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The paths of ESG Disclosure research: bibliometric analysis of the concept and research trends

Os caminhos da pesquisa em Disclosure ESG: análise bibliométrica do conceito e tendências de pesquisa

Los caminos de la investigación en Divulgación ESG: análisis bibliométrico del concepto y tendencias de investigación

João Pedro Tavares Damasceno
Federal University of Goiás
Campus Samambaia - FACE, Rua Samambaia, s/n,
Goiânia, GO, Brazil – ZIP: 74.001-970
https://orcid.org/0000-0001-8768-0616
tavaresgyn@discente.ufg.br

Caio Bruno Santana Soares
Federal University of Goiás
Campus Samambaia - FCS, Rua Jacarandá, s/n,
Goiânia, GO, Brazil – ZIP: 74.001-970
https://orcid.org/0009-0007-5959-7031
caiosoares@discente.ufg.br

Gabriela Rosa Vasconcelos
Federal University of Goiás
Campus Samambaia - FACE, Rua Samambaia, s/n,
Goiânia, GO, Brazil – ZIP: 74.001-970
https://orcid.org/0009-0006-4597-8856
gabrielavasconcelos@discente.ufg.br

Estela Najberg
Federal University of Goiás
Campus Samambaia - FACE, Rua Samambaia, s/n,
Goiânia, GO, Brazil – ZIP: 74.001-970
https://orcid.org/0000-0002-2852-4442
estela@ufg.br

KEYWORDS
Disclosure. ESG. Bibliometrics.

Abstract: Academic interest in ESG has grown significantly in recent years. However, bibliometric and visualization research on this topic is still incipient. This study aims at reviewing research on ESG disclosure through bibliometric research and identify research trends related to the topic. In this study, data from the Web of Science database were used. Various bibliometric techniques, such as bibliographic coupling and co-occurrence analysis, were combined with varied themes to present an overview. This study contributes to the literature on ESG and provides an overview of trends and trajectories with a visual and schematic framework for ESG research. Thus, it promotes an understanding of current trends and future research directions within the theme.

PALAVRAS-CHAVE
Disclosure. ESG. Bibliometria.

***Resumo**: O interesse acadêmico em ESG tem crescido significativamente nos últimos anos. No entanto, pesquisas bibliométricas e de visualização sobre este tema ainda são incipientes. Este estudo tem como objetivo analisar as pesquisas sobre disclosure ESG por meio de uma pesquisa bibliométrica, no período de 2016 a 2021. Neste trabalho, foi utilizado dados do banco de dados Web of Science. Várias técnicas bibliométricas, como acoplamento bibliográfico e análise de coocorrência, foram combinadas com temas variados para apresentar uma visão geral do tema. Este estudo contribui para a literatura sobre ESG e fornece um panorama das tendências e trajetórias com um quadro visual e esquemático para a pesquisa deste tema, promovendo assim um entendimento das tendências atuais e futuras direções de pesquisa dentro da temática.*

PALABRAS CLAVE
Disclosure. ESG. Bibliometria.

***Resumen**: El interés académico en ESG ha crecido significativamente en los últimos años. Sin embargo, la investigación bibliométrica y de visualización sobre este tema es aún incipiente. Este estudio tiene como objetivo analizar la investigación sobre la divulgación de ESG a través de una investigación bibliométrica e identificar tendencias de investigación relacionadas con el tema. En este estudio, se utilizaron datos de la base de datos Web of Science. Se combinaron varias técnicas bibliométricas, como el acoplamiento bibliográfico y el análisis de coocurrencia, con temas variados para presentar una visión general. Este estudio contribuye a la literatura sobre ESG y proporciona una descripción general de las tendencias y trayectorias con un marco visual y esquemático para la investigación de ESG. Por lo tanto, promueve una comprensión de las tendencias actuales y las direcciones futuras de investigación dentro del tema.*

Introduction

Defined as the analysis of a company's environmental, social and governance practices, the term ESG first caught the attention of the financial and corporate world after the publication of a report by the United Nations Global Compact in 2005, which stated that the incorporation of ESG factors by companies would facilitate “doing well by doing good” (Hill, 2020). Since then, the importance of ESG issues has experienced a significant increase, driven by stakeholders’ growing perception that strong ESG performance can safeguard a company's success (Khalid, Sun, Huang & Su, 2021).

For companies, drafting an ESG plan has a positive impact on long-term value and on their business. Increased investment in environment, society and human capital may empower companies to maximize their resources; to promote employee engagement, thereby increasing productivity and work efficiency; and ultimately to build the company's sustainable development capabilities (Friede, Busch & Bassen, 2015). Likewise, many studies have shown that companies with high ESG performance also have better financial performance, a lower risk of crisis and are more attractive to institutional investors (Khalid et al., 2021).

ESG was born out of Socially Responsible Investment (SRI), a concept that can be traced back to the 1960s and 1970s. The fast-paced industrial growth in European and American countries after the Second World War brought about several environmental and social problems, as well as environmental protection campaigns. Accordingly, the capital market started paying attention to and value environmentally responsible investment. The term “Environment, Social and Governance” first appeared in the UN report “Who Care Wins” in 2004. “The United Nations Principles for Responsible Investment (UN-PRI), in turn, were established in 2006, and introduced the ESG framework listing some factors to be considered (Hill, 2020).

With the ongoing development of the economy, companies need to meet increasing standards of social responsibility. Companies should not only strive for high market value and profitability, but also take on multiple responsibilities. The companies’ potential is increasingly combined with the concept of ESG (Fatemi, Glaum & Kaiser, 2018).

The ever-changing world leads to a greater need to understand what risks or opportunities a company faces due to ESG issues. The COVID-19 pandemic has further stressed the need to consider these factors, leading to the recent increase in interest in the subject (Hill, 2020). The debate about key sustainability issues - such as climate change, biodiversity, social diversity and inclusion - has also been enhanced. Concurrently, the emergence of technology and increasing access to information has empowered stakeholders to challenge companies on how they behave (Huang & Kung, 2010).

In this context, ESG disclosure, i.e., the demand for transparency in sustainable practices, is gaining importance. Companies are accountable to their stakeholders, such as investors, customers, employees and regulators, who want to evaluate their information for different purposes such as investment, study and control. Environmental, social and governance (ESG) analysis and reporting can provide valuable insights to stakeholders (Bhatia & Tuli, 2017).

The ever-expanding literature on ESG demands sorting out and summarizing the related bibliography and investigating the status of research on this topic. This is so because of the difficulty faced by new scholars to quickly understand past achievements and future development trends in the field. This article, then, aims at reviewing the articles published on ESG disclosure through a bibliometric survey, and identify work trends. It intends to summarize the main trends in ESG disclosure literature to identify research opportunities in the area.

