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Research Article

A Bibliometric and Context Analysis of the Impact of ESG Disclosure on Firm Value

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ABSTRACT

As the concept of Environmental, Social and Governance (ESG) gains popularity, companies enhance the quality of their ESG disclosures in order to achieve better financial returns. Much literature has studied the relationship between them, but the impact of ESG disclosure on firm value is still a subject of debate. We use VOSviewer and CiteSpace to quantitatively analyze and visualize the relevant 142 papers published in the Web of Science from 2013 to 2023. This paper presents a range of bibliometric findings, including the most influential countries, leading authors at the institution and journal levels, co-authorship, co-organization, bibliographic coupling, keyword occurrence and evolution. By context analysis, the development process and thematic areas of this relationship are gradually identified and illustrated. Finally, this paper identifies the research frameworks and impact mechanisms of ESG disclosure on corporate value in existing literature and points out that future research should explore the discrepancies among different countries, industries and types of enterprises. This paper also emphasizes the importance of uncovering the mediating mechanisms that influence both variables and explores the long-term impact of ESG disclosure on corporate value.

Keywords: ESG disclosure, Firm value, Bibliometric analysis, Stakeholder theory.

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INTRODUCTION

The concept of Environmental, Social and Governance (ESG) has significantly gained recognition in the last decade. Originating in the realm of socially responsible investment, ESG has become a corporate assessment criterion that emphasizes a company's environmental, social and governance performance.[1] The notion of ESG was introduced in 2004 by former UN Secretary-General Kofi Annan in a report titled "Who Cares Wins"1. Afterwards, international organizations including the Global Reporting Initiative (GRI), International Integrated Reporting Council, Sustainability Accounting Standards Board (SASB), Carbon Disclosure Project and Task Force on Climate-related Financial Disclosures (TCFD) have developed multiple frameworks and procedures to assist companies in fulfilling their disclosure obligations regarding ESG issues.[2,3] The framework for sustainable development reporting is also becoming increasingly mature. The GRI takes a broader view of sustainability, offering a comprehensive, multi-stakeholder approach that focuses on significant ESG issues across various industries. In contrast, the SASB is more targeted, providing industry-specific and financially material ESG metrics for investors. The TCFD emphasizes climate-related risks and opportunities, promoting transparent disclosure to support informed decision-making.[4] Despite their differences, these three frameworks aim to align on defining key ESG issues, making them comparable within the context of this study.

The introduction of ESG concept has sparked ongoing debate regarding its positive impact on corporations, as well as further disputes regarding the Shareholder Primacy Theory versus Stakeholder Theory. The debate between the two opposing views has inspired scholars to conduct empirical studies to explore the extent to which ESG performance contributes to financial performance. These studies have been carried out across diverse fields, including CEO power, strategic management, marketing, environmental economics, business ethics and finance.[5] Some research indicates that the initial costs of implementing ESG are often higher than the immediate financial benefits, while in the long term, it may enhance a company's competitive position and ultimately yield advantages for its stakeholders.[6]

On October 27th, 2022, the European Securities and Markets Authority added ESG disclosures to its Union Strategic Supervisory Priorities List, aiming to increase transparency of information and improve investor awareness of sustainability

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performance within the European Union[2]. The influence of non-financial disclosures on key indicators can be significant. As a result, this field has garnered considerable scholarly interest, with researchers endeavoring to develop theories regarding the financial implications of ESG disclosures.[7,8] A multitude of studies have investigated various facets of ESG disclosure. Several studies have evaluated the prevalence of ESG disclosure and observed that, although initially modest, it has experienced a significant upward trend over time.[9] The majority of studies concentrate on examining the impact of ESG performance on financial performance and firm value.[3,10] However, the findings have been inconsistent. Some empirical studies find a negative relationship between corporate ESG disclosure and financial performance.[11,12] For example, agency cost theory suggests managers may pursue ESG activities for self-interest as shareholders struggle to monitor these activities. In contrast, certain researchers have found empirical evidence supporting a positive relationship between firms' ESG disclosure score and TobinQ.[13,14] For instance, according to stakeholder theory, ESG disclosures signal to investors that a company is responsibly managing its environmental, social and governance issues, which can attract socially responsible investors and increase the company's market value.[15,16] The increasing number of studies on the relationship between ESG disclosure and firm value provides a basis for bibliometric analysis. To the best of our knowledge, previous literature reviews on the relationship between ESG and firms have primarily concentrated on the overall concept of ESG or ESG performance,[8,17,18] which makes our study on the relationship between ESG disclosure and firm value a significant contribution to contemporary literature. Moreover, previous literature reviews have tended to use ESG and CSR interchangeably.[18] ESG represents a more comprehensive and strategic framework that takes into accounts a company's overall performance, risk management, strategic objectives and interactions with stakeholders. CSR places a greater emphasis on a company's social, environmental and ethical responsibilities, highlighting the company's commitment to sustainable operations in these domains and its cooperation and engagement with society.[19-22] While CSR is self-regulated, ESG involves external evaluation and supervision, compelling companies to enhance their ESG management. In this context, we believe it is necessary to accurately distinguish the two concepts. Therefore, our study focuses exclusively on ESG information disclosure.

This research aims to fill this gap by locating, summarizing and analyzing available studies on ESG disclosure and firm value in order to answer the research questions as follow:

Research question 1: What impact does ESG disclosure have on firm value?

Research question 2: Which factors influence the mechanism of ESG disclosure's impact on firm value?

Research question 3: How does ESG disclosure research promote more responsible and sustainable ESG practices in companies?

The structure of this paper is organized as follows. Section 2 presents the research's methodology and data selection, Section 3 explains the bibliometrics results and discusses implications and future directions and section 4 presents the conclusions and limitations.

METHODOLOGY AND DATA SELECTION

Methodology

We opted to employ bibliometric analysis as it aligns with the current literature analysis practices.[8,18,20,21] Bibliometrics is a quantitative research method that utilizes countries, citations, keywords and textual data to depict and analyze developments and progress within a particular discipline or research field.[18,23] Its primary objective is to evaluate and reveal the characteristics of scientific research activities such as scale, development trends, cooperative relationships and impact.[24] Some scholars emphasize that in research fields with concentrated topics, paradigms and studies, bibliometric analysis often provides more relevant data than subjective analysis.[25,26] We use the VOSviewer and CiteSpace software for the analysis and visualization in this study, utilizing two main research steams: initial performance analysis and science mapping analysis.

Data selection

We selected the Web of Science database because of its comprehensive and reliable literature access and authoritative content.[18] This database is widely accepted and regarded as the most appropriate platform for conducting bibliometric analysis.[27] This study follows PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) data extraction process, see Figure 1, which consist of (1) identification, (2) screening, (3) eligibility and (4) inclusion. This method assists researchers in refining the selection of relevant sample databases and bibliographic data.

