articles published from 2013 to 2023, ensuring a robust representation of current trends and scholarly contributions. By systematically analyzing these articles, we aim to uncover patterns of authorship, publication outlets, and collaborative networks within the ESG research community. In the current study, data was collected using the Scopus database, which offers a greater variety and depth compared to the Web of Science (WOS) and Google Scholar (Alsalamah & Callinan, 2021; Kasbar et al., 2023). Unlike WOS, which primarily focuses on high-impact journals, Scopus includes a wider array of sources, making

it more suitable for interdisciplinary research. Additionally, it maintains higher quality control than Google Scholar by excluding predatory and non-peer-reviewed sources, ensuring reliable and credible data. Fig. 1 below describes the data selection process.

As indicated in Fig. 1, we began the data collecting process by employing the search terms “ESG” and “performance,” which yielded a total of 530 documents (see Fig. 1). We then carefully reviewed these records to eliminate duplicates and irrelevant entries. To maintain consistency and focus, we did not utilize any alternate databases other than Scopus.

To ensure the relevance and quality of the selected studies, we applied specific inclusion and exclusion criteria. The inclusion criteria required that articles be published between 2013 and 2023 and fall within the subject areas of Business, Management, and Accounting; Economics, Econometrics, and Finance; Environmental Science; and Social Science. Only peer-reviewed journal articles were considered, ensuring a focus on high-impact research, while publications in languages other than English were excluded to maintain consistency in analysis. Furthermore, only studies published in their final stage were included, omitting preprints and in-progress works. Articles explicitly discussing ESG and performance, as determined by their titles, abstracts, and keywords, were retained for analysis. After this screening process, we retained the original 530 unique records. Applying additional selection criteria related to publication years, subject areas, and document types, we ultimately narrowed our pool down to 225 articles deemed eligible for inclusion in the bibliometric analysis.

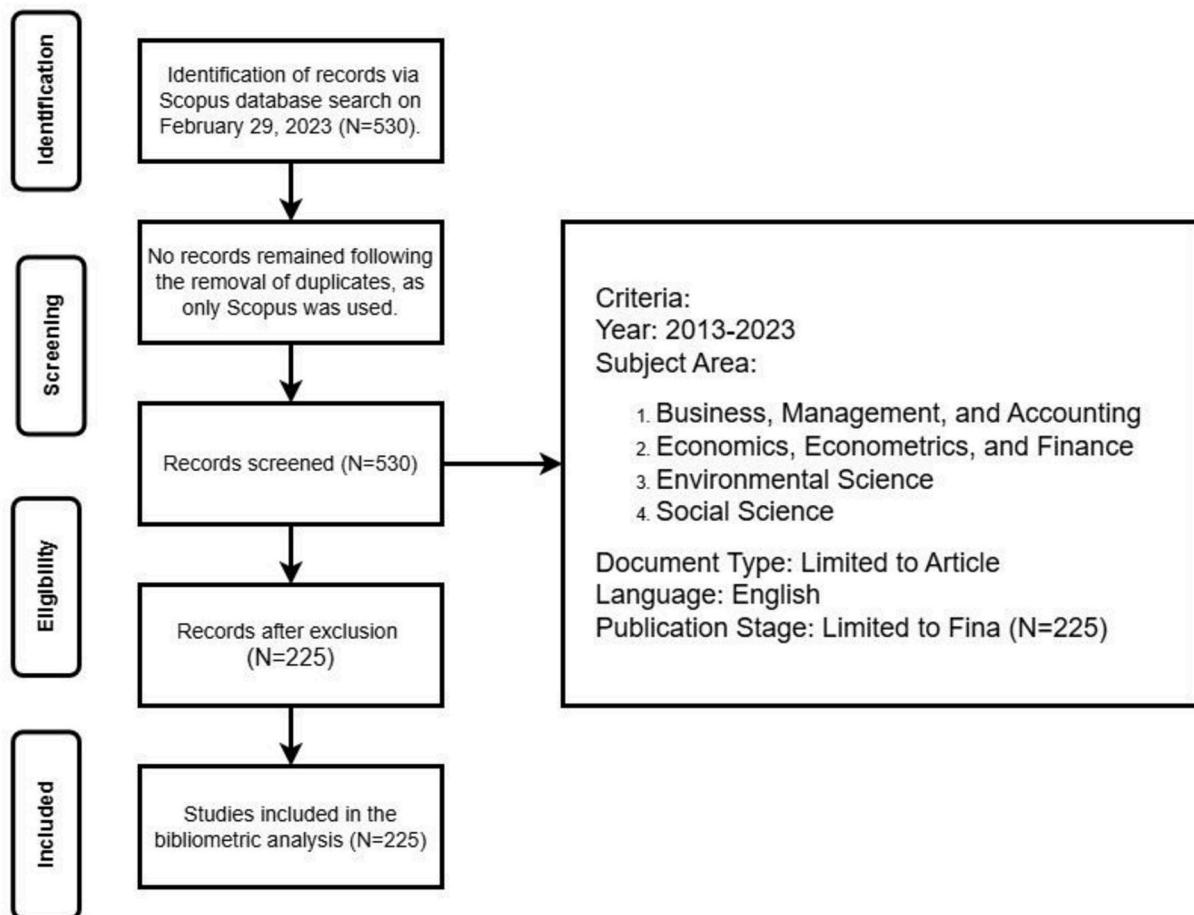


Fig. 1. Data selection process.

### 3.2. Data analysis method

In the current study, bibliometric analysis was employed to evaluate the dataset of 225 articles published from 2013 to 2023. The choice was made for two main benefits. First, the analysis allowed the identification of publication trends, research productivity, authorship patterns, and collaborative networks (Jain et al., 2022). Second, with the support from VOSviewer application, bibliometric analysis enables the visualization of complex relationships among keywords, authors, and institutions, making large datasets easier to interpret. Through its text-mining function, VOSviewer simplifies complex keyword linkages and offers various display options, such as zooming and scrolling, to facilitate the interpretation of large bibliometric maps. VOSviewer visualizations depicted keyword co-occurrence networks, collaborative authorship, and thematic clusters, which were instrumental in identifying key areas of focus within ESG research (Singh et al., 2024). To enhance replicability and methodological transparency, we analyzed the co-occurrence analysis based on author keywords with a minimum occurrence threshold of 5. For network visualizations, the normalization method was set to association strength, and the layout utilized attraction and repulsion values at default settings. In R-Studio, the bibliometric analysis was conducted using the bibliometrix package, where parameters such as timespan = 2013–2023, document type = article, and language = English were specified.

