

# ESG Factors and Relationship with Performance: A Bibliometric Analysis

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## **Abstract**

*This study employs bibliometric analysis to investigate the landscape of Environmental, Social, and Governance (ESG) factors and their relationship with performance. Drawing from a dataset of 634 papers retrieved from the Web of Science (WoS) database and analysed using Biblioshiny, the research explores academic interest trends, temporal dynamics, and citation impacts. Results indicate a surge in scholarly attention since 2010, peaking notably in 2022, reflecting the growing importance of ESG research. Prominent institutions such as Stanford and Bocconi emerge as collaborative hubs, with China leading in scientific production. Key themes include financial performance, governance, risk, responsibility, and management, reflecting comprehensive explorations of sustainable business practices and effective corporate governance. Thematic maps highlight essential elements in ESG and performance studies, with clusters like "impact" emphasizing critical factors such as "governance" and "financial performance." Future research directions could explore the integration of emerging technologies into ESG reporting procedures or sector-specific discrepancies in ESG effects on performance. The study acknowledges limitations inherent in bibliometric analysis and underscores the importance of triangulating findings with additional data sources for a comprehensive understanding of the scholarly landscape.*

**Keywords:** ESG factors, performance, environmental factors, social factors, governance factors, bibliometric study.

**JEL classification:** M41

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## **1. Introduction**

The implementation of sustainable development is important in order to address climate change and secure the welfare of future generations. Businesses should give foremost importance to maximizing profit (Deac et al., 2016), while simultaneously maintaining ethical and social values, preserving the environment, and ensuring equitable compensation (Abbas et al., 2023). The 2030 Agenda of the United Nations for Sustainable Development prioritizes equity and durability, whereas the Paris Agreement focuses on achieving economic decarbonization and safeguarding the environment. Europe places a high importance on achieving the

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Sustainable Development Goals in order to achieve carbon neutrality by the year 2050 (Galletta et al., 2022).

Business sustainability is a primary factor in current global conditions (Gruia et al., 2022; Dima et al., 2023). Environmental, social and governance (ESG) factors are pivotal for achieving sustainable development, with the goal of fostering positive coexistence amongst humans and the environment (Wan & Dawod, 2022). This encompasses the harmonious integration of economic growth, environmental preservation, and social equity, effectively tackling pressing issues such as the climate change or economic downturn. ESG is a crucial criterion for assessing businesses and encourages environmentally friendly financial practices.

ESG practices are an innovative approach for comprehending the potential advantages and hazards encountered by businesses, as they encompass both ethical responsibility and contribute to a company's esteemed reputation (Egorova et al., 2023). The correlation between ESG and business operations, corporate governance, risk, cost of capital, and company performance has been thoroughly established. Adhering to environmental, social, and governance (ESG) principles has a measurable financial effect, as research indicates that organizations that embrace sustainable development have a 20% enhancement in their capitalization-to-earnings ratio (Doogan, 2009). The significance of intangible assets, such as brand value and intellectual property, is growing, as seen by their proportion in the S&P 500 index rising from 30% in 1998 to 68% in 2018 (Subramanian et al., 2019). Consequently, the financial industries have seen substantial transformations, with socially responsible investment emerging as a prominent trend in the mutual fund business. Studies have demonstrated a direct correlation between ESG factors and financial metrics. Specifically, a higher return on assets has been found to positively impact ESG performance (Velte, 2017; Alareeni & Hamdan, 2020). Greater net ESG scores correlate with a rise in firm worth, and eco-efficiency indicators, when combined with production indicators and market value, also demonstrate a favourable influence. Nevertheless, certain research has demonstrated a detrimental effect, contrasting with the beneficial influence observed in others (Horváthová, 2010). The majority of studies validate a prevailing positive correlation between ESG performance and financial performance, as opposed to a negative one.

The performance of organizations in terms of environmental, social, and governance (ESG) factors has a substantial impact on the risks they confront. Specifically, higher levels of product differentiation have a more pronounced effect on the overall risk of the system (Wan et al., 2023). Companies exhibiting superior ESG performance demonstrate increased adaptability and outperform their counterparts during periods of financial crises. Additionally, they possess a wider range of investors and encounter reduced litigation risks, resulting in decreased capital expenses (El Ghouli et al., 2011). The credit rating of corporate bonds is contingent upon the jurisdiction in which the company is situated and the level of significance it assigns to ESG factors (Zhang et al., 2022).

