FROM REPORTS TO RETURNS: A BIBLIOMETRIC ANALYSIS OF THE INVESTOR'S ROLE IN SHAPING SUSTAINABILITY DISCLOSURES

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ABSTRACT

This research examines the relationship between investor focus and sustainability disclosures, emphasizing the influence of Environmental, Social, and Governance (ESG) factors on investment decisions. As sustainability reporting gains prominence in corporate strategy, this research aims to identify critical trends, influential aspects, and gaps in the current literature regarding investor behavior toward corporate sustainability disclosures. Through bibliometric analysis of studies conducted between 1999 and 2021, the research highlights the increasing role of sustainability disclosures in shaping investor sentiment and corporate valuation. Specifically, the research identifies three influential streams: the effect of investor relations and corporate governance on sustainability reporting, the role of environmental disclosures in improving firm value, and the growing importance of institutional investors in driving corporate transparency on sustainability issues. The thematic analysis classifies the relationship between investor focus and sustainability disclosures into four categories: niche themes (e.g., financial reporting and information asymmetry), motor themes (e.g., investors, sustainability reporting, and firm value), emerging/declining themes (e.g., climate change and financial reporting), and basic themes (e.g., corporate social responsibility and investor relations). While the research reveals critical insights, it also identifies limitations, such as the exclusion of non-listed companies and a lack of granularity in measuring investor sentiment. Future research should focus on standardizing reporting frameworks, broadening regional and industry coverage, and exploring the dynamic interaction between investors and managers in shaping CSR disclosure strategies. This research contributes to the growing body of knowledge on the role of investor behavior in fostering corporate responsibility and sustainability.

Keywords: Sustainability Disclosure; Investor Influence; Environmental, Social and Governance; Bibliometric Analysis

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1. INTRODUCTION

Investor focus on sustainability disclosure has intensified as ESG factors become crucial in investment decisions (Sultana et al., 2017). Investors are increasingly concerned with long-term value, recognizing that companies with strong sustainability practices can better mitigate risks such as climate change and regulatory changes while seizing opportunities in green innovation (Pinkse & Kolk, 2010). Sustainability disclosures provide critical perception into an enterprise's environmental and social impact, helping investors evaluate its commitment to responsible business practices. Institutional investors, like pension funds and mutual funds, now demand greater transparency, often using ESG ratings to guide investment strategies (Sebastianelli et al., 2024). Companies with higher ESG scores attract more investment, while those with poor sustainability performance risk market penalties. These disclosures are about managing risks and highlight growth opportunities in areas like renewable energy and sustainable practices. Investors also use sustainability disclosures to hold companies accountable, ensuring they adopt ethical practices beyond legal compliance (Elijido-Ten & Clarkson, 2019; Li et al., 2023). The emergence of impact investing, in which investors aim for both financial returns and favorable social or environmental consequences, is another factor fuelling this increased desire for transparency(Shaukat et al., 2024; Gulzar et al., 2024 & Sarwar et al., 2024). Ultimately, sustainability disclosures are becoming vital for investors to assess a company's long-term viability and alignment with global sustainability goals (Kölbel et al., 2020).

According to Global Fortune, 250 companies publish a separate sustainability report (Kolk, 2010). CSR is not a new concept, including the features of ethics, govt policy, and society as a means of doing social work for the general public and an essential part of business growth (Ali et al., 2024). Sustainability disclosure shows the big picture of the internal activities of companies, like firms' aspirations and public image for stakeholders. Researchers explore that using CSR disclosure reduces the gap between firms, or firm's managers and stakeholders of any company (Arslan, Khan, et al., 2022). This helps to improve the firms' value and decrease the capital cost. Sustainability disclosure builds a relationship between stakeholders for decision-making. From an investor's point of view, analysis of all disclosure information, every investor has different interests in social or environmental disclosure (Cormier et al., 2011). Researchers argue that social or environmental disclosure is treated differently. Complementary disclosure is suitable for the financial market or stakeholders but not for substitute disclosure (Arslan, Chengang, et al., 2022). An excellent social performance shows

the firms' visibility in the general public and managers hire efficient employees. CSR's good rating gives a positive image to many stakeholders (Valiente et al., 2012).

