

Review article

Board gender diversity and corporate social responsibility: A bibliometric analysis

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ABSTRACT

The objective of this study to analyze developments in relating to board gender diversity (BGD) and corporate social responsibility (CSR) research and provide future researchers with new avenues for research in the field. A bibliometric analysis was conducted by focusing on the most productive articles, authors, journals, institutions, sponsors, and countries and as co-occurrence analyses based on 1961 peer-reviewed articles published between January 1966 and April 2021 in the Scopus database. Results revealed that the number of publications relevant to BGD and CSR has been gradually increasing, and a significant increase has been observed since 2010. Keywords such as “gender,” “gender equality,” “sustainable development,” and “corporate social responsibility” reveal the key themes in BGD and CSR research. Cluster analysis revealed three clusters: Cluster 1 focused primarily on the board composition and board structure, Cluster 2 focused on board composition and its connection to CSR or philanthropy, and Cluster 3 (comprising more recent articles) mainly stressed the impact of gender diversity on CSR or sustainability initiatives. Results also provided different implications with future research directions. It reveals the collaboration between authors in conducting research in the domain of BGD and CSR is still lacking, suggesting further research in collaboration different authors in CSR and BGD. Journal of business ethics, Corporate governance: an international review, and Academy of management journal were the top-ranking journals in term of source co-citation, and thus journals ought to be further expanded more research in CSR and BGD to enhance their source co-citations. The most productive sponsors and institutions were in developed countries, while country co-authorship analysis revealed more research need to cooperatively be undertaken in developing countries.

1. Introduction

The concepts of board gender diversity (BGD) and corporate social responsibility (CSR) have become vitally important in the current era, with its focus on sustainability [1,2], Yarram and Adapa, 2021. BGD is an aspect of corporate governance that has been extensively discussed in the management literature, particularly concerning firms' approaches to social, economic, and environmental

Abbreviations: CSR, Corporate social responsibility; BGD, Board Gender Diversity; UAE, United Arab Emirates; UK, United Kingdom; USA, United States of America.

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issues [3–5]. Today it serves as an effective corporate governance monitoring device and is regarded as one of the key drivers of sustainability [6]. Legal requirements and social pressures have also encouraged firms to prioritize gender diversity on the board and the top management team [7,8]. Consequently, many countries have implemented quotas for women who are on the board. For instance, countries such as Norway, Belgium, Germany, Iceland, France, Italy, Denmark, and Malaysia led this initiative by mandating a minimum 30–40% representation of each gender on their firms' corporate boards, while other countries such as Finland, Israel, the UAE, and India have mandated the presence of at least one woman on the board [9]. Empirical studies have shown that women are more driven toward generous and philanthropic activities; as such, they can improve CSR implementation and firm performance [9–11]. Hence, BGD and CSR tend to be interrelated, though the developments of scientific knowledge in both CSR and BGD areas significantly vary. However, since the extent to which gender diversity appears on the corporate board significantly vary accordance with the contexts and country, their likely BGD-CSR nexus can be different.

With regard to the benefits of appointing women on boards, research results are mixed. Some scholars have argued that appointing female directors on the board has, at best, various positive effects on firm-related outcomes and values, primarily in terms of improving directors' ethical behavior and firm CSR performance [12,13]. However, some authors suggest that BGD has no significant effect on firm-related outcomes, including CSR [5,14–16]. Given these inconsistent results, it is necessary to systemically investigate previous research papers that examine how BGD is related to CSR activities.

Due to different institutional contexts among countries in terms of culture and the nature of corporate governance regulations [17, 18], the effects of BGD on the level of CSR performance can be expected to vary depending on the country and context. Hence, extensive research has been conducted on both CSR and BGD, considering various countries and institutional settings [3,9,19]. However, the evolution of the knowledge structure in this field and the connections between the prevailing knowledge bases relating to BGD and CSR in developed and developing countries remain unclear. Hence, this topic is full of remarkable opportunities for future research avenues.

Therefore, this study intends to conduct comprehensive bibliometric review of BGD and CSR literature. The purpose of a bibliometric review is to identify the most influential authors, articles, journals, and themes across various countries, institutions, and topics with respect to a particular body of knowledge [20–22]. To formulate and review the intellectual structure of the extant literature concerning BGD and CSR, this study aims to incorporate several bibliometric analyses relating to the related keywords, and the most productive authors, articles, journals, research sponsors, and countries. To understand the landscape of BGD-CSR research, this study embarks on answering the following research questions:

- I. How is BGD and CSR research organized and evolved in terms of publications, authors, journals, and other bibliometric trends (co-authorship, co-citation, co-occurrence, etc)
- II. What are the organizations and research sponsors in terms of the productivity of BGD and CSR research?
- III. Which countries and country co-authorship are productive in the area of BGD and CSR research (developed countries or developing countries?)
- IV. To discuss, based on the results obtained, the underexplored areas and suggest future research avenues to gain a profound understanding of BGD and CSR research

The key contributions of this study are threefold. First, this is the first bibliometric analysis relating to BGD and CSR. To the best of our knowledge, there have been no bibliometric analyses as to the field of BGD and CSR to assess the progress in this field. Second, the study contributes to CSR and BGD literature by providing future researchers with new avenues for research that are imperative for the growth of CSR and BGD field. Third, though there have been some reviews relating to gender diversity, which considered the presence of women on boards and its impact on firm performance (e.g. [9,11]), they were conducted in a shorter time period. Hence, there is a need to conduct a BGD-related bibliometric analysis covering a longer period. Table 1, compares earlier gender diversity reviews with the current study.

The results of the present study can guide new researchers in this field in determining the core articles and their themes and the most cited articles, authors, and journals relating to BGD and CSR. It will also inform researchers about how BGD and CSR have been used in extant literature. Moreover, the keyword occurrence and co-occurrence analyses reveal the most frequently studied topics in the BGD and CSR literature and their collaborations in term of keywords, authors, and countries and how the popularity of the topics

Table 1
Comparison between recent review studies on BGD and the current study.

Dimension	Velte [23]	Drago and Aliberti (2018)	Baker et al. [9]	Sánchez-Teba et al. [11]	This study
Focus	Female presence on boards and its impact on performance	Interlocking directorships network and gender	Current dynamics related to board diversity	The presence of women on boards	BGD and CSR
Time period	2008–2016	2010–2017	1999–2019	1994–2020	1966–2021
Keywords	Not specified	Governance, interlocking, directorates, diversity	A string of keywords related to board diversity only	Women and boards of directors	A string of keywords concerning BGD and CSR
Methodology	Structured review	Bibliometric analysis	Bibliometric analysis	Bibliometric analysis	Bibliometric analysis

has changed over time, which provides a valuable reference for scholars seeking emerging areas of interest in the field.

The rest of the paper is organized as follows: in the next section, the relevant literature is reviewed, followed by the discussion of the methodology used. Subsequently, the findings are presented visually and descriptively and discussed. Finally, a summary of the avenues for future research studies relating to BGD and CSR is provided.

2. Literature review

2.1. Corporate social responsibility

CSR is defined as the “actions that appear to further some social good, beyond the interests of the firm and that which is required by law” [24]; p. 17. Bergamaschi and Randerson [25]; p. 73 defined CSR as “a company’s voluntary contribution to sustainable development which goes beyond legal requirements.” Sustainable development is defined as “development meeting present needs without compromising the ability of future generations to meet their own needs” [26]. Accordingly, CSR can be referred to as the long-term maintenance of systems in a way that is consistent with the economic, social, and environmental considerations. Several previous bibliometric analyses and reviews on CSR have revealed an exponential growth in CSR and sustainable development-related studies, as discussed in Table 2.

Moreover, a considerable body of empirical studies supports the argument that CSR is beneficial for firms. For instance, CSR has a positive influence on attracting and retaining productive employees, providing effective access to valuable resources, contributing to social legitimacy, and improving organizational performance in terms of organizational commitment, competitiveness, and financial performance [15,31]. This positive impact of CSR may be attributable to several board characteristics [5] such as board diversity because research on organizational theory has shown that board diversity has a considerable positive influence on the quality of corporate governance [9] and firm performance [10]. However, according to the analysis of bibliometric reviews of CSR research presented in Table 2, studies examining the knowledge base connecting CSR and BGD are still lacking.