For the purpose of achieving comprehensive and accurate data retrieval, we exclude CSR from our keyword construction, as discussed early in the section above. So, the search query 1 presented as TS=("ESG disclosure" OR "environ* soci* govern* disclosure" OR "disclosure of ESG" OR "disclosure of environ* soci* govern*" OR "ESG report*" OR "environ* soci* govern*

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[2]See more details at https://www.esma.europa.eu/document/esma-strategy-2023-2028
[3]See more details athttps://www.consilium.europa.eu/en/press/press-releases/2022/11/28/council-gives-final-green-light-to-corporate-sustainability-reporting-directive/
[4]See more details at https://charteredabs.org/academic-journal-guide-2021

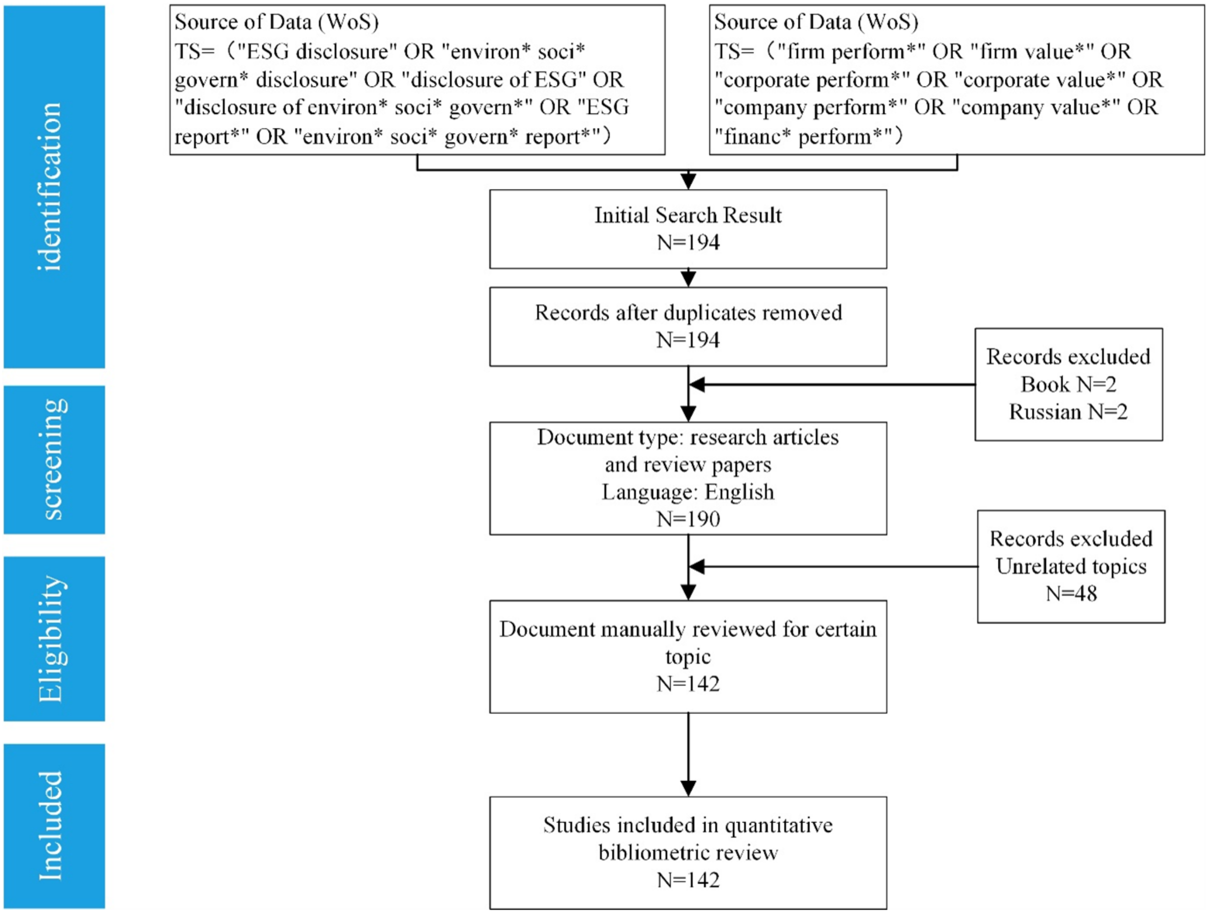

Figure 1: PRISMA Data extraction process.

Table 1: Summary of data source and selection.

Category	Specific Standard Requirements
Research database	Web of Science core collection.
Searching period	January 2000 to June 30th, 2023.
Language	English
Search query	#1 TS= ("ESG disclosure" OR "environ* soci* govern* disclosure" OR "disclosure of ESG" OR "disclosure of environ* soci* govern*" OR "ESG report*" OR "environ* soci* govern* report*").
	#2 TS= ("firm perform*" OR "firm value*" OR "corporate perform*" OR "corporate value*" OR "compan* perform*" OR "compan* value*" OR "financ* perform*" OR "profit*").
	#1 AND #2
Document types	NOT book.
Data extraction	Export with full records and cited references.
Sample size	142

report*"). Meanwhile, we use firm value, firm performance, finance performance and profitability as the synonymous replacement for firm value in search query 2.

The study focuses on ESG disclosure literature from 2013-2023, as ESG gained prominence in recent decades and the research emphasizes the latest developments in the relationship between ESG disclosure and firm value, rather than historical evolution of ESG itself. As of September 30th, 2023, we have generated a total of 194 documents combining the two search queries mentioned above. After deduplication, we follow the screen criteria conduct by Galletta *et al.*[18] to only select papers written in English and set document type as not book, which exclude 4 papers. To ensure the papers within the scope of the research, we conducted manual text analysis and excluded 48 papers on unrelated topics. Eventually, 142 studies are retained for this review. Table 1 provides a detailed description of the PRISMA data selection criteria.

RESULTS AND IMPLICATIONS

Descriptive analysis

The selected 142 papers were written by 368 authors from 231 organizations in 48 countries, published in 78 journals and cited 7068 references from 2541 journals.

Temporal distribution analysis

Figure 2 shows the temporal distribution of papers published from 2013 to 2023. The annual number of published documents shows a significant upward trend. From the perspective of the authors, organizations, countries and journals, this is also aligned with the evolving trends in publishing. This phenomenon originates from the recognition of the necessity and urgency of sustainable development by major global economies. For example, On November 28, 2022, the Council of the European Union officially adopts the Corporate Sustainability Reporting Directive (CSRD), asking all listed companies to provide ESG reports[3]. The COVID-19 pandemic has further intensified the attention to corporate social responsibility,[28] as reflected in the sharp increase in the number of publications in 2022.

Geographical distribution analysis

Table 2 lists the countries of origin of the top 10 countries in the study sample. India, China and UK are among the top three countries with the highest cumulative publications, while UK, Australia and USA are the countries with the highest average citations. The column 4 in this table indicates that emerging market countries, represented by India and China, have become the main driving force of research growth.

This phenomenon suggests that the integration of the ESG concept is reliant on the level of market maturity. Traditional European and American markets embraced it earlier within the sustainable development framework, with the academic community also recognizing the ideological shift at an earlier stage. However, the clear policy orientation of developing countries in recent years has promoted industry reforms and the process of academic research, gradually bringing about a transformation in the current situation.

Co-authorship analysis

Table 3 shows the top 5 authors. Dr. Buallay from Brunel University has become the most prolific author in this field of research, far ahead of other scholars. Adding another 12 authors who have published 2 papers, all the 17 authors contribute 29 papers, accounting for 20.42% of the total publications (142). Over 95% authors only have a single publication on the topic of ESG disclosure and firm value, which is considered to lack coherence in terms of thematic and temporal references.[18]

Top organization analysis

Table 4 shows the statistical result of top organizations, which is consistent with Table 3. Notably, authors and organizations from India, China, Italy, or the USA failed to make it onto the list, despite having a large number of publications (shown in Table 2). This research status indicates the absence of emerging academic leaders in these countries.

For visualizing the collaboration network diagram, a minimum of 2 documents per organization is required to ensure robustness and continuity in research. As depicted in Figure 3, only two nodes have formed strong connections within them, where each line represents collaborations between two organizations. The network of organizations appears loosely connected, leaving significant opportunities for potential collaborations and communications.

