

Article

Research Trends in Corporate Social Responsibility and Innovation: A Bibliometric Analysis

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Abstract: The relationship between corporate social responsibility (CSR) and innovation has received considerable attention in the last two decades. While several studies have explored the impact of CSR on innovation. While several studies have explored the impact of CSR on innovation, few studies have attempted to use bibliometric methods to analyze and visualize the evolution and trends in the CSR and innovation fields. In this research, 1279 Web of Science (WoS) published papers on CSR and innovation were collected and analyzed using VOSviewer, CiteSpace, and Bibliometrix R-package and the MK trend test. The analysis was conducted in terms of the number of articles published per year, most productive journals, authors, and countries, as well as collaboration between countries and authors, keyword analysis, co-citation clustering analysis, and research frontiers. The results showed that: (a) The MK trend test shows that the amount of CSR and innovation research is increasing. The top three journals in terms of productivity are *Sustainability*, *Journal of Cleaner Production*, and *Corporate Social Responsibility and Environmental Management*. The collaboration between authors forms a loose network and Ahmad, N has the most extensive network of international collaborations. There is close cooperation between countries, with a predominance of Asian, European, and North American collaborations, and the MK trend test shows that each country's publications on the relationship between corporate social responsibility and innovation in the past 20 years have an obvious upward trend. (b) Through the analysis of keywords, it is necessary to research "corporate social responsibility", "sustainability", "innovation", "financial performance", and other topics associated with these themes. (c) The intellectual structure of CSR and innovation establishes five core clusters, including social innovation, CSR practice, sustainable global value chain, sustainable business model, and buyer-supplier collaboration. (d) Two forward-looking directions for future CSR and innovation research are proposed, and the limitations of the research are discussed.

Keywords: corporate social responsibility; innovation; bibliometric analysis; research trends

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1. Introduction

In recent years, corporate social responsibility (CSR) has received widespread attention from scholars and companies alike. The European Commission defined CSR essentially as "a concept whereby companies decide voluntarily to contribute to a better society and a cleaner environment" [1]. In addition, the Millennium Development Goals (UN, 2005) [2], as well as the ISO26000 Global Network of Stakeholders (UN, 2018) [3], established to promote CSR and sustainable development, have demonstrated their commitment to CSR. These advances have brought CSR to many regional and international organizations.

The Introduction of new directions in the field of research combining CSR and innovation by countries to maintain a competitive position in the globalized world economy has led to an expansion of the existing literature in this field [4]. This is since innovation is driven not only by the development of new technologies and skills, but also by the global focus on CSR issues. Today, for companies to succeed and innovate, they must consider the social and environmental impact of their operational processes, stimulate the creativity of their employees, and collaborate with their suppliers, customers, and other business

partners to design and develop new and innovative products and services, which closely link corporate social responsibility and innovation.

The relationship between CSR and innovation has been studied for almost 20 years, and many scholars have achieved fruitful results during this period. In 2001, official documentation showed the significance of the connection between CSR and innovation [1]. However, there is disagreement regarding how CSR and innovation are related [5]. Wagner [6] noted that although many academics agree theoretically that there is a connection between CSR and innovation, empirical research is limited and only leads in one direction—from CSR to innovation. According to other writers, this connection is a positive feedback cycle that finally results in the tightly integrated use of CSR and innovation on the company's path to maturity [7]. Therefore, the recent increase in research on CSR [8,9] and innovation [10–12], indicates that these research areas have developed rapidly in recent years. The relationship between CSR and innovation is multidisciplinary and multidisciplinary [13–15], and case studies and empirical studies from a single perspective may not provide a comprehensive understanding of the relationship between CSR and innovation, and no scholars have been found to have completed a systematic review and bibliometric analysis of the research in this area. Therefore, this paper aims to summarize the current research on CSR and innovation by combining bibliometric methods, analyzing the research structure and quantitative information in this field comprehensively, and providing a visual mapping to outline the overall framework of research in this field for scholars, and show the focus of research in this field, this year's development trend and predictions for the future. Specifically, the following research questions (RQs) are posed:

1. What is the status of publication on CSR and innovation?
2. What are the most productive journals, authors, and countries in the field of CSR and innovation? What are the authors and the trends of cooperation between countries?
3. What are the “hot spots” in CSR and innovation and how have these “hot spots” evolved over time?
4. What is the knowledge structure between CSR and innovation?
5. What are the future research directions in the field of CSR and innovation?

2. Materials and Methods

This paper presents a bibliometric analysis of CSR and innovation, including an analysis of the evolutionary trends in the field over the years, publications, authors, national collaborations, cluster analysis, and research perspectives. The rationale for the choice of bibliometric analysis is as follows:

1. The bibliometric analysis employs computer analysis using mathematical, statistical, and graphical tools, to accurately analyze large amounts of data over a period of time [16].
2. It provides research ideas for researchers in the world who are studying core literature and core clusters [17].
3. The tools VOSviewer [18], CiteSpace [19], Bibliometrix R-package [20,21], and the Mann–Kendall (MK) trend test [22] used for bibliometric analysis, allow the reader to understand the development and evolution of the research field clearly and intuitively, and also increase the interest of scholars studying this field and contributing to it.

2.1. Data Collection

Using the statistical tools VOSviewer, CiteSpace, and bibliometrix R-package, 1279 articles on CSR and innovation were analyzed to determine the research's evolution, current state, and outlook for the future in the field. All articles on CSR or innovation published in the Web of Science Core Collection™ were analyzed for this study [23]. Because Web of Science (WoS) publications are considered the most acceptable database for collecting and analyzing scientific papers [23,24], and it also has a large number of journals and papers that all meet the peer review requirements [25].

The search for the study was conducted In January 2022, so the data collected were all data up to 31 December 2021. It should be noted that when searching for research topics in the field of CSR and innovation, two articles from 1997 and 1999 were removed because their content did not fit the field, so the research in this field started in 2002, that is, the article's study period is from 2002 to 2021.

Figure 1 shows the logical sequence used to obtain the data to be studied. First, only original papers and reviews are included. Conference proceedings papers, online publications, book chapters, editorial material, and books are excluded. Second, non-English articles were removed [26,27]. Finally, articles that were not relevant to the study topic were removed. A total of 1297 articles were identified for the final study.