Furthermore, thematic analysis was applied to qualitatively explore the intellectual structure of the field (Ayaz & Zahid, 2023). A thematic analysis was done by creating clusters that reflect various critical factors associated with ESG performance, thereby illuminating the connections between different aspects of the literature and their implications for future research. The rationale for integrating these techniques lies in their complementary strengths: bibliometric analysis offers a macro-level quantitative view of the research landscape, while thematic analysis provides a nuanced, qualitative understanding of the concepts shaping the field (Ahmi, 2021, pp. 1–180). In the current study, keywords, titles, and abstracts from the dataset were analyzed to identify and categorize thematic clusters into motor, basic, emerging, and niche themes (Ali Basah et al., 2024). Specifically, the main themes identified in the underlying literature were classified into the following categories: benchmarking, decision making, disclosure, economic & social impact, environmental impact and governance approach.

### 4. Findings

This current bibliometric study analyzes the trends in the field of ESG (Environmental, Social, and Governance) performance studies from 2013 to 2023. The collected dataset encompasses 225 documents sourced from 112 journals, books, and other academic materials, reflecting a steady and robust annual growth rate of 26.81 %. On average, each document is relatively recent, with an age of 3.26 years, and has garnered 27.82 citations, demonstrating significant academic engagement and impact. Collectively, these documents reference 13,135 sources, highlighting extensive scholarly interconnectivity.

In terms of content, the dataset includes 312 keywords under “Keywords Plus (ID)” and 675 unique author keywords (“DE”), indicating a diverse range of research themes and focus areas. As described in Table 1, authorship analysis reveals contributions from 590 authors, with only 20 being sole authors, and a total of 25 single-authored documents. Collaborative efforts dominate, with an average of 2.84 co-authors per document and 22.22 % of publications resulting from international co-authorship, showcasing the global nature of the research collaboration. All documents are categorized as “articles,” underscoring the dataset’s alignment with formal scholarly communication channels. This detailed bibliometric profile provides valuable insights into the research’s growth, collaboration, and thematic diversity over the past decade.

**Table 1**  
The dataset for bibliographic analysis.

Description	Results
Timespan	2013–2023
Sources (Journals, Books, etc)	112
Documents	225
Annual Growth Rate %	26.81
Document Average Age	3.26
Average citations per doc	27.82
References	13135
DOCUMENT CONTENTS	
Keywords Plus (ID)	312
Author’s Keywords (DE)	675
AUTHORS	
Authors	590
Authors of single-authored docs	20
AUTHORS COLLABORATION	
Single-authored docs	25
Co-Authors per Doc	2.84
International co-authorships %	22.22
DOCUMENT TYPES	
article	225

#### 4.1. Research productivity and collaborative authorship

The first research question explored publication trends exist in productivity and collaborative authorship within ESG performance research between 2013 and 2023. The productivity of ESG (Environmental, Social, and Governance) performance research has shown a significant upward trajectory over the past decade. Between 2013 and 2023, the field experienced a robust annual growth rate of 26.81 %. As illustrated in Fig. 2, initial interest in ESG performance studies was modest, with only a handful of publications—approximately four articles per year—between 2013; 2015. A significant increase occurred in 2017, when the number of published articles rose to 11. However, publication numbers again declined temporarily to four articles per year in 2017 and 2018. The trend subsequently saw a substantial upward trajectory from 2019 to 2022, culminating in a peak of 75 publications in 2022. This increasing trend is indicative of a growing scholarly interest in ESG performance and reflects the integration of ESG principles into corporate reporting and strategic frameworks.

Collaboration has been reflected in ESG research. Across 225 articles, 590 authors contributed, with only 20 single-authored works, highlighting the collaborative nature of the field. The average number of co-authors per article is 2.84, suggesting that ESG research is often interdisciplinary. Furthermore, 22.22 % of publications involve international co-authorship, reflecting the global importance and interconnectedness of ESG issues. Countries like China, Italy, and Germany lead in publication volume, while the UK, Malaysia, and Italy are prominent in international collaborative efforts. Such trends underscore the increasing productivity and collaboration in ESG performance research. The field has evolved from a niche area into a globally recognized and rapidly expanding discipline, characterized by its interdisciplinary nature and international partnerships. This collaborative growth trajectory aligns with the global importance of addressing sustainability challenges and advancing ESG principles.

The upward trend in publications can be attributed not only to heightened recognition of the relevance of ESG in academia but also to its increasing importance in corporate governance and social responsibility. This correlation underscores the necessity for ongoing research and discourse surrounding ESG issues, as evidenced by the consistent publication output in Scopus-indexed journals. Notably, as per Table 2, the years 2014 and 2015 produced articles that garnered the highest mean citation counts, highlighting their impactful contributions to the field.