The data-based bibliometric research method is useful to identify trends in literature publications, to explore the networking of authors, countries and journals, and to conduct a keyword analysis. In this sense, this study makes three contributions. Firstly, findings reveal the patterns of research related to ESG disclosure. Secondly, it provides an overview of the conceptual framework of ESG research through the use of bibliographic data. Thirdly, it outlines some suggestions for future research, empowering researchers to understand and identify potential topics for study.

Theoretical elements of the research

The ESG evaluation system consists of three dimensions: Environmental, Social and Governance. These dimensions represent the environmental responsibility, social responsibility and corporate governance responsibility of organizations, respectively. Environmental responsibility refers to the idea that the company should improve its environmental performance in production and operation, reducing the environmental impact per unit of production. This includes practices such as reducing greenhouse gas emissions, waste management, sustainable use of natural resources, and protection of biodiversity. Social responsibility means that a company should maintain good relations with society. It comprises human rights, working conditions, equal opportunities, impact on the community and other stakeholders. Socially responsible companies seek to benefit not only their shareholders, but also society at large. Corporate governance responsibility refers to the company's management system, ensuring an efficient and transparent governance structure. It includes improving the corporate system, rational distribution of power between shareholders, the board of directors and executive management (Hill, 2020).

Early in the 2010s, corporate managers started carrying out a series of corporate governance reforms to rebuild investor confidence in capital market following the 2008 financial crisis (Hill, 2020). Although the global economy has gradually recovered over the last decade, the environmental and social problems caused by companies have increased rapidly. Many corporate crises affecting consumers, the environment and society have occurred in recent years, posing the need for rethinking the dynamics in organizations that have become more concerned with ESG aspects (Buallay, 2019).

ESG is a core indicator of non-financial performance. Investors who agree with the concept of socially responsible investment believe that ESG factors help to gain a long-term view of the company. At the same time ESG has aroused the interest of a wide range of scholars. Researchers found that ESG has an impact on the performance and reputation of corporations, and plays a role in the corporations' internationalization process (Garcia, 2017).

Corporate ESG initiatives refer to principles, plans or strategies that reflect the philosophy of corporate sustainability. With the increase in proposals to improve ESG reporting by international organizations, a growing number of companies are integrating ESG issues into their management strategies, and voluntarily disclosing information about environmental, social and governance aspects (Khalid et al., 2021).

In line with the aforementioned conditions, a wide range of recent research begun to focus on the effects of ESG initiatives on corporate performance. Regarding this relationship, two controversial points of view prevail in these studies. Some studies have reported that corporate ESG initiatives have a positive link with financial performance, while others have not found a material relationship between these two factors (Garcia, 2017).

In this context, Garcia (2017) shows that a moderate level of ESG disclosure has a positive influence on corporate efficiency, and that ESG activities have a non-negative relationship with corporate economic results measured by corporate efficiency, return on assets and market value. Below is a breakdown of each of the ESG initiatives.

Environment-oriented initiatives

Corporate environment-oriented initiatives have been defined as the commitment of companies to contribute to natural systems, including saving energy, reducing emissions, sorting waste, and recovering resources (Garcia, 2017).

According to Gomes and Tortato (2011), companies that adopt environmental practices send a signal that they are willing to act altruistically on the issue of environmental production. Such a positive signal enhances their corporate environmental reputation, contributes to stronger stakeholder identification and therefore promotes positive stakeholder responses.

In the corporate management process, stakeholders play a crucial role as facilitators and supporters, and their support is considered instrumental to obtain the resources needed to promote corporate sustainability, especially for innovation-oriented activities that require heterogeneous resources as input. Moreover, corporate environmental initiatives also serve as desirable, adequate or appropriate actions, in line with the expectations of institutions and stakeholders regarding environmental protection (Donaldson & Preston, 1995).

Silva et al. (2012) establish the importance of environmental legitimacy for a company. According to the authors, environmental initiatives promote the alignment of business entities and socially constructed systems with prevailing norms, values, beliefs and definitions, leading to enhanced corporate environmental legitimacy, making easier to obtain responses from consumers. Environmental legitimacy reduces the communication barrier between companies and their cooperative partners. Therefore, actions that meet the environmental demands of stakeholders elicit positive responses and lead to obtaining their resources in a way that positively strengthens their capacity.

Given the growing importance of ESG criteria, companies need to adopt a more robust and detailed approach to their environmental initiatives. This includes implementing strict sustainability policies, being transparent in communicating environmental impacts and committing to long-term targets aimed at reducing the ecological footprint. A proactive and well-founded stance is crucial to empower companies to meet stakeholder expectations and make a significant contribution to environmental responsibility.

Social initiatives

Corporate social initiatives refer to discretionary behavior to meet society's expectations beyond the immediate interests of a company and its shareholders. Similar to environment-oriented corporate initiatives, these act as signals that meet the demands of stakeholders, arousing the perception and identification of stakeholders, and helping a company to establish reputational advantages over its competitors.

According to Oliveira, Oliveira & Pinto (2008), companies with high reputation generally use this advantage to engender feedback from stakeholders and improve their knowledge. This knowledge may be combined or transformed into valuable intangible resources, providing a path to new products or new processes.

In this sense, corporate social initiatives are considered an important strategic approach to business performance. Corporate social initiatives have come to be perceived as a transparent and socio-politically legitimate activity (Barbieri & Cajazeira, 2009). Corporate social initiatives help companies to deal with government concerns and onerous regulations, resulting in the accumulation of political resources, such as low tax rates, and providing protection for property rights. Thus, it would be reasonable to conclude that corporate social initiatives can be instrumental in obtaining stakeholder support or the political resources necessary for their performance.

Governance initiatives

Corporate governance initiatives stand for practices aimed at managing the corporate structure and strategy to build a shared economic bond between managers and shareholders, and reduce conflicts of interest between minority and majority shareholders. Suitable corporate governance mechanisms, including incentive-based governance and monitoring-based governance, can increase CEOs' or managers' sense of collective honor and organizational belonging by encouraging them to engage in initiatives that will improve shareholder wealth and company value.

Incentive-based governance, in the form of managerial shareholding and managerial remuneration, prompts managers to devote their best efforts to environmental and social practices, strengthening the positive effects of environmental and social initiatives and promoting long-term benefits.