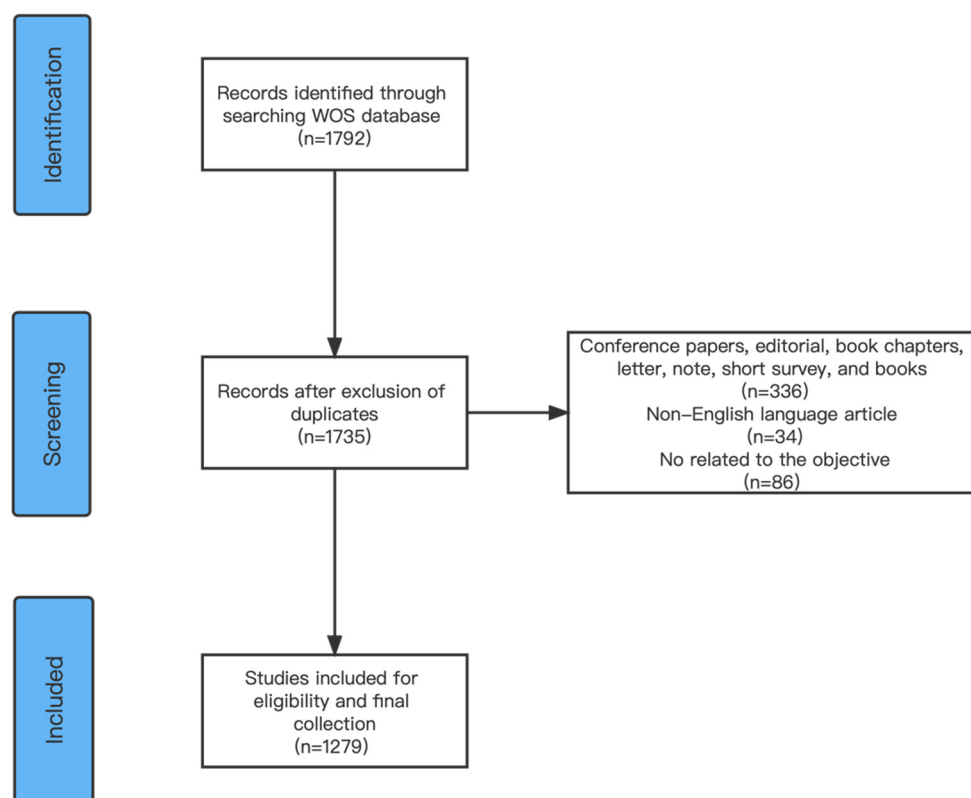


Figure 1. The flowchart of data selection.

2.2. Bibliometric Analysis

In this paper, four types of analyses of the data were performed using statistical software: (a) journal, author, and country analysis, (b) keyword analysis, (c) cluster analysis, and (d) research frontier analysis.

The first analysis is an analysis of journals, authors, and countries that will provide information about the most productive journals, authors, and countries for the study (RQ2). To achieve this goal, first, all data were analyzed to filter the top ten journals, authors, and countries and to analyze the important indicators associated with them. Secondly, a network diagram of the collaboration between authors was presented using VOSviewer, which was color-coded into different clusters and illustrated using a table for the different clusters. Third, the bibliometrix R-package and the MK trend test were used to analyze the collaboration between countries.

In the second analysis, a collaborative analysis was conducted using the software VOSviewer and bibliometrix R-package to identify the hot topics of research in the field of CSR and innovation in the last 20 years (RQ3). First, keywords were analyzed using the software VOSviewer, and keyword co-occurrence was used to analyze the most popular and emerging topics in the CSR and innovation knowledge base. Second, the bibliometrix

R-package was used to divide the collected articles from 2002 to 2021 into four phases, each spanning five years: (a) 2002–2006, (b) 2007–2011, (c) 2012–2016, and (d) 2017–2021. Then, a quantitative analysis of keywords was conducted for each phase.

The third analysis was a cluster analysis using CiteSpace software to identify the knowledge structure of research in the field of CSR and innovation (RQ4). It is worth noting that the knowledge structure can represent the main research directions in a given research area [28]. To determine the knowledge structure of research in the field of CSR and innovation, a co-citation cluster analysis was used. First, in the CiteSpace software, the node type “Reference” was selected, referring to the selected start time of January 2002 and end time of December 2021, to generate a clustering map based on co-cited literature. Second, the keywords extracted from the co-cited literature were clustered, and this co-cited literature was grouped into different clusters. Third, each co-cited literature is in a cluster with the co-cited literature related to it.

The last type of analysis was performed using CiteSpace software to predict emerging trends and future research in the field of CSR and innovation (RQ5). First, the keywords were visualized. Second, 20 burst keywords were generated and analyzed.

3. Results

3.1. Publications by Year

We analyzed publication trends from 2000 to 2021. Figure 2 shows the publication trend in the number of articles on CSR and innovation from 2000 to 2021. Only about 10% of the articles were published between 2002 and 2013 (134 out of 1279); it is after 2013 that the number of publications shows a clear increasing trend. This is close to the release of ISO 26000 in 2012, an international standard that provides guidance on the responsibility of organizations for the impact of their activities on society and the environment. The upward trend also indicates that these topics are receiving academic attention, especially in recent years. In addition to, 94% of the articles (1200 out of 1279) were published in the last decade (2012–2021), while 77% of the total articles (985 out of 1279) were published in the last 5 years (2017–2021). This demonstrates the novelty of research on CSR and innovation. Overall, the increase in the number of publications on CSR and innovation over time reflects the recognition by scholars of the importance of the field of CSR and innovation. There is no indication that interest is waning. Figure 3 shows the results of the MK trend test for the trends in the number of CSR and innovation publications from 2000 to 2021 has a significant upward trend.