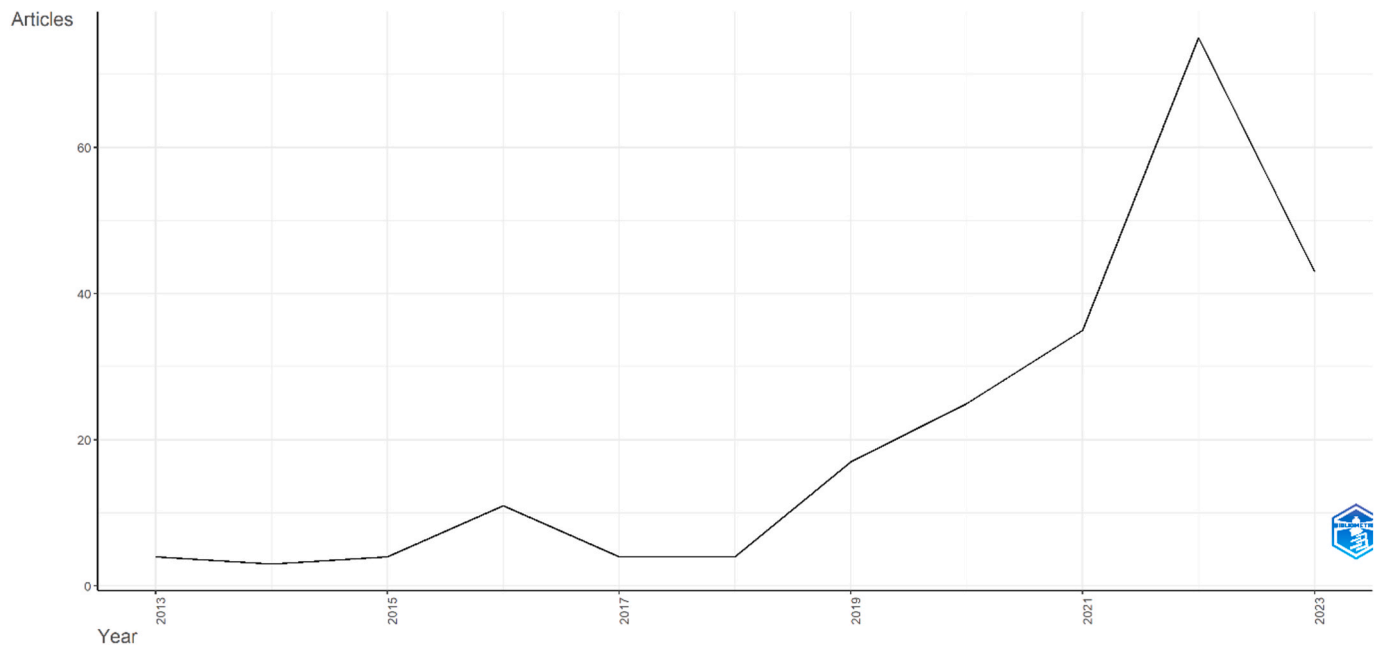


Fig. 2. Annual scientific production.

**Table 2**  
Citation metric.

Year	N	MeanTCperArt	MeanTCperYear
2013	4	11.25	0.94
2014	3	527	47.91
2015	4	216	21.60
2016	11	64.73	7.19
2017	4	96.75	12.09
2018	4	45.75	6.54
2019	17	42.65	7.11
2020	25	31.6	6.32
2021	35	10.17	2.54
2022	75	7.04	2.35

Note: N: number of articles, MeanTCperArt: Mean total citation per article, MeanTCperYear: Mean total citations per year.

### (1) Most Relevant Sources

The most influential journals in the context of ESG research were assessed through total citations, align with Bradford's law (Brookes, 1969), which classifies journals into three productivity zones. The "Business Strategy and Environment" (BSE) journal ranks highest, contributing 18 articles and accounting for 12.27 % of total publications in the field. Following this, "Frontiers in Environmental Sciences" (11.6 %) and "Corporate Social Responsibility and Environmental Management" (10.8 %) also stand out as significant contributors. Further elaboration of journal data suggests categorization of journals based on publication volume and illustrating the core (high productivity), moderate, and fringe (low productivity) zones. Notably, this analysis highlights the importance of core journals in shaping the ESG discourse while indicating that some well-established journals like "Corporate Governance" and "Journal of Banking and Finance" published comparatively fewer articles, each contributing only four.

Moreover, the "Business Strategy and Environment" journal demonstrated a long-term commitment, consistently publishing significant volumes across the study period from 2014 to 2022 (see Fig. 3). The "Journal of Sustainable Finance and Investment" also exhibited a notable increase in publication output, rising from just one article in 2015 to seven in 2022. Conversely, journals like "Finance Research Letters" and "Frontiers in Environmental Science," while observing

growth since their inception, still maintain lower publication counts with a total of 8 and 12 articles, respectively.

### (2) Leading authors

From our data analysis, it was demonstrated that Buallay (e.g. Buallay, 2020; Buallay et al., 2020) emerges as a prolific author, contributing across multiple years with varying influence (see Fig. 4). For instance, in 2020, they published 3 articles that collectively garnered 115 citations, translating to an impressive total citations per year (TCpY) of 23, highlighting substantial academic recognition. However, their more recent works, such as the single article in 2022, have not yet accumulated citations, indicating the time-dependent nature of citation metrics.

In addition, author Boukadhaba A demonstrates notable impact with two articles published in 2021, achieving a high TCpY of 13.5 from 54 citations, reflecting the immediate relevance and quality of their research (Nekhili, 2021b; Nekhili et al., 2021). Similarly (Capelle-Blancard et al., 2017), shows consistent influence, with a TCpY of 7.5 in 2017 and 8.167 in 2019, underscoring the enduring value of their contributions. In contrast, newer authors like (Li et al., 2022; Matemane et al., 2022) have made recent entries into the field (2022 and 2023), with limited citations thus far (e.g., 6 citations for CHEN X in 2022, yielding a TCpY of 2), but their potential for future impact remains.

### (3) Institutional contribution to ESG performance research

In addition to the individual contributions of these authors, it is essential to consider the broader institutional context for ESG performance research. The analysis reveals that Sapienza University of Rome started contributing research in 2019 with 2 articles, and its output steadily increased to 8 articles by 2023. This growth highlights its rising prominence in the field and increasing research focus. Similarly, Ahlia University began contributing in 2020 with 5 articles, quickly ramping up its output to 9 articles in both 2022 and 2023, demonstrating significant expansion in scholarly activity within a short period.

In addition, University of Macedonia entered the research field in 2020 with 2 articles, followed by consistent output of 6 articles annually from 2021 to 2023. This consistency reflects sustained engagement and