Implementing ESG practices can mitigate a company's particular legal liabilities and result in an increased market worth (Aich et al., 2021). Companies

operating in impoverished surroundings have elevated capital expenses, whereas green firms experience reduced costs (Radulescu et al., 2016). Chinese listed businesses who demonstrate superior ESG performance have experienced a notable decrease in their borrowing expenses, leading to an enhancement in their market worth (Qiu & Yin, 2019). The impact of ESG factors on the performance or value of enterprises has been extensively studied and remains a subject of debate. The selection of a rating agency has a significant influence on the performance of a portfolio, limited by ESG factors (Aich et al., 2021). There has been a discovery of a direct relationship between ESG factors and the performance or value of a company. ESG performance acts as a mediator between R&D investment and green innovation performance (Xu et al., 2021).

ESG ratings have the potential to influence market participants and impact business actions and market returns (Chursook et al., 2022). Nevertheless, when firms enhance their ESG ratings, they experience a reduction in flexibility, resulting in diminished advantages for stakeholders. ESG ratings can be subject to varying interpretations of the ESG framework and concerns over sustainability issues (Chursook et al., 2022). To ensure consistent ratings, users must carefully choose specific scenarios. Enterprises with high ESG performance may not be actively engaging in social responsibility, but they are likely to secure finance in order to enhance their brand or engage in greenwashing.

The study of ESG research has been thoroughly examined using bibliometric studies. Khan (2022) and Senadheera et al. (2022) employed quantitative bibliometric analysis to investigate the relationship between ESG performance and potential areas for further research. Galletta et al. (2022) and Gao et al. (2021) conducted a comprehensive evaluation of the ESG literature by utilizing the Scopus database and the CiteSpace analytic tool to examine the internal connections between ESG research.

The novelty of this research lies in its comprehensive and nuanced analysis of the scientific production on ESG factors and their relationship with performance. This research uses bibliometric techniques and the WoS database to analyse the scholarly landscape of ESG factors and their relationship with performance. It provides insights into academic interest patterns, temporal dynamics, and citation impacts. The study highlights key institutions, impactful countries, and niche contributions, and analyses top-cited papers, frequent words, trending topics, and theme clusters for a comprehensive understanding.

The research questions of the present study are the following:

1. How has academic interest in ESG factors and their relationship with performance evolved over the past decade?
2. What temporal dynamics can be observed in the number of publications on ESG factors and performance?
3. How does global scientific production in this field vary by country?
4. What are the significant themes and topics within the scientific production on ESG factors and performance?

5. What future research directions can be identified for further advancing understanding on ESG factors and performance?

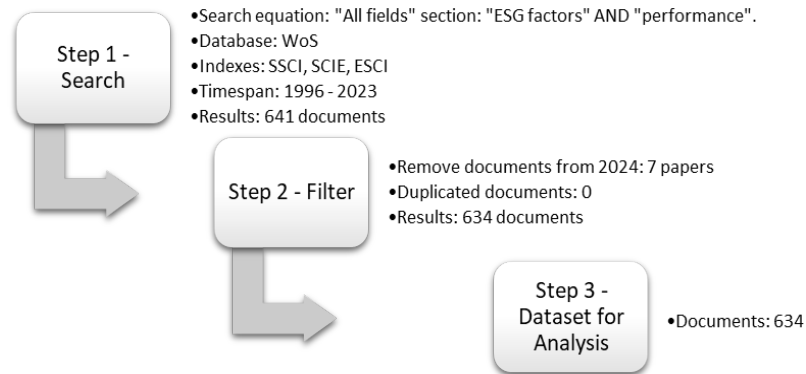
To provide answer to these research questions, this study uses a comprehensive bibliometric analysis of scholarly literature retrieved from the Web of Science (WoS) database and evaluated using Biblioshiny, an integral component of the bibliometrix package in RStudio. This offers a powerful platform for bibliometric data processing and visualization. The chosen methodology enables a systematic examination of the scientific production related to ESG factors and their association with performance, providing valuable insights into publication trends, citation patterns, and thematic clusters within the research domain.