On the one hand, offering higher salaries meets managers' material needs and offsets the time and opportunity costs they spend on environmental and social initiatives, leading to greater environmental and social awareness on the part of managers, and more initiatives to allocate and exploit the company's resources in the environmental and social spheres. This strategy is pivotal for improving corporate reputation, maintaining organizational legitimacy and leading to an improvement in profits (Garcia, 2017).

On the other hand, managers' equity ownership rights increase their managerial discretion in organizational behavior, enhancing their influence on a company's decisions. In such situations, managers have more power to lead environmental and social practices and exercise their advantages to increase corporate reputation and legitimacy (Miguel & Teixeira, 2009).

Monitoring-based governance, in the form of large external shareholders on a Board and the separation of CEOs and chairpersons, aims at ensuring that managers treat shareholders equally. The effect of this type of governance depends on information about the management behaviors to be monitored. In fact, many companies started to voluntarily disclose environmental and social responsibility information, suggesting that the asymmetry of information between shareholders or directors and external managers is tending to decrease (Campos, et al., 2013).

Thus, under high level of monitoring, managers' selfish behaviors will be limited and pressures will push them to fulfill corporate environmental and social responsibilities, and obey laws and regulations. Likewise, these managers will be more attentive to exercising their effects, such as building long-term and stable relationships, improving corporate reputation and maintaining organizational legitimacy. It can then be inferred that corporate governance initiatives serve as a benchmark for environmental and social initiatives to generate reputation and legitimacy, bringing benefits for the organization.

Methodological elements of the research

Bibliometrics refers to the cross-science of using mathematical and statistical methods to quantitatively analyze all knowledge holders. Araújo (2006, p. 12) defines bibliometrics as a "quantitative and statistical technique for measuring indices of production and dissemination of scientific knowledge". The number of documents (several publications, mainly journal articles and citations), the number of authors (individual or in groups), or the keywords and different documentary identifications are the main objects of measurement.

Bibliometrics is widely used in science. Identifying key records, reviewing publications, analyzing the use of documents and understanding the scientific management of library and information departments are all applications. Designing more economical intelligence systems, improving the efficiency of intelligence processing, forecasting the direction of publication and developing and improving basic intelligence theories are examples of applications (Araújo, 2006).

This article uses the bibliometric method to review the performance and structure of the ESG disclosure literature. Literature performance may be reflected by the number of times the literature has been cited, and scientific mapping allows viewing the structure and dynamics of the field. To achieve these objectives, literature was mainly analyzed as follows: (1) Citation and co-citation analysis; (2) Bibliographic coupling; and (3) Keyword co-occurrence analysis.

Citation, co-citation and bibliographic coupling mainly reflect the literature importance and the similarity between themes in literature. Citation analysis allows scholars to quickly understand the influence of journals, articles or authors in the field, while co-citation analysis simplifies the complex relationship between many articles into the relationship between several groups, and expresses the relationship between documents. Keyword co-occurrence analysis mainly explores the similarity between words and infers the research points of the subject by analyzing the relationship between keywords.

To obtain the metadata for the bibliometric research, a query was carried out on the Web of Science database, which provides subscription-based access to various databases that offer comprehensive data for many different academic disciplines, making it an interesting platform for carrying out a bibliometric analysis. For data collection, the word "ESG" was used as a filter in the subject and title fields. The choice to not use all the filters stems from the fact that many authors have the name ESG, which can bias the sample. In addition, the types of documents were filtered by “articles” freely accessible. The selected filters resulted in a sample of 46 results. The next topic presents a bibliometric analysis of these 46 articles related to ESG disclosure published on the WoS.

Presentation and discussion of results

Data analysis and descriptive statistics

The bibliometrix appl called biblioshiny was used to systematize the data. This is an open source tool for carrying out bibliometric analyses. The most important information relating to results quantification is summarized in Table 1, which contains a summary of the main descriptive statistics of the results obtained.

Table 1
Descriptive statistics of the sample

Description	**Results**
Period	2016: 2021
Sources (Journals, Books, etc.)	34
Articles	46
Mean citations by document	13.63
References	2715
Keywords Plus (ID)	144
Keywords of the author (DE)	155
Authors	124
Occurrence of the author	128
Authors of single-authored document	5
Authors of multi-authored document	119
Single-authored documents	5
Documents by author	0371
Index of authors by article	2.7
Index of co-authors by article	2.78
Collaboration Index (CI)	2.9

Source: Own elaboration (2023).

The Index of Authors by Article of 2.7 was calculated by dividing the total number of authors (124) by the total number of articles (46). The Index of Co-Authors by Article of 2.78 was calculated by dividing the number of appearances of the author (128) by the number of articles (46), which is the mean number of coauthors per article. In this case, the index considered the author's appearances, whereas for ‘authors by article’ an author, even if he/she had published more than one article, is counted once. For this reason, the Index of Authors by Article ≥ Index of Authors by Article. The Collaboration Index (CI) represents the mean number of authors by bibliographic production, which was 2.9.

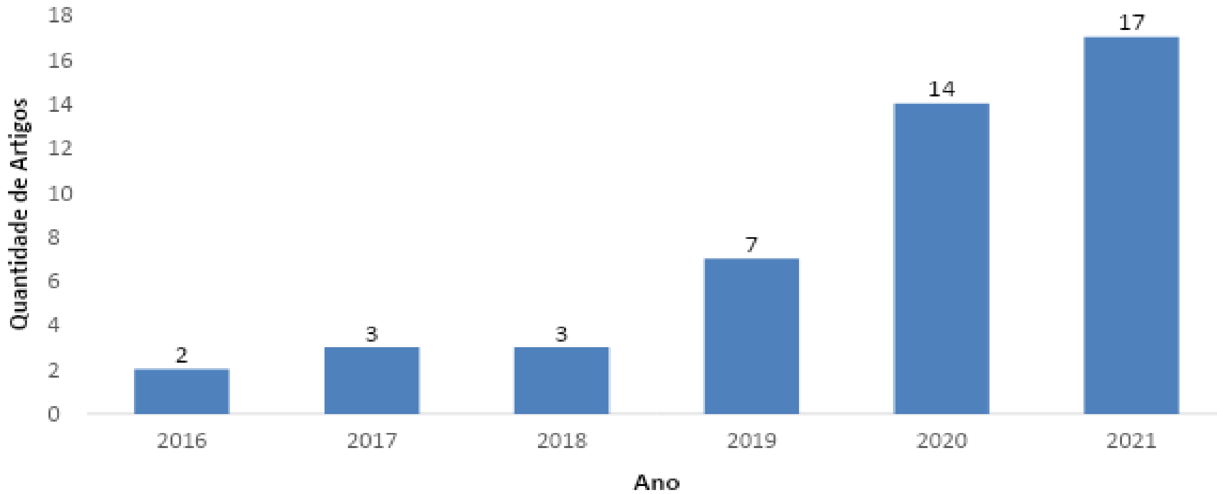
Publishing trends

Figure 1 shows the publication trend in the field of ESG research during the period reviewed. This interval shows a significant increase between the years 2019 and 2021.