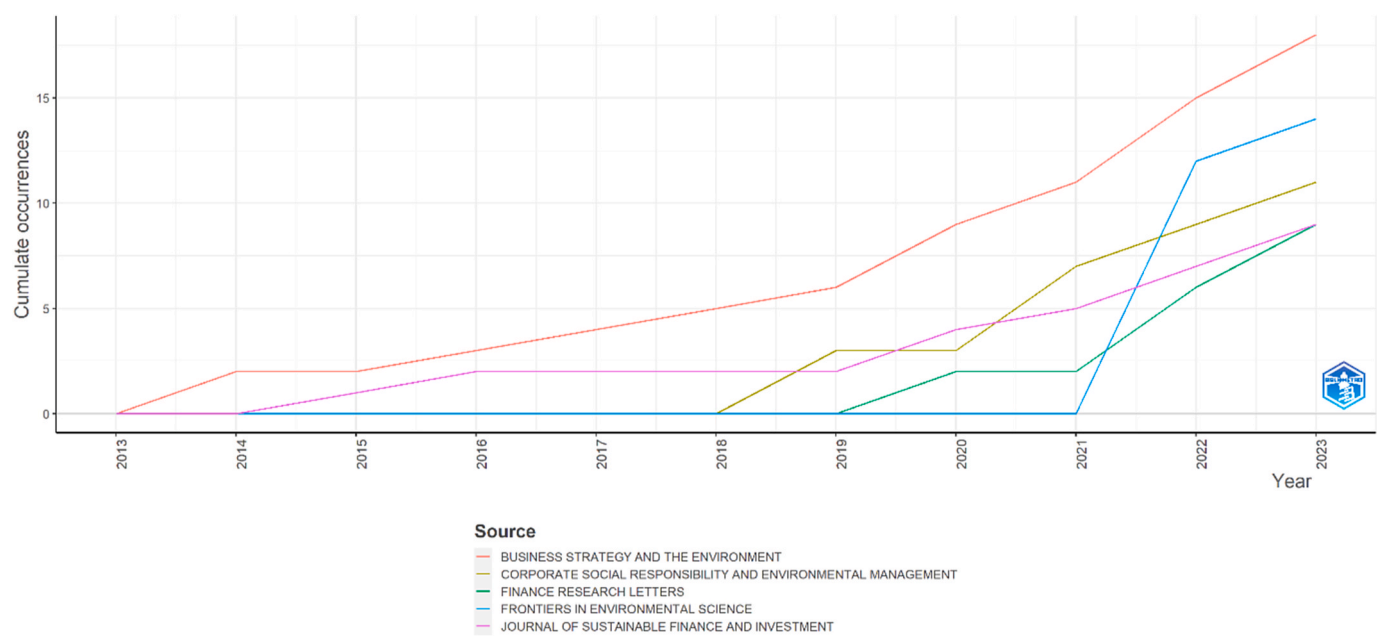


Fig. 3. Sources' production over time.

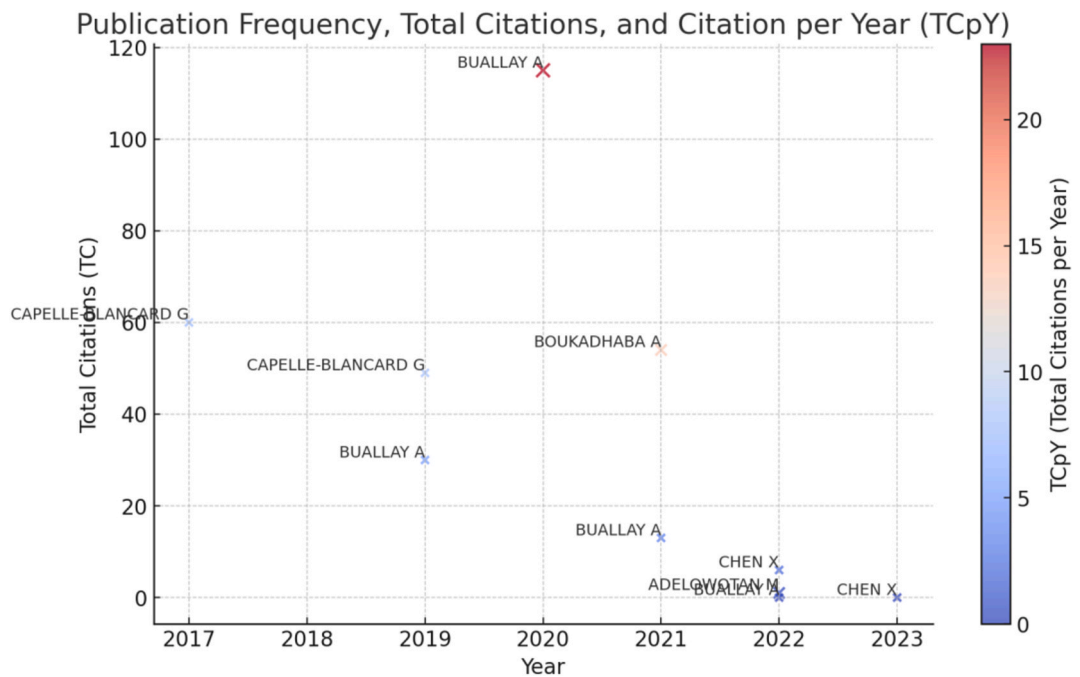


Fig. 4. Leading authors that present key publication in the ESG research: publication frequency, total citations, and citation per year (TCpY).

a steady research focus. Universidad de Salamanca started slightly later, with its first articles appearing in 2021 (3 articles), increasing to 6 articles by 2023, indicating gradual but notable involvement in the domain. Zhejiang University of Finance and Economics is the most recent entrant, publishing its first articles in 2022 (3 articles) and growing rapidly to 7 articles in 2023. This steep increase suggests an emerging focus and rapid scaling of its research contributions. Overall, the timeline underscores the dynamic growth of these institutions in the field, with some demonstrating steady progression and others, like Zhejiang University of Finance and Economics and Ahlia University, showing rapid recent expansion. This reflects both established and emerging centers of academic activity in this domain. More importantly, the diversity in institutional contributions highlights a global interest in

ESG themes and emphasizes the collaborative nature of the research landscape. Moreover, as shown in Fig. 5 above, a geographical perspective on ESG research reveals that China leads with the highest volume of publications, totalling 28 papers, followed by Italy and Germany, which have 24 and 15 articles respectively. In contrast, developed countries like the UK and the USA show lower numbers, with 10 and 8 publications, respectively. This statistical overview suggests that while European nations are significantly engaged in ESG research, Asia, particularly Malaysia, is just beginning to explore this domain more thoroughly. ESG research in Malaysia is in its developmental stage, with growing but limited contributions to the global body of knowledge. While Europe has historically dominated ESG research, Malaysia and