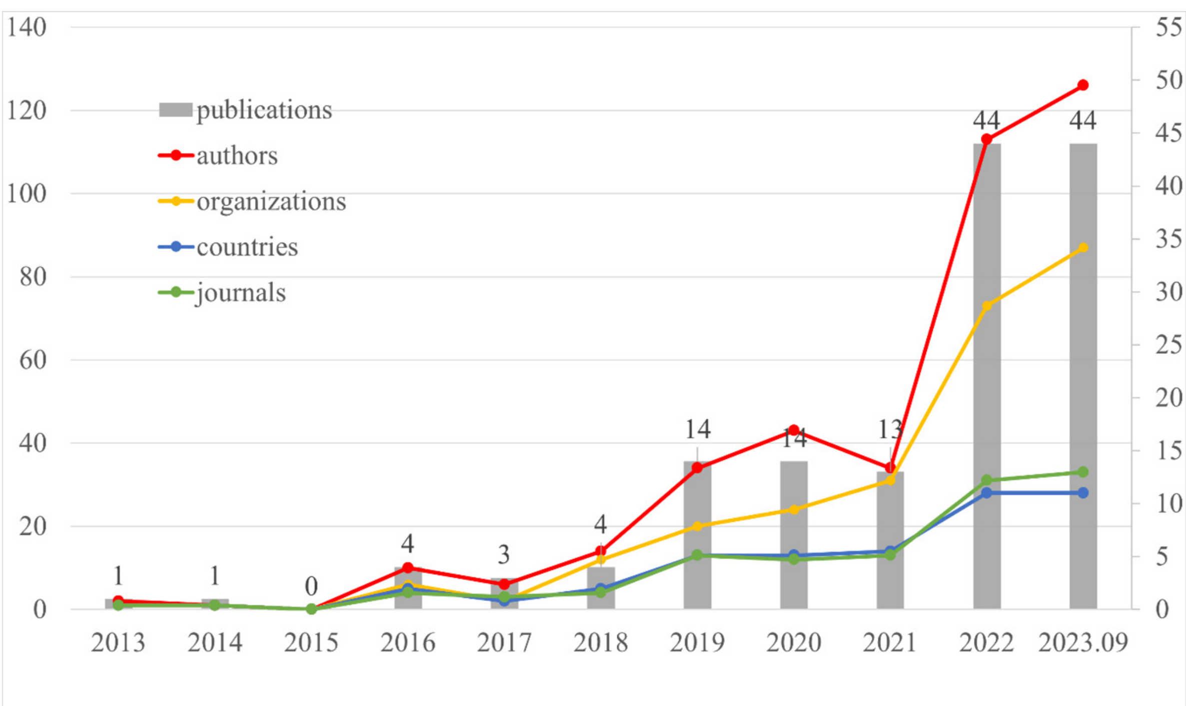

Figure 2: Distribution of publications from 2013 to 2023.

Table 2: Top countries.

Country	Documents	Citations	Average citations	Documents published during 2021-2023
India	22	144	6.55	20
China	16	247	15.44	15
UK	15	1500	100.00	6
Italy	13	522	40.15	9
USA	11	618	56.18	5
Malaysia	11	93	8.45	8
Spain	8	136	17.00	7
Australia	7	401	57.29	6
Bahrain	7	295	42.14	3
Turkey	6	182	30.33	4

Table 3: Top authors.

Name	Documents	Citations	Average citations	Affiliation
Amina Mohamed Buallay	7	372	53.14	Ahlia University/Brunel University.
Herenia Gutiérrez Ponce	4	12	3.00	Universidad Autónoma de Madrid.
Khaled Hussainey	3	132	44.00	Portsmouth University.
Julian Chamizo Gonzalez	3	10	3.33	Universidad Autónoma de Madrid.
Núria Arimany-Serrat	3	10	3.33	Universitat de Vic.

Table 4: Top organizations.

Organizations	Documents	Citations	Average citations	Country
Ahlia University.	7	295	42.14	Bahrain
Portsmouth University.	5	552	110.40	UK
Brunel University London.	4	314	78.50	UK
Universidad Autónoma de Madrid.	4	12	3.00	Spain
Universiti Teknologi Malaysia.	4	5	1.25	Malaysia

In synthesizing the analyses from co-authorship and Top Organizations, we believe that the lack of academic leaders and research teams may constrain the development of the field. Currently, there are no widely influential leaders or research teams in the international academic community within this domain. This may limit the depth and expansion of research on the impact of ESG disclosure on company value.

Top journals analysis

Table 5 listed the top 10 journals that have published more than 3 papers on ESG disclosure issue. All these journals account for 40.85% of the total journal papers (142) with a citation rate of 51.50% out of the total citations. Calculating the average number of citations per document, results are listed in Table 5 (column 4). *British Accounting Review* attains the highest indicator (127), followed by *Business Strategy and the Environment* (110), surpassing other journals significantly. Both journals have achieved high rankings in the AJG rankings[4].

Through the classification of these 10 journals, it becomes apparent that scholars adopt a multidisciplinary approach to conduct research on ESG disclosure and firm value, leading to the emergence of two development paths. One perspective is based on business and finance and the other starts with environmental concerns. Combining the information from Figure 4, which displays the weighted average publication year with an overlay range from 2019 to 2023, the differences in timeline between the two development paths are evident. Journals focusing on business strategy and finance performance (*Business Strategy and the Environment, British Accounting Review, Journal of Applied Accounting Research*) cluster into nodes with blue color, which means publications of these journals, on average, were published before 2021. On the contrary, journals focusing on environmental sustainability (*Sustainability, Corporate Social Responsibility and Environmental Management, Journal of Sustainable Finance and Investment*) cluster into red nodes indicating a more recent time period. The shift from financial concern to environmental

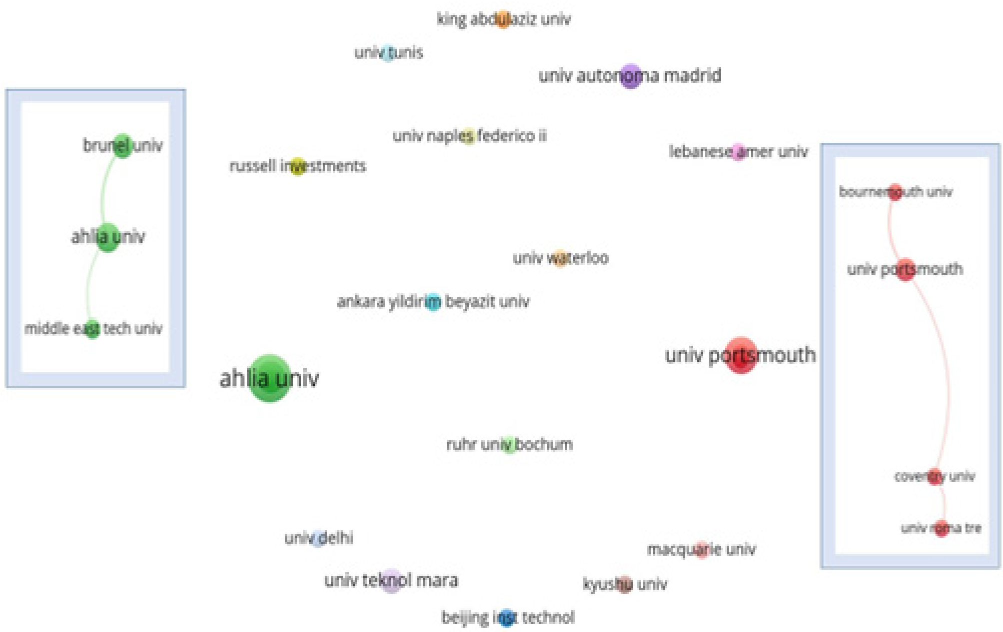

Figure 3: Co-organizations network.

Table 5: Top journals.

Journals	Documents	Citations	Average citations	Main Category
Sustainability	15	384	25.60	Environmental Science.
Business Strategy and the Environment.	8	880	110.00	Business Environmental Studies.
Corporate Social Responsibility and Environmental Management.	7	153	21.86	Business Environmental Studies.
Journal of Sustainable Finance and Investment.	6	90	15.00	Business, Finance.
Environment Development and Sustainability.	5	106	21.20	Environmental Science.
Research in International Business and Finance.	4	213	53.25	Business, Finance.
Asia-Pacific Management Accounting Journal.	4	5	1.25	Business, Finance.
British Accounting Review.	3	381	127.00	Business, Finance.
Sustainability Accounting Management and Policy Journal.	3	240	80.00	Business, Finance Environmental Studies.
Journal of Applied Accounting Research.	3	194	64.67	Business, Finance.

concern suggests a change in the research focus and development trend of this issue.

