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A Bibliometric Analysis regarding ESG Reporting

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Abstract

The objective of the present study is to conduct a bibliometric analysis of publications in the field of environmental, social, and governance (ESG) reporting. The work is based on articles collected from the Web of Science (WoS) database. To analyse and visualise data, this paper uses VOS Viewer and Microsoft Office Excel for a large number of scientific papers. This study reveals information on science mapping and performance analysis and shows the state of the intellectual structure and emerging trends of the present research topic. Results show that research in this field has significantly increased over time. The results of the study could be of interest to scholars, as it highlights the most important research constituents and articles with the highest impact.

Keywords: ESG reporting, bibliometric analysis, performance analysis, science mapping, WoS, Vos Viewer.

JEL Classification: Q56.

1. Introduction

The global financial crisis drew attention to companies' attitudes towards risk, ethics, degree of responsibility, and ability to manage their stakeholders. However, the crisis has shown that the world is changing rapidly and that economies are inevitably interconnected. Globalisation and a changing political landscape are closely related to significant changes in populations, urbanisation, resource use, climate change, and employee and consumer behaviour. In this respect, ESG reporting plays an essential role for the business environment.

Although discussions about ESG reporting have gained momentum following this event, reporting on these indicators is not a new topic. ESG reporting emerged in the 1970s through the efforts of a small body of investors who were interested in the social and environmental practices of the companies in which they invested (Richardson, 2009). Later, ESG elements became key indicators of managerial competence, risk management, and nonfinancial performance of companies

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(Boerner, 2011). Thus, the aim of the present study is to conduct a bibliometric analysis to reveal the status of the literature and other aspects of research performance in this field to provide a starting point for those interested in studying ESG reporting.

The use of bibliometric analysis is a relatively new research method, and its use has increased over time (Donthu et al., 2021). This technique has been used by other authors to investigate the production of research in this field. For example, Galletta et al. (2022) analysed publications related to ESG performance in the banking industry between 1986 and 2021, while Khan (2022) performed a study related to ESG disclosure and firm performance. The present paper covers a different period than the other studies and focuses on ESG reporting topic in general.

Following the introduction part, the problem statement is presented. The next section provides information on the method used and data collection. Subsequently, the main results of the analysis are discussed. The last part of the paper presents the main conclusions, limitations, and future research directions.

2. Problem Statement

The literature in the field of ESG reporting offers mixed results regarding its impact on companies. First, it represents a factor influencing the financial performance of companies. According to the results of the study conducted by Friede et al. (2015), 90% of the 2,200 papers analysed demonstrated a positive effect of ESG reporting on financial performance. However, the results of Almeyda and Darmansya (2019) study do not show significant relationship between the social and governance factor and financial performance, but, nevertheless, high transparency in reporting this information can improve financial performance.

Second, ESG performance can have an impact on companies' risks. In this respect, Sassen et al. (2016) investigated the extent to which the performance of ESG indicators influences systematic risk, idiosyncratic risk, and total risk. The results show that environmental performance leads to a decrease in idiosyncratic risk, while total risk and systematic risk are only affected in environmentally sensitive industries. No significant effect of corporate governance performance has been found on firm risk. On the other hand, a study conducted on the banking sector in Europe shows a negative relationship between corporate governance performance and idiosyncratic risk for medium and high-risk levels, and this effect becomes more pronounced as the degree of risk increases (Izcan & Bektas, 2022).

Another association studied by researchers is the one between ESG performance and the market performance of companies. According to the results of the study carried out by Sahut and Pasquini-Descomps (2015) on companies listed on the capital markets of Switzerland, the USA, and the UK, ESG performance has a low but significant impact on stock performance in certain periods or certain sectors and the results vary between countries. Instead, following a study conducted on four countries in Asia between 2013 and 2017, Junius et al. (2020) did not identify the existence of a significant influence between the ESG score and the performance of firms and their market value.