Stakeholders are concerned about the social or environmental standards of companies. In the case of new enactment (ISO 1400, ISO 26000), believing these standards stakeholders demand increased (Sarwar et al., 2023). These all disclosures are not free of cost. ISO provides guidelines on social responsibility. The purpose of encouraging the companies to make CSR activities and attract stakeholders and external communities (Marcuzzi et al., 2023). The Legitimacy Theory explains the behavior of developing sustainability reports under the socially constructed system of norms, values, and beliefs. This constructed system means how companies perform activities and how they impact stakeholders (O'donovan, 2002). According to the Shareholder theory, explain that companies do not forget the stakeholder demands. The companies' behavior of disclosure of environmental information will impact stakeholder demands. Companies use sustainability tools to communicate this behavior to stakeholders. This may be helpful from the stakeholders' point of view (Herremans et al., 2016).

According to GRI (Global Reporting Initiative), 2011 explains that social or economic dimensions may impact organizations at a local or global level (del Mar Alonso-Almeida et al., 2014). The organization has a social or economic system in which companies operate. Previous literature explains the relationship between investor pressure and sustainability information. Disclosure of greenhouse emissions is important for stakeholders (Chithambo et al., 2022). In international capital markets, more dominating stakeholders influence the other stakeholders and it is difficult to determine the exact stakeholder group pressure. A sustainability report is sensitive to investor pressure. GRI reports for 2008–2010 analyze sustainability disclosure transparency, which relies on stakeholders rather than the environment (Fernandez-Feijoo et al., 2014). Belonging to different environmental, cultural, and stakeholders, they affect the sustainability report quality (Arslan & Bashir, 2021). The objective of our study focuses on investor pressure or sustainability disclosure.

This research aims to analyze or provide a bibliometric analysis of sustainability disclosure and investors. We divided the objectives into parts. Firstly, we find the core publication citations, authors, countries, and institutions by using the biblioshiny tool provided by the R-program to evaluate the documents. Following the Bradford law and analyzing the articles through the biblioshiny tool, we describe the global citation, h, g, and m index. The second

objective is to identify the main research themes and streams. We are using the conceptual framework tool to achieve the objective using the related keywords. After achieving our study's 1 and 2 objectives, we are making the way for the future researcher.

After analysis of the factors related to our research area, we have some questions that need to be solved. All these questions will help address the main problems or guide the future research field. Future researchers will use this literature to support our study. So, we have a list of the following questions.

1. What are the influential aspects of investor and sustainability disclosure in the field of social sciences?
2. Exploring investor and sustainability disclosure of social sciences, what are the main trends and key themes?
3. What thorough lessons can we draw from the literature of the past and what long-term goals can we establish in order to prepare for the future?

In order to address question 1, we use descriptive analysis to identify key sources, writers, nations, publications, and connections in the social sciences related to investor and sustainability disclosure. We have used the total citation or net publication of articles per year for core sources or authors. By using the Bradford law, we divided the sources into two zones. Zone 1 has a high production of publications, and Zone 2 has a low production. We recommend the top nations' affiliations based on publication frequency or citations.

We focus on the core area of study and keyword themes and describe the link between various research streams or clusters to benefit future studies. We focused on the co-occurrence network or thematic map interpretation to achieve this purpose. We use some keywords that explain the main theme of the study or describe the research area (Gerged et al., 2023). We also used the author’s keywords plus titles keywords that identify the main criteria of the research or may explain the basic content of the research (Zhang et al., 2016). We develop a new concept in the form of a bibliophily tool provided by the R-program to find the study themes and streams by using keywords of investor and sustainability disclosure.