2.2. Board gender diversity

Female representation in boards of directors, that is BGD, has attracted considerable interest among CSR practitioners and policymakers in recent years [7,8,10]. This is partially due to the relatively less representation of women on boards and the corporate world in general compared to their presence in the general population [10]. For example, studies show that female boardroom representation is only approximately 10.3% across 67 countries [32]. Additionally, a survey concluded that the average proportion of female directors on the boards of 2765 companies, constituents of the MSCI ACWI Index, was approximately 20.0% in 2019 and approximately 57.3% of these companies had at least one female director [33]. Among the six Arabian Gulf countries, women hold 5.2% of the top department leadership positions, whereas female representation in the ranks of senior management leaders is only 3.1% in the 2805 private and publicly listed firms [34]. The Dubai-based Hawkamah Institute of Corporate Governance (Hawkamah) reported that women occupy only 1.5% of corporate board seats in the Gulf Cooperation Council.

To address this lack of diversity, many countries have implemented gradually increasing quotas for women on boards. For example,

Table 2
Literature synthesis: Bibliometric analyses of CSR research.

Author	Objective	Method	Findings
Ye et al. [27]	To generate a knowledge map of the CSR research regarding sustainable development	A bibliometric analysis using CiteSpace software and applying 13 burst terms (2005–2019)	CSR involvement in sustainable development is on a long-term basis but has recently become a productive research area. The three most productive journals are Sustainability, Corporate Social Responsibility and Environment Management, and Journal of Cleaner Production.
Low and Siegel (2020)	To examine knowledge development and dissemination of employee-centered CSR research	Analysis of bibliometric data obtained from Scopus (2000–2018)	Social Responsibility Journal and Journal of Business Ethics are the two key journals publishing employee-centered CSR research. The UK and the US are the two most productive countries in this regard. Most publications are in the discipline of business, accounting, and management.
Frerichs and Teichert [28]	A bibliometric analysis of issues related to CSR reporting	Bibliometric analysis using data retrieved from the Web of Science database and VOSviewer	Research relating to CSR reporting is expanding to the following sub-areas: the disclosure of non-financial information, Global Reporting Initiative standards, and integrated reporting.
Guillén et al. [29]	To study CSR in the context of small and medium-sized enterprises (SMEs)	Bibliometric research in SMEs over the last 20 years: analysis of 120 papers	A growing interest in CSR in North America and Europe and a relative rise in empirical papers on CSR vis-a-vis a relative decline in descriptive papers. CSR research relating to SMEs is still at the growing stage.
Zainuldin and Lui [30]	To illustrate the intellectual structure and knowledge development of CSR studies relating to the banking industry	Bibliometric analysis to examine the bibliographic data from the Scopus database (2009–2019)	Disclosure, stakeholders, financial performance, Islamic and international banks, and corporate governance are among the most prominent trends.

Norway mandated a minimum of 40% representation of each gender on corporate boards. This was followed by Denmark, France, Germany, Belgium, Iceland, Italy, the Netherlands, Spain, and Malaysia, whose mandatory quotas range from 30 to 40% [9]. Further, Israel, Finland, India, and the UAE have mandated that there should be at least one woman on every board [9]. Hence, it is clear that the extent of gender diversity on corporate boards varies significantly among countries. Thus, the impact of BGD on CSR is likely to vary in different contexts.

Empirical studies have shown that women are more driven toward generous and philanthropic activities; as such, they can improve CSR implementation and firm performance [9–11]. Female directors' psychological characteristics (increased sensitivity to different groups of stakeholders' expectations) may make them more inclined to promote their firms' social practices [5]. This is usually attributed to the fact that women's decisions tend to be more socially oriented than that of men [15]. Díez-Martín et al. [35] also found that women and men have divergent mental approaches when making decisions and evaluating their organization's legitimacy. Thus, the strong presence of female leaders tends to increase the attention of top leadership and management toward CSR issues and is expected to improve CSR practices.

Other reasons why BGD may have an effect have been analyzed; these include increased independence of the women represented on boards, their impact on the quality of decision making, and changes to the boardroom atmosphere. The empirical results of Baker et al. [9] and Sánchez-Teba et al. [11] are consistent with the above views. They found that the presence of female directors on corporate boards positively impacts CSR activities. Based on the literature, this study argues that gender diversity influences effective CSR implementation.

Nevertheless, other studies have pointed out that the vast gender imbalance on boards may not change instantaneously if we rely upon organic change processes [14,16,36]. These studies tend to conclude that gender diversity may not necessarily impact organizational CSR activities because the change is not occurring rapidly. Other studies have even identified negative effects. Husted & de Sousa-Filho [37] found that BGD impacts environmental, social, and governance disclosure negatively. In terms of methodology, Ferreira [38] challenged studies investigating the effect of BGD on firm-related outcomes by identifying complications, in terms of the timing of the experiment, sample selection, choice of the control group, the mechanism elucidating the results, and confounding effects, that are common to such studies. Hence, in light of these mixed findings, it is apparent that the association between BGD and the success of CSR activities is still unclear. Therefore, the current state of the extant literature as to the association between BDG and CSR and their future research directions are ambiguous.

Table 3, summarizes previous bibliometric analyses of BGD research. There is still a lack of bibliometric studies that identify the trends in the publications on BGD and its evolving knowledge base. The current study aims to bridge these research gaps by a bibliometric analysis that synthesizes the existing literature and publication patterns relating to BGD and CSR, identifying the prominent journals, authors, articles, and clusters, and indicating the directions for future research.

3. Data and methodology

The key purposes of bibliometric analysis are to identify, organize, and analyze the key components within a specific research arena [40]. The bibliometric analysis aims to collect an abstract overview by quantitatively structuring and analyzing a large database of journal publications with multi-faceted sub-topics [22]. It has recently become more popular in the discipline of Management (e.g. [20, 21,41–44]). Moreover, it has also been employed to map CSR-related research [9,19].

This study presents a bibliometric analysis of the existing literature on BGD and CSR by analyzing citations, productive journals, source co-citation, themes of keywords, authors, co-authorship, countries, country co-authorships, institutions, and sponsors. This widely used method is appropriate for answering the RQs listed above [45]. The research procedure is broadly depicted in Fig. 1.

Mapping and statistical tools were utilized on a total of 1961 journal articles related to BGD and CSR to identify the existing

Table 3
Literature synthesis: Bibliometric analyses in BGD research.

Author	Objective	Method	Findings
Mumu et al. [39]	To analyze the literature on corporate governance from the gender perspective by applying bibliometric analysis and content analysis.	Citation mapping and content analysis using a total of 393 Web of Science journal articles	Four underlying research stems in the gender and corporate governance literature: participation of women on boards and their characteristics, female directors and their roles across different countries, BGD and firm financial performances, and stock prices.
Drago and Aliberti (2018)	To provide a bibliometric analysis of the results in extant literature relating to interlocking directorships and gender	Co-citation mechanisms and co-word analysis (2010–2017)	This includes the structure of the interlocking directorship networks by gender, role type on boards, presence in board committees, and impact on performance.
Baker et al. [9]	To examine research activity regarding board diversity conducted during 1999–2019	A bibliometric analysis with a sample of 579 articles from the Web of Science database	Though the research on board diversity occurs globally, there is still a lack of international collaboration, particularly between the authors of developing and developed countries.
Sánchez-Teba et al. [11]	To analyze articles examining the presence of women on boards	Bibliometric approach using VOSviewer to analyze 300 documents from the Web of Science (1994–2020)	This highlights the characteristics of the women of importance to boards within the current context: open innovation, concern for the needs of interest groups, empathy, and a sensitive perception of risks.

relationships between the two concepts. The Scopus database (Elsevier) was considered the most appropriate for this bibliometric analysis as it incorporates many journals, papers, and authors and meets the peer-review requirement for scientific quality [46]. For this analysis, articles published between January 1966 and April 2021 were considered. In terms of keywords, we searched for terms related to BGD and CSR combined with the Boolean operations OR/AND, as presented in Table 4. VOSviewer was used to generate bibliometric maps and networks.

Filtering and analysing keywords were critically important due to three reasons. First, keywords characterize the author's opinion of the most important words in their articles. Second, keyword analysis can detect the former and current publication trends in BGD and CSR research. Bibliometric keyword analysis can answer whether certain keywords vis-à-vis BGD and CSR are linked with an increased likelihood of an article being cited.

Graphic analyses mainly display scientific outputs using some visualization software packages and tools. Various bibliometric methods have been proposed such as keyword co-occurrence analysis, co-authorship analysis and co-citation analysis:

Subsequently, the keywords, names of authors, journals, institutions, subject areas, publication years, and countries included in this research were analyzed using VOSviewer software (version 1.6.17). This software produces network maps for each variable or keyword used in the study, allowing the processing and grouping of words. Additionally, the application also enables the researcher to create and visualize occurrence networks of the key terms extracted from the literature. The citation network analysis was also used to analyze research clusters relating to BGD and CSR.