3. Research Questions / Aims of the Research

In the European Union (EU), ESG reporting became mandatory for certain companies starting with 2024, and the first reports will be disclosed in 2025. Initially, the presentation of information on these elements was imposed under Directive 95/2014 of the European Union with the aim of identifying risks related to sustainability and increasing investor and consumer confidence. On the other hand, according to the Directive, the presentation of this information contributes to the monitoring and management of companies' performance and the impact they have on society. Therefore, the objective of the present paper is to investigate the status of the research before this reporting becomes mandatory in the EU. Thus, this paper aims to answer the following research questions:
RQ1: What are the most important research constituents in the ESG reporting field?
RQ2: What topics in this field have been explored until now?
RQ3: What are the potential future research paths?

4. Research Method

The present paper uses bibliometric analysis as a research method to investigate the evolution of the literature and other quantitative aspects, such as performance analysis and science mapping (Donthu et al., 2021), related to academic studies in the field of ESG reporting. Through performance analysis, the contribution of different research constituents is shown, while science mapping refers to the relationships between them. When analysing large volumes of data, bibliometric analysis is one of the most suitable techniques, having that systematic reviews or other traditional methods could only be used for tens or low hundreds of papers (Snyder, 2019), which can be manually reviewed.

Data were collected from the WoS database, having that it contains large amounts of bibliometric data (Kemeç & Altınay, 2023) and it is recommended as the one of the most preferred databases for citation information sources (Wan et al., 2023). The searching process started with a set of boundaries. To ensure the most high-quality data acquisition, proceedings papers or reviews articles have been removed and the selection was based only on English written papers. Furthermore, because the analysis refers to ESG reporting, the WoS categories selected were *Business Finance, Business, Management,* and *Economics.* The words searched were "ESG reporting" and "Environmental, Social, Governance reporting". Upon the search procedure, the number of studies obtained was 1,243, which have been used for further analysis.

A summary of the most relevant information regarding the data set is presented in Table 1. The number of authors is 2,847, while the number of journals where the articles have been published is equal to 357. The authors involved in writing articles on ESG reporting are affiliated with 1,447 institutions and live in 94 countries. There are in total 49,869 references cited in the analysed articles. The total number of citations at the time of this analysis was 34,113, while the average number of

citations was 27,44 per article. All these numbers show a very high interest in this topic. The next section will provide an in-depth analysis regarding these data.

Table 1. Dataset summary

Ref. No.	Unit	Quantity
1	Articles number	1,243
2	Authors number	2,847
3	Journals number	357
4	Institutions number	1,447
5	Countries number	94
6	Cited references number	49,869
7	Total citations as of April 15th 2024	34,113
8	Average citations as of April 15th 2024	27.44

Source: author based on WoS data.

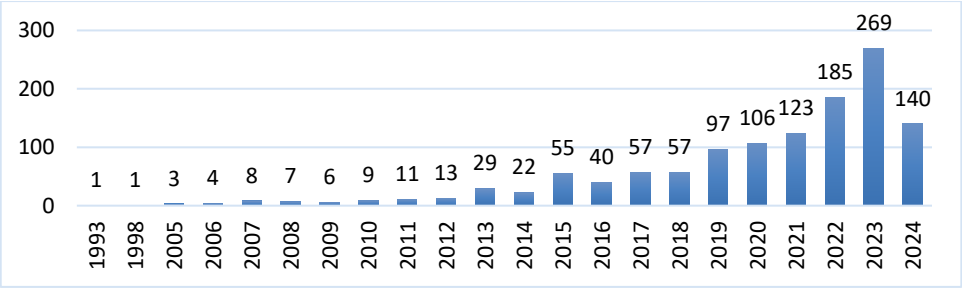
5. Findings

5.1 Performance Analysis

The most relevant measures when conducting a performance analysis are represented by the publication number that can be used as a proxy for productivity followed by the citation number, used as a proxy for articles influence or impact (Donthu et al., 2021).

Data set distribution on years is presented in Figure 1. The topic of ESG reporting is not new in the scientific literature. As the figure shows, the first article was published in 1993 with the focus on different governance approaches and the relationship between them, environmental uncertainty effect, and relational interactions (Gundlach & Achrol, 1993). The period between 1993 and 2012 could be considered an embryonic stage, given that a very small number of studies have been published per year. The scientific literature and the interest in this area began to increase in 2013, when the number of publications reached 29 in one year. The blooming development has recently started, especially in 2019 when the number of publications per year was 97, reaching 269 articles in 2023. Given that this study was conducted at the beginning of the second quarter of 2024, the number of articles published this year was smaller than in 2023, but also greater than in 2021 and the other previous years.