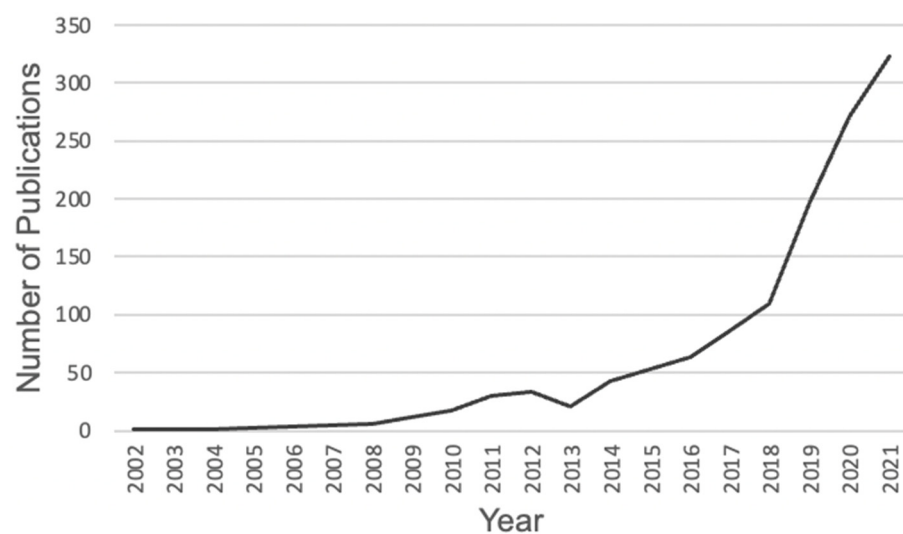


Figure 2. Publications associated with CSR and innovation on a yearly basis.

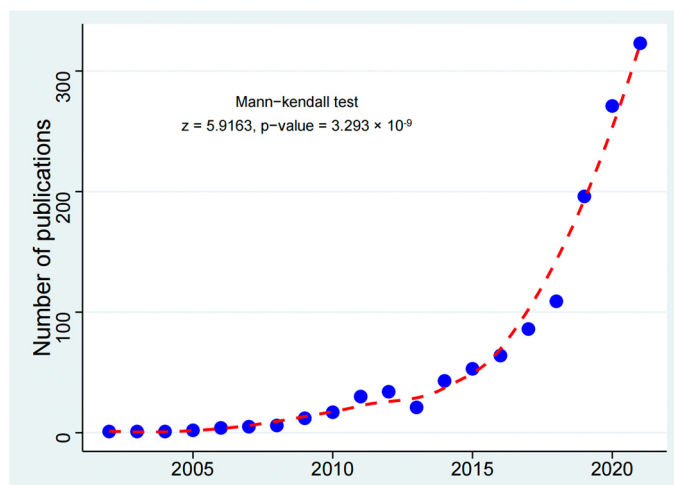


Figure 3. Results of the MK trend test for the number of publications in different years.

Figure 3 shows the results of the MK trend test for the trends in the number of CSR and innovation publications from 2000 to 2021. The MK statistic z-values of annual CSR and innovation publication numbers were calculated to obtain the correlation significance level (p-value). The results show that the time series data have a significant upward trend at the 99% confidence level ($z \geq 2.576$).

3.2. Analysis of Scientific Production by Areas: Journals, Authors, and Countries

3.2.1. Distribution of Publications by Journal

This section presents the distribution of publications from different journals. Table 1 shows the top 10 journals publishing in the field of CSR and innovation. It is worth noting that they are all in the first quartile (Q1) of the SJR 2021 index. These journals have a total of 514 articles, representing 40% of all articles published in this research area.

Table 1. Ranking 10 journals with the highest scientific production.

Journal Name	A	Percentage	SJR	C	First Article	Last Article	Article Number			
							2002–2006	2007–2011	2012–2016	2017–2021
Sustainability	157	12.28%	Q1	Switzerland	2013	2021	0	0	10	147
Journal of Cleaner Production	80	6.25%	Q1	United Kingdom	2008	2021	0	2	15	63
Corporate Social Responsibility and Environmental Management	70	5.47%	Q1	United Kingdom	2011	2021	0	1	7	72
Journal of business ethic	67	5.24%	Q1	Netherlands	2002	2021	3	19	22	23
Business Strategy and the Environment	49	3.83%	Q1	United Kingdom	2012	2021	0	0	7	42
Journal of Business Research	28	2.19%	Q1	United States	2013	2021	0	0	9	19
Social Responsibility Journal	18	1.41%	Q1	United Kingdom	2017	2021	0	0	0	18
Management Decision	16	1.25%	Q1	United Kingdom	2008	2021	0	3	5	8
Technological Forecasting and Social Change	15	1.17%	Q1	United States	2015	2021	0	0	3	12
International Journal of Environmental Research and Public Health	14	1.09%	Q1	Switzerland	2018	2021	0	0	0	14

Table 1 shows the top 10 journals publishing articles in the area of CSR and innovation. It was found that 1279 articles related to this topic were published in 86 journals. The journal with the highest output was “Sustainability”, which published 12.28% of the sample articles, followed by “Journal of Cleaner Production” (80, 6.25%), “Corporate Social Responsibility and Environmental Management” (70, 5.47%), “Journal of business ethic” (67, 5.24%) and “Business Strategy and the Environment” (49, 3.83%). Moreover, only “Journal of business ethic” has been published continuously for four five-year periods, and it is the first journal to include articles on this field, while “Social Responsibility Journal” and “International Journal of Environmental Research and Public Health” started to receive articles in this field only in the last five years. The above shows that this research topic has attracted the attention of the research community. Finally, it is worth noting that 70% of scientific journals belong to EU member states, while the remaining 20% are in the United States and 10% are from Switzerland, while no other continent has any journals in the most productive journals.

3.2.2. Author Productivity

The aim of this section is to show the authors with high productivity and the collaboration between them based on co-authorship metrics. Thus, Table 2 shows the 10 most productive researchers in the analysis of CSR and innovation-related articles from 2000–2021.

Table 2. Top 10 of most productive authors.