4. Results

4.1. Evolution of publications

Fig. 2 illustrates the evolving number of published papers relating to BGD and CSR. The first article relating to the field was published in 1966. The number of papers published every year remained low until the early 1990s. In 1993, the number of publications began increasing to at least 9 per year, before significantly rising to 21 documents by 1997. From 1997 to 2009, annual publications gradually increased and reached 42 in 2000. A substantial increase has been occurring since 2010. This boom may have been a response to the huge corporate financial scandals that occurred during the financial crisis of 2007–2009. As of 2020, the number of documents published annually had reached 392.

4.2. Productive articles

4.2.1. Citation analysis

This section aims to analyze and map the most influential articles based on their level of productivity measured by the number of citations. Table 5, lists the most productive BGD and CSR articles between 1966 and 2021. As shown in Table 5, Campbell and Mínguez-Vera's [47] study has the highest number of citations (681), followed by Bear et al. [49]; 612 citations, Roberts et al. [51]; 376 citations, Post et al. [53]; 319 citations, and Liao et al. [6]; 310 citations. Among the top 20, Ben-Amar et al. [65]; 154 citations had the least citations.

4.2.2. Cluster analysis of BGD and CSR research articles

The network map of the most productive BGD and CSR articles (Fig. 3) shows three major clusters comprising the 20 most influential documents (the articles in each cluster are also listed in Tables 6a, 6b and 6b). Cluster 1 (shown in pink colour) includes seven articles: Campbell and Mínguez-Vera [47], Kor [51], Michelon and Parbonetti [54], Roberts et al. [56], Seifert et al. [58], Webb [61] and Wang and Coffey [63]; Cluster 2 (colored green) included six articles: Bear et al. [49], Boulouta [50], Post et al. [53], Terjesen and Singh [57], Zhang et al. [59] and Williams [60]; and Cluster 3 (colored blue) consisted of only four publications: Ben-Amar et al. [6], Rao and Tilt [52], Jizi et al. [64] and Liao et al. [65]. Hence, it was clear that the first cluster represented the influential articles

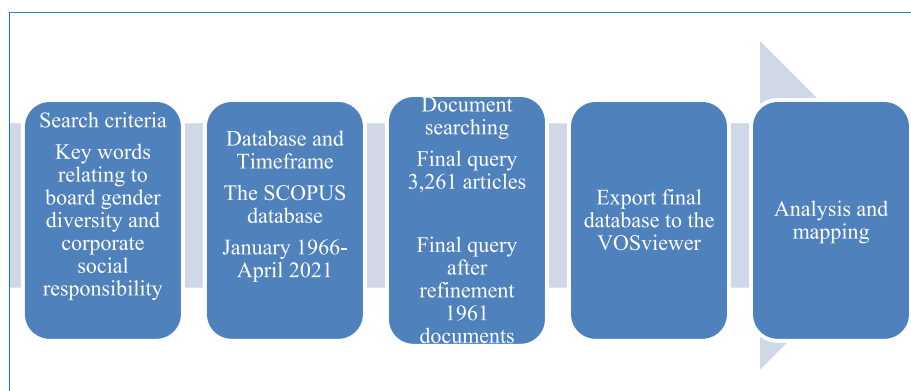


Fig. 1. Research procedure.

Table 4
Keyword searching.

Description	Conditions	Number of documents
The search query of TITLE-ABS-KEY	We have combined the following keywords related to “board gender diversity” with the keywords of “corporate social responsibility” Board gender diversity: board gender diversity, gender balance, female board, women on board, women on the board, women empowerment, gender composition, female directors, gender equality, glass ceiling, gender power, equal opportunities, women lead*, women CEO, board attributes, board structure, board characteristic, board composition, executive gender, gender quota* Corporate social responsibility: corporate social responsibility, corporate social performance, triple bottom line, social responsibility, accountability, the pyramid of CSR, philanthropy, corporate social responsive*, green*, ethic*, sustain* (LIMIT-TO (SRCTYPE, “j”)) AND (LIMIT-TO (DOCTYPE, “ar”)) AND (LIMIT-TO (LANGUAGE, “English”)) AND (EXCLUDE (EXACTKEYWORD, “Human”))	3261 Documents
Refinement of search query	We included both open access and non-open access documents.	1961 documents
Access	April 18, 2021	
Query search data	All years (January 1966–April 2021)	
Years	All subject areas included.	
Subject area	We limited our search to “article.”	
Document type	We limited our search to “journal.”	
Source type	We limited our search to English language.	
Language	We excluded all articles that include the keyword “human.”	
Other exclusions		

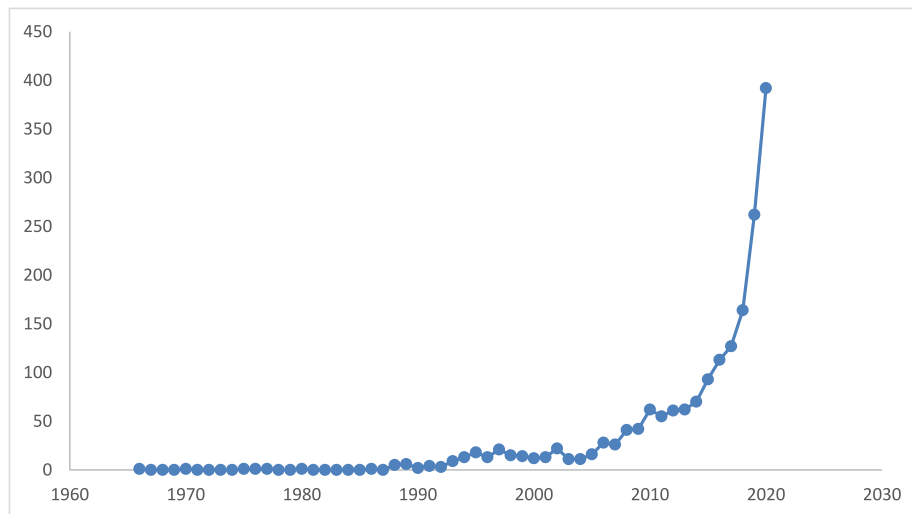


Fig. 2. Change in documents by year from 1966 to 2020 (1961 Articles).

Table 5
The most important articles in BGD and CSR research.

Rank	Authors	Citations	Rank	Authors	Citations
1	Campbell and Mínguez-Vera [47]	681	11	McCrudden [48]	235
2	Bear et al. [49]	612	12	Boulouta [50]	224
3	Roberts et al. [51]	376	13	Rao and Tilt [52]	198
4	Post et al. [53]	319	14	Wang and Coffey [54]	197
5	Liao et al. [6]	310	15	Liebig et al. [55]	177
6	Kor [56]	297	16	Terjesen and Singh [57]	176
7	Michelon and Parbonetti [58]	289	17	Zhang et al. [59]	169
8	Williams [60]	285	18	Webb [61]	164
9	Mayoux [62]	261	19	Seifert et al. [63]	155
10	Jizi et al. [64]	246	20	Ben-Amar et al. [65]	154