Figure 1. Number of publications per year



Source: author based on WoS data.

Of the total number of 357 journals, 52.38% (187) contain only one study on this topic, while 45.38% (162) published between 1 and 20 studies. The remaining 2.24% (8) of the journals accepted for publications between 22 and 77 papers about ESG reporting. Table 2 presents the most active journals and their number of publications for the entire period. *Corporate Social Responsibility and Environmental Management* journal is the most productive journal with 77 publications, followed by the Business Strategy and The Environment journal, that published 68 studies.

Table 2. Most active journals

Ref. No.	Journal name	Pub. No.
1	Corporate Social Responsibility and Environmental Manag.	77
2	Business Strategy and The Environment	68
3	Sustainability Accounting Management and Policy Journal	54
4	Meditari Accountancy Research	37
5	Corporate Governance-The International J. of Business in Soc.	35
6	Social Responsibility Journal	29
7	Journal of Business Ethics	26
8	Cogent business & Management	22

Source: author based on WoS data.

As presented in the methodology section, the number of citations represents the interest shown by researchers in a certain scientific paper and the impact this article can make. Hence, the next performance analysis presents the top articles depending on their number of citations. Out of 1,243 articles, 223 have never been cited by the time of performing this study, while 466 have been cited from 1 to 10 times. Another set of articles (469) ranges between 11 and 100 citations, and the remaining part (86) presents between 101 and 738 citations. The most cited articles from the data set are presented in Table 3. As revealed, the article with the greatest number of citations is that of Liao et al. (2015) published in the British Accounting Review Journal. This study presents an analysis of the relationship between gender diversity and the propensity to disclose greenhouse gas information. Because of its great number of citations, this article could be considered to have the biggest impact in this area.

Table 3. Most cited articles

Ref. No	Authors (Year)	Article title	Journal	Cit.
1	Liao et al. (2015)	Gender diversity, board independence, environmental committee, and greenhouse gas disc.	British Accounting Review	738
2	Hussain et al. (2018)	Corporate Governance and Sustainability Performance: Analysis of Triple Bottom Line Performance	Journal of Business Ethics	501
3	Ben-Amar et al. (2017)	Board Gender Diversity and Corporate Response to Sustainability Initiatives: Evidence from the Carbon Disclosure Project	Journal of Business Ethics	481

Ref. No	Authors (Year)	Article title	Journal	Cit.
4	Amel-Zadeh and Serafeim (2018)	Why and How Investors Use ESG Information: Evidence from a Global Survey	Financial Analysts Journal	388
5	Kolk and Perego (2010)	Determinants of the Adoption of Sustainability Assurance Statements: An International Investigation	Business Strategy and the Environment	386
6	Frias-Aceituno et al. (2013)	The Role of the Board in the Dissemination of Integrated Corporate Social Reporting	C.S.R. and Environmental Management	380

Source: author based on WoS data.

The most influential institutions are presented in Table 4. According to WoS data, University of Salamanca (Spain) could be considered the most influential institution from the data set, having 1,242 citations obtained from the 23 articles published by the authors. The second most influential one is Harvard University, with 1,187 citations from 9 articles. The other universities with a high number of citations are The University of Newcastle (Australia), Southwestern University of Finance & Economics (China), University Southampton (United Kingdom), and The University of Western Australia, each of them having a relatively small number of publications.

Table 4. Most influential institutions

Ref. No.	Organisation	Citations	Pub. No.
1	University of Salamanca	1,242	23
2	Harvard University	1,187	9
3	The University of Newcastle	839	8
4	S-W Univ. of Finance & Economics - China	798	8
5	University Southampton	794	10
6	The University of Western Australia	734	6

Source: author based on WoS data.

As presented in Table 5, the most influential country for research in the field of ESG reporting is England, presenting 7,347 citations, while the most productive country is the United States of America (USA) with 194 publications. Australia is the second most influential country, followed by USA, Italy, Spain, and China.