Authors	A	TC	Institution	C	First A	Last A
Gallardo-Vazquez, D	7	86	Technol Inst Sonora	Mexico	2017	2021
Ahmad, N	6	82	Univ Cent Punjab	Pakistan	2017	2019
Garcia-Sanchez, IM	6	240	Univ Salamanca	Spain	2011	2021
Kumar, A	6	34	London Metropolitan Univ	United Kingdom	2019	2021
Liu, Y	6	63	Aalto Univ	Finland	2017	2021
Adomako, S	5	65	Univ Bradford	United Kingdom	2020	2021
Blok, V	5	179	Wageningen Univ	Netherlands	2015	2021
Gallego-Alvarez, I	5	293	Univ Salamanca	Spain	2011	2021
Pinkse, J	5	67	Univ Manchester	United Kingdom	2015	2021
Poussing, N	5	216	Luxembourg Inst Socioecon Res	France	2013	2019

First, the authors with more than four publications are Gallardo-Vazquez, D (7), Ahmad, N (6), Garcia-Sanchez, IM (6), Kumar, A (6), Liu, Y (6), Adomako, S (5), Blok, V (5), Gallego-Alvarez, I (5), Pinkse, J (5), and Poussing, N (5). The most prolific author is Gallardo-Vazquez, D from the Technol Inst Sonora institution, while Garcia-Sanchez, IM and Gallego-Alvarez, I are the two most cited authors, and they are also the authors who have studied the field for the longest duration. In addition, Ahmad, N and Poussing, N have not published in this field since 2019.

Second, among the ten most productive researchers, three are from the UK, two are from Spain, and the other five are from different countries.

Third, Figure 4 shows a map of collaboration between lead authors publishing in CSR and innovation based on co-authorship analysis. These papers were entered into the VOSviewer, which grouped the authors into clusters in Table 3. Each color represents a different cluster, and the size of the circle represents the number of articles published by each author, the larger the circle the higher the number of publications. It can be observed that the network is rather fragmented, and the clusters are not strongly connected. Among the most productive authors in Table 2, only Ahmad, N has a stable network of international collaborations, which may be more conducive to the rapid development of the field. As for the other authors, Sial, Muhammad Safdar, and Scholz, Miklas have also developed an international collaborative network on CSR and innovation.



Figure 4. The network of cooperation, based on the co-authorship of the main author.

Table 3. Clusters on co-authorship for scientific production.

Cluster 1 Red	Cluster 2 Green	Cluster 3 Blue	Cluster 4 Yellow
Alvarez-Otero, Susana	Husain, Shahid	Arshad, Muhammad Z.	Cheng, Guping
Cherian, Jacob	Khan, Mohammed Arshad	Han, Heesup	Fu, Qinghua
Comite, Ubaldo	Liu, Xintao	Jafri, Syed Khuram Ali	Rabbani, Mustafa Raza
Fan, Xu	Olah, Judit	Khan, Waris Ali	Sun, Huidong
Li, Beili	Popp, Jozsef	Sabir, Raja Irfan	Zia-Ud-Din, Malik
Sial, Muhammad Safdar	Yucel, Ali Gokhan	Scholz, Miklas	
Vasa, Laszlo	Zhang, Boyao	Ullah, Zia	
Cluster 5 Purple	Cluster 6 Light blue	Cluster 7 Orange	
Ahmad, Naveed	Badulescu, Alina	Adnan, Mohammad	
Ahmed, Rahil Irfan	Badulescu, Daniel	Guo, Mengneng	
Usmani, Muhammad S.	Khan, Farman ullah	Khalil-Ur-Rehman	
Yan, Cheng	Ullah, Sajid	Naveed, Rana Tahir	
Zhao, Guohao			

3.2.3. Productivity of Countries

Table 4 shows the countries with the highest productivity in the field of CSR and innovation for the period 2002–2021. First, the analysis shows that the countries of origin are more dispersed, with 50% in Europe (Spain, Italy, UK, Germany, and the Netherlands), followed by 20% in the Americas (USA and Canada), 20% in Asia (China and Korea) and 10% in Oceania (Australia). Second, China has the highest number of publications (241), followed by the United States (129) and Spain (111). Finally, it is worth noting that although China is the country with the highest number of published articles (17.69% of published articles), the number of citations to papers is much lower than that of the United States, which far exceeds the number of citations to all countries.

Table 4. Top 10 of the most productive countries in the number of articles.

R	Co-Authorship by Countries	Number	% of 1279	Total Citations	Average Article Citations
1	China	241	17.69%	3778	15.68
2	USA	129	9.47%	9648	74.79
3	Spain	111	8.15%	2309	20.80
4	Italy	83	6.09%	1536	42.88
5	United Kingdom	82	6.02%	3516	18.51
6	Australia	46	3.38%	1302	28.30
7	Germany	35	2.57%	1146	32.74
8	Canada	34	2.50%	1434	42.18
9	Netherlands	34	2.50%	793	23.32
10	Korea	33	2.42%	333	10.09

Figure 5 shows the results of the MK trend test for the top 10 of the most productive countries in the number of articles. Calculate the MK statistic Z value for the top 10 of the most productive countries and obtain the associated significance level (p -value). The results show that the time series data for each country has a clear upward trend at the 99% confidence level ($z \geq 2.576$).