The importance and relevance of this research are multifield. Firstly, it contributes to the academic understanding of the ESG factors and its intricate relationship with performance. By employing bibliometric analysis on a substantial dataset from the WoS database, the research provides a comprehensive overview of scholarly activities, highlighting trends, collaborations, and impactful contributions over the past decade. The study holds practical relevance for researchers, professionals, policymakers, and practitioners in the ESG domain. The insights derived from the analysis, such as the identification of top-cited papers, frequent words, and emerging trends, can inform decision-making and strategic planning in corporate sustainability and governance practices. Moreover, the research emphasizes the global and collaborative nature of scholarly engagement, shedding light on key institutions, influential countries, and niche contributions. This can foster international collaboration, knowledge exchange, and collective efforts toward sustainable business practices.

## 2. Methodology

In order to provide answer to the abovementioned research questions, the current study conducted a bibliometric analysis on the domain of ESG factors and performance. Bibliometric analysis is a quantitative method of investigating scientific production, which represents a pivotal approach in academic research. It systematically explores publication outputs, revealing trends, thematic clusters, and citation impacts in a specific field. This method enhances literature reviews, providing insights into research evolution, identifying gaps, and guiding future directions. Integrated with scientometrics, bibliometric analysis contributes to evidence-based decision-making and the advancement of knowledge across academic disciplines. Bibliometric review has been used in many new scientific research on various domains: artificial intelligence (Agustí & Orta-Pérez, 2023), digital transformation (Tirnovanu et al., 2023), economics (Dominko et al., 2023), e-learning (Djeki et al., 2022; Dima et al., 2022); environment (Enciso-Alfaro & García-Sánchez, 2023), food science (Popescu et al., 2022; Radu et al., 2023), governance (Effah et al., 2023), management (Zupic & Čater, 2015; Bratianu & Paiuc, 2022; Ștefan & Breazu, A. 2022), social factors (Kumar et al., 2021).

Figure 1 presents the protocol set for the current research. Thus, in the "All fields" search category of the WoS database, the terms "ESG factors" and "performance," were introduced and a comprehensive search was executed on February 1, 2024. The selection of these keywords was made due to the varied nomenclature associated with reporting, which is often identified by alternative terms such as disclosure, criteria, and others. The initial query generated 641 results, indicating substantial academic interest. To maintain precision and considering the limited timeframe for the year 2024, this year was eliminated from the search and thus seven results were excluded. The refined dataset comprises 634 documents, forming the basis for a detailed examination of trends, methodologies, and key insights into the relationship between ESG reporting factors and performance.



**Figure 1. Research protocol**

*Source: Author*

The selection of WoS database for this study was made because WoS stands out as a comprehensive and widely recognized academic database that encompasses a vast array of scholarly journals, conference proceedings, and research articles across diverse disciplines. Its meticulous indexing and rigorous selection criteria ensure the inclusion of high-quality and impactful research. Additionally, the reputation and credibility of WoS make it a preferred choice for researchers seeking to conduct rigorous bibliometric investigations, aligning with the scholarly standards and requirements of the academic community.

The bibliometric analysis was conducted on 634 documents utilizing Biblioshiny, a Java software tool developed by Massimo Aria from the University of Naples. Biblioshiny is a powerful bibliometric analysis tool integrated into RStudio, enabling in-depth exploration of scholarly landscapes. This software facilitates comprehensive examination and visualization of bibliometric data, allowing for the identification of patterns, trends, and insights within the extensive corpus of literature on ESG reporting factors and corporate performance. The utilization of Biblioshiny enhances the precision and efficiency of bibliometric analysis, contributing to the robustness of the findings presented in this research. The choice of this tool aligns

with contemporary best practices in bibliometric research, ensuring a rigorous and systematic approach to data analysis.

### 3. Results

In the examination of data spanning 1996 to 2023 from publication sources (291 journals and books), 634 documents were analysed (Table 1). The annual growth rate was 9.28%, indicating sustained scholarly interest. The document average age was 3.06 years, highlighting a recent focus on ESG factors and performance. Each document averaged 15.15 citations, indicating the research area's significance. The dataset included 27,116 references, emphasizing extensive knowledge interconnections.

In document contents, 1,114 Keywords Plus (ID) and 1,755 Author's Keywords (DE) were identified, revealing the discourse's multifaceted nature. Collaboration was observed among 1,705 authors, with 62 single-authored documents. Collaborative efforts averaged three co-authors per document, with 25.08% international co-authorships. Document types included 512 articles, eight articles with book chapters, 63 early access articles, one proceedings paper, two editorial materials, and 16 reviews. This diversity reflects multifaceted approaches in the scholarly exploration of ESG reporting and performance.