Results presented show a general upward trend in publications related to ESG disclosure. Although the term ESG first appeared in the UN report in 2004 (Hill, 2020), no articles on ESG disclosure were identified in the sample before 2016. The numbers of annual publications in ESG fields were at a steady state before 2018. After 2019, the number of publications increased significantly and maintained an upward trend.

In addition, the number of articles on ESG disclosure went from 7 in 2019 to 14 in 2020. This phenomenon is related to the international community's attention to corporate social responsibility and environmental protection issues. It also shows that the topic of ESG has received more attention from scholars, reinforcing the importance of studying this topic.

Figure 1
Distribution of Articles on ESG Disclosure (2016-2021)



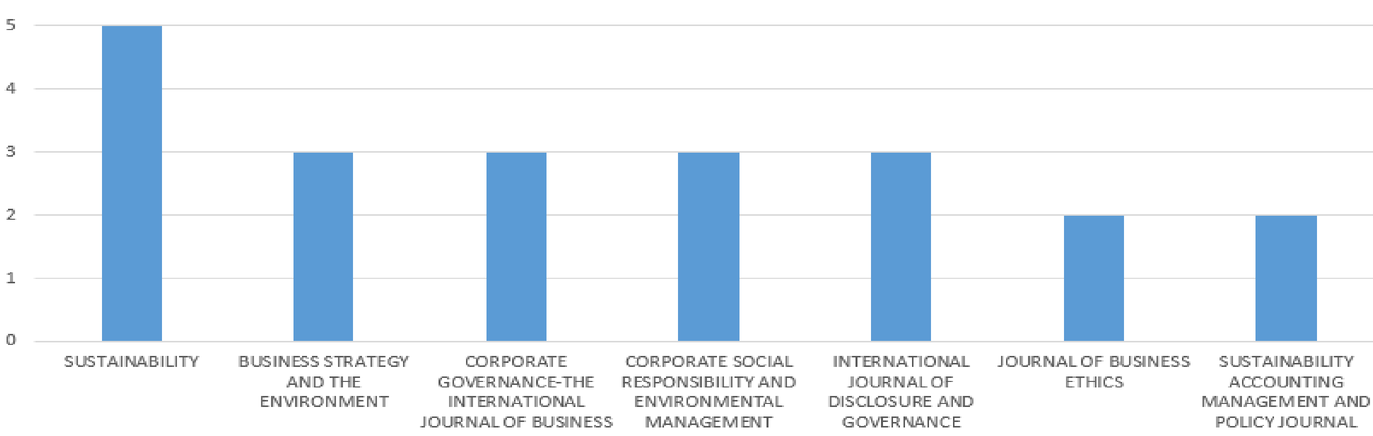
Source: Own elaboration (2023).

Most productive newspaper

Since the metadata search filter was used only for articles, a total of 46 journals were registered. Of these, the journal 'Sustainability' had the highest number of observations, with a total of 14% of observations. This was followed by Business Strategy and The Environment, Corporate Governance - The International Journal of Business in Society and Corporate Social Responsibility and Environmental Management, which each accounted for 8% of the journals. Figure 2 shows the main journals and the number of observations recorded.

Sustainability is an international, interdisciplinary, academic, peer-reviewed and open-access journal that publishes articles related to environmental, cultural, economic and social sustainability. Despite being the journal with the largest number of articles published, the most influential publications ranked by number of citations are not published in it, as discussed in the next section.

Figure 2
Main journals with publications on ESG Disclosure (2016-2021)

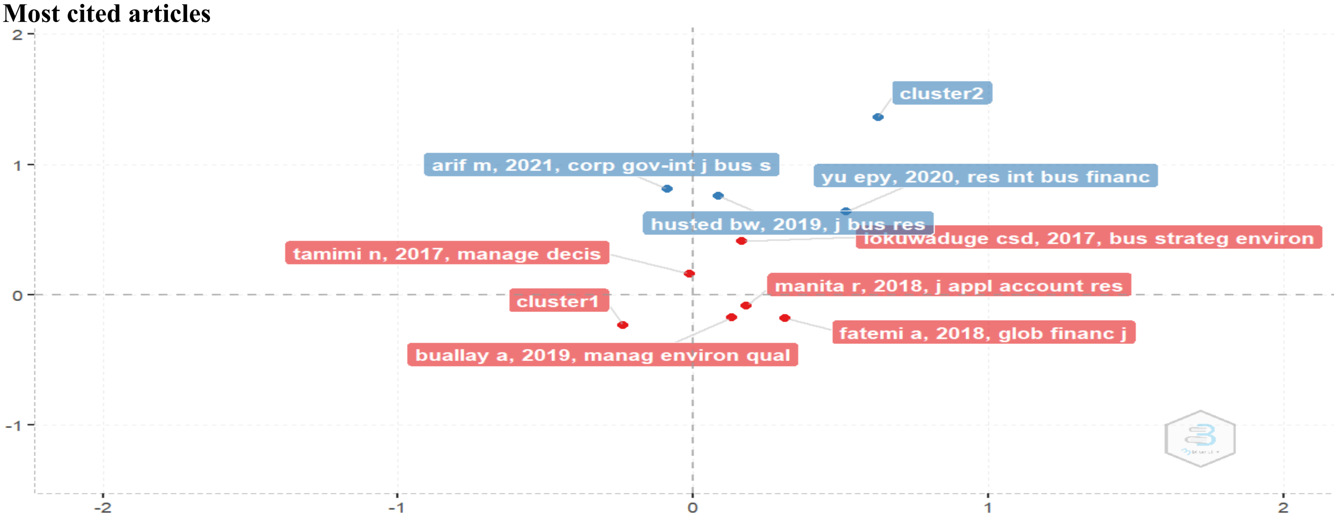


Source: Own elaboration (2023)

Most prominent publications

The articles content addresses the relation between ESG disclosure and corporate performance, and how to achieve sustainable development through ESG. In the articles, corporate disclosure is a key research topic, including ESG disclosure and reporting. In addition, many articles focus on a single country or region, such as the United States, Australia, Latin America and Europe. The list of the most cited publications is shown in Figure 3, where they are organized into two clusters. Tables 2 and 3 give details of the articles in each cluster.