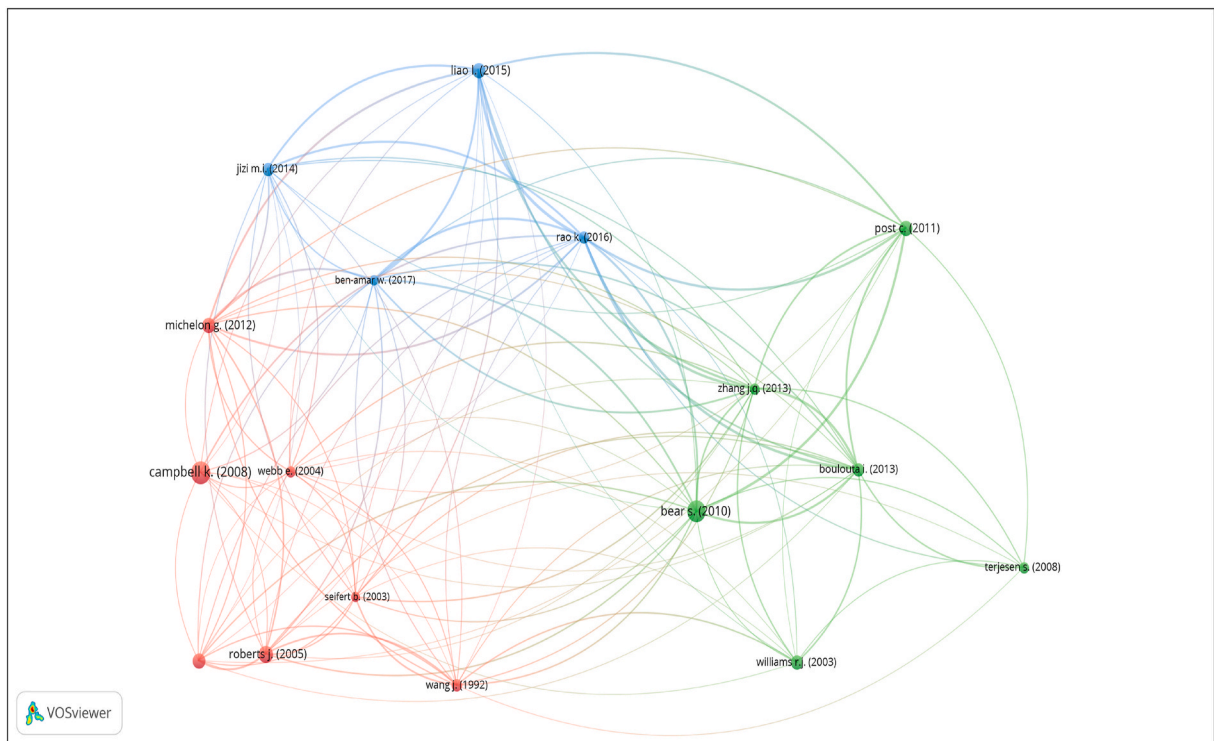


Fig. 3. The influential clusters in three distinct colors: The most influential BGD and CSR articles published from 1966–April 2021. (For interpretation of the references to colour in this figure legend, the reader is referred to the Web version of this article.)

Table 6a

Cluster analysis relating to productive articles – Cluster 1.

Cluster	Author	Citations
Cluster 1	Campbell and Mínguez-Vera [47]	681
	Kor [56]	297
	Michelon and Parbonetti [58]	289
	Roberts et al. [51]	376
	Seifert et al. [63]	155
	Wang and Coffey [54]	197
	Webb [61]	164

Table 6b

Cluster analysis relating productive articles – Cluster 2.

Cluster	Author	Citations
Cluster 2	Bear et al. [49]	612
	Boulouta [50]	224
	Post et al. [53]	319
	Terjesen and Singh [57]	176
	Williams [60]	285
	Zhang et al. [59]	169

Table 6c

Cluster analysis relating productive articles – Cluster 3.

Cluster	Author	Citations
Cluster 3	Ben-Amar et al. [65]	154
	Jizi et al. [64]	246
	Liao et al. [6]	310
	Rao and Tilt [52]	198

published between 1992 and 2012, Cluster 2 reflected articles published between 2003 and 2013, and Cluster 3 contained recent influential articles (2014–2017).

In terms of focus, Cluster 1 articles tend to be highly focused on the board composition and structure. For example, Kor [56] examined the effects of the top management team and board composition on R&D investment strategy, while Campbell and Mínguez-Vera [47] investigated gender diversity in the boardroom and its impact on firm financial performance. Only a few studies (e.g., [54,61]) linked board composition to corporate philanthropy or the structure of the boards of socially responsible firms. Hence, the studies presented in Cluster 1 are narrowly focused on corporate governance, suggesting to widely focus on future studies linking corporate governance with BGD and CSR.

The studies presented in Cluster 2 mainly link board composition to CSR and philanthropy. For example, Zhang et al. [53] and Post et al. [59] linked board composition and CSR. However, a few studies, such as Bear et al. [49] and Williams [60]; attempted to link CSR and board composition with the concept of board diversity, suggesting more related future studies board composition to BGD and CSR.

The studies in Cluster 3 focused on the impact of gender diversity on CSR or sustainability initiatives. For example, Ben-Amar et al. [65] attempted to link BGD and corporate responses to sustainability initiatives in the context of carbon disclosure projects. Similarly, Liao et al. [6] investigated the relationships between gender diversity, board independence, and environmental committees from the perspective of greenhouse gas disclosure. Hence, Cluster 3 shows that, in the recent past, there has emerged a growing trend of investigating the link between BGD and CSR.

4.3. Productive authors and co-authorship analysis

4.3.1. Most productive authors

The most productive authors in the BGD and CSR literature between 1966 and 2021 are listed in Table 7. A combination of the number of articles published (>5) and the number of citations was used for the ranking. Martínez-Ferrero is the most productive author in the field, having contributed to nine articles with a total of 139 citations. García-Sánchez and Pucheta-Martínez were the second and third most prolific authors; they have each published seven articles which received 146 and 61 citations, respectively. Sial and Uyar were the fourth and fifth most productive authors, each with six published articles to their credit and 51 and 114 citations, respectively. Post, Mayoux, Galbreath, Nadeem, and Yount followed, each with five published articles.

4.3.2. Co-authorship analysis

Co-authorship analysis is one of the most extensive ways of analysing scientific cooperation [66]. The co-citation analysis of authors enables to visualize the collaboration of authors. Fig. 4 shows the authors' collaboration network analysis. The threshold of documents per author was set to five while, their respective number of citations was set to 18 to confirm that particularly relevant articles are depicted in VOSviewer. The map shown in Fig. 4 includes nodes representing the authors and edges indicating the links between the authors. The edges reveal that the connected authors have published at least two articles together. The size of the nodes shows the number of journal articles collaboratively published by the author.

Of the 4362 authors, 11 met these thresholds. Table 8 lists the authors with the greatest total link strength over other authors. Table 8 and Fig. 4 reveal that a well-established collaboration between authors cannot be seen in the domain of CSR and BGD, except to collaboration between García-Sánchez I.-M. and Martínez-Ferrero J. and between Uyar A. and Karaman A.S. with having a total link strength of five. Accordingly, it reveals the collaboration between authors in conducting research in the domain of BGD and CSR is still lacking, suggesting further research in collaboration different authors in CSR and BGD.

4.4. Productivity by journal and source Co-citation analysis

4.4.1. Most productive journal

Most of the journals relevant to BGD, corporate governance, and CSR/sustainability research were analyzed. The productivity of journals was evaluated by the number of published articles and the 10 most productive journals were identified. They are listed in Table 9a along with the number of BGD and CSR-related studies published in these journals and the number of their citations. These journals are devoted to fields ranging from business research (e.g., *Sustainability (Switzerland)*, *Journal of Business Ethics*, *Sustainability*,

Table 7
The most productive authors in BGD and CSR research.

Rank	Author	Total Publications	Citations
1	Martínez-Ferrero	9	139
2	García-Sánchez	7	146
3	Pucheta-Martínez	7	61
4	Sial	6	51
5	Uyar	6	114
6	Post	5	1140
7	Mayoux	5	321
8	Galbreath	5	280
9	Nadeem	5	76
10	Yount	5	79

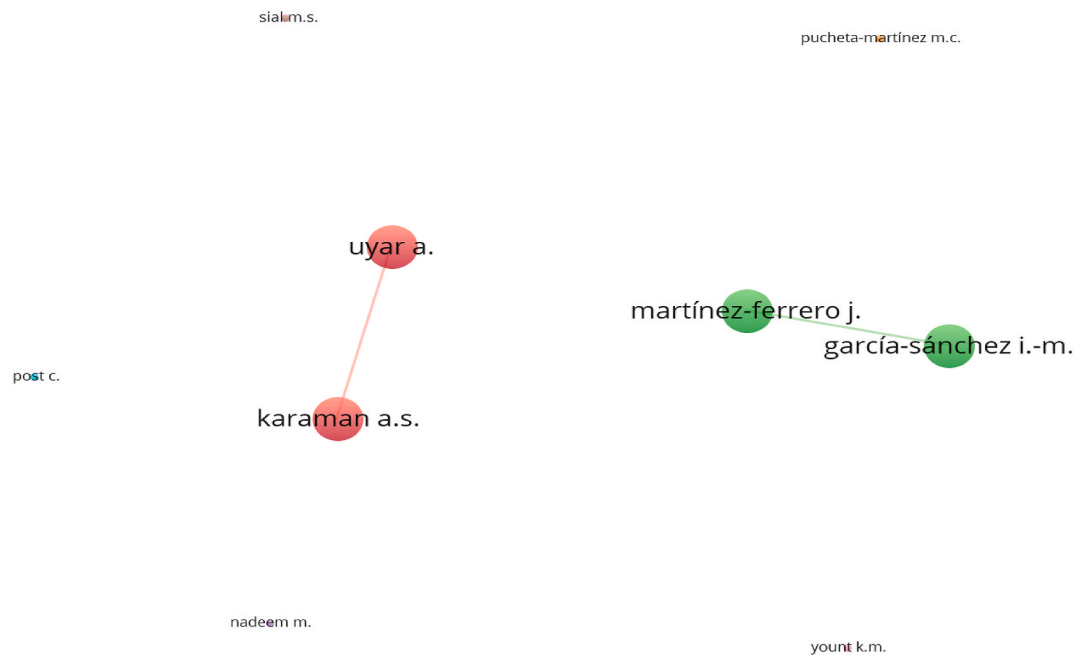


Fig. 4. The author's collaboration network in BGD and CSR.