**Main Information about Data**

**Table 1**

Description	Results	Description	Results
Timespan	1996 - 2023	<b>Authors Collaboration</b>	
Sources (Journals, Books, etc)	291	Single-authored docs	67
Documents	634	Co-Authors per Doc	3
Annual Growth Rate %	9,28	International co-authorships %	25,08
Document Average Age	3,06	<b>Document Types</b>	
Average citations per doc	15,15	article	512
References	27116	article; book chapter	8
<b>Document Contents</b>		article; early access	63
Keywords Plus (ID)	1114	article; proceedings paper	1
Author's Keywords (DE)	1755	editorial material	2
<b>Authors</b>		proceedings paper	28
Authors	1705	review	16
Authors of single-authored docs	62	review; early access	4

*Source:* Author data processing in Biblioshiny

The annual production analysis reveals the evolving scholarly engagement with ESG reporting factors and performance over the examined timespan (Table 2). In the initial years, from 1996 to 2006, minimal contributions were observed, with sporadic articles and occasional spikes. Notably, a substantive increase occurred from 2010 onwards, with a marked rise in 2019 (32 articles), further accelerating in 2020 (56 articles) and peaking in 2022 with 140 articles. The subsequent years

maintained a high level of productivity, with 244 articles in 2023. It is essential to note that the year 2024, representing a partial period and having been eliminated from the query, included an output of 12 articles. It is pertinent to mention that there were 12 papers published in 2023, made available as early access, which would later be included in the journal volume for 2024. This nuanced temporal pattern reflects the evolving significance and growing scholarly interest in the intersection of ESG reporting factors and corporate performance.

### Annual Production

**Table 2**

<b>Year</b>	<b>Articles</b>	<b>Year</b>	<b>Articles</b>
1996	1	2015	9
1997	3	2016	9
2006	1	2017	12
2008	1	2018	14
2008	1	2019	32
2010	4	2020	56
2011	2	2021	68
2012	6	2022	140
2013	9	2023	244
2014	11	2024	12

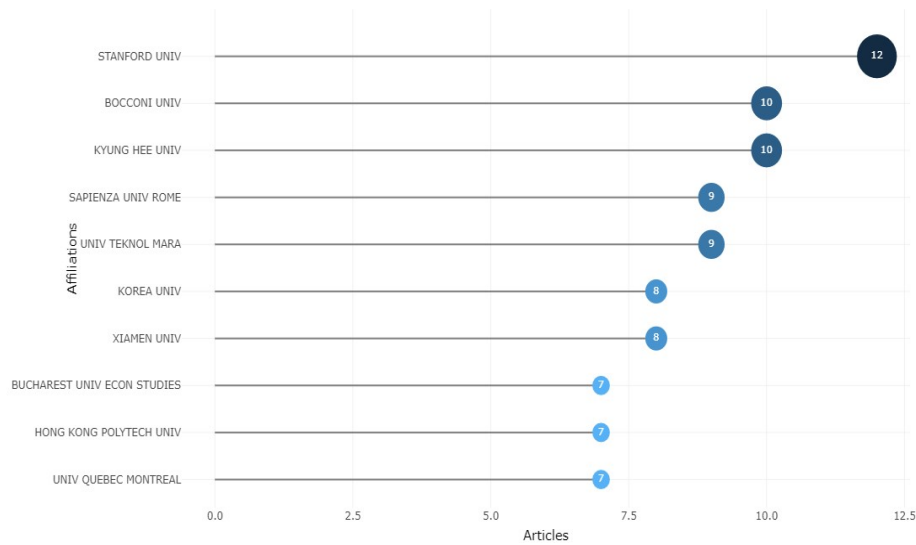
*\*For the years not shown in the table, there was no publication in WoS.*

The examination of the most relevant affiliations in the scientific production on ESG reporting factors and performance reveals noteworthy contributions from various institutions across different countries. Leading this discourse is Stanford University, located in the United States, with 12 articles, underscoring its significant role in advancing research in this field. Bocconi University in Italy and Kyung Hee University in South Korea closely follow with 10 articles each, exemplifying their substantial scholarly impact. Sapienza University of Rome in Italy and Universiti Teknologi MARA in Malaysia both contribute significantly with 9 articles each, further diversifying the academic landscape (Figure 2).