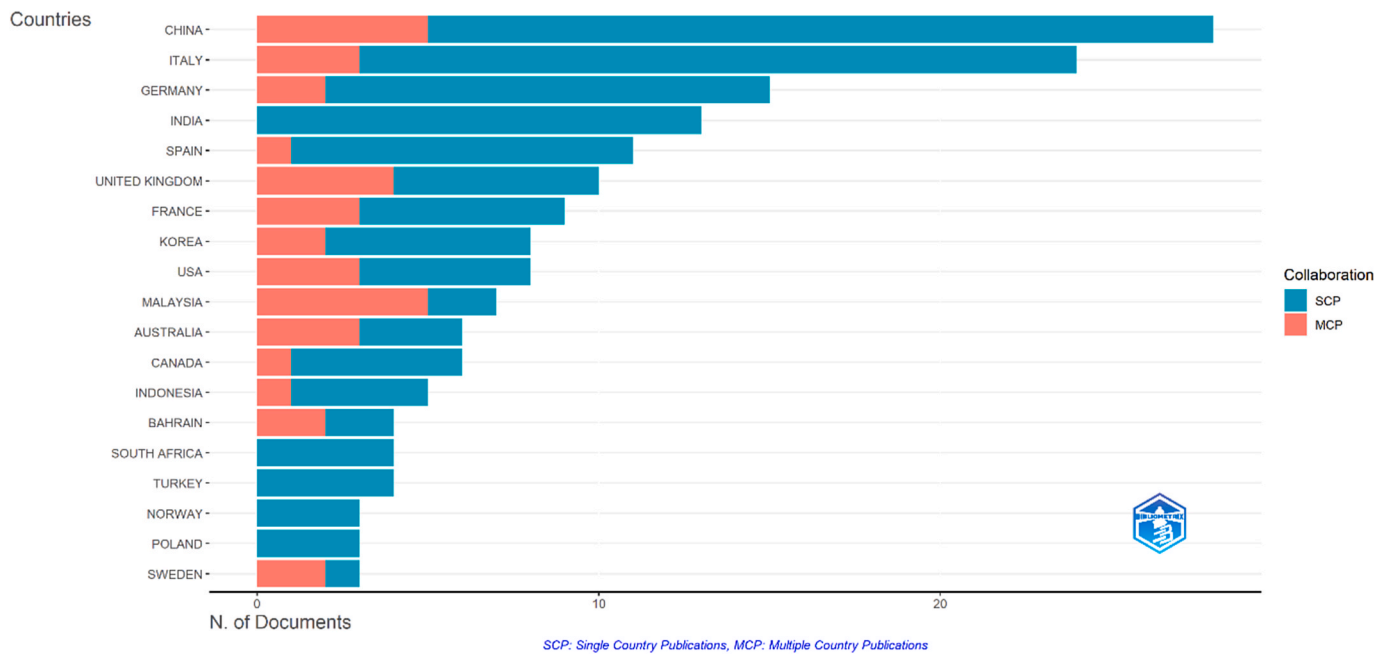


Fig. 5. Geographical trends in ESG research.

other Asian countries are emerging as important contributors. Malaysian researchers have started focusing on ESG topics, primarily driven by the increasing global emphasis on sustainability and the local adoption of corporate governance frameworks aligned with international standards. Although, recently, there has been an uptick in Malaysian ESG research output, reflecting the nation's gradual alignment with global sustainability goals. Key areas of focus in Malaysian studies include the integration of ESG factors into corporate strategies, the role of Islamic finance in promoting sustainable investment, and governance reforms in local enterprises. Institutions like the International Islamic University Malaysia and Universiti Malaya have begun contributing to this growing field, though the scale and impact of Malaysian research remain modest compared to leading nations like China, Germany, and Italy.

The findings also illustrate variations in academic impact across countries. For instance, Germany and the USA lead in total citations with 1561 and 1430 respectively, and the USA boasts the highest average citations per article at 178.80, indicating substantial influence on a per-publication basis. Conversely, countries like China, while productive, show lower average citations per article, averaging only 6.40. This discrepancy highlights a complex landscape where the quantity of research output does not always equate to its academic impact, underscoring the need for continued engagement with and enhancement of ESG scholarship across various global contexts. Social network analysis among countries were also generated in the current study. International collaborations undertook by the researchers to take comprehensive picture of the current issues happening worldwide. The result of social network analysis showed the most research collaboration on ESG performance is China with the highest percentage with 15.68 %. This number followed by UK, Malaysia, and Italy by 11.11 %, 8.40 % and 7.84 % respectively.

In terms of influential articles, Velte (2017) study, published in the "Journal of Global Responsibility," stands out with an impressive 162 citations, underscoring the substantial impact it has made on the field of Environmental, Social, and Governance (ESG) performance research. The study, which focused on a dataset comprising 412 firms from the years 2010–2014, found a positive correlation between ESG performance and financial outcomes, specifically in terms of Return on Assets (ROA). Notably, however, it observed no significant impact on Tobin's Q. Moreover, when segregating the three components of

ESG—environmental, social, and governance—the analysis revealed that corporate governance had the most substantial influence on financial performance, surpassing the effects of environmental and social dimensions.

In addition to Velte's work, other notable articles contribute significantly to the discourse surrounding gender diversity on management boards and its relationship to ESG performance. For instance, (Velte, 2016), titled "Women on Management Board and ESG Performance," published in the same journal, received 79 citations and explores the implications of gender diversity within executive teams across European nations. This body of literature is particularly crucial as it highlights the nuanced ways in which management composition can affect ESG outcomes. This discourse is further enriched by comparable studies that examine sustainability reporting and bank performance in post-financial crisis contexts, showcasing diverse perspectives and methodologies that continue to shape academia's understanding of ESG dynamics. Ultimately, the influence of these articles is not only evidenced in their citation metrics but also in the ongoing debates they inspire about governance structures and sustainable financial practices.

#### 4.2. Key thematic clusters emerge in ESG performance research in term of future research direction

To address the second research question, the first analyze the most frequent words and draw interconnection among them. Co-occurrence analysis of all keywords was applied to conceptualize the development and growth of ESG performance (Zhou et al., 2022). In order to have a meaningful analysis of the database, a minimum threshold of two for the occurrence of a particular keyword was required and filtered. Finally, a thematic map was developed to identify and categorize themes within the textual data drawn from the literature on ESG performance (Alkhamash, 2023). These themes are constructed based on the analysis of keywords, titles, and abstracts extracted from relevant publications.

##### (1) Most frequent words

The analysis of bibliometric data in the context of ESG performance research reveals several key themes identified by the frequency of

specific terms. The term “governance approach” leads with 19 occurrences, indicating a strong emphasis on governance structures and practices in relation to ESG performance. Following closely is “sustainable development” with 18 mentions which reflects significant scholarly interest in how sustainability is integrated into development practices and policies. In addition, the term “investment” appears 16 times indicating the growing importance of responsible investment strategies influenced by ESG criteria. The term “Sustainability” itself, with 15 occurrences, is indicated as a foundational concept in this research area and it encompass various dimensions of sustainability practices within organizations and their outcomes. Additionally, “performance assessment,” with 14 mentions, highlights the necessity of evaluating the effectiveness of ESG initiatives, pointing to a trend toward empirical analyses of sustainability performance.