Figure 3
Most cited articles



Source: Own elaboration using data from WoS and biblioshiny (2023).

The articles in cluster 1 are related to ESG disclosure and company performance. Lokuwaduge and Heenetigala (2017) address how ESG issues have become a pivotal part of business strategy. The article explores the extent of ESG reporting by companies in the metals and mining sector listed on the Australian Securities Exchange to determine the nature of the existing ESG indicators in the sector. According to the study, stakeholder engagement is the key to improving a company's environmental policy and sustainable development. Results suggest that, given the diversity in ESG reporting, the comparability of strategic ESG performance is problematic. The authors also point out the existing demand for more empirical research about the integration of sustainability into the strategic planning process.

Table 2
Cluster 1 - Most cited articles

Author(s)	Journal	Article
Lokuwaduge e Heenetigala (2017)	Business Strategy and the Environment	Integrating Environmental, Social and Governance (ESG) Disclosure for a Sustainable Development: An Australian Study
Tamimi e Sebastianelli (2017)	Management Decision	Transparency among S&P 500 companies: An analysis of ESG disclosure scores.
Fatemi et al. (2018)	Global Finance Journal	ESG performance and firm value: The moderating role of Disclosure
Manita, Bruna, Dang & Houanti (2018)	Journal of Applied Accounting Research	Board gender diversity and ESG disclosure: evidence from the USA.
Buallay (2019)	Management of Environmental Quality	Is sustainability reporting (ESG) associated with performance? Evidence from the European banking sector

Source: Own elaboration (2023).

Unlike Lokuwaduge and Heenetigala (2017), the authors Tamimi and Sebastianelli (2017) explored the state of transparency of companies in the Standard & Poor's 500, or S&P - an index made up of five hundred assets listed on the New York Stock Exchange (NYSE) or NASDAQ Stock Market. The authors reviewed the Bloomberg disclosure scores using the ESG analysis function for the companies that make up the index, showing that companies differ in their level of disclosure in the three areas (ESG). The highest level of transparency is found in Governance and the lowest in Environment. The results also reveal that large companies report significantly higher ESG disclosure scores than medium-sized companies, and that governance factors affect ESG disclosure. The study focuses on corporate transparency through a granular analysis of ESG disclosure scores. Stakeholders are increasingly scrutinizing companies' sustainability disclosures in their assessment of management quality, as they reflect the practices/policies employed to improve companies' environmental and social footprints.

Similar to Lokuwaduge and Heenetigala (2017), the authors Fatemi et al. (2018) investigate the effect of ESG disclosure on firm value, finding that ESG strengths increase firm value and weaknesses decrease it. According to the authors, ESG disclosure alone decreases valuation and plays a vital moderating role, mitigating the negative effect of weaknesses and attenuating the positive effect of strengths on firm value, according to investors.

Buallay (2019) intends to demonstrate how sustainability reporting has been widely adopted by companies around the world considering the stakeholders' need for more transparency on ESG issues. The article aims at to investigating the relation between ESG and operational, financial and market performance, applied to the financial sector. Findings show a significant positive impact of ESG on performance. However, the relation between ESG disclosures varies if measured at individual level. The study results may be used to present a successful model for global banks to focus on the role of ESG disclosure regarding performance.

Finally, the work by Manita et al. (2018) investigates the relation between corporate debt compensation and the value of excess cash, in which the ESG disclosure score provided by Bloomberg is used as a proxy for the extent of corporate social responsibility. The research empirical analysis is based on a sample of 379 companies that made up the S&P 500 Index in the period 2010-2015. To account for the endogeneity issue between gender diversity in the Board and ESG disclosure, a fixed-effect model with lagged board variables is used. Two main results emerge from this study. First, no significant relation is found between board gender diversity and ESG disclosure. Secondly, evidence also partially confirms the critical mass theory, as below three female directors, the relation between board gender diversity and ESG disclosure is not statistically significant. However, no significant relationship was found.

Table 3 shows the list of articles in cluster 2, mainly characterized by the relation between aspects of transparency and ESG disclosure.

Table 3
Cluster 2 - Most cited articles

Author(s)	Journal	Article
Husted and Sousa-Filho (2019)	Journal of Business Research	Board structure and environmental, social, and governance disclosure in Latin America
Yu, Luu & Chen (2020)	Research in International Business and Finance	Greenwashing in environmental, social and governance disclosures
Arif, Sajjad, Farooq, Abrar & Joyo (2021)	Corporate Governance International Journal of Business in Society	The impact of audit committee attributes on the quality and quantity of environmental, social and governance (ESG) disclosures

Source: Own elaboration (2023).

Husted and Sousa-Filho (2019) examined the effect of Board structure on ESG disclosure in Latin America which, according to the authors, is rarely studied. According to them, the institutional context of Latin America should alter some of the relations between Board structure and ESG disclosure typically found in literature. In the article, the hypotheses about the influence of Board size, women on the Board, CEO duality and independent directors on ESG disclosure are tested using a four-year panel collected from the Bloomberg and Capital IQ databases. Results suggest that board size and the number of independent directors positively impact ESG disclosure, but the duality of women on the Board and CEO negatively impact disclosure.

Yu et al. (2020) show that, as a general rule, ESG data in companies' sustainability reports is not audited. If the ESG information disclosed by companies is unreliable, greenwashing behavior, which is the disclosure of false information about sustainability, can be a barrier to integrating ESG factors into investment decisions. The article studies mechanisms to reduce greenwashing behavior in ESG dimensions in a holistic way. One point raised by the authors is the need to identify "greenwashers" as companies that seem to be transparent and disclose large amounts of ESG data, but perform poorly in this area. Results suggest that governance factors at the company level are more effective in mitigating companies' misleading disclosure about ESG dimensions.

Finally, Arif et al. (2021) check the impact of audit committee activism and independence on the quality and quantity of ESG disclosures in energy companies in Australia. The purpose is to verify how committee attributes, such as frequency of meetings, number of independent Board members and an independent chairperson, influence compliance with Global Reporting Initiative (GRI) guidelines and the number of disclosures. Bloomberg ESG disclosure scores are used as a method. Results show a positive effect of Board activism and independence on the level of compliance with GRI guidelines, suggesting a favorable effect of Board attributes on the quality of ESG reporting. Similarly, attributes positively affect the number of ESG disclosures.

As can be seen, studies from both cluster 1 and cluster 2 used data from sources such as the S&P 500 and Bloomberg. The articles also focus on relating ESG aspects to the performance of companies and/or their practices on governance and transparency.