Korea University in South Korea and Xiamen University in China have made notable contributions with 8 articles each, while Bucharest University of Economic Studies in Romania, Hong Kong Polytechnic University in Hong Kong, and Université du Québec à Montréal in Canada are also prominent, each having produced 7 articles. These findings not only highlight the global nature of scholarly engagement but also emphasize the collaborative efforts among universities from different countries in advancing our understanding of the relationship between ESG reporting factors and corporate performance.

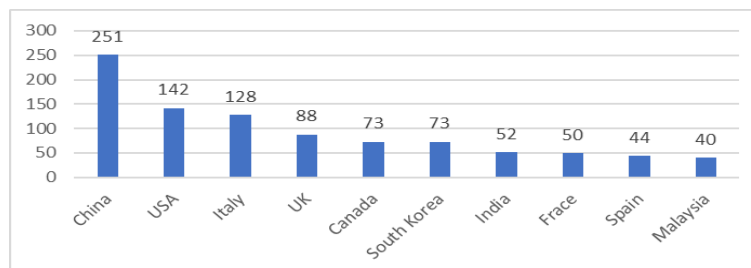
The examination of country-wise scientific production in the discourse on ESG reporting factors and corporate performance reveals a diverse and widespread engagement across the globe (Figure 3). China emerges as the leading contributor with a substantial production of 251 articles, demonstrating a prominent role in advancing research in this field. The United States closely follows with 142 articles,

underlining its significant scholarly impact. Italy, the United Kingdom, Canada, and South Korea exhibit robust scientific production with 128, 88, 73, and 73 articles, respectively, contributing significantly to the global academic landscape.



**Figure 2. Most Relevant Affiliations**

Other notable contributors include India (52), France (50), Spain (44), and Malaysia (40), indicating a broad international representation. Further, Australia, Poland, Russia, Romania, and Germany maintain active scholarly participation with article frequencies ranging from 34 to 39. Brazil, the Czech Republic, Sweden, Switzerland, and Japan also demonstrate noteworthy engagement, each contributing between 20 to 23 articles.



**Figure 3. Top 10 Most Productive Countries**

Among the most cited documents in the topic of ESG reporting factors and performance, several influential contributions stand out (Table 3). Bellenger et al.'s (2014) seminal work garners significant attention with 666 citations, reflecting on understanding the repercussions of air pollution on public health in the US. Cucari et al.'s contribution (2018) investigating the factors influencing responsible environmental behaviour in decision-making processes accrues 291 citations. The



pivotal paper of Pástor et al. (2021) in the Journal of Financial Economics analyses ESG investing practices and received 268 citations so far, while the work of Baldini et al. (2018) in the Journal of Business Ethics provides valuable insights into the ethical dimensions of corporate behaviour during financial crises and obtained 230 citations. Yu EPY et al. (2020) analysed the nuanced relationship between ESG performance, firm value, and disclosure practices.

The research of Tamimi et al. (2017) explores the intricate connections between CSR, corporate performance, and marketing outcomes. The paper of Halbritter et al. (2015) delves into the corporate governance dynamics during the global financial crisis, offering valuable insights into its impact on financial institutions. Atan et al. (2018) investigated the interplay between environmental management accounting, innovation investment, and firm performance. The paper of Alsayegh et al. (2020) explores the relationship between ESG performance and innovation, providing insights into the potential drivers of innovation in the U.S., while the research of Capelle-Blancard et al. (2019) offers a comprehensive examination of socially responsible investments, going beyond divestment strategies and contributing to the broader understanding of risk and return in this context.