Table 5. Most influential countries

Ref. No.	Country	Citations	Pub. Number
1	England	7,347	164
2	Australia	5,938	133
3	United States of America	5,506	194
4	Italy	4,038	112
5	Spain	3,281	82
6	China	2,293	92

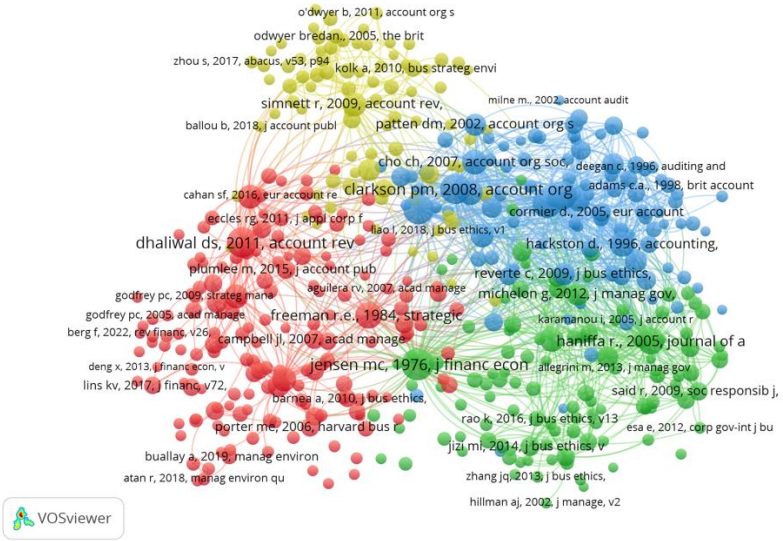
Source: author based on WoS data.

5.1 Science Mapping

The relationships between different constituents are usually presented through science mapping and the techniques often used by authors are co-citation analysis, co-authorship analysis, and co-word analysis. The first technique assumes that the studies cited among each other generally discuss similar subjects (Hjørland, 2013). The co-citation network map is presented in Figure 2.

The network of co-citations appears if a scientific study is presented in the reference list of another study. The minimum citation number for a publication was set to 20, and out of 49,869 references, 460 of them have met the threshold, obtaining four different clusters. The focus of the studies in the first cluster (red colour) is on Corporate Social Responsibility (CSR) Reporting. The second cluster (green cluster) has its focus on corporate governance in relation to CSR or other types of sustainability disclosure. The publications in the third cluster (blue colour) provide information on environmental reporting, while studies in the fourth cluster (yellow colour) refer to the assurance on sustainability reports.

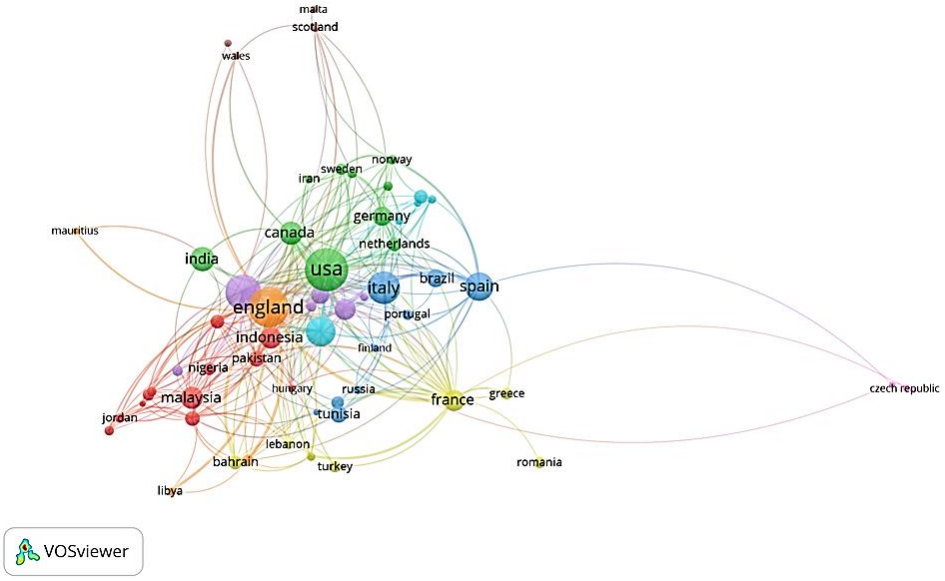
Figure 2. Co-citation network map by references



Source: author based on WoS data.