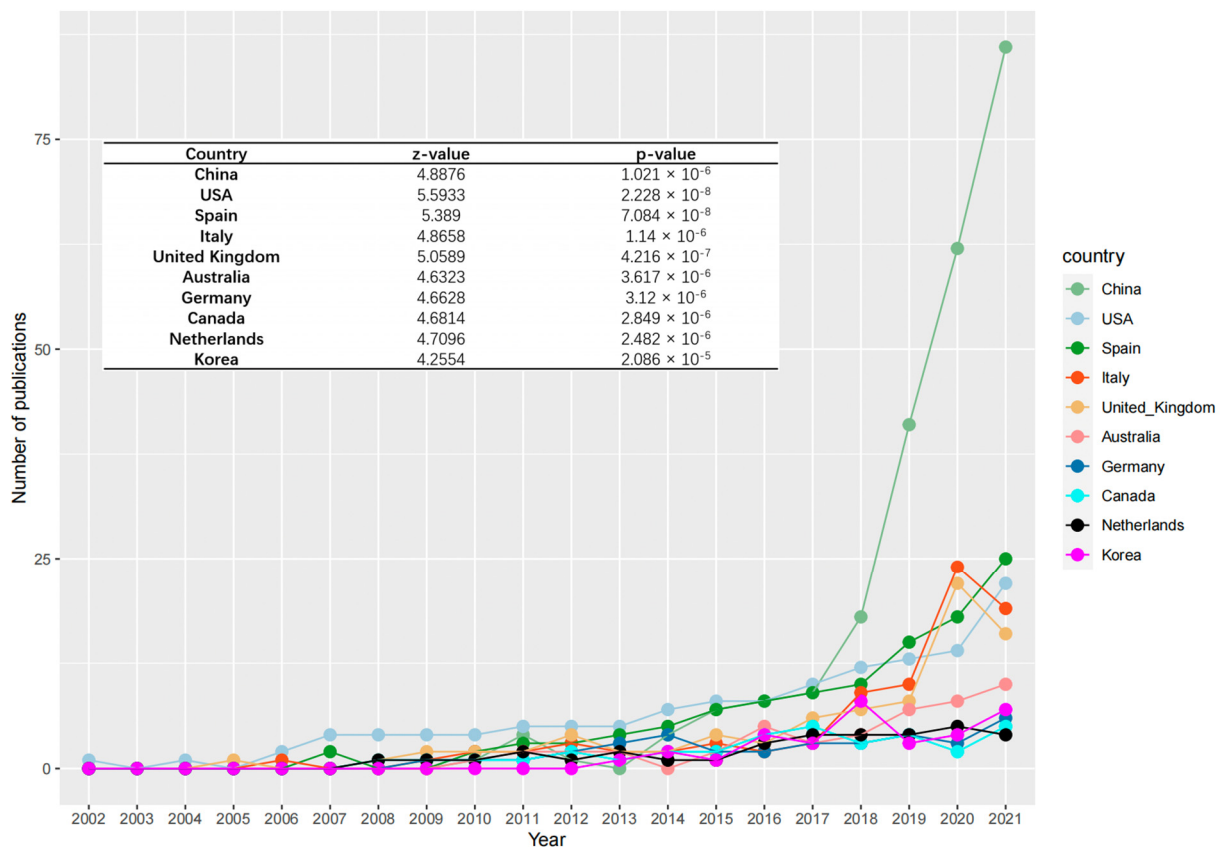
**Figure 5.** Results of the MK trend test for the top 10 of the most productive countries in the number of articles.

Figure 6 shows the level of cooperation between participating countries in the field of CSR and innovation for the period 2002–2021. The intensity in blue indicates the number of articles published, and the thickness of the pink line indicates the intensity of cooperation with other countries. As can be seen from the graph, China has large-scale cooperation with other countries, followed by the UK and the US, which also cooperate more with other countries.

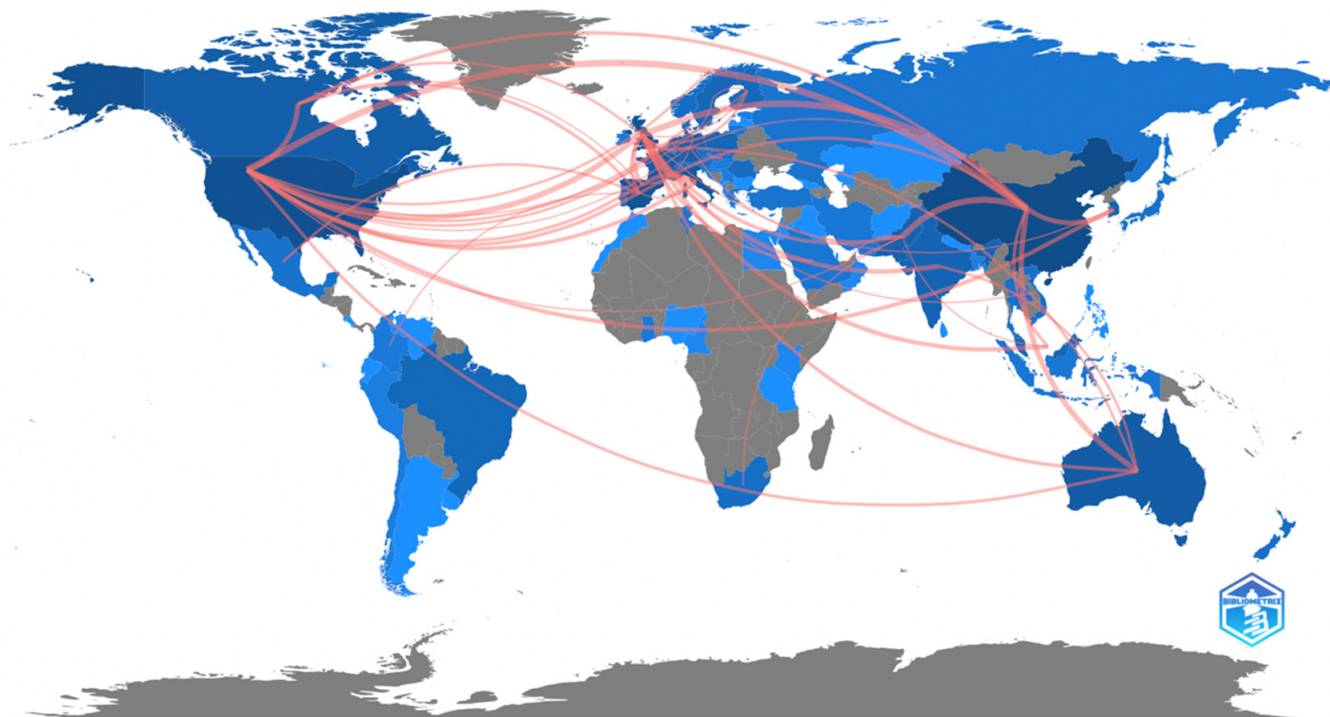







Figure 6. International research collaboration map in original articles.

Figure 7 shows the number of articles published in collaboration with authors from different countries as well as the number of articles published in collaboration with authors from the same country. It can be observed that, first, except for Germany and Canada, there are more articles in which researchers from the same country collaborate than the number of collaborations with other countries. This indicates that the rate of collaboration between countries is relatively low. Second, among the countries that collaborated with authors from other countries on publications, China tops the list (75 articles), followed by the United Kingdom (37), the United States (34), and Italy (26). Finally, it should be pointed out that Australia, Germany, Canada, and South Korea have a generally consistent number of articles published in collaboration with different countries and with national authors.