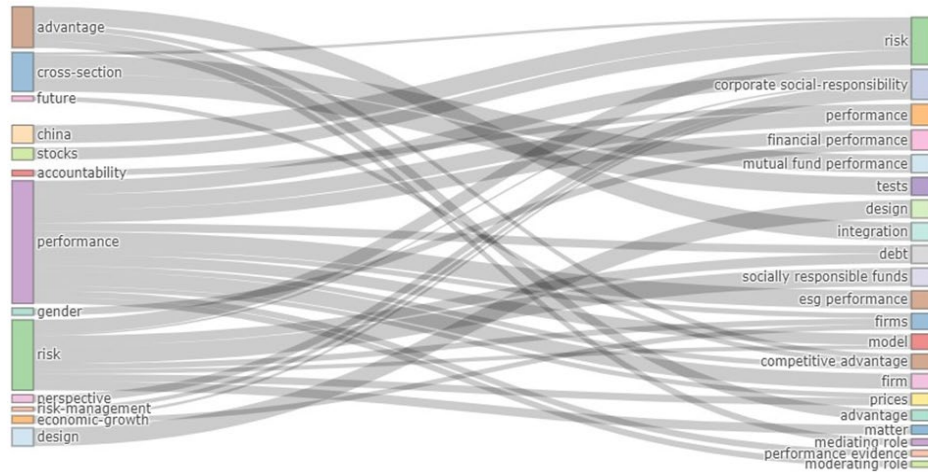
### Most Cited Documents

**Table 3**

N.	Reference	DOI	TC	TC per Year
1.	Bellenger et al. (2014)	10.1007/s00382-013-1783-z	666	60,55
2.	Cucari et al. (2018)	10.1002/csr.1452	291	41,57
3.	Pástor et al. (2021)	10.1016/j.jfineco.2020.12.011	268	67,00
4.	Baldini et al. (2018)	10.1007/s10551-016-3139-1	230	32,86
5.	Yu EPY et al. (2020)	10.1016/j.ribaf.2020.101192	170	34,00
6.	Tamimi et al. (2017)	10.1108/MD-01-2017-0018	159	19,88
7.	Halbritter et al. (2015)	10.1016/j.rfe.2015.03.004	151	15,10
8.	Atan et al. (2018)	10.1108/MEQ-03-2017-0033	151	21,57
9.	Alsayegh et al. (2020)	10.3390/su12093910	146	29,20
10.	Capelle-Blancard et al. (2019)	10.1007/s10551-017-3667-3	140	23,33

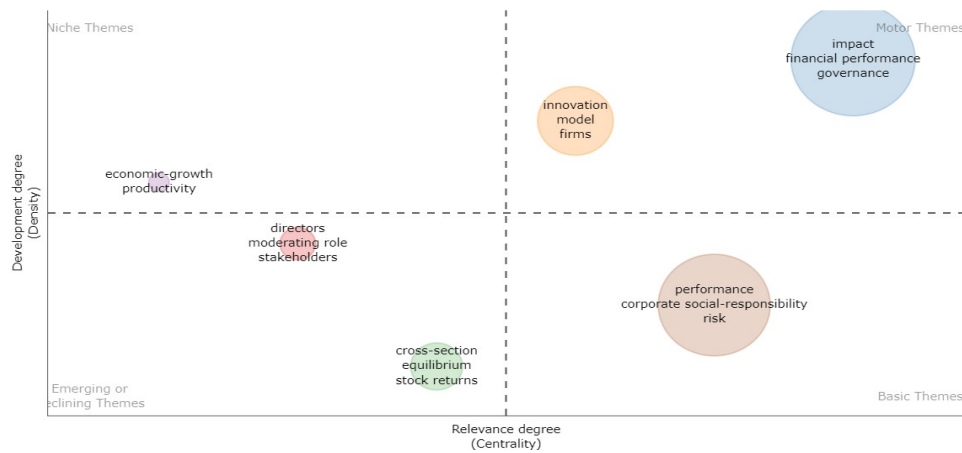
*\*TC = Total Citations*

The analysis of topic evolution demonstrates the changing research focus within the ESG and performance field (Figure 4). The shift from "accountability" to "performance" indicates a current focus on assessing company results. The continuing importance of fundamental concepts such as "risk" and "corporate social responsibility" is emphasized by elevated inclusion indexes and instances. The presence of intricate subjects like "sustainability," "innovation," and "mediating role" indicates the development of scholarly interests over time. Furthermore, the examination of certain concepts such as "competitive advantage," "integration," and "mutual fund performance" emphasizes several paths of investigation.



**Figure 4. Thematic Evolution**

The examination of thematic map reveals important elements within the ESG and performance field. The predominant cluster, labelled as "impact," contains crucial subjects such as "governance," "responsibility," and "financial performance" (Figure 5).