Science mapping analysis

Bibliographic coupling analysis

Bibliographic coupling refers to the mutual connection between two or more documents through a shared citation relationship.[25] It is conducted to reveal the hot topics and development trends in the relevant research fields.[19,22,29] We perform this analysis with a minimum citation criterion set equal to 80 as shown in Figure 5.

As shown in Table 6, the focal point of cluster1 (red) is to build a theoretical framework and use empirical data to reveal the connection between ESG disclosure and firm value. According to Nollet *et al.*,[30] Corporate Social Performance (CSP) and Corporate Financial Performance (CFP) exhibit a nonlinear U-shaped relationship and capital expenditures only receive returns after reaching the threshold of CSP. More important, governance serves as the primary factor in this mechanism when disentangling the ESG Disclosure Score into its environmental, social and governance sub-components. According to Li *et al.*,[30] evidence suggests that the extent of ESG disclosure has a positive correlation with the firm value, regardless of the chosen

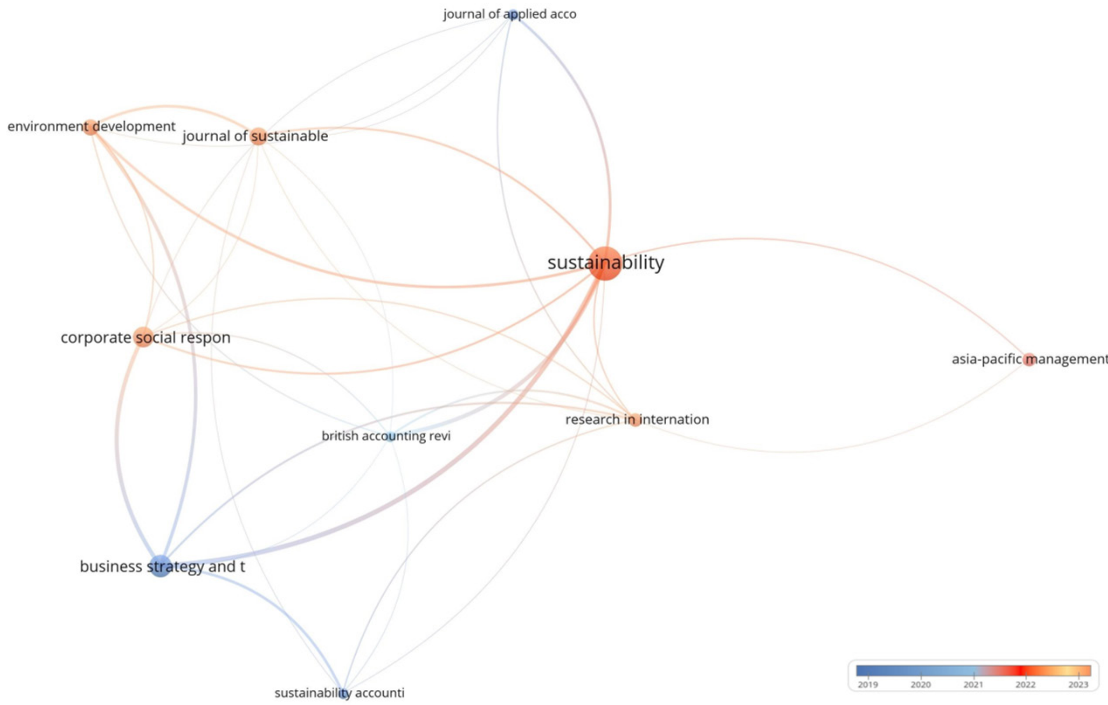

Figure 4: Overlay visualisation for chronological analysis of journals.

measures of ESG disclosure rating. Introducing CEO power as a moderating variable amplifies the relationship by improving information transparency and strengthening stakeholder trust. In contrast, Xie *et al*.[31] proves the existence of nonlinear relationship between corporate efficiency and ESG disclosure. To be specific, the correlation shows a positive relationship only when ESG disclosure is at a middle level; otherwise, it is negative. At the same time, this paper suggests focusing main efforts on corporate governance rather than environmental and social issues.

Cluster 2 (green) attempts to clarify different theoretical basis and operating mechanism with diverse financial indicators and a broader national perspective. Garcia *et al*.[7] identify research gaps in sensitive industries and emerging markets where there is an increased demand for ESG practices. As the only proxy of ESG performance, environmental issue, which is predominant in these companies from sensitive industries, has positive correlation with ROA.[7] It should be noted that the study implies empirical associations, not causal. The paper "ESG performance and firm value: The moderating role of disclosure" from Fatemi *et al*.[14] winning both the highest citations and total strength among 142 samples, also mentions the complexity of the association. Author creatively employs ESG strengths or concerns as a proxy for ESG performance. Through two-stage model, it is concluded that ESG strengths increase firm, while ESG concerns decrease it. The study also sheds light on empirical evidence in support of the moderating role of disclosure. Similarly, Eliwa *et al*.[32] probe the consequences of ESG performance and its related disclosure with a focus on cost of debt. Their main contribution to the literature is that they push the effects forward to a country level, which means the "free market" can be reshaped by government policy regulation.

Cluster 3 (blue) has a highly distinctive starting point: board gender. The different perspectives and experiences of women on boards contribute to inclusive and diverse decision-making.[33] This intuitive understanding can also find arguments supporting it from stakeholder theory, such as women are more concerned with the welfare and more likely to be involved in strategic issues. Contrary conclusions are reached in the studies conducted by Arayssi *et al*.[34] and Manita *et al*.[35] The impact of board gender diversity on the signaling, legitimacy and significance of ESG disclosure remains uncertain, with empirical results varying greatly across different sample populations. Manita *et al*.[35] suggest future research should consider how innovation capabilities, market recognition and the quality of decision-making influence the relationship as mediators.

Cluster 4 (yellow) consists of two papers by the same first author, looking into the impact of ESG disclosure quality on firm value. Yu *et al*.[36] document that companies with improved ESG transparency are more likely to access capital at reduced costs due to decreased systemic risks and agency cost. ESG transparency, viewed as an additional source of nonfinancial information, can help reduce investors' information asymmetry and provide new visions for them. According to Yu *et al*.,[37] ESG data faces multidimensional risks: unaudited ESG report, lack of global governance institutions, absence of specific regulatory guidelines