A network map of co-authorship is presented in Figure 3. The aim of this analysis is to provide an overview of the authors' interactions in a certain research field to reach insights and increase clarity (Tahamtan et al., 2016). The country of the author has been chosen as the unit of analysis and the minimum number of publications for one country was set to 5. Of the 94 countries in the study, 60 met the threshold. The importance of a country in this research field is given by the size of its circle, while the strong collaboration of the authors to produce articles is given by the size of the relationships between countries. Strong links could be observed between France and England, Spain and England, Italy and England, or between China and England.

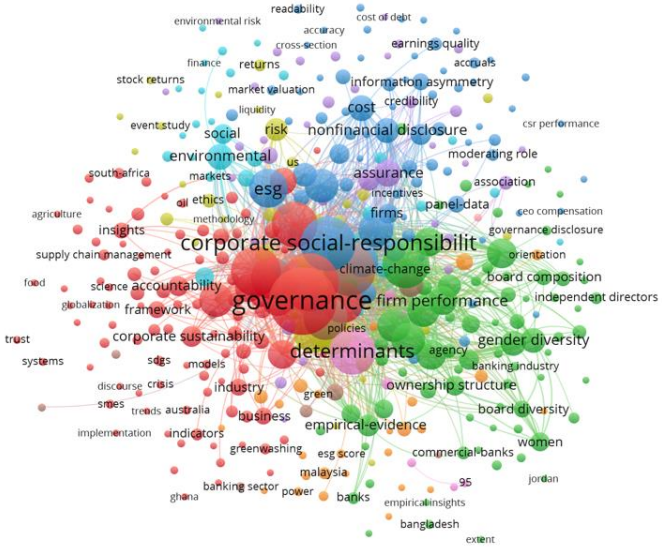
Figure 3. Co-authorship network map by countries



Source: author based on WoS data.

The third technique is represented by co-word analysis, presented in Figure 4, which examines the publication content. According to Donthu et al. (2021) a similar thematic exists for the words that usually appear together, and strong links exist between circles that have the same colour. The minimum number of occurrences of a keyword was set to 5 and of the 3,767 keywords, 404 met the threshold.

Figure 4. Keywords co-occurrence network map



Source: author based on WoS data.

As shown in the figure, the map has 10 different clusters, with the focus on similar subjects. The word that appears the most is "governance" (450 times) followed by "performance" (327 times), "corporate social responsibility" (294 times), "impact" (263 times), and "sustainability" (246 times). However, if we look at the overlay visualisation, the term "ESG" has mostly been used in 2022, meaning that, a huge attention has been given to this topic in the last years.

6. Conclusions

This paper presented a bibliometric analysis regarding ESG reporting using WoS to collect data and Vos Viewer for analysing and visualising it. The analysis shows that studies in this field have increased from one year to another. *Corporate Social Responsibility and Environmental Management Journal* is the most productive in this area, followed by *Business Strategy and The Environment*. The most productive university is the University of Salamanca, which can also be considered the most influential institution along with Harvard University, both presenting over a thousand citations for their articles related to ESG reporting. With respect to the impact, England is the most influential country, while the United States country shows to be the most productive one.

The analysis on science mapping provides information about the topics presented in each cluster of co-citation network. The focus of the biggest one is on CSR reporting. Also, it reveals information regarding co-authorship networks by countries showing strong collaborations, especially between authors from France and England. Regarding keyword co-occurrence, the most common word used in research papers is "governance", as part of the ESG reporting.

The main contributions of this work are as follows. On the one hand, this paper gives an overview and a starting point to those interested in researching this field as it highlights the most important research constituents in terms of productivity and impact. On the other hand, this study can help researchers find peers interested in this topic to collaborate with each other.

The results of the present study should be considered in line with several limitations. First, this paper only uses the WoS database to retrieve bibliometric information. Future studies could conduct a similar analysis by using, for example, Scopus database. Second, for the bibliometric analysis, only articles in English have been selected. Future research can consider articles written in different languages, but also conference and proceeding papers.

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