3.3. Keyword Analysis

This section generated a keyword co-occurrence network as shown in Figure 8. This analysis was implemented with VOSviewer, using the color of the nodes to distinguish the different clusters, the size of each circle representing the frequency of keyword occurrences, and the distance of the circles representing the relevance of the keywords. For the keyword selection, at least seven interactions were identified, resulting in the identification of 92 keywords. Thereby, eight clusters of each different color were generated to identify the focus of the study. As shown in Table 5, the red cluster highlights the importance of “firm performance” and consists of 17 projects. The green cluster, which is organized around “sustainability” and “innovation,” consists of 13 items. Three is the blue cluster with 12 items. Four is the yellow cluster with 11 items associated with “sustainable development. Five is the purple cluster, which focuses on “corporate sustainability” with 10 items. Six is the light blue cluster, which is associated with “CSR” with 11 items. Seven is the orange cluster, which is closely related to “stakeholder engagement”. Eight is the pink cluster, which focuses on “corporate social responsibility”.

Table 5. The details of keywords in clusters.

Cluster	Color	Keywords
1		competitive advantage, competitiveness, eco-innovation, economic performance, environmental innovation, environmental performance, environmental policy, financial performance, firm performance, firm value, green innovation, institutional theory, manufacturing industry, Pakistan, product innovation, social responsibility, tourism
2		entrepreneurship, environmental sustainability, innovation, innovativeness, knowledge management, organizational performance, smes, social entrepreneurship, strategy, supply chain management, sustainability, sustainable entrepreneurship, triple bottom line
3		corporate governance, corporate social responsibility, esg, ethics, governance, industry, intellectual capital, performance, research and development, responsible research and innovation, stakeholders, technological innovation
4		circular economy, corporate responsibility, dynamic capabilities, environmental regulation, family firms, innovation performance, organizational learning, r&d, sme, sustainable development, sustainable development goals
5		business ethics, case study, collaboration, corporate citizenship, corporate sustainability, environmental management, food industry, small and medium enterprises, supply chain, sustainable business model
6		csr, entrepreneurial orientation, environment, Ghana, market orientation, regulation, responsible innovation, small and medium-size enterprises, stakeholder, value creation
7		business model, business strategy, climate change, content analysis, creating shared value, open innovation, organizational culture, stakeholder engagement, sustainability reporting, sustainable innovation
8		China, corporate social responsibility, emerging markets, environmental responsibility, resource-based view, service innovation, social innovation, stakeholder management, stakeholder theory

On the other hand, Figure 8 shows that the most frequently used keyword is “corporate social responsibility”, corresponding to cluster 8, with 405 occurrences. Subsequently, “sustainability” and “innovation” ranked first and second in cluster 2 with 173 and 149 occurrences, respectively. These three keywords are closely interconnected with most of the keywords, and most of the other clusters are extensions of them. Moreover, the keywords in the study of CSR and innovation areas show different industries, such as “manufacturing industry”, “food industry” and “tourism”, as well as the different countries “Pakistan”, “Ghana” and “China”, showing that the study is distributed in different fields and different countries. Finally, keywords about the environment are repeated, such as “environmental regulation”, “climate change”, “sustainable innovation”, “environmental responsibility”, etc., and the repeated repetition of the economic terms “financial performance”, “circular economy”, “business strategy”, etc., shows the importance of corporate social responsibility and innovation research to the environmental and economic fields.

3.4. Evolution of CSR and Innovation Research from 2002 to 2021

Figure 9 presents an alluvial diagram of the thematic evolution of research in the field of CSR and innovation over the last 20 years in different time phases. The time frame is divided into four phases, each spanning 5 years, represented in blocks. The first phase (2002–2006) was the initial phase of research in the field, with only one cluster of “corporate social responsibility”, while the second phase (2007–2011) was the breakthrough phase of the field, growing to six clusters, with the addition of research on “smes”, “sustainability development”, “corporate social performance”, “innovation” and “CSR”. The third phase (2012–2016) is the rapid development of the field, with 14 clusters and the addition of new clusters such as “entrepreneurial orientation”, “collaboration”, and “service innovation”. The fourth stage is the maturing stage, where many clusters are gradually integrated,

with “sustainability”, “corporate social responsibility”, “financial performance” and “green innovation” as the main research objects.