Table 8

Co-Authorship in CSR and BGD research.

Authors	Total link strength	Documents	Citations	Normalized citations
García-Sánchez I.-M.	5	7	146	27.5428
Karaman A.S.	5	5	18	17.3416
Martínez-Ferrero J.	5	9	139	20.1858
Uyar A.	5	6	114	21.2833
Galbreath J.	0	5	280	19.9708
Mayoux L.	0	5	321	8.4811
Nadeem M.	0	5	76	11.9706
Post C.	0	5	1140	41.3689
Pucheta-Martínez M.C.	0	7	61	14.9734
Sial M.S.	0	6	51	9.5414
Yount K.M.	0	5	79	11.1987

Table 9a

Journals with the maximum number of publications and citations.

Rank	Source	Articles published	Percentage (%)	Citations
1	Sustainability (Switzerland)	106	30.2%	5960
2	Journal of Business Ethics	67	19.1%	5226
3	Corporate Social Responsibility and Environmental Management	36	10.3%	899
4	Gender and Development	28	8.0%	296
5	Corporate Governance (Bingley)	22	6.3%	366
6	Business Strategy and The Environment	20	5.7%	577
7	Women's Studies International Forum	16	4.6%	153
8	Gender in Management	14	4.0%	209
9	Journal of Cleaner Production	14	4.0%	229
10	Social Responsibility Journal	14	4.0%	199

and *Business Strategy and the Environment*), sustainability research (e.g., *Corporate Social Responsibility and Environmental Management* and *Social Responsibility Journal*).

Sustainability (Switzerland) is the most productive journal with 106 articles published, followed by *Journal of Business Ethics* and *Corporate Social Responsibility and Environmental Management* journals with 67 and 36 published papers, respectively. *Gender and Development*, *Corporate Governance (Bingley)*, and *Business Strategy and the Environment* were the fourth, fifth, and sixth most important

journals relating to BGD and CSR with 28, 22, and 20 publications, respectively. The most influential journals in BGD and CSR are mapped in Fig. 5.

4.4.2. Source Co-citation analysis

The co-citation analysis of the sources (journals), as shown in Fig. 6, provides a more specific overview of the critical areas of CSR and BGD from which the most citations were attracted. As a threshold, 20 was chosen as the minimum number of citations of a journal source. Out of 1052 journal sources, 420 journal sources met the threshold. The source co-citation map shown in Fig. 6 includes nodes representing the journal sources and edges indicating the links between the journal sources. The edges reveal that the journal sources are connected by citing each other. The size of the nodes shows total link strength between sources.

The result shows a contradictory result in comparison to the most productive journals listed in listed Table 9b. Accordingly, Journal of business ethics (a total link strength of 165,928 and 3295 citations), Corporate governance: an international review (a total link strength of 51,796 and 829 citations), and Academy of management journal (a total link strength of 46,798 and 819 citations) are the top-ranking journals in term of source co-citation, implying they are cited in more than two journals.

Source co-citation analysis further revealed three major displayed clusters. The journal source in the red colour is the biggest clusters (Cluster 1) relating to CSR and BGD (Table 9b), dominated by Journal of business ethics, Corporate governance: an international review, Strategic management journal, Academy of management journal, Academy of management review, Corporate social responsibility and environmental management sources, which are closer to each other.

Cluster 2 presented in green colour represents source such as Food policy, Agricultural economics, Agricultural systems, Marine policy, Global environmental change, and Journal of rural studies (Table 9c). Cluster 3 presented in blue colour, on the other hand, represent sources cited by Journal of human development, Comparative education, International political science review, Development southern Africa, and Ethnic and racial studies (Table 9d). However, the size of cluster 2 and 3 reveal that they are still in the initial phase research relating to CSR and BGD subjects with no adequate amount references from cluster 1 source co-citation domain.

4.5. Productivity by organization

Table 10 shows the top 20 organizations contributing to BGD and CSR research in terms of the number of citations. The University of Stirling and the Polytechnic University of Cartagena were the most influential organizations (both had 681 citations), followed by Lehigh and Pace Universities (both with 612). The Lebanese American University, Oxford University, and Judge Business School were with the least citations among the top 20.

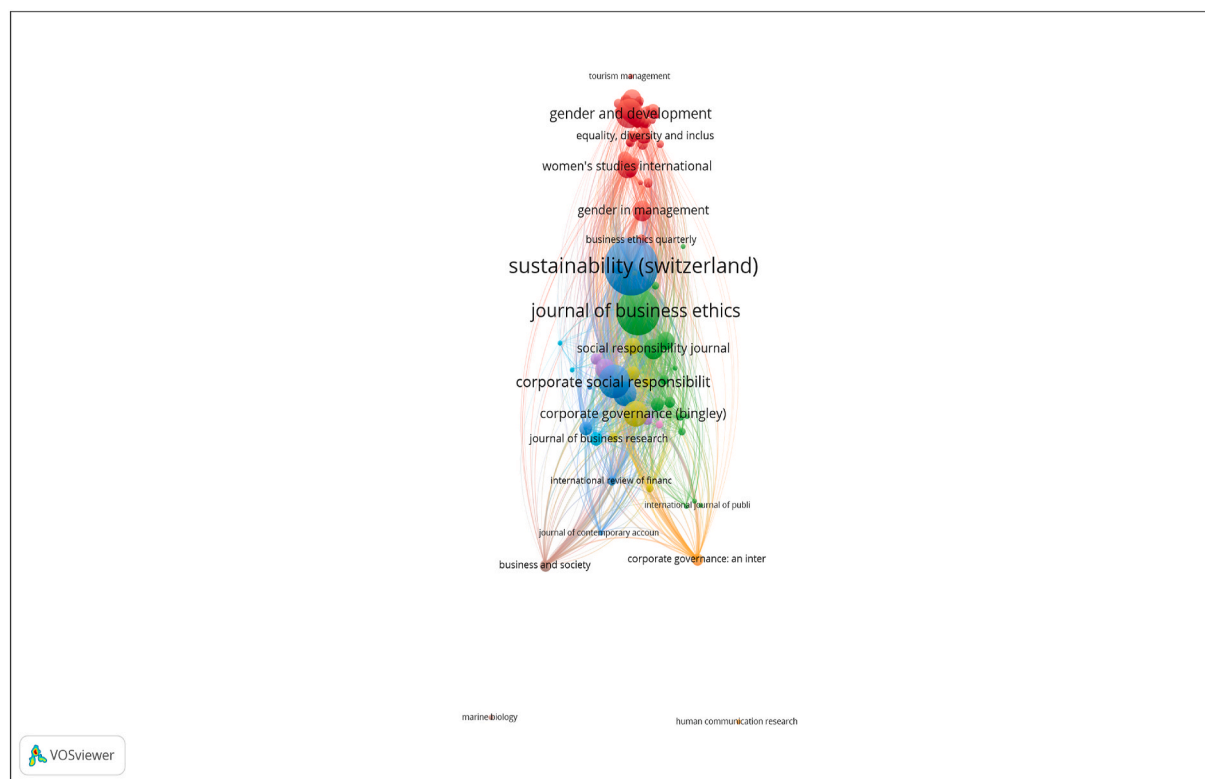


Fig. 5. The source clusters the variables in nine distinct colour groups: The most influential journals in the field of BGD and CSR. (For interpretation of the references to colour in this figure legend, the reader is referred to the Web version of this article.)