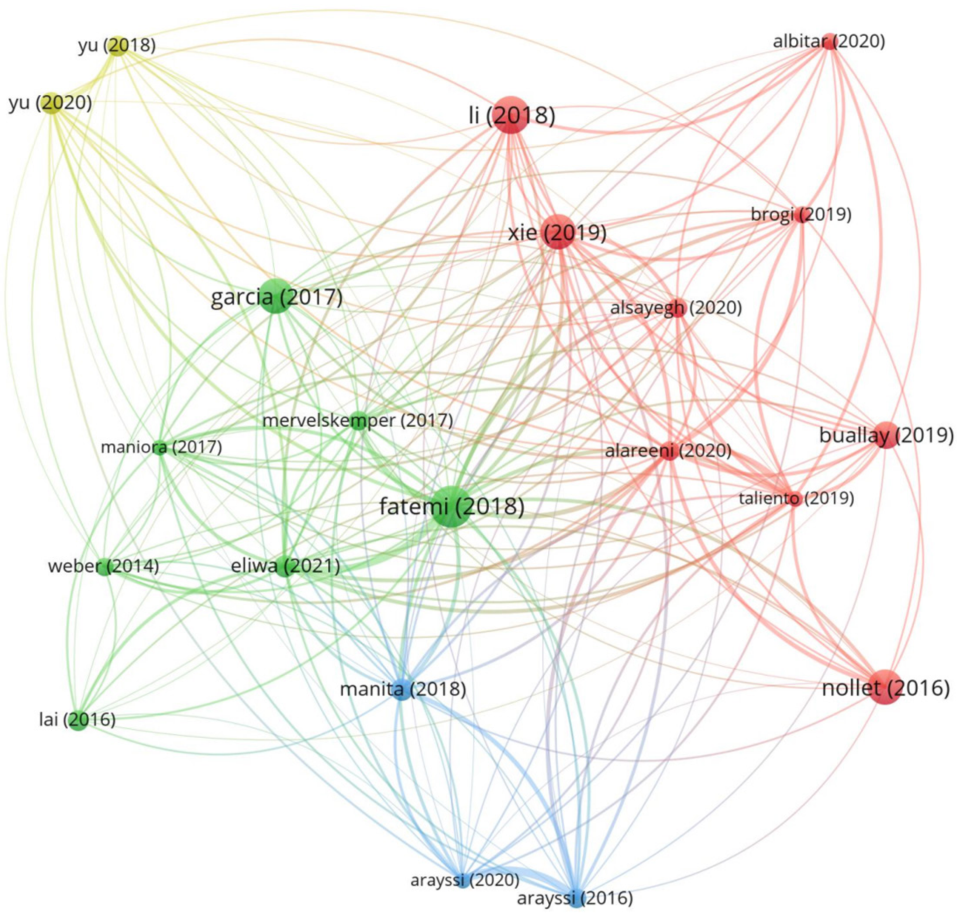

Figure 5: Bibliographic coupling analysis map.

and inadequate internal controls. Exploiting these institutional flaws, greenwash behavior help to improve corporate image and fulfill green financing requirements. Subsequently, conducts further research and find that, governance and ownership factors play a crucial role in deterring ESG "greenwashing".

Keyword co-occurrence analysis

Keyword co-occurrence refers to the correlation and frequency of occurrence between keywords within a set of documents and it is essential for predicting future development trajectories.[8] Based on the citation relationship between the references, keyword co-occurrence classifies the keywords into thematic clusters with different colors.[24,38] Figure 6 is mapped by 34 keywords that occur more than 8 times and detailed information is shown in Table 7.

"Corporate social responsibility" and "financial performance" undoubtedly become the two cores of the entire figure with strong links to each other, which indicates that the research boundary in this field is clear, the fundamental issues are well-defined and the research direction is focused. In a considerable portion of the papers, the concept of ESG and CSR is not distinguished and mixed used. Due to its earlier proposition, the occurrence of CSR is even higher than that of ESG.[14,34] Meanwhile, with the emergence of new ideas and the implementation of new policies, their impacts on financial performance have always been the focus of attention.

Further exploration of the keyword co-occurrence network reveals that "sustainability", "responsibility" and "corporate governance" are secondary keywords in this research field. Scholars attempt to explore the inner mechanisms of these influences from the perspectives of environmental protection, social responsibility and other aspects. Based on this, feasible strategies and recommendations for corporate governance are proposed. In this context, corporates devote their main effort to resolve the economic-environmental dilemma by shifting to more sustainable business models.[1,10,22]

Keyword evolution analysis

In contrast to co-occurrence analysis of keywords that uncovers research background, hot topics and focal points, keyword

Table 6: Bibliographic coupling analysis.

Cluster	Title	Author	Year	Citations	Total Strength
1 Red	Corporate social responsibility and financial performance: A non-linear and disaggregated approach	Nollet *et al.*	2016	270	54
	The impact of environmental, social and governance disclosure on firm value: The role of CEO power	Li *et al.*	2018	302	70
	Do environmental, social and governance activities improve corporate financial performance?	Xie *et al.*	2018	278	87
2 Green	Sensitive industries produce better ESG performance: Evidence from emerging markets	Alexandre Sanches Garcia, *et al.*	2017	272	51
	ESG performance and firm value: The moderating role of disclosure	Fatemi *et al.*	2018	342	156
	ESG practices and the cost of debt: Evidence from EU countries	Eliwa *et al.*	2021	150	118
3 Blue	Women on boards, sustainability reporting and firm performance	Arayssi *et al.*	2020	133	92
	Board gender diversity and ESG disclosure: evidence from the USA	Manita *et al.*	2018	148	82
4 Yellow	Greenwashing in environmental, social and governance disclosures	Yu *et al.*	2020	141	40
	Environmental, social and governance transparency and firm value	Yu *et al.*	2018	150	55

evolution analysis shares insights into the developmental trajectory of the research field. CiteSpace provides us with timeline visualization to deepen the co-occurrence relationships between themes.[39] To ensure the rationality and independence of cluster theme labels, the LSI (Latent Semantic Indexing) algorithm was chosen to name the clustering themes,[40] resulting in the clustering of research topics on ESG disclosure and firm value, as shown in Figure 7.

Based on the evaluation of network modularization indicators to measure the credibility of clustering results, the data shows that the Modularity Q is 0.4285, which is greater than 0.3, indicating a significant community structure in the clustered network. The Mean Silhouette is 0.7576, which is greater than 0.7, indicating that the clustering result is reliable.[40] To sum up, ESG disclosure research on corporate value covers a wide range of hotspots and exhibits significant co-occurrence network clustering characteristics, forming multiple clustering themes. Specific information is listed in Table 8.

We classify these nine clusters into four thematic areas. Cluster #0 and #2 primarily align their focus with the core domains of CSR. Based on the positions of these two clusters in the timeline, we believe that earlier studies mostly centered on exploring the role of corporate traits in the process of implementing CSR from the internal perspective of the company.[41] The exploration of behavioral causes has stimulated transformations within the industry and expanded the range of evaluations made by the public.[42]

Cluster #1, #3 and #6 demonstrate the academic foundation on which the research is based. Legitimacy theory and stakeholder theory are widely used in ESG theoretical framework,[32,43] which is in line with intuitive perceptions. In order to dig out the relationship between ESG disclosure and firm value under different scenarios, scholars use panel data to construct econometric regression models to validate theoretical mechanisms.[14,30]

Cluster #4 and #5 mainly focuses on corporate governance within the ESG framework, exploring the impact of corporate ownership structure on sustainability. A distributed ownership structure enhances the ability of company management to effectively balance the diverse requirements of stakeholders,[34] thereby serving as a significant driver of the company's competitive advantage. Moreover, the inclusion and diverse perspectives brought by female directors further empower the company to navigate complex market environments and explore greater opportunities.[33,41]

Cluster #7 and #8 explores sustainable investment orientations arising from environmental disclosure. ESG resources and capabilities of a corporate are increasingly being embraced as a