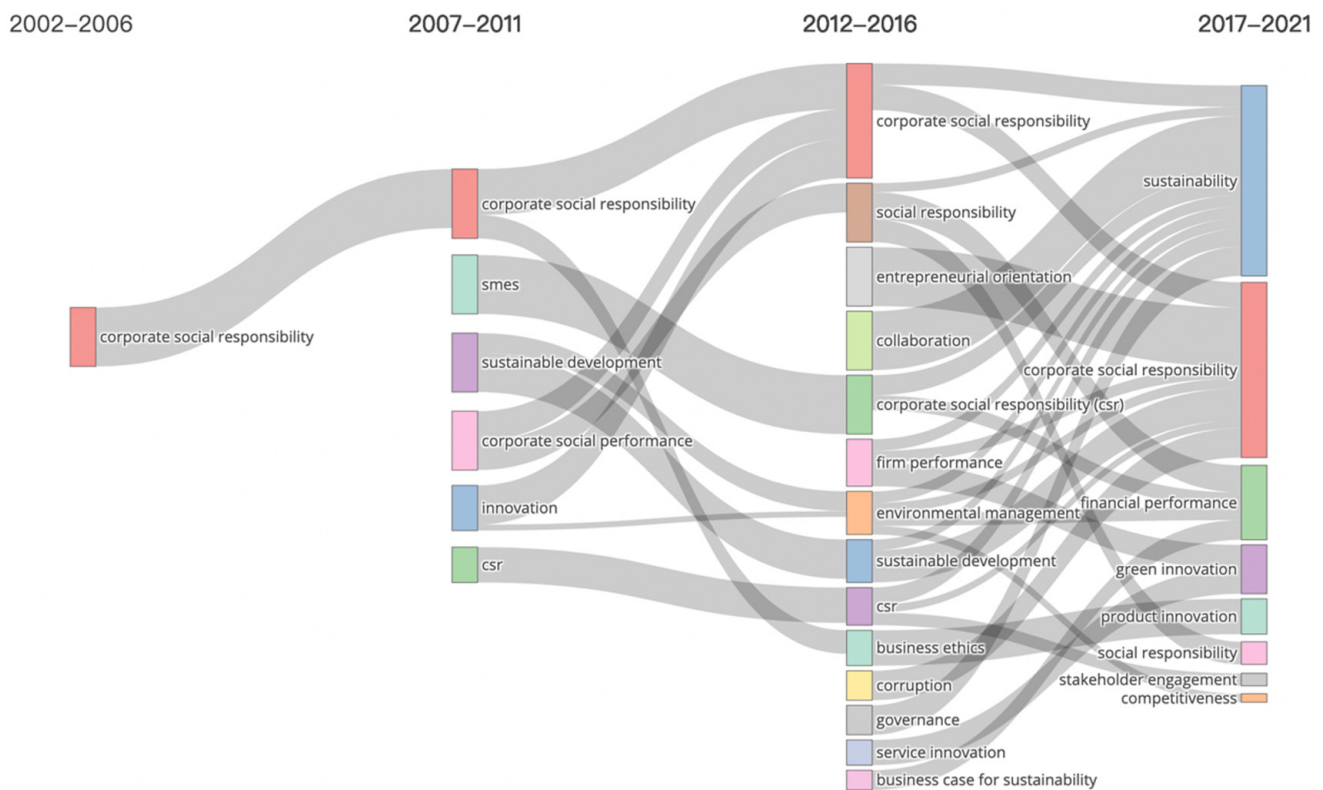


Figure 9. The alluvial diagram of the keyword.

It is also shown in Figure 9 that there are multiple curve variations between blocks, which lead to the merging of subsequent phases and the formation of new clusters. First, the alluvial diagram shows the various variations between the blocks in the three phases from 2002–2016. Most of these curve flows are eventually combined with “corporate social responsibility” and “sustainability” in the final phase of 2017–2021. Secondly, the dominance of CSR has been evident from 2002 to 2016, while innovation became the main cluster in the 2007–2011 period, with a break after 2011, which does not mean that research on this topic stopped, but rather that it merged with the CSR and environmental management clusters to form other new research topics. Third, from the first phase of 2002–2006, there was only one keyword “corporate social responsibility” to the next three phases, which added “innovation”, “sustainability”, “sustainable development”, “firm performance” and “green innovation”, showing that research in this area is continuing to develop rapidly. Finally, it is worth noting that the research on innovation is diversifying into “service innovation”, “green innovation” and “product innovation”.

3.5. Intellectual Structure of CSR and Innovation Research

Citation–author co-citation analysis is based on the combination of cited authors and references between different articles [29,30] and can therefore be used to identify the research focus of a specific field and the influential authors in that field. This conclusion uses CiteSpace to analyze the co-citation relationships in the collected dataset. First, CiteSpace was used to generate authors and article years by setting the node type to “reference” [31]. Second, the most popular terms were extracted from the abstracts of the most cited articles within the clustering labels as clustering criteria, and the visual clusters in Figure 8 were generated. Finally, additional content analysis was performed on the authors’ high-frequency co-cited articles and journals, as shown in Table 6.

This section analyzes the largest and most representative top five clusters, i.e., cluster 0 (social innovation), cluster 1 (CSR practice) cluster 2 (sustainable global value chain), cluster 3 (sustainable business model), cluster 4 (buyer–supplier collaboration). Moreover, the first five clusters with a cluster profile value greater than 0.8 were considered as high-quality clusters and proved the reliability of the data [32–34]. Figure 10 reveals that Porter M paper is mainly cited by social innovation and CSR practice clusters, while Boons F and Bocken N’s paper plays a key role in sustainable business model study. The buyer–supplier collaboration cluster is less cited, and Berrone P is the most popular author. In addition, Harvard Business Review (26) and J Clean Prod (55) are the two most cited journals, Harvard Business Review is mainly cited before 2011, while J Clean Prod is mainly cited from 2012 onwards.

Table 6. The top five clusters in CSR and innovation research.

Cluster ID	Size	Silhouette	Cluster Label	Top Term in LLR	Articles with High-Frequency Co-Citation
0	64	0.929	Social innovation	Social innovation, absorptive capacity, for-profit organization, social entrepreneurship, nonprofits development	Porter M (2011) [35] Harvard Business Review (13) Gallego-Álvarez, I (2011) [36] Manage Decis (5) Bouchard, M. (2012) [37] Serv Bus (4) Austin J. (2012) [38] Nonprof Volunt Sect Q (4)
1	51	0.955	CSR practice	Csr practice, sustainable practice, csr engagement, divergent corporate social responsibility, Canada, Tunisia	Porter M (2006) [39] Harvard Business Review (13) Hull C (2008) [40] Strategic Manage J (11) Porter M (2008) [41] Harvard business review (6) Mcwilliams A (2006) [42] J Manage Stud (6) Mackey A (2007) [43] Acad Manage Rev (6)
2	50	0.996	Sustainable global value chain	Sustainable global value chain, global value chain, corporate responsibility, new concept, international business	Aguilera R (2007) [44] Acad Manage Rev (5) Barnett M (2008) [45] Acad Manage Rev (5)
3	43	0.955	Sustainable business model	Sustainable business model, business model innovation, business model, institutional logics, corporate sustainability	Boons F (2013) [46] J Clean Prod (16) Bocken N (2014) [47] J Clean Prod (15) Klewitz J (2014) [48] J Clean Prod (12) Jay J (2013) [49] Acad Manage J (7) Crane A (2014) [50] Calif Manage Rev (7)
4	41	0.837	Buyer–supplier collaboration	Buyer–supplier collaboration, technical innovation, top management commitment, nonlisted firm	Berrone P (2013) [51] Strategic Manage J (8) Engert S (2016) [52] J Clean Prod (6) Gallardo-vazquez D (2014) [53] J Clean Prod (6) Aguilera-caracuel J (2013) [54] Organ Environ (5)

3.6. Citation Burst Analysis

This section synthesizes keyword data from 2002 to 2021 and extracts burst keywords. Burst keywords show frequent occurrences during a specific time period [55] as well as predict future trends [56,57] (RQ5). In this paper, we detect changes in burst words over time through CiteSpace, and the 20 burst keywords in Figure 11 show that, first, the keywords “business ethic” (2005–2017) and “capability” (2007–2016) have the longest burst durations of 12 and 9 years, respectively, indicating their long-term impact on the CSR and innovation domains. Secondly, the keywords “strategy” and “business” have the strongest citation bursts of 6.29 and 6.18, respectively, indicating that they are the most frequently discussed cutting-edge topics in the field. Third, it is worth noting that knowledge management is the breakout word in the field for 2020–2021, and although it has only been around for one year recently, it cannot be ignored in the future.