Co-occurrence of keywords

To identify future research directions in ESG disclosure, the co-occurrence of keywords and trends in subject topics were analyzed. Keywords are the most refined introduction to an academic article. By observing the co-occurrence of keywords in a field, scholars can quickly understand the research and future research directions in the academia. In this study, a keyword co-occurrence graph was created, as shown in Figure 4. Keyword co-occurrence analysis creates a network of topics and their relations based on a network of topics and their relations.

The size of the node in this map indicates the number of times the keyword appears. The strength of co-occurrence between keyword pairs is defined by the distance between two nodes. The color of the nodes represents groups of keywords, which often contain simultaneous words and may be construed as broad research topics in the area. In the sample reviewed, four clusters seem to summarize the focuses of interest in ESG disclosure.

Cluster 1 (Red): The topics presented in this cluster (red cluster) focus on corporate social responsibility (CSR), governance, the environment, voluntary disclosure, and equity. Corporate Social Responsibility (CSR) is a concept proposed by the European Union in 2001 and refers to a responsibility that companies take on in relation to social and environmental factors in decision-making processes and their operations (Buallay, 2019). There are some differences between CSR and ESG. CSR focuses on the interests of several parties and a wide range of groups. Environment, society and governance are important cornerstones of corporate social responsibility. ESG starts mainly from the perspective of investors in the capital market, with a focus on the relation between companies and their performance and shareholder returns. CSR application scenarios may appear in areas such as corporate supply chain management, marketing, communications, and employee management.

These departments are all related to CSR work (Barbieri; Cajazeira, 2019). ESG application scenarios focus on the capital market, especially between investors and listed companies. Within the company, the investor relations department is usually responsible for ESG work (Hill, 2020).

Figure 4
Co-occurrence of words on ESG disclosure

Source: Own elaboration using data from WoS and biblioshiny (2023).

Cluster 2 (Purple): The topics presented in this cluster (purple cluster) prioritize performance, ownership, cost, quality, evaluation, reputation, institutional investor, legitimacy and sustainable development. The ongoing market development requires companies to be aware of the importance of disclosing ESG information, their social responsibilities and promoting sustainable development in the long term. These aspects are linked to performance issues and the type of ownership of the organization (Khalid et al., 2021).

Cluster 3 (Blue): The topics presented in this cluster (blue cluster) emphasize ESG impact, corporate governance practices, stewardship, CEO duality and company diversity. The ESG appraisal system brings impact for stakeholders and helps companies formulate sustainable development strategies, affecting the financial performance of multinational companies. Luo and Bhattacharya (2006) and Skarmeas and Leonidou (2013) believe that customers may be skeptical of a company's investment in social responsibility, invalidating its ESG strategy. Companies well-ranked in ESG in an area often have a competitive advantage over local companies, and continue to maintain their own advantages when formulating business plans and incentive plans. At the same time, a competitive advantage will help companies make profits and maintain the momentum of development (Garcia, 2017).

Cluster 4 (Green): The topics presented in this cluster (green cluster) highlight financial performance, including finance, financial performance and stakeholder theory. Companies that attach great importance to ESG and perform well are better than their peers at managing ESG risks; likewise, companies with good ESG performance have a stable, long-term positive correlation with financial performance. McWilliams, Siegel & Wright (2006) show the existence of studies indicating that the relation between ESG and financial performance is not entirely positive, being also negative or mixed, with varying effects.

Factor analysis and the use of dendrograms is another possible approach to keywords in the articles reviewed.

Figure 5 (factor analysis) and Figure 6 (dendrogram) show the thematic clusters emerging from text mining of the 46 articles' keywords. After reviewing the articles related to each cluster, the largest cluster emerged from papers dealing with issues related to the market in general (market), items in red in the figures.

The second largest cluster arose from papers associated with issues related to empirical evidence of ESG disclosure (items in blue). The two clusters represent research trends well, considering that when dealing with ESG disclosure there is a great concern to analyze its aspects in relation to financial performance and issues related to the firm and stakeholders. It is also clear that considering the empirical aspects to perform disclosure and disseminate ESG aspects remains a huge challenge.

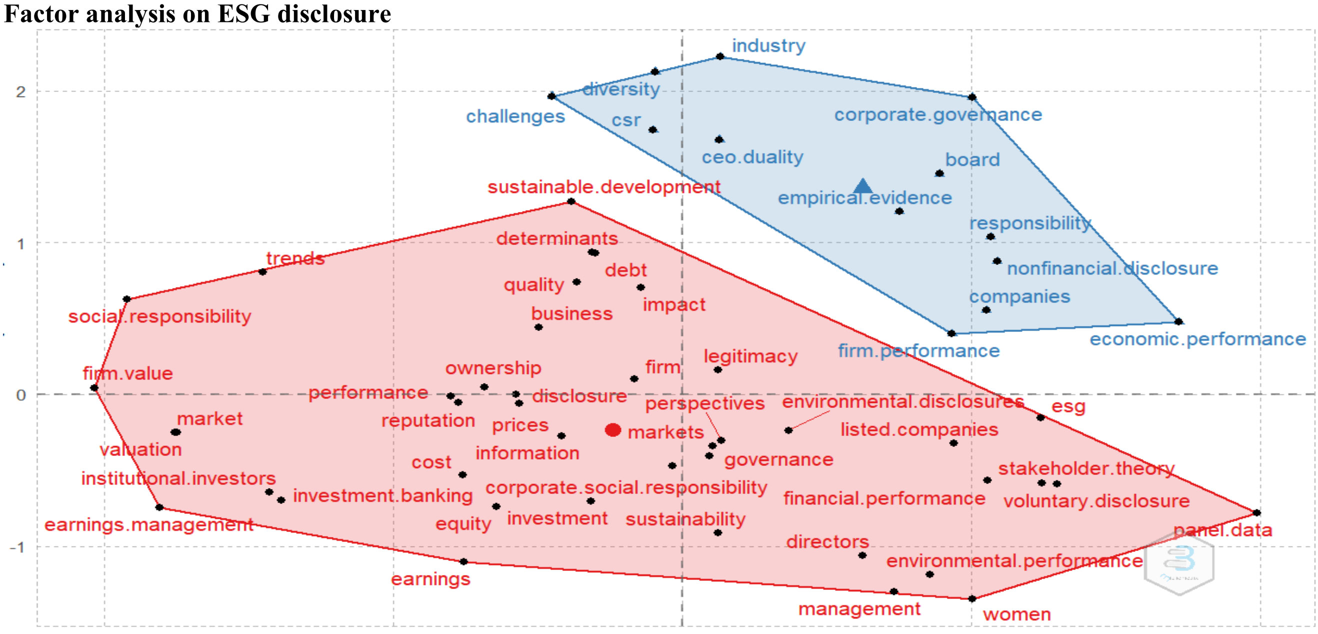
Co-occurrence of keywords

According to the concept of bibliographic coupling, the cluster with the same color shows a common research area. The database comprises a total of 124 authors. The result in Figure 7 shows the collaboration and connection between the authors in the field of ESG. Clusters are evenly distributed over the area of the graph, showing the non-existence of great concentration in any of them.