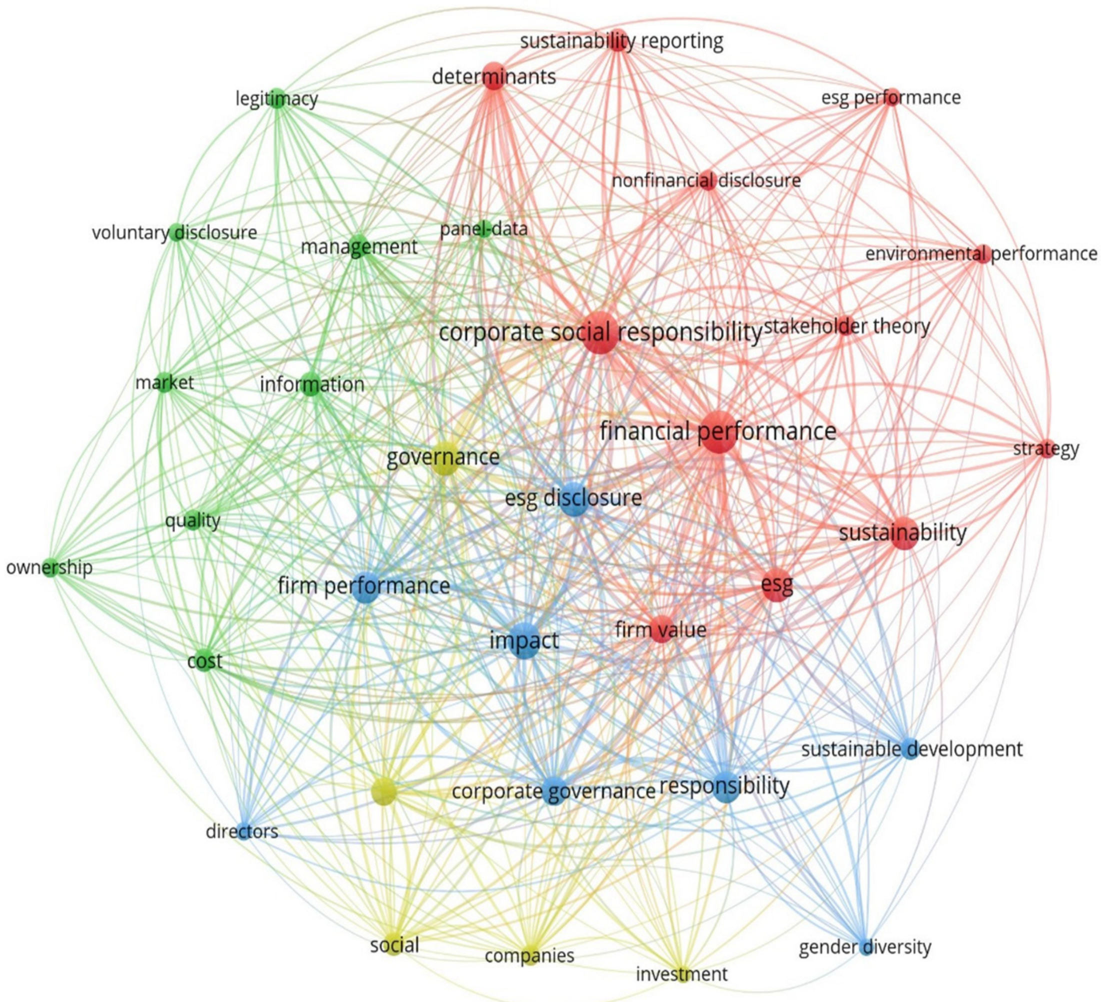

Figure 6: Keyword co-occurrence network.

Table 7: Keywords occurrence.

Keyword	Occurrence	Link Strength
corporate social responsibility	67	392
financial performance	67	392
impact	49	309
ESG disclosure	40	234
ESG	39	219
sustainability	36	207
firm performance	33	216
responsibility	33	179
corporate governance	29	178
environmental	26	143
determinants	25	156
firm value	25	150

form of strategic asset,[44] which can enable the company to gain a more accurate understanding of market trends and improve investment sentiment.[45,46]

The impact of ESG disclosure on firm value

Through keyword co-occurrence analysis and keyword evolution analysis, this section aims to answer RQ1, that is, to briefly outline the impact of ESG disclosure discussed in the selected sample on enterprise value, how ESG disclosure impacts firm value and possible future research directions on this topic.

Our selected sample suggests that the impact of ESG disclosure on enterprise value can be categorized as linear or nonlinear. The linear relationship demonstrates a significant positive or negative correlation, while no clear significant relationship is observed, dependent on various research backgrounds, samples and methodological factors. A number of studies have highlighted the nonlinear relationship between ESG disclosure and firm value. For example, Teng *et al.*[47] observe an inverted U-shaped relationship between ESG and financial performance of listed companies in

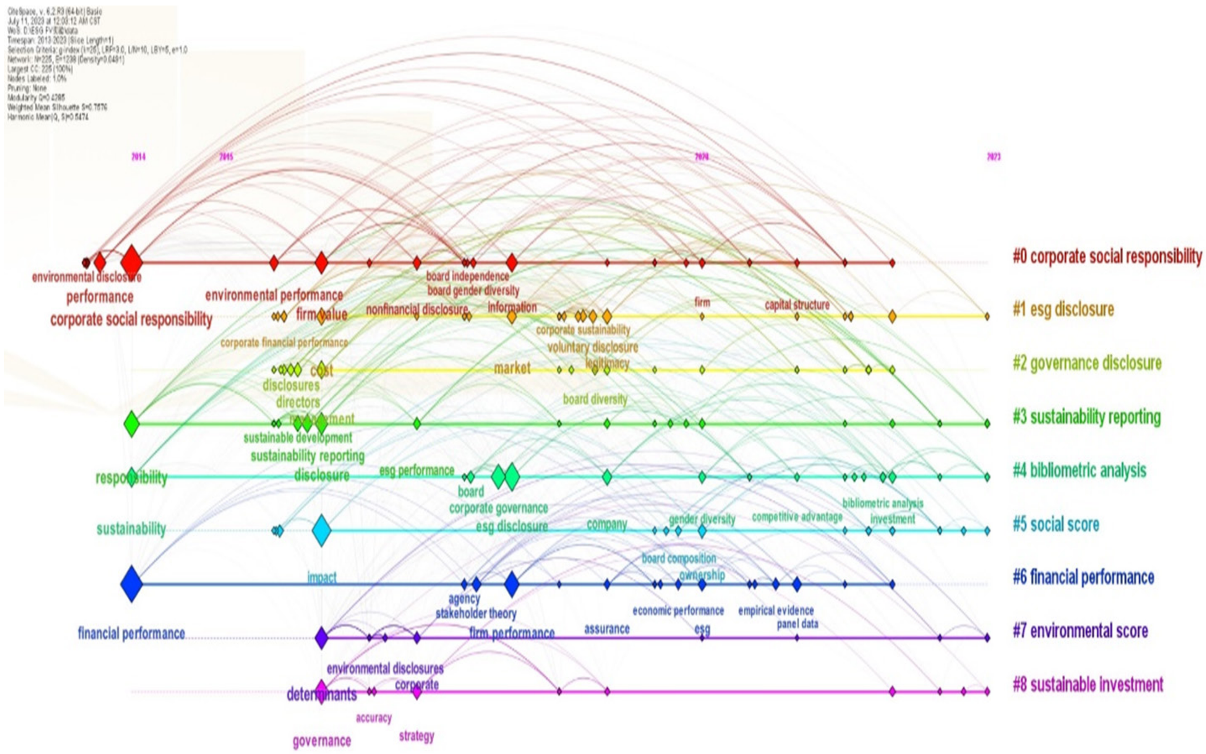

Figure 7: Timeline map of keyword evolution.