Figure 10. A visualized output of the co-citation cluster analysis [35–54].

Top 20 Keywords with the Strongest Citation Bursts

Keywords	Year	Strength	Begin	End	2002 - 2021
business ethics	2002	4.31	2005	2017	
small business	2002	4.35	2006	2014	
initiative	2002	3.51	2006	2014	
capability	2002	4.03	2007	2016	
business	2002	6.18	2008	2016	
corporate citizenship	2002	4.18	2009	2014	
issue	2002	3.32	2010	2013	
small firm	2002	4.11	2012	2017	
strategy	2002	6.29	2013	2015	
conceptual framework	2002	4.53	2015	2017	
value	2002	4.26	2015	2017	
framework	2002	3.51	2015	2017	
competitiveness	2002	3.29	2016	2018	
succe	2002	3.28	2016	2019	
management	2002	3.24	2016	2016	
perspective	2002	4.59	2017	2018	
future	2002	3.58	2018	2019	
corporate sustainability	2002	3.29	2018	2018	
knowledge management	2002	3.35	2020	2021	
engagement	2002	3.35	2020	2021	

Figure 11. Top 20 citation burst of keywords.

On the other hand, it needs to be clarified that other emergent keywords may reappear or disappear soon. Taking corporate sustainability as an example, it can be seen from Figure 9 that the burst period of corporate sustainability is only one year in 2018, but this does not necessarily mean that the research on it will continue to fade in the future, because for the current topic on corporate sustainability, the many influential papers have been published on, for example, the impact of the three strategic management dimensions of the strategic process, strategic content and strategic context on corporate sustainability [58], the impact of corporate sustainability on organizational processes and performance [59], etc., these articles have put together a substantial analysis of the factors that affect corporate sustainability and the impact of corporate sustainability on other factors. Thus, research on corporate sustainability may continue to gain momentum, but not in this relationship between corporate social responsibility and innovation.

4. Conclusions

This study analyzed the literature in the field of CSR and innovation in the WoS database, with the aim of conducting an econometric analysis of the CSR and innovation fields and identifying the knowledge map between these two topics. In this study, quantitative analysis and visualization of the CSR and innovation domains were carried out using VOSviewer, CiteSpace, and bibliometrix R-package. We focused on the journal, author and country analysis, author collaboration analysis, country collaboration analysis, keyword and keyword evolution analysis, clustering analysis, and emergent word analysis of articles.

4.1. CSR and Innovation Research Becomes Richer and More Global

First, regarding the annual publication trends of CSR and innovation research, research in this field from 2002, which grew slowly in 2002–2013, showed a significant growth trend after 2013, which is consistent with the study of Ratajczak and Szutowski [60]. Secondly, regarding journals, the top three productivity journals are *Sustainability*, *Journal of Cleaner Production*, and *Corporate Social Responsibility and Environmental Management*. This is consistent with the results of the bibliometric analysis of previous studies focused on the CSR and sustainability domains [31,61]. It is worth mentioning that although *Sustainability* only started publishing papers on CSR and innovation between 2012 and 2016, the number of publications in the last five years far exceeds that of other journals. Third, regarding authors, Gallardo-Vazquez, D is the most productive author, while Ahmad, N has the most extensive network of international collaborations. Fourth, regarding the analysis of countries, European countries represent 50% of the 10 most productive countries. It is worth noting that the United States and China contribute the most to the output of papers in this field. Specifically, China is the country with the highest number of publications and collaborative publications with other countries, while the number of citations to US articles far exceeds that of other countries. Fifth, the results show steady growth in the development of the study in terms of collaboration across countries, especially in Asia, North America, and Europe.

4.2. Knowledge Structures in CSR and Innovation Research Have Become More Complex

First, our co-citation analysis identifies Porter M, Boons F, and Bocken N as the most influential authors in CSR and innovation research. All these authors have made significant contributions to the field of CSR and innovation. In addition, we clustered these co-citations and found that they influence different fields. For example, Porter M is highly respected in the fields of social innovation and CSR practice, and Boons F and Bocken N are more important in the fields of Boons F and Bocken N. This distinction provides a more concrete reference for more in-depth research in corporate social responsibility and innovation.

4.3. Hot Diversity in CSR and Innovation Research

After analyzing the keywords, we generated seven different clusters to help researchers understand the hot topics in the field, including CSR, sustainability, innovation, financial performance, and other topics associated with these themes, such as sustainability, corporate sustainability, technology innovation, green innovation, environmental performance, etc., which are the focus of research today (e.g., [13,31,62–65]).

4.4. CSR and Innovation Research Will Face Two Forward-Looking Directions

First, when performing the keyword evolution analysis, innovation appears in other forms in the study from 2011, such as: service innovation, green innovation, etc. Similarly, the co-citation analysis confirms that innovation becomes more diversified, which is in line with the current research trend (e.g., [66–70]). This suggests that there should be horizontal expansion and vertical depth in the study of CSR and innovation. Second, from the co-citation analysis and burst words, since 2005, there are papers with outstanding citations and burst words at each stage, which represent the research direction at that time. For example, “business ethic” and “capability” continued to appear for 12 and 9 years, respectively. However, after 2016, the number of articles and keywords with significant impact became fewer and less influential. In particular, the rate of emergence of breakout words has slowed down significantly in the past three years. This means that the relationship between CSR and innovation needs to include more new research directions.

5. Limitations

Despite the contribution of this paper to the field of CSR and innovation, there are some limitations. First, the chosen database web of science is probably one of the most important bibliographic databases in the world, but it covers a limited number of articles. It is the search for articles related to CSR and innovation in different databases that can be analyzed to make the study more convincing. Second, the article only analyzes articles whose language is English, and the research in other countries and regions where English is not the first language cannot be analyzed systematically. Third, although the article evolves the keywords of the main studies using an alluvial diagram and clusters the co-citation analysis, other information about the deeper level of the research topics involved, including the methodology and theoretical background, is not explored more completely and thoroughly. Future research should continue to follow this area to gain deeper insights.

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