The three-field chart shown in Figure 8 is a Sunkey-type chart. It is a flow chart and shows the main authors, their origins (shown in the middle column), and their respective links to the author's keywords (shown in the right-hand column). Regarding nationalities of the authors, it can be seen that the United Kingdom, the United States and Australia are the three main contributing countries; most of them are developed countries. The keywords most used by authors are "ESG disclosure", ESG and sustainability.

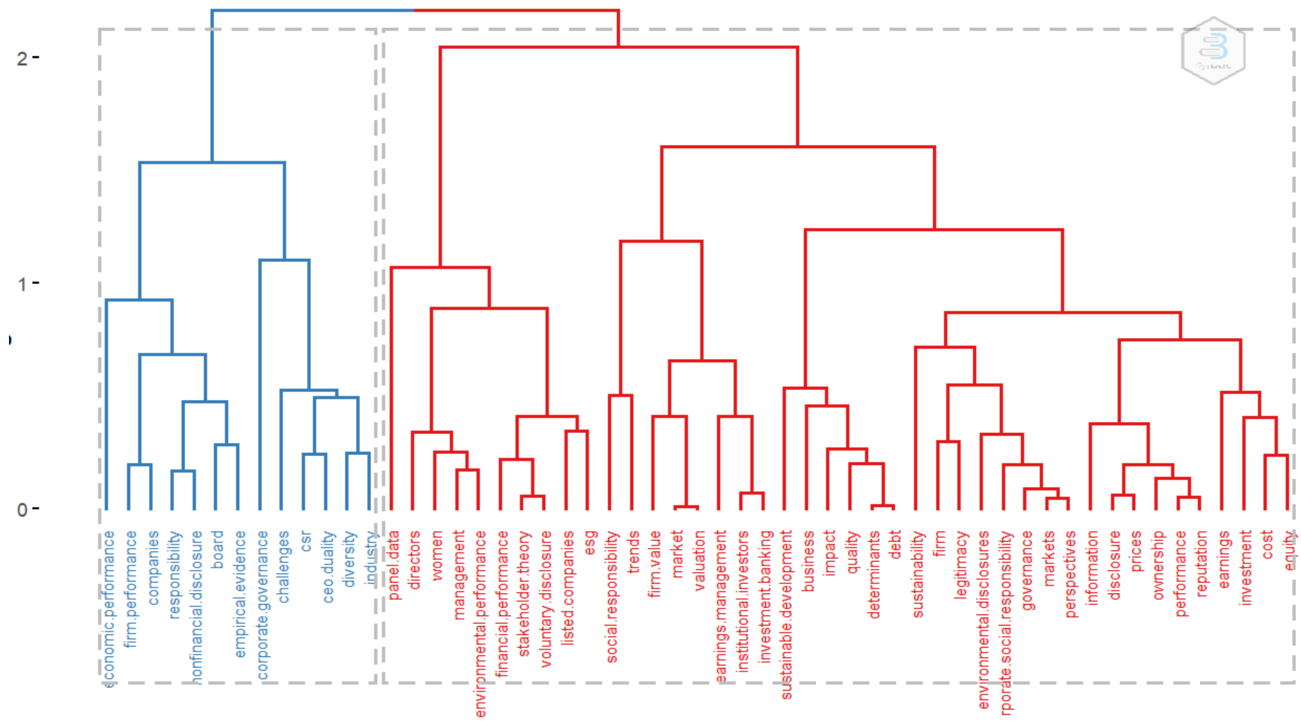
As environmental and corporate social responsibility traits grow around the world, more developing countries will acquire an interest in ESG issues. Besides entailing benefits for shareholders, companies should also contribute to the environment, human rights, gender equality, anti-corruption and other fields to improve the common interests of all stakeholders (Hill, 2020).

Figure 5
Factor analysis on ESG disclosure



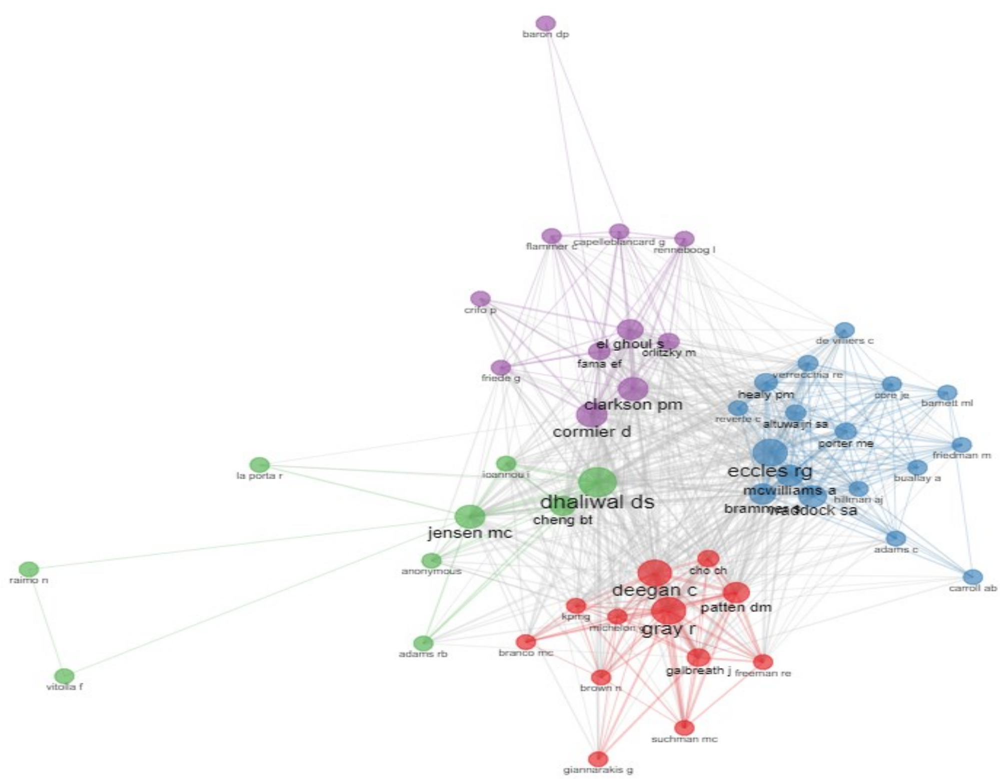
Source: Own elaboration using data from WoS and biblioshiny (2023).