**Figure 5. Thematic Map**

The rise of "innovation" as a separate group highlights the changing dynamics of corporate research. Clusters such as "cross-section," "economic-growth," and "performance" highlight the complex and diverse nature of research in these fields. Within the "performance" category, the thorough examination of concepts such as "corporate social responsibility," "risk," and "investment" demonstrates the complex viewpoints that are taken into account in modern research. The significant centrality and pagerank indicators linked to the "performance" cluster

highlight its crucial influence on scholarly debate. Furthermore, the various sub-themes encompassed in this cluster, such as "ethics," "efficiency," and "institutional investors," clarify the wide range of topics that are discussed.

The factorial analysis reveals the core structure of ESG and performance-related concepts. The cluster in Dimension 1, which includes topics like "performance," "corporate social responsibility," and "financial performance," demonstrates how linked they are (Figure 6). The term "risk" demonstrates a significant inverse correlation in Dimension 1.

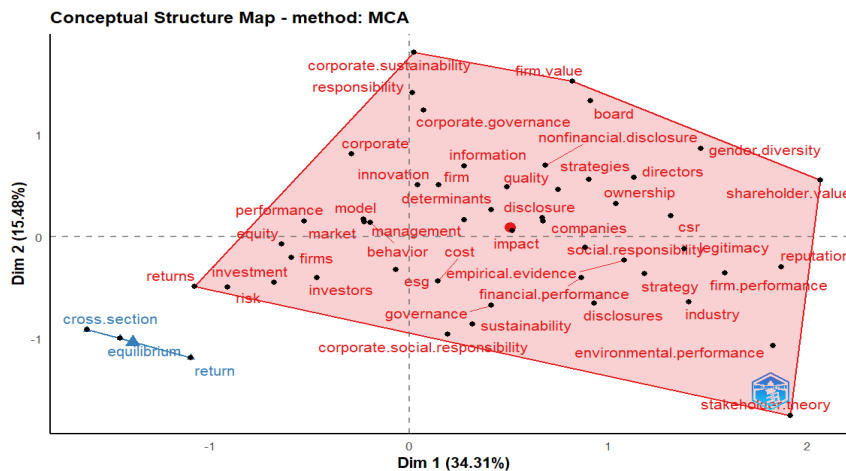


Figure 6. Factorial Analysis

Dimension 2 has discernible dynamics, characterized by the presence of unique concepts such as "return," "cross-section," and "equilibrium," which form a distinct cluster. Significantly, the terms "equity" and "legitimacy" hold a distinct position inside Dimension 2. Cluster 1 mostly consists of terms linked to business practices, governance, and environmental factors, whereas Cluster 2 comprises phrases associated with financial aspects and equilibrium considerations. The use of terminology such as "shareholder value" and "stakeholder theory" emphasizes the intricate aspects within the debate on ESG and performance.

#### 4. Conclusions

The bibliometric analysis of ESG reporting factors and their connection with performance indicates a significant increase in scholarly attention since 2010, with a particularly noteworthy peak in 2022. The analysis demonstrates a strong and widespread intellectual involvement, with prominent institutions such as Stanford and Bocconi acting as collaborative centres. China is the top producer of scientific research, with Italy and France having a strong presence in citations. Lebanon's high average citation per article indicates specialized contributions, emphasizing the worldwide influence of research in ESG reporting. The key themes encompassed in this analysis are financial performance, governance, risk, responsibility, and management. These

themes provide a thorough examination of sustainable business practices and the implementation of good corporate governance. The ESG reporting and performance literature demonstrates sustained scholarly interest in subjects such as "performance," "corporate social responsibility," and "impact" from 2021 to 2023. Thematic maps provide valuable insights into ESG and performance analyses, with the conspicuous "impact" cluster emphasizing key factors such as "governance" and "financial performance."

Future investigations on ESG factors and performance could aim the introduction of emerging technologies: artificial intelligence and blockchain, to improve the precision, openness, and effectiveness of ESG reporting procedures. Furthermore, an analysis of the influence of ESG factors in various businesses, as well as the potential discrepancies in their effect on performance across sectors, could offer significant insights for professionals and policymakers.

Despite its insights, the study faces certain limitations. The bibliometric analysis, while comprehensive, relies on available datasets and databases, potentially overlooking contributions from sources outside the studied databases. This limitation underscores the need for researchers to triangulate findings with additional data sources for a more comprehensive understanding of the scholarly landscape.

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