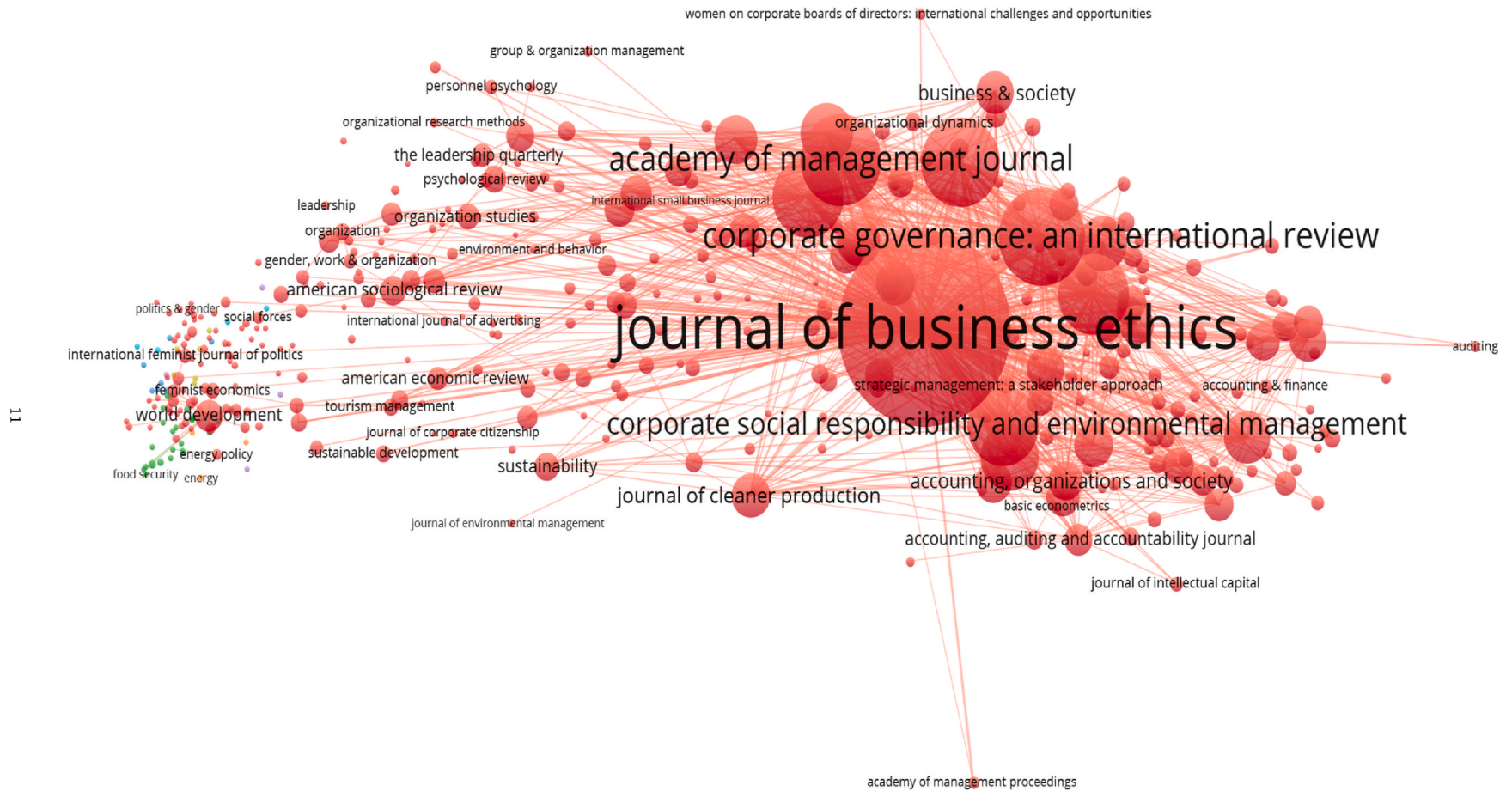


Fig. 6. Source Co-citation map.

Table 9b

Source Co-citation - Cluster 1.

Journal source	Total link strength	Citations
Journal of business ethics	165,928	3295
Corporate governance: an international review	51,796	829
Academy of management journal	46,798	819
Strategic management journal	44,707	726
Academy of management review	38,482	712
Journal of financial economics	37,879	726
Corporate social responsibility and environmental management	37,775	622
Business strategy and the environment	27,223	464
Journal of management	23,619	392
Journal of corporate finance	20,186	331
Journal of accounting and public policy	18,551	308

Table 9c

Source Co-citation - Cluster 2.

Journal source	Total link strength	Citations
Food policy	1022	57
Agricultural economics	713	32
Agricultural systems	628	35
Marine policy	600	37
Global environmental change	574	36
Land use policy	553	49
World dev.	444	85
Current opinion in environmental sustainability	418	23
Journal of rural studies	413	27
Development as freedom	410	32

Table 9d

Source Co-citation - Cluster 3.

Journal Source	Total link strength	Citations
Journal of human development	382	26
Comparative education	338	23
International political science review	296	21
International journal of educational development	247	39
Development southern Africa	209	20
International peacekeeping	208	22
Ethnic and racial studies	187	22
Agenda	137	20
International review of education	112	21
Human development report	59	20

4.6. Top research sponsors

The top 10 contributors to the research stream are depicted in Fig. 7. The European Commission was the most active sponsor (42 studies), followed by the National Natural Science Foundation of China (20 studies), UK Research and Innovation (18 studies), and the Economic and Social Research Council (17 studies). The least number of publications among the top sponsoring intuitions were the Social Science and Humanities Research Council of Canada (11 publications), Government of Canada (11 publications), and United States Agency for International Development (11 publications).

4.7. Productivity by country and country Co-authorship

4.7.1. Most productive countries

Table 11 present the most productive countries in terms of BGD and CSR research, according to publication frequency and citations. Table 10 shows the number of articles published; countries were ranked by the number of citations. The UK was the most influential country (287 publications; 7135 citations), followed by the US, whose 360 papers have been cited 6885 times. They were followed by Australia, Spain, Canada, and China. Among the top 20 countries, India, Lebanon, and Bangladesh were the 11th, 13th, and 18th largest contributors, respectively. Moreover, China, India, Lebanon, and Bangladesh were the top contributors of BGD and CSR related research amongst developing countries.

Table 10

The 20 most productive organizations in BGD and CSR research.

Rank	Organization	Citations	Rank	Organization	citations
1	University of Stirling	681	11	School of Business, University of Western Sydney	310
2	Polytechnic University of Cartagena	681	12	Alfred Lerner College of Business and Economics, University of Delaware	297
3	Lehigh University	612	13	University of Delaware, 214 Lerner Hall, Newark, de 19,716-2710, the United States	297
4	Pace University	612	14	Department of Economics and Management, University of Padova	289
5	Judge Institute of Management, University of Cambridge	376	15	Department of Management, College of Business, University of North Alabama	285
6	Leeds University Business School, Maurice Keyworth Building, University of Leeds, Leeds	376	16	Women in Sustainable Enterprise, Women's Empowerment with Programmes	261
7	Lehigh University, Corinne Post	319	17	Durham Business School, Durham University, Durham, United Kingdom	246
8	Pace University, United States	319	18	Lebanese American University, Business School, Beirut, Lebanon	246
9	Newcastle Business School, University of Newcastle, Sydney, Australia	310	19	Oxford University, Oxford, United Kingdom	235
10	Research Institute of Economics and Management, Southwestern University of Finance and Economics, Chengdu, China	310	20	Judge Business School, University of Cambridge, Cambridge	224

**Fig. 7.** Top sponsors in BGD and CSR research.**Table 11**

The most productive countries in BGD and CSR research.

#	Country	Articles	Citations	#	Country	Articles	Citations
1	United Kingdom	287	7135	11	India	118	580
2	United States	360	6885	12	Norway	33	542
3	Australia	131	2950	13	Lebanon	11	461
4	Spain	134	2499	14	New Zealand	37	431
5	Canada	87	1167	15	France	42	400
6	China	61	909	16	Hong Kong	15	384
7	Germany	69	895	17	South Africa	70	350
8	Italy	67	818	18	Bangladesh	22	338
9	Netherlands	52	701	19	Switzerland	25	326
10	Sweden	62	654	20	South Korea	24	285

4.7.2. Country Co-authorship

Country co-authorship is another vital form of scientific collaboration. The threshold of documents per country was set to 5 and the number of citations was set to 20 to confirm that particularly relevant countries are depicted in VOSviewer. The map shown in [Fig. 8a](#)

and 8b includes nodes representing the countries and edges linking countries with publications. The edges reveal that the connected country have published at least two articles together. The closer the nodes the more frequent the cooperation between two countries is. Out of 85 countries, 61 journals met the threshold, and they were ranked by using total link strength.