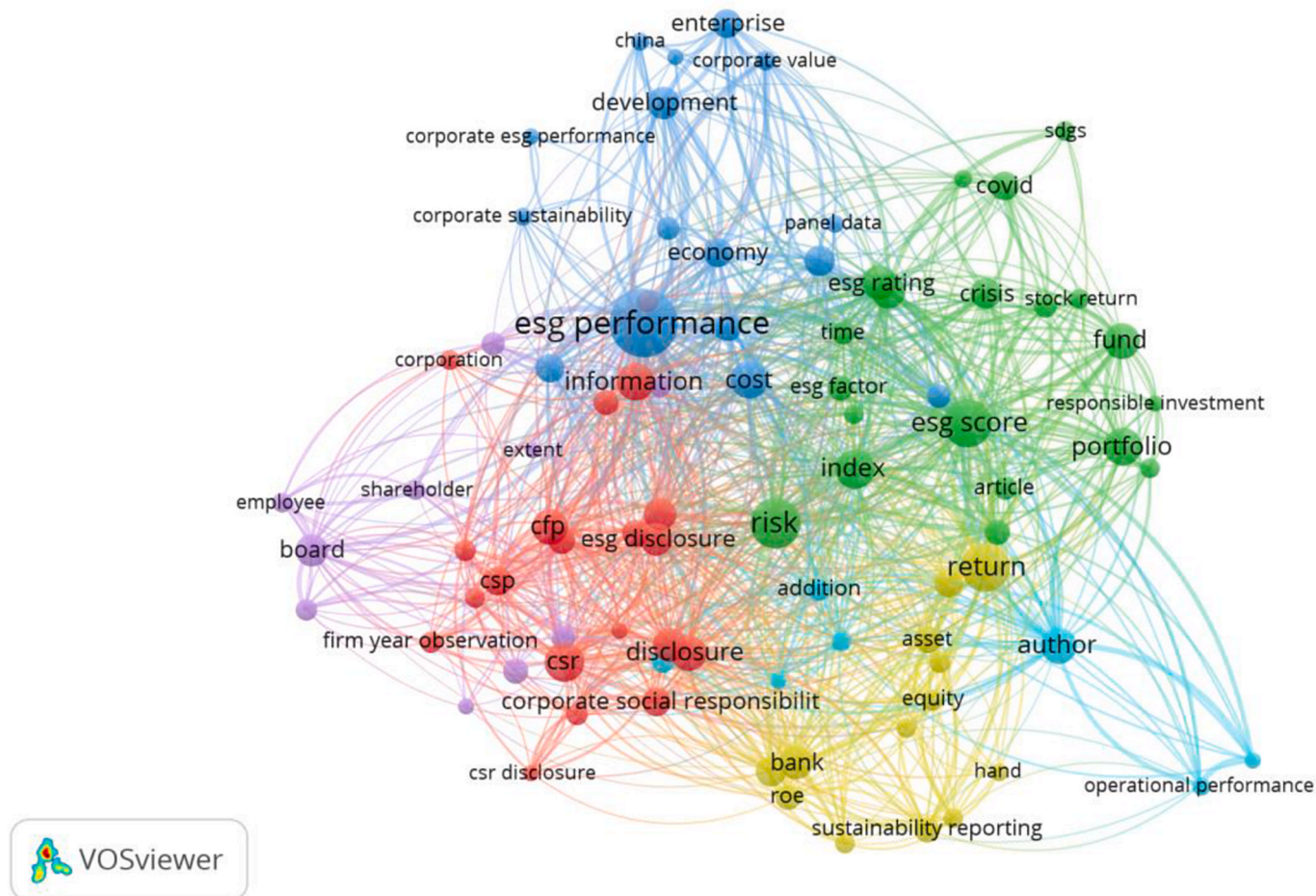
Furthermore, the term “industrial performance” is observed to occur 13 times and this demonstrates a focus on how ESG practices impact specific industries. Similarly, “corporate social responsibility” and “finance,” both mentioned 11 times, reflect the interconnections between corporate accountability and sustainable practices, as well as the integration of financial considerations within ESG evaluations. The term “empirical analysis” appears 9 times. Such occurrence highlights the trend toward evidence-based research in the ESG domain, while “China,” cited 8 times, indicates its growing influence in the global ESG discourse. Collectively, these frequently used terms not only explain the primary areas of focus within ESG performance research but also serve as a guide for future investigations. The observed patterns illustrate the critical themes shaping current scholarly dialogues and point toward where further research may be necessary to deepen understanding of ESG dynamics within an evolving landscape.

## (2) Co-occurrence analysis of the keywords

The VOSviewer visualization presented in Fig. 6 describe the results of a co-occurrence analysis conducted on 86 keywords extracted from a comprehensive dataset of 4329 terms related to ESG performance research.

The center of the visualization as in Fig. 6 reflects the node labeled “ESG Performance,” which serves as the core theme around which various related terms cluster. The numerous connections emanating from this central node underscore the extensive engagement with ESG performance across diverse dimensions and contextual applications. The proximity of surrounding keywords indicates how frequently they co-occur in published studies, revealing critical areas of scholarly interest and inquiry. Key terms such as “Risk,” “Return,” and “Portfolio” highlight the financial implications of ESG practices, suggesting a robust focus on how ESG performance affects investor decision-making and the valuation of portfolios. The presence of “ESG Score” and “Corporate Value” further emphasizes the integration of ESG metrics into financial assessments, reflecting a trend toward quantifying ESG impact in terms of economic performance.

Moreover, the keyword “Information’ suggests a significant emphasis on the role of transparency and data disclosure in ESG practices. This is reinforced by the presence of “ESG Disclosure’ and “Corporate Social Responsibility,’ indicating that scholars are increasingly interested in understanding how organizations communicate their ESG activities and social responsibilities to stakeholders. The terms “Sustainability Reporting’ and “Board’ are also prominent, highlighting the relevance of corporate governance in relation to reporting practices and the oversight responsibilities of corporate boards in promoting



**Fig. 6.** Co-occurrence analysis.



sustainability initiatives. The connections to terms such as ‘Author’ and ‘Development’ suggest an exploration of individual researchers’ contributions and the evolution of thought leadership within the ESG field.

### (3) Thematic map

The resulting two-dimensional graph classifies themes according to their density and centrality, providing valuable insights into their relevance and developmental stages. Fig. 7 presents a thematic map from the analysis which is divided into four distinct quadrants, each representing different aspects of research themes in the ESG domain. In the figure, the X-axis represents centrality, which measures a theme’s importance within the research landscape, while the Y-axis denotes density, reflecting the degree of development of each theme. To assess the centrality and density of the research themes, measures of central tendency, such as mean and median, are utilized.