2. MATERIALS AND METHOD

For developing bibliometric analysis, we describe the sources from which we collect the data. In which segment, we define the data sources where we selected or collected the data,

including Scopus, Emerald Insight, Google Scholar, web of Sciences, Direct Sciences, etc. We also describe the keywords that we used to collect the data, such as (TITLE-ABS-KEY ("corporate social responsibility" OR CSR OR sustainability OR carbon OR "Carbon emission*" OR "climate change" OR ghg OR "greenhouse gas*" OR environment*) AND TITLE ("investor*") AND TITLE-ABS-KEY (disclosure*)) AND (LIMIT-TO (LANGUAGE, "English")) these all keywords used for achievement of related articles that were matched with our topic. We used all these keywords because the past research articles are available in the present literature. After using keywords, we received a list of 135 related documents, but we selected approximately 105 documents. These are related to accounting and finance, and econometrics and economics are related to social sciences. We drop 30 documents that are not relevant to our topic. During the selection of relevant articles, we used different inclusion criteria, including CSR and particularly the environmental aspect of CSR, environment-related disclosure like carbon emission disclosure or environment disclosure on the other side, investor interest, performance, firm value, stakeholder point view, portfolio relevant, investor reaction and investor judgment these all used for theme generation of an article.

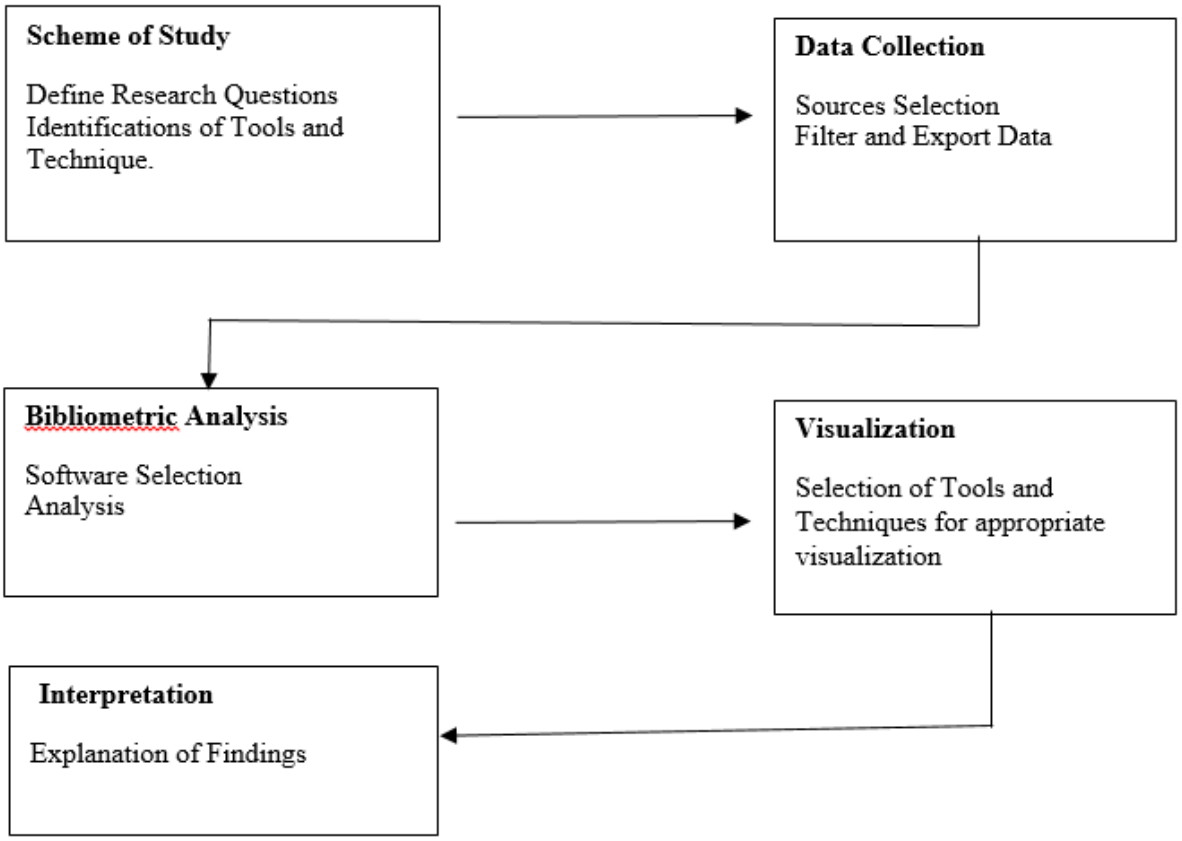

Figure 1. *The Procedure of Bibliometric Analysis*

This research adopts a five-step process recommended by (Silvente et al., 2018), referred to as the bibliometric workflow. Figure 1 illustrates these five steps in the bibliometric analysis of Investors and sustainability.