Taiwan. These findings suggest that the impact of ESG disclosure on firm value is dynamic and varies across different levels of ESG performance. Additionally, numerous studies indicate a positive or negative correlation between ESG disclosure and firm value, with the positive correlation evident in cases of high ESG disclosure levels, aligning with improvements in enterprise value.[5,48] On the contrary, negative correlation occurs when ESG disclosure is inversely correlated with corporate performance. For instance, Agarwala *et al*.[49] find a negative correlation between ESG disclosure and corporate financial performance in the case of Indian companies. Additionally, Sharma *et al*.[9] conduct a study that shows there is no significant relationship between ESG disclosure and firm value. These findings suggest that the effectiveness of ESG disclosures in enhancing firm value may not universally apply across all contexts and industries. Discrepancies in these findings can be attributed to variations in research methods, sample selection and different market environments.[50,51] Moreover, cultural and governance contexts also play an important role in shaping the relationship between ESG disclosure and firm value.[52] Furthermore, the definition and scope of ESG activities, as well as the assessment of their costs and benefits, significantly impact the relationship between these two variables, as mentioned in the study by Mervelskemper and Streit.[53]

The mechanism of ESG's influence on enterprise value is mainly achieved by reducing information asymmetry and agency cost. ESG disclosure enhances the transparency of companies, reducing information asymmetry for investors and bolstering the reputation and credibility of firms. This, in turn, attracts more investors and consumers, indirectly elevating enterprise value. Furthermore, it fosters trust among investors, diminishing agency costs and ultimately enhancing enterprise value.[54] Additionally, ESG disclosure aids companies in identifying and managing risks, improving long-term performance and subsequently increasing corporate value.[53] Lastly, effective ESG information disclosure enhances the innovation capabilities of enterprises and boosts employee satisfaction, leading to improved productivity and enhanced enterprise value.[31] However, the mechanisms become more complex when other factors are introduced. Khan *et al.*[55] introduced the concept of the materiality of ESG information as a key variable in explaining the relationship between ESG performance and financial performance. They found that only ESG issues that are material to the industry in which a company operates are significantly positively correlated with the company's future financial performance. Similarly, the research by Brandon *et al.*[56] introduced investor preferences as a key variable affecting the market impact of ESG ratings. They discovered that when ESG ratings fall below investor expectations, the negative stock price reaction is stronger; conversely, when ESG ratings exceed expectations, the positive stock price reaction is stronger.

Future research trends regarding ESG disclosure and enterprise value can incorporate the following aspects. Firstly, current research is relatively concentrated on industries with high pollution and strict regulations, while other sectors receive less attention, lacking a comparative perspective.[57] More studies should focus on a more diverse range of industries, analyzing

Table 8: Keywords clustering.

Cluster 0 Corporate social responsibility	Cluster 2 Governance disclosure	Cluster 1 ESG disclosure	Cluster 3 Sustainability reporting	Cluster 6 Financial performance	Cluster 4 Bibliometric analysis	Cluster 5 Social score	Cluster 7 Environmental score	Cluster 8 Sustainable investment
Corporate social responsibility	Disclosure	Cost	Responsibility	Financial performance	Gender diversity	Impact	Determinants	Governance
Board gender diversity	Board diversity	Market	Sustainability reporting	Firm performance	Competitive advantage	Board composition	Environmental disclosure	Accuracy
Board independence	Management	Corporate sustainability	Sustainable development	Economic performance	Corporate governance	Ownership		Strategy
Capital structure	Directors	Voluntary disclosure	ESG performance	Stakeholder theory	Company			
		Legitimacy		Panel data	Sustainability			
Corporate social responsibility	ESG Disclosure and firm performance				Corporate governance		Environmental disclosure	

how industry characteristics affect ESG information disclosure across different sectors. Secondly, it would be valuable to explore the mediating role of ESG disclosure on firm value, investigating how ESG impacts enterprise value by influencing intermediate variables within companies, as well as the varying degrees of influence from different ESG dimensions on enterprise value.[30] Thirdly, examining the long-term impact of ESG disclosure on firm value and exploring the interaction between ESG activities and other factors like corporate governance and financial risk and their combined effect on firm value, becomes essential.[31] Finally, focusing on the standardization of ESG disclosure and investigating the influence of ESG report content and format on enterprise value should also be prioritized.[53]

Key influencing factors

Based on a comprehensive review of relevant literature and keyword co-occurrence analysis, we discover that the three terms-"market", "voluntary disclosure" and "ownership"-presented in Figure 6 offer visionary insights from various perspectives. These insights provide insight into the mechanisms of the relationship between ESG disclosure and corporate value and answer RQ2.

Firstly, the attributes of the market play a significant role in shaping the relationship between ESG disclosure and firm value, with notable differences between developed and developing countries. In developed markets, greater maturity, robust regulations and stringent demands for ESG disclosure create an environment where companies proactively engaging in ESG disclosure are rewarded with higher firm value.[32,58] Conversely, developing markets often exhibit lower levels of regulation and weaker ESG disclosure requirements, leading to reduced adherence to ESG disclosure and increased information asymmetry.[7] This can result in an ambiguous correlation between ESG disclosure and corporate value. Furthermore, varying levels of investor demand and public attention across markets provide companies with differing ESG strategic guidance.[28] Despite these disparities, data from Section 3.1.2 indicates a positive trend in emerging markets, with growing recognition and significance attributed to ESG, suggesting a potential convergence in the influence of market attributes on the ESG disclosure-firm value relationship. Moreover, cultural norms and institutional environments also shape this relationship by influencing stakeholder expectations, corporate governance practices and the overall business landscape.[59] As ESG continues to gain prominence in both developed and developing markets, understanding the nuances of market attributes and their impact on ESG disclosure and firm value becomes increasingly critical for companies, investors and policymakers alike.

Secondly, the inherent attributes of ESG disclosure play a crucial role in influencing firm value. Companies demonstrate their commitment to ESG issues by engaging in voluntary disclosure and proactively providing relevant information to investors and

Table 9: Future Research Directions.

Category	Topic	Description
Theoretical issues	Trade-offs and underlying mechanisms	Investigate the dynamic trade-offs between short-term costs and long-term benefits associated with ESG practices.
	Collaboration between scholars and policymakers	Foster partnerships between scholars and policymakers to develop practical frameworks and policies that support companies in their ESG disclosure efforts.
	Long-term impact	Emphasize the mechanisms that have long-term impacts on value creation within companies.
ESG rating issues	Reliability of ESG ratings	Examine the potential impact of ESG rating divergence on corporate financing costs, stock volatility and investor confidence.
	Standardized quantitative measures	Refine crucial elements for ESG disclosure and establish standardized quantitative measures to promote in-depth and concrete research.
	ESG disclosure assurance	Explore the need for more relevant assurance activities due to the escalating prevalence of "greenwashing" and the emergence of mandatory disclosure policies.
Stakeholder issues	Stakeholder focus and feedback differences	Systematically compare the focus and feedback differences of various stakeholders to extract pathways for aligning the interests of all parties.
	Communication and interaction reshaping	Explore how improving ESG information disclosure can reshape communication and interaction between companies and diverse stakeholders, achieving long-term, mutually beneficial development.
	Investor preferences and market demand	Investigate the relationship between disclosure practices and market demand to provide insights into how companies can better align their disclosure strategies with market expectations.
	Role of media in ESG topics	Explore the role of media in ESG topics and how it influences the public and investors' perceptions of a company's ESG performance.
	Materiality assessment	Research how to improve materiality assessments to better identify and prioritize ESG issues most relevant to various stakeholders.

stakeholders. This type of disclosure enhances transparency, builds trust and attracts ESG-conscious investors and stakeholders, ultimately contributing to value creation for companies.[36] However, voluntary disclosure is not without its challenges, as it faces issues related to incomplete information, inconsistent reporting and limited comparability.[44] Mandatory disclosure also serves a dual purpose for companies. On the one hand, it encourages companies to actively manage and improve their ESG performance to comply with disclosure obligations and regulatory standards. On the other hand, it raises concerns about some firms viewing disclosure as a mere formality, neglecting their genuine commitment to ESG matters and resorting to superficial actions to meet disclosure requirements.[60,61] This is particularly challenging for SMEs, as mandatory disclosure imposes operating costs and burdens that can negatively impact their competitiveness. Based on Figure 6, a strong connection is observed between "voluntary disclosure" and both "legitimacy" and "information," suggesting a direct influence of disclosure attributes on corporate legitimacy and the information environment. As more countries introduce relevant regulations, the shift from voluntary to mandatory disclosure has alleviated the challenge of quantifying ESG metrics within standardized reporting frameworks. However, the risk of "greenwashing" or misleading disclosures has also increased.[62] Additionally, companies may struggle to balance the demand for transparency with the need to protect sensitive information and maintain competitive advantages.[63] Addressing these issues and obstacles will be keys for companies to further expand their value.