The first quadrant, located in the upper right corner and labeled Motor Themes, features areas of high density and high centrality. This indicates that these themes are both essential and well-developed within the field. Key themes such as ‘Sustainable Development Goals,’ ‘ESG,’ ‘Performance,’ ‘Strategic Approach,’ and ‘Organization’ are prominent here. These foundational themes reflect significant areas of focus in ESG studies, highlighting their critical role in guiding future research directions. In contrast, the second quadrant, labeled Basic Themes and located in the lower right corner, exhibits high centrality but low density. This suggests that while these themes are important, they are not yet fully developed. Notable themes in this category include ‘Governance Approach,’ ‘Sustainable Development,’ and ‘Sustainability.’ These themes are relevant to ongoing discussions in ESG research, but they require further exploration to enhance their development and

impact.

The third quadrant, positioned in the lower left corner and referred to as Emerging Themes, contains topics that are weakly developed, designating them as ripe for future research opportunities. Themes such as ‘Environmental Impact,’ ‘Qualitative Analysis,’ and ‘Decision Making’ prominently feature in this category. These areas present exciting prospects for researchers to investigate and contribute to the evolving discourse surrounding ESG. Lastly, the fourth quadrant, located in the upper left corner and termed Niche Themes, is characterized by high density and low centrality. This quadrant includes specialized themes that, although well-developed, may not be broadly relevant to the wider ESG discourse. Themes such as ‘Disclosure,’ ‘Economic and Social Effects,’ ‘Environmental Regulations,’ and ‘Green Economy’ fall within this category. They highlight specific aspects of ESG that have garnered significant scholarly attention but may lack broader applicability across the field.

## 5. Discussion and future research direction

The findings from this bibliometric analysis provide a comprehensive overview of the current landscape of Environmental, Social, and Governance (ESG) performance research and reveal significant trends that illuminate both established knowledge and promising avenues for future investigations. The analysis indicates a substantial increase in publications related to ESG performance, particularly since 2016, signaling a heightened awareness of sustainability issues and the increasing relevance of ESG in corporate governance and investment practices (Amel-Zadeh & Serafeim, 2018). Leins (2020) and J. Lee et al. (2022) argue the integration of ESG criteria into financial analysis significantly enhances analysts’ capacity to interpret factors associated

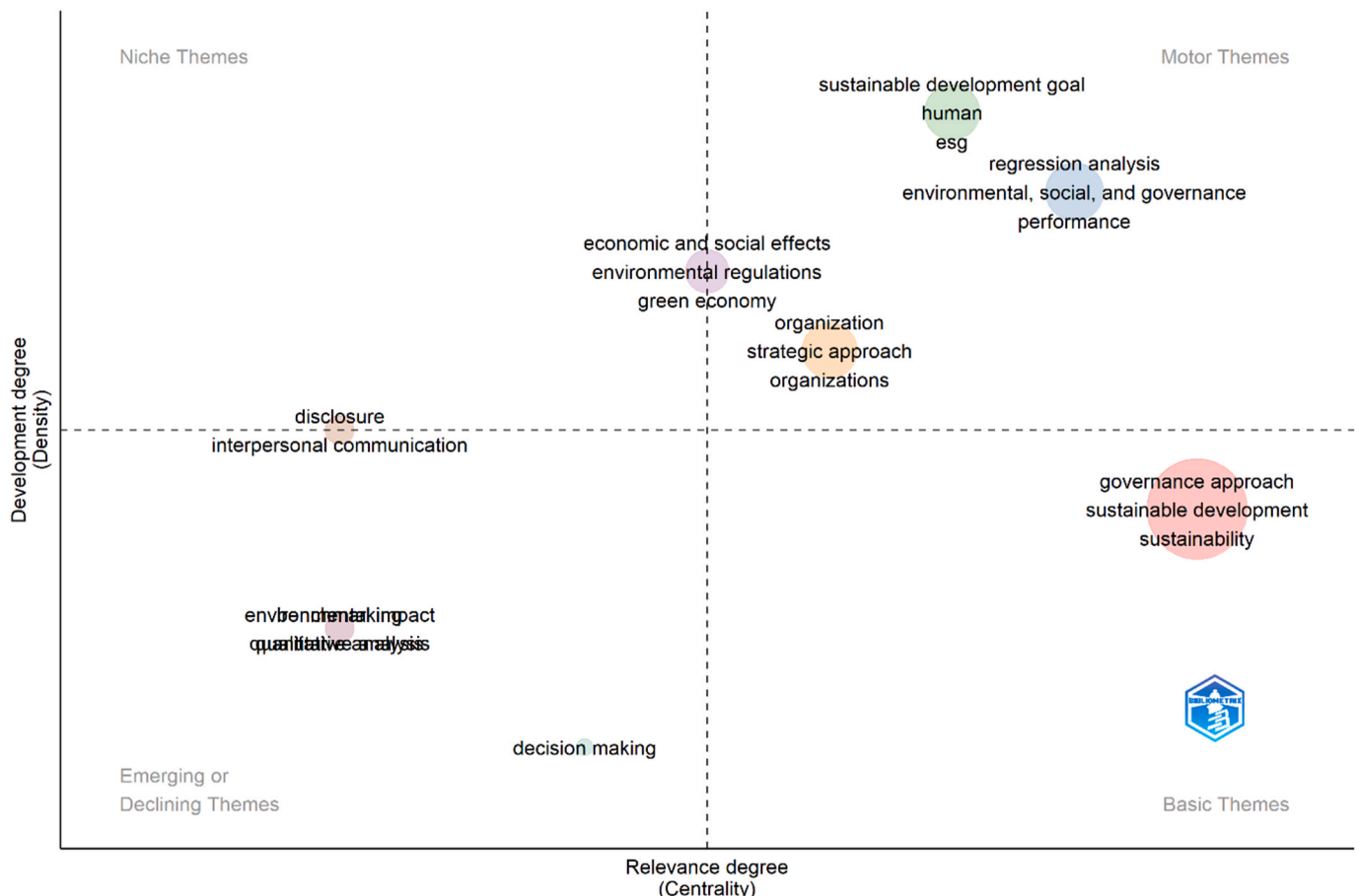


Fig. 7. Thematic map.

with corporate responsibility as key market signals which thus support their investment narratives. Leins' argument has signifies a crucial evolution in how sustainability issues are perceived within the financial sector. By framing ESG factors within the context of corporate responsibility, analysts can evaluate how a company's sustainability practices influence its long-term viability and market valuation. The notion that investors can influence ESG data as part of their investment strategy reflects a broader understanding of sustainability as not just an ethical concern but a fundamental component of financial performance (Amel-Zadeh & Serafeim, 2018; Leins, 2020).