Fig. 8a and 8b shows that United Kingdom, United States, and Germany, South Africa, Netherland, Norway, Sweden, Switzerland, and India are the most active countries in term of country co-authorship represented by red colour cluster in Fig. 8a and 8b, indicating they are cooperative partners. However, Australia is corporative with New Zealand, Malaysia, Taiwan, Indonesia, Vietnam, Thailand Bangladesh, China, Pakistan, and United Arab Emirates (Yellow colour cluster). Moreover, Portugal, Austria, Poland, Belgium, Ireland, Romania and Denmark are corporative (blue colour cluster), while South Korea, Hong Kong, China, Pakistan, Egypt, Qatar, and United Arab Emirates countries are collaborative in term of conducting CSR and BDG research.

4.8. Keyword analysis and keyword Co-occurrence analysis

4.8.1. Keyword analysis

Keyword occurrence, that is the appearance of keywords in a journal article, provides an insight into the main themes in BGD and CSR research. These main themes are presented in Table 12 and Fig. 8a and 8b.

Table 12 suggests that “gender” is the most cited keyword with 251 mentions in the selected articles published between 1966 and 2021, followed by “sustainable development” with 202 mentions during the same period. The third most frequently used keyword was “gender equality,” which implies that gender equality research has mostly centered on the issue of women and their presence in working place and top management. Among the top 20 keywords, there were seven strong keywords showing future trend related to gender diversity (“gender,” “gender equality,” “women’s status,” “gender issues,” “gender relations,” “women empowerment,” and “gender disparity”).

“Corporate social responsibility” and “sustainability” have also appeared as dominant themes within the extant literature. As illustrated in Fig. 8a and 8b, “gender diversity,” “sustainable development,” “gender equality,” and “corporate social responsibility” are the most important nodes in the network, revealing their relative standing in the field of BGD and CSR.

However, the weaker keyword nodes, such as board characteristics, accountability, climate change, gender issue, feminism, and equal opportunities have been understudied in the extant literature relating to BGD-CSR nexus.

4.8.2. Keyword Co-occurrence analysis

Fig. 9 shows the key word co-occurrence analysis and its associations. As with Vallaster et al. [67]; the threshold for keyword co-occurrence analysis was set to five. The closer the nodes are related to each other, the stronger the association between the keywords. The line linking two nodes indicates that the two keywords have been utilized in the same article. The larger node indicates the number of times the linked keywords co-occur in multiple articles. Hence, gender, sustainable development, gender equality, sustainability, gender equality, women status, corpore social responsibility, and corporate governance showed they have co-occurred in more articles compared to other associated pairs of keywords.

The keyword co-occurrence analysis structures the CSR and BGD research field into three clusters. The individual clusters resulted are colour-coded as per the subject areas. The clusters are characterized by the areas of research in which these keywords are frequently co-occurring. As depicted in Fig. 9, the keywords in red and blue clusters are interrelated than the green cluster. However, key word co-occurrence between red and green cluster are closer than the link between blue and green cluster.

The keywords in the red cluster are closer to research areas such as gender, sustainable development, gender equality, sustainability, gender equality, women status, gender relation, gender role, gender disparity, empowerment, and feminism. This implies that sustainability and the role of gender integrates into one cluster. The blue cluster are closer to corporate social responsibility, corporate governance, board of directors, board diversity, board composition, and ethics, while green cluster represents research areas such as women, united nation, human right, social policy, politics, women rights, and developing countries. However, these pairs of keywords do not appear are smaller than red cluster, indicating their growth in using in more articles are slow.

5. Discussion

The objective of this study to analyze developments in relating to board gender diversity (BGD) and corporate social responsibility (CSR) research and provide future researchers with new avenues for research in the field. The bibliometric analysis conducted in this study revealed several implications for BGD and CSR research, which facilitated the identification of the prevalent research gaps and identified the directions for future research.

First, this study shows that despite the overall paucity of research that links the two concepts of BGD and CSR, the publications linking them have been increasing gradually in number, particularly since 2010. As mentioned above, this finding may relate to the increasing importance placed on board diversity and CSR as a consequence of the huge corporate financial scandals that came to light during the financial crisis of 2009. The crisis caused a great financial loss to small investors because of the financial frauds committed by corporate leaders, and there was a demand for reforms in corporate law. This compelled corporate governance practitioners and academics to address the issue of board composition and compel the corporations to fulfil their responsibility toward the society. This demand led to the imposition of BGD and CSR.

The analysis of keywords was consistent with this finding. It revealed that gender, sustainable development, gender equality, and CSR were the most important themes concerning BGD and CSR. As such, the focus on gender diversity in the research conducted after 2009 emphasized its relevance for cultivating corporate governance and CSR.

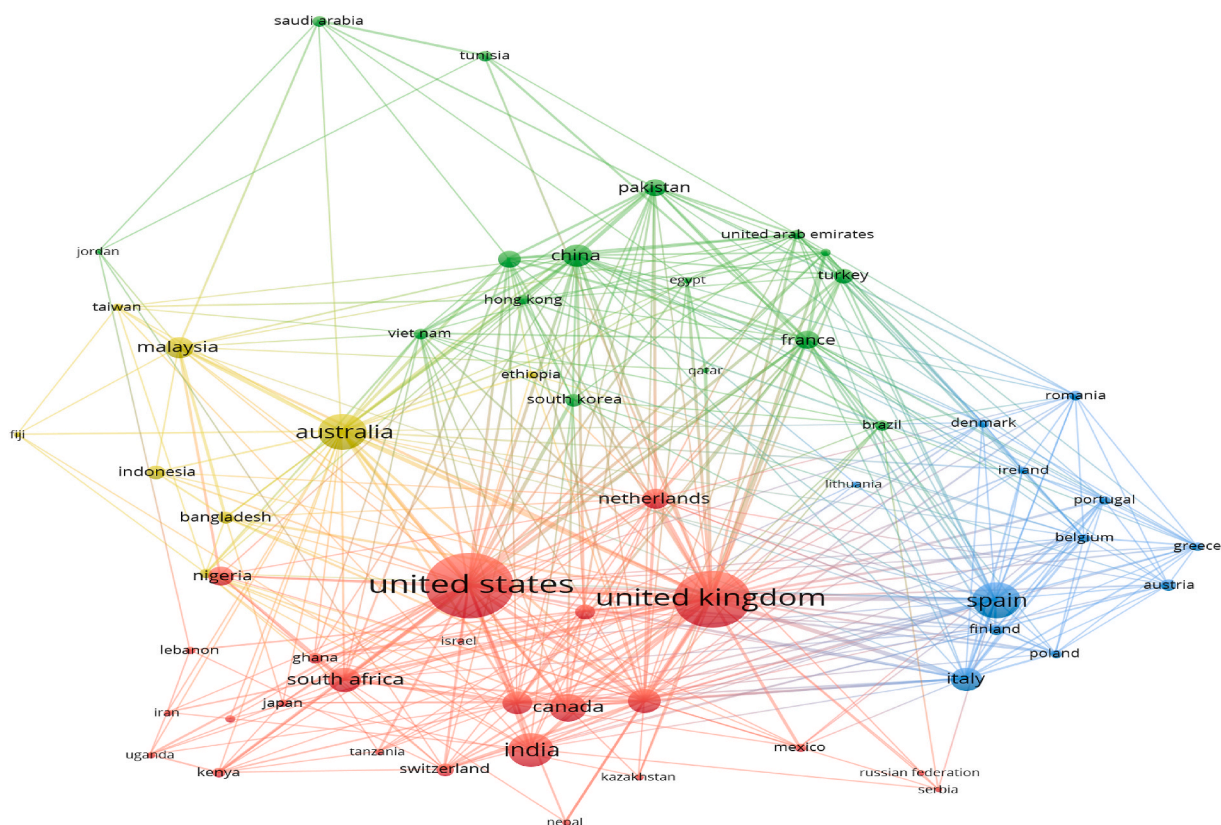


Fig. 8a. Country Co-authorship map.

The keyword co-occurrence analysis structured the CSR and BGD research field into three clusters. The keywords co-occurred in the red cluster are closer to research areas such as gender, sustainable development, gender equality, sustainability, gender equality, women status, gender relation, gender role, gender disparity, and feminism, implying that sustainability and the role of gender interrelated. The blue cluster are closer to corporate social responsibility, corporate governance, board of directors, board diversity, board composition, and ethics, while green cluster represents research areas such as women, united nation, human right, social policy, politics, women rights, and developing countries. However, these pairs of keywords are smaller than red cluster, indicating their slow growth in using in more articles.