Finally, ownership concentration not only influences decision-making and disclosure practices regarding ESG strategies but also plays a crucial role in shaping the transparency and accountability of ESG reporting. In situations of high ownership concentration, major shareholders exert significant influence and control over corporate decision-making. Ensuring the independence and objectivity of ESG disclosure becomes challenging in such circumstances, as risks associated with ESG-related issues may be concealed or minimized.[11,43] When the integrity and reliability of ESG reports are compromised, stakeholders may subsequently question the company's profitability. Additionally, companies become more vulnerable to the short-term profit-oriented objectives of major shareholders, potentially overlooking the long-term sustainability implications of ESG factors.[50,64] In enterprises with low ownership concentration, managers need to balance the interests of different shareholders with the imperative for ESG disclosure. This environment may foster a greater commitment to ESG accountability, as managers seek to maintain the trust and confidence of a broader range of stakeholders.

Research prospects

In response to RQ3, future research should seek a more comprehensive and in-depth exploration of the mechanisms affecting ESG disclosure, enabling companies to transform their business models and fundamentally meet stakeholder needs. Given the complex relationship between ESG disclosure and firm value, we should apply divergent thinking to view this relationship as dynamic, influenced by external factors and random events, rather than being confined to a simple positive or negative correlation. Future research should also delve into the dynamic trade-offs between short-term costs and long-term benefits associated with ESG practices. It is essential to investigate the boundaries and evolution of these trade-offs, as well as the underlying mechanisms that drive them. To advance this field, collaboration between scholars studying this issue and those appointed by governments or authorities to formulate strategic guidance would be highly beneficial. Such partnerships can foster the development of practical frameworks and policies that support companies in their ESG disclosure efforts while considering the broader societal and economic context. It should be noted that, due to the comprehensive changes and adjustments required in a company's strategy and operations, as well as the need for communication and coordination with the supply chain and partners, the benefits brought by ESG disclosure are usually not immediate but gradual. The mechanisms that have long-term impacts on value creation within companies need to be emphasized accordingly in future research.

Moreover, with ESG-related indicators being incorporated by an increasing number of third-party rating agencies, a new issue arises, which is the reliability of ESG ratings. Data sources, the extent of disclosure and the weight allocation are the main reason leading to ESG rating divergence. The potential impact of divergence on corporate financing costs, stock volatility and investor confidence is worth examining. Further refinement of crucial elements for ESG disclosure and establishment of standardized quantitative measures are necessary to promote in-depth and concrete research in this field. Moreover, ESG disclosure assurance is being called for due to the escalating prevalence of "greenwashing". Some companies choose to establish audit committees led by independent directors or choose third-party agencies to provide both financial auditing and assurance reports, in order to alleviate concerns about the credibility of the ESG disclosure. The continuously emerging policies on mandatory disclosure in many countries have also brought into foresight the need for more relevant assurance activities.

Finally, enhancing the relevance, efficacy and transparency of ESG disclosure from the perspective of stakeholders is the fundamental objective of this research, ultimately promoting more responsible and sustainable corporate practices. Based on richer data, future studies could systematically compare the focus and feedback differences of various stakeholders on ESG information disclosure. This would help to extract pathways for aligning the interests of all parties. Additionally, it would be beneficial to explore how improving ESG information disclosure can reshape communication and interaction between companies and diverse stakeholders, achieving long-term, mutually beneficial development. Especially, the preferences of investors and their impact on ESG disclosure should be given more attention. The relationship between disclosure practices and market demand would provide valuable insights into how companies can better align their disclosure strategies with market expectations. What's more, with the transformation of media channels, exploring the role of media in ESG topics and how it influences the public and investors' perceptions of a company's ESG performance may become a new research trend. This includes the content, format and frequency of media coverage, as well as its association with corporate reputation and stock prices. From a corporate perspective, materiality assessments are a crucial means for companies to identify key issues in the ESG field, in order to reflect their sustainable development efforts more comprehensively in disclosures. Therefore, the identification methods, priority order and feedback tracking are all worth further exploration.

Please see the summary of research prospects in Table 9.

CONCLUSION

The purpose of this paper is to elucidate the impact mechanisms and key factors of ESG disclosure on firm value through bibliometric analysis and a core interpretation of existing literature and further explore whether and under what conditions ESG disclosure contribute to value creation for companies. We aim to trace the development history of ESG, demonstrate how fundamental theories operate from different perspectives and based on the current research status, put forward expectations for future prospects.

Technically, a grand total of 135 papers written by 343 authors are analyzed using VOSviewer and CiteSpace to record the intellectual structure of ESG disclosure. Several bibliometric approaches are employed on the issue, including spatial-temporal distribution analysis, co-authorship analysis, co-organizations analysis; journal overlay analysis, bibliographic coupling analysis, keyword co-occurrence and timeline mapping analysis. Through cluster analysis, we summarized four research thematic areas, namely: academic foundation, pillars of ESG, sustainable indicators and research methodology, which may contribute to targeted information mining. This study combines data analysis with literature review, focusing on correlation analysis and trend prediction.

Academically, this paper reviews the research conclusions on the complex relationship between ESG disclosure and firm value in different context and suggests that it should be viewed with a developmental and dynamic perspective. Future research should consider employing more detailed measures or exploring how the determinants differ across various stakeholders and countries. To address the current misconduct at the corporate level and the regulatory shortcomings at the market level that "greenwashing" brings, we recommend increased collaboration between the academic institution and government agencies for research purposes.

Practically, given the previous neglect in research on economic performance, we emphasize that research should be problem-oriented and highlight industry characteristics. This approach is vital in providing policymakers, business leaders and investors with more pragmatic insights to formulate effective economic policies, strategic business decisions and sustainable development initiatives across different sectors, contributing to the stable growth of the global economy.

LIMITATIONS

While this study strives to objectively analyze the development and research frontiers of ESG disclosure literature using rigorous selection criteria, it is subject to certain limitations.

Firstly, the sample size and quality constraints pose a challenge. The relatively small number of included studies (135) and the potential publication bias towards studies with significant findings may limit the generalizability and robustness of the results. Future research should aim to expand the sample size, incorporate unpublished literature and conduct sensitivity tests to validate the reliability of the conclusions.

Secondly, there are methodological limitations to consider. Over-reliance on bibliometric methods may overlook nuanced differences between studies and fail to delve into the motivations, processes and impacts of ESG disclosure. Additionally, the accuracy of keyword analysis may be limited by its dependence on author-provided keywords. Future studies should combine qualitative methods, such as case studies, employ advanced text mining techniques like topic modeling and engage in expert cross-validation to enhance research depth and breadth.

Thirdly, variable selection constraints are evident. Due to data availability limitations, the control variables included in this study may not be comprehensive, leading to potential omitted variable bias. Furthermore, systematically comparing the impact of different dimensions of ESG disclosure (economic, social, governance) proves challenging. Future research should incorporate a richer set of data, consider firm heterogeneity and institutional factors and explore the heterogeneous effects of different disclosure dimensions to comprehensively understand the impact of ESG disclosure on firm value.

Lastly, temporal scope limitations are present. It is important to note that existing research on the long-term effects of ESG disclosure remains relatively limited. This study, constrained by the available time span of data, is not yet able to draw definitive conclusions regarding the long-term impact of ESG disclosure. Future research could attempt to introduce methods such as event studies to decompose short-term and long-term effects, providing a more comprehensive understanding of the temporal dynamics at play.

In conclusion, while this study endeavors to objectively analyze the development and research frontiers of ESG disclosure literature within the constraints of available data and methods, it inevitably has limitations. Future research should focus on expanding research samples, enriching research methods and broadening theoretical perspectives to provide more comprehensive and precise references for ESG disclosure practices.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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