Moreover, the emphasis on dominant themes such as "governance approach," "sustainable development," and "investment," as revealed in the current bibliometric study, underscores a focused scholarly interest in the essential factors that facilitate effective ESG integration. Research conducted by Rau and Yu (2023) indicates that government-led green financial policies significantly enhance corporate ESG performance. They argue that the participation of market actors, particularly institutional investors, plays a vital role in magnifying the impacts of these policies. However, the trend toward solitary authorship highlights missed opportunities for interdisciplinary collaboration, which is crucial for effectively addressing the complex challenges associated with ESG.

Niche themes, while specialized and well-developed, have limited broader applicability. Topics like the green economy, economic and social effects, and regulatory compliance dominate this category. These themes focus on the transition to sustainable economic models, the societal and financial implications of ESG adoption, and the role of environmental regulations in driving corporate ESG practices. Future research could assess the effectiveness of green economy initiatives in achieving sustainability goals and examine how ESG regulations encourage corporate innovation. While previous studies have acknowledged the importance of ESG frameworks, this research provides a novel contribution by systematically mapping ESG themes based on their centrality and density, offering a structured understanding of their development and relevance. However, it is important to recognize the value of expert validation for the thematic findings for future studies. Involving bibliometric specialists in reviewing the keyword networks and thematic classifications would enhance analytical rigor and ensure greater accuracy in interpreting thematic clusters—particularly when differentiating between overlapping or ambiguously defined topics.

The thematic analysis also distinguishes emerging themes such as environmental impact, qualitative analysis, and decision-making, signaling critical gaps for future research. These findings underscore the need for further investigation into how ESG regulations encourage corporate innovation and whether green economy initiatives effectively achieve sustainability goals. Additionally, this study advances existing ESG literature by demonstrating how distinct thematic clusters evolve within the research landscape. Future studies should capitalize on this foundation by fostering interdisciplinary collaboration, exploring sectoral and regional ESG variations, and assessing ESG's role in addressing pressing global challenges, including climate change, income inequality, and biodiversity loss. By advancing these clusters, ESG research can further contribute to sustainable development and responsible corporate practices. This study finding align with the previous study by Nor et al. (2024) findings that companies' commitment to sustainability, environmental responsibility, and social welfare play a significant role in promoting inclusive and sustainable practices within their operations and the wider community.

The co-occurrence analysis reveals the interconnectedness of key concepts, demonstrating how "ESG Performance" relates to terms such as "Risk," "Return," and "Portfolio." This connection underscores a strong emphasis on the financial implications of ESG initiatives. According to De Spiegeleer et al. (2021), integrating ESG criteria into portfolio allocation can indeed influence the risk and return characteristics of investment strategies. However, empirical analyses indicate that portfolios with high ESG ratings do not consistently outperform others (Schmidt, 2022). In fact, these portfolios may not reliably exhibit lower

risk or improved returns, suggesting a more nuanced financial impact of ESG integration in investment strategies. Additionally, the identification of emerging themes, such as "Environmental Impact" and "Decision Making," points to areas ripe for further exploration, while niche themes indicate specialized topics that require attention for their specific implications in ESG discourse. The effective ESG disclosure by companies is identified as a critical factor that not only strengthens their sustainability efforts but also enhances their economic value and societal benefits (Alsayegh, 2020). This confluence of factors suggests that robust governance and transparency in ESG practices are pivotal for fostering sustainable corporate growth and driving broader societal progress.

## 6. Conclusion

This bibliometric analysis provides a comprehensive overview of ESG performance research trends from 2013 to 2023, highlighting the increasing scholarly attention to this critical area. The study identified 225 publications by 590 researchers across 112 peer-reviewed journals, with a marked rise in publication volume, peaking at 75 in 2022. This upward trajectory reflects the growing recognition of ESG issues in both academic and corporate spheres. However, our analysis also reveals a persistent tendency for scholars to work independently rather than collaboratively, underscoring the need for greater interdisciplinary and cross-sectoral engagement to foster a more holistic understanding of ESG dynamics. The thematic analysis further identifies five primary research clusters: Benchmarking, Decision Making, Disclosure, Economic and Social Impact, and Governance Approach. These themes align with real-world ESG challenges, emphasizing the need for more policy-relevant research that can directly inform regulatory frameworks and corporate sustainability strategies.

Beyond mapping the academic landscape, these findings have practical implications for ESG policy and corporate decision-making. The identification of Disclosure and Governance Approach as key themes suggests that transparency in ESG reporting remains a pivotal issue for regulators and investors. As policymakers push for standardized ESG disclosures, future research should critically assess the effectiveness of these regulations and their influence on corporate behavior. Similarly, the economic and social impact of ESG initiatives, particularly in relation to financial performance and stock market valuation, warrants further empirical investigation. Companies and regulators can leverage these insights to refine ESG strategies, ensuring that sustainability efforts align with financial performance and stakeholder expectations.

Despite its contributions, this study has several limitations. The exclusive reliance on the Scopus database may have excluded relevant studies from other sources, such as Web of Science or regional repositories, potentially limiting the comprehensiveness of the dataset. Furthermore, the focus on English-language publications may underrepresent contributions from non-English-speaking scholars, particularly those in emerging markets where ESG concerns are rapidly evolving. Additionally, while the study employs bibliometric tools to identify research themes, a more in-depth qualitative analysis—such as manual coding of abstracts or expert interviews—could provide richer insights into ESG trends and challenges. Future research should not only address these limitations but also move beyond descriptive bibliometric analysis to explore causal relationships and industry-specific ESG implementations. By bridging the gap between academic research and ESG practice, scholars can contribute more effectively to shaping sustainable policies, investment strategies, and corporate governance models.

## CRedit authorship contribution statement

**Ummu Salma Al Azizah:** Writing – review & editing, Writing – original draft, Visualization, Validation, Software, Resources, Project administration, Methodology, Investigation, Formal analysis, Data

curation, Conceptualization. **Razali Haron:** Writing – review & editing, Validation, Supervision, Resources, Methodology.

## Ethical statement

The current study had obtained the ethical approval from the research committee at IIBF, International Islamic University Malaysia (IIUM) to ensuring compliance with institutional policies regarding research ethics. Through adherence to these ethical principles, this study aims to contribute valuable insights to the field of ESG performance, fostering informed discussions and encouraging further inquiries within the academic community. The current study has ensured integrity and honesty by accurately presenting all data, results, and interpretations without fabrication or falsification, drawing exclusively from credible ESG databases to maintain the legitimacy of the sources utilized.

## Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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