Second, the analysis of articles revealed that, in terms of the number of citations, the three most productive articles were Campbell and Mínguez-Vera [47], Bear et al. [49] and Roberts et al. [51]. These studies focused on the link between board gender composition and firm performance, including CSR. A few more recent studies, such as Rao and Tilt [52] and Ben-Amar et al. [65], tended to interconnect BGD and CSR in terms of environmental responsibilities. As such, we conclude that more studies explicitly investigating the relationship between BGD and CSR should be conducted linking CSR and BGD due to their slow growth.

Third, the bibliometric analysis identified the most influential authors in the field to help other researchers to select a relevant line of research. The most productive authors were Martínez-Ferrero, García-Sánchez, and Pucheta-Martínez who focused more on gender diversity and the related firm outcomes, such as in terms of the quality of financial information. Pucheta-Martínez et al. [12] studied corporate governance, female directors, and the quality of financial information. They found a positive association among these variables. This is consistent with other bibliometric analyses of the relationship between female directors and the quality of financial information [27]. García-Sánchez focused more on the role of the board in sustainability or CSR performance with some emphasis on BGD. For example, in the study by Frias-Aceituno et al. [68]; García-Sánchez, who was the third author, found that the board has a role in the dissemination of integrated corporate social reporting. This finding is consistent with other bibliometric analyses on board and CSR or sustainability reporting [20]. These findings imply that more studies are needed for a more comprehensive understanding of the relationship between BGD and CSR. The work by even the most productive authors shows that the research on this relationship is still at a nascent stage.

Co-authorship analysis, however, did not show a well-established collaboration between authors in the domain of CSR and BGD, except to collaboration between García-Sánchez I.-M. and Martínez-Ferrero J. and between Uyar A. and Karaman A.S. Accordingly, it reveals the collaboration between authors in conducting research in the domain of BGD and CSR is still lacking, suggesting further research in collaboration of different authors in the field of CSR and BGD.

Fourth, the analysis of journals revealed the most relevant and productive publications in the field. This will help future researchers

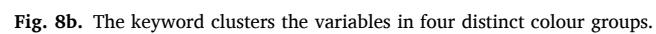


Table 12
Themes of BGD and CSR by keyword.

Rank	Keyword	Occurrence	Rank	Keyword	Occurrence
1	Gender	251	11	Ethics	64
2	Sustainable development	202	12	Gender diversity	63
3	Gender equality	187	13	Female	63
4	Corporate social responsibility	180	14	Gender issue	62
5	Sustainability	174	15	Gender role	57
6	Corporate governance	171	16	Gender relations	56
7	Women's status	140	17	Women empowerment	53
8	Empowerment	126	18	India	53
9	Women	99	19	Sustainable development goals	52
10	Board of directors	79	20	Gender disparity	52

undertaking studies on BGD and CSR to select the most relevant journals. The most cited journals were sustainability-focused (*Sustainability [Switzerland]*, *Journal of Business Ethics*, and *Corporate Social Responsibility and Environmental Management*), followed by other journals such as *Journal of Cleaner Production*, and *Business Strategy and the Environment*, which also focus on sustainability research. Moreover, according to the 2018 impact factor (IF) scores, *Journal of Cleaner Production* (IF: 5.651), *Business Strategy and the Environment* (IF: 5.355), and *Corporate Social Responsibility and Environmental Management* (IF: 4.918) were the most impactful journals, followed by *Journal of Business Ethics* (IF: 2.917). This clearly shows that BGD and CSR are drawing a growing attention in business strategy and sustainable development research. This is consistent with previous studies that were published in business and sustainable development-focused journals [27,31]. Despite this growing impact, more studies that combine the concepts of BGD and CSR are required in journals with higher IF scores.

Nonetheless, source co-citation analysis showed a contradictory result in comparison to the most productive journals discussed above. Accordingly, only three sources such as *Journal of business ethics*, *Corporate governance: an international review*, and *Academy of management journal* were the top-ranking journals in term of source co-citation. They are productive sources citing in more than two journals. This indicates existing journals ought to be further expanded more research in CSR and BGD to enhance their source co-citations. Source co-citation analysis further revealed three major displayed clusters. The journal source in the red colour is the biggest clusters (Cluster 1). However, the size of cluster 2 and 3 reveal that they are still in the initial phase research relating to CSR and BGD subjects with no adequate amount references from cluster 1 source co-citation in the domain.

Moreover, it was revealed that research sponsoring organizations, such as the European Commission, National Natural Science Foundation of China, UK Research and Innovation, Social Science and Humanities Research Council of Canada, and United States Agency for International Development were the top funders of the BGD and CSR research. It can be seen that research institutions contributing to the largest number of BGD and CSR studies are established in Europe, China, the UK, Canada, and the US, which are the regions and countries where the largest corporations are headquartered. The growing trend of financing studies on BGD and CSR and the number of times these studies are cited, which is significantly high, show that there is an increasing interest in BGD and CSR in the countries where the funding institutions are located. This establishes such countries as the most productive sponsors.

This analysis also revealed that the majority of BGD and CSR research has been conducted in developed countries, such as the US and UK. The finding was consistent with Low and Siegel (2020). However, BGD and CSR research is still at a nascent stage in developing countries. Only four developing countries (China, India, Bangladesh, and Lebanon) appear among the top 20 productive countries. Hence, future researchers should particularly explore the link between BGD and CSR in the context of developing countries.

The analysis of recent studies also revealed that the most of the studies relating to CSR and BGD undertaken in the context of developing countries have been limited to China (Ali et al., 2019 [69–71]), followed by Vietnam [72–75]; Thu and Khanh 2021b. Most of these studies have linked CSR to quantitative measures, such as firm's performance [71,76–78]; Thu and Khanh, 2021b, earnings management [71], agency cost [72], trade receivables [69,74], and risk-taking [73].

Only a few studies, however, explored the BGD in developing countries and they have been limited in developing countries, such as China [69,70] and Vietnam [72], gulf countries, such as Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the UAE [79–82].

The BGD-CSR nexus in developed countries such as USA and UK tend to be positive [65,83,84] whereas studies showed the BGD-CSR nexus would be stronger in the firms located in North America than firms located in Asia and developing countries [85,86]. However, the current literature still suggests a paucity of empirical evidence linking the concept of BGD and CSR in developing countries [79–82,87].

Country co-authorship also denoted that the United Kingdom, United States, Germany, South Africa, Netherlands, Norway, Sweden, Switzerland, and India are the most active countries in term of country co-authorship than other countries. It thus inferred more research has cooperatively been undertaken in developed countries than in developing countries.

6. Conclusions and limitations

BGD and CSR have been attracting increasing attention in business research because of the importance that sustainability has gained in the current era. However, the evolution of knowledge in these fields and their connections remain unclear. This study contributes to the literature by providing the first comprehensive bibliometric review of BGD and CSR studies, focusing on the most productive articles, authors, journals, institutions, sponsors, and countries, and keyword analysis. The study revealed that journal



Fig. 9. Keyword co-occurrence network map.

articles relating to BGD and CSR had been growing gradually until the number began rising significantly since 2010. “Gender,” “gender equality,” “sustainable development,” and “corporate social responsibility” are the central themes and widely used keywords in BGD and CSR research.

According to citation analysis, three clusters were identified. Cluster 1 tended to be highly focused on board composition and structure, and Cluster 2 mainly tended to link board composition to CSR or philanthropy. However, Cluster 3 (the most recently published articles) focused more on the impact of gender diversity on CSR or sustainability initiatives. The study also found that key research institutes and sponsors are largely established in Europe, China, the UK, Canada, and the US. Thus, developed countries were the most influential in BGD and CSR research. Hence, there is a need for conducting more studies on the linkages between BGD and CSR in developing countries.

This study has a few limitations. First, the bibliometric analysis did not include the complete sample of relevant papers as the data were sourced only from the Scopus database (Elsevier). Second, this study included only English-language articles, which probably skews the results in favor of certain countries. Third, only papers from peer-reviewed journals were considered in this study, which potentially limits the scope of the analysis. Fourth, citation analyses considered the number of citations of the articles. This method is likely to be biased in favor of previously published papers, as they have had a longer period of time to accrue citations than the recently published papers. Due to the above-mentioned limitations, this bibliometric analysis has overlooked some of the important studies of the recent times that may have shed light on more aspects of the linkages between BGD and CSR.

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