Figure 6
Dendrogram on ESG disclosure



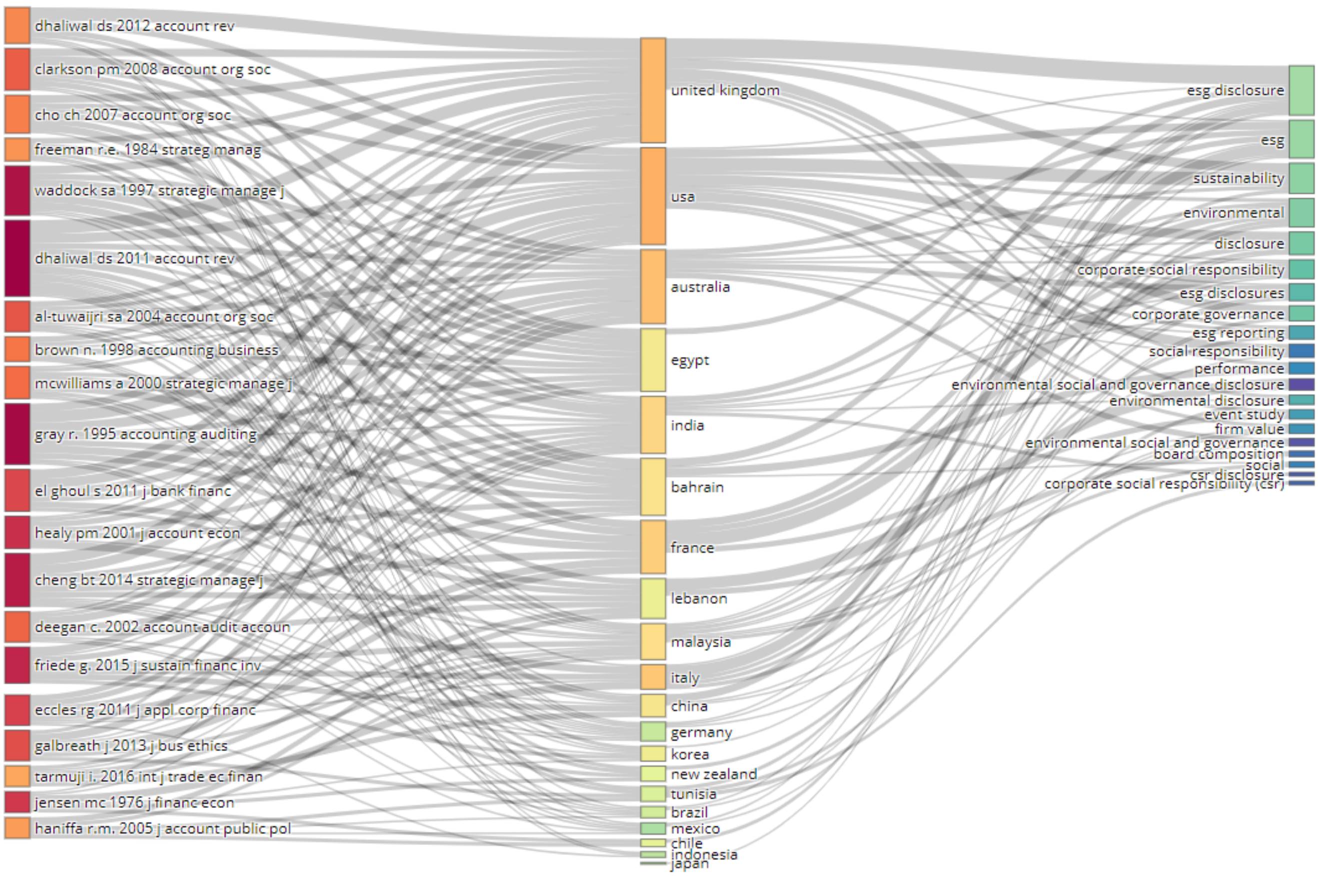
Source: Own elaboration using data from WoS and biblioshiny (2023)

Figure 7
Authors' Collaboration Network



Source: Own elaboration using data from WoS and biblioshiny (2023)

Figure 8
Three Fields Graph



Source: Own elaboration using data from WoS and biblioshiny (2023).

Final considerations

Bibliometric analysis is used to determine the main trends and paths of research fields or journals. In light of this, this study aimed at reviewing research on ESG disclosure and identifying study trends related to the topic. Data used came from the Web of Science database, from 2016 to 2021. Research on ESG disclosure is still in its infancy, although it has developed rapidly in the last three (3) years, indicating that this is a potential topic for study.

ESG data are mainly collected and organized by rating entities or stock exchanges, such as Bloomberg ESG and risk agencies like S&P 500 Index. By now there is no unified, universal and comprehensive ESG database system. Variations between the ESG ratings of the same company are common. Therefore, establishing an effective and standardized ESG system, a standardized format for disclosing information, and a scoring system is a challenge for research in this field all over the world.

The study of co-occurrence of keywords and keyword trends, combined with a literature review, shows the possible future directions of ESG research related to factors such as ESG disclosure, ESG investment, environmental protection and corporate governance.

Academics and practitioners are expected to present more research on ESG and integration of research findings in this area. The article summarizes existing research and results published so far on ESG disclosure, and analyzes research results and ESG research trends. On the one hand, this research can provide guidance for researchers who are new to the topic, and they can quickly obtain vital information and necessary material and gain a basic understanding of it.

Although the research has set the basis for the trend of developing ESG disclosure, it is still expected to be widely implemented in many fields in the future. This work is expected to provide a wealth of information for researchers interested in carrying out future investigations into ESG disclosure in research.

There are some limitations to this study. Firstly, data were taken exclusively from the Web of Sciences database. Other databases, such as Scopus, can be used to extract bibliographic data. Secondly, in terms of results, there is a lot of duplicate and similar data in bibliometric data, such as the singular and plural of the same keyword or the use of hyphens in the same word compound, which interferes with the validity of the results to some extent.

Future researchers are recommended to use different data collection methods, including more related research. In addition, future work could generate bibliography coupling networks and keyword co-occurrence with more flexible boundary configurations to identify more potential links between identified sub-topics. Thus, more promising fields of study could be explored by associating relevant subtopics or through other forms of literature clustering.

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