3. RESULTS AND DISCUSSION

Bibliometric analysis is the branch of econometrics that analyzes the descriptive analysis of media communications (Çağlayan Akay et al., 2022). Bibliometric analysis is the bibliophily tool that details documents, sources, and authors. The information under which table and image show multiple results(Wei, 2019).

Table 1. *Descriptive Characteristics of Investor and Sustainability Disclosure*

Description	Results
Timespan	1999:2021
Sources (Journals, Books, etc)	67
Documents	101
Average citations per year per doc	2.917
References	6449
article	89
book chapter	3
business article	1
conference paper	3
note	2
review	1
short survey	2
Keywords Plus (ID)	198
Author's Keywords (DE)	285
Authors	248
Authors of single-authored documents	12
Authors of multi-authored documents	236
Single-authored documents	13
Documents per Author	0.407
Authors per Document	2.46
Co-Authors per Documents	2.61

Collaboration Index	2.68

Table 1 explains the descriptive analysis of investor and sustainability disclosure before analysis, which is essential to understand. We have selected 101 documents, which are articles, journals, conference papers, notes, and reviews. Include 198 keywords plus the author's keywords of 285. The timespan of investor and sustainability disclosure literature is from 1999-2021. The total number of authors is 248 who wrote all these documents, with single-author documents being 12 and multi-author documents being 236. The table also shows that the collaborations index value is 2.68, and there is high collaboration in investor publications. The ratio of documents per author is 0.407

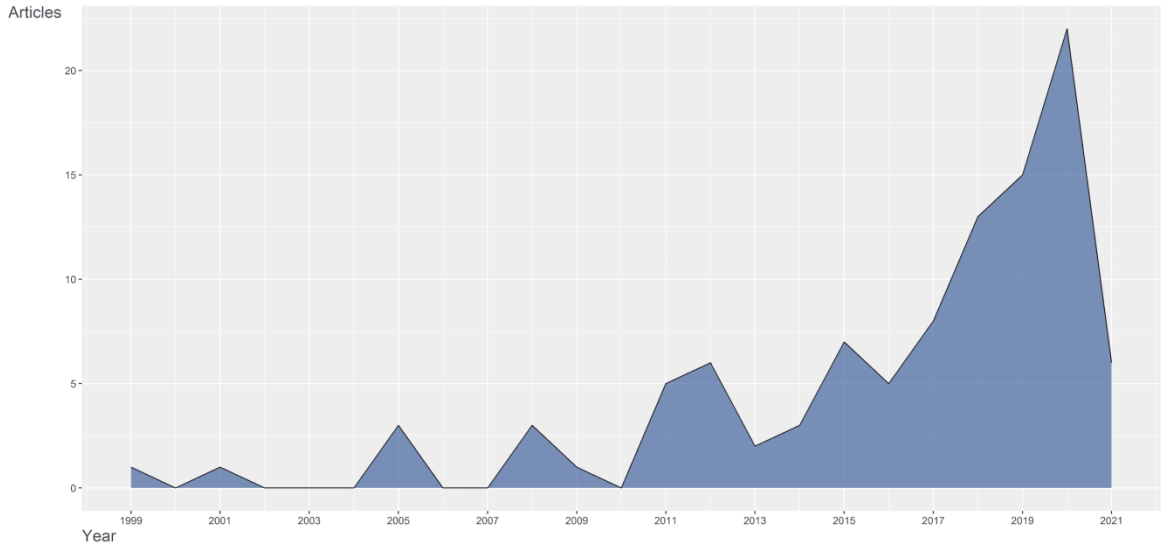

Figure 2. *Annual scientific production*

Figure 2 represents the annual scientific production data. In the year 1999, starting point, there is a low production record of articles publications but later increased yearly. After reviewing the data from 1999 to 2021, we see a significant increase in publication. The highest trend is in 2020, and the lowest trend is in 1999. The middle year saw miners' ups and downs in production, but mainly increasing trends followed. However, overall, it is a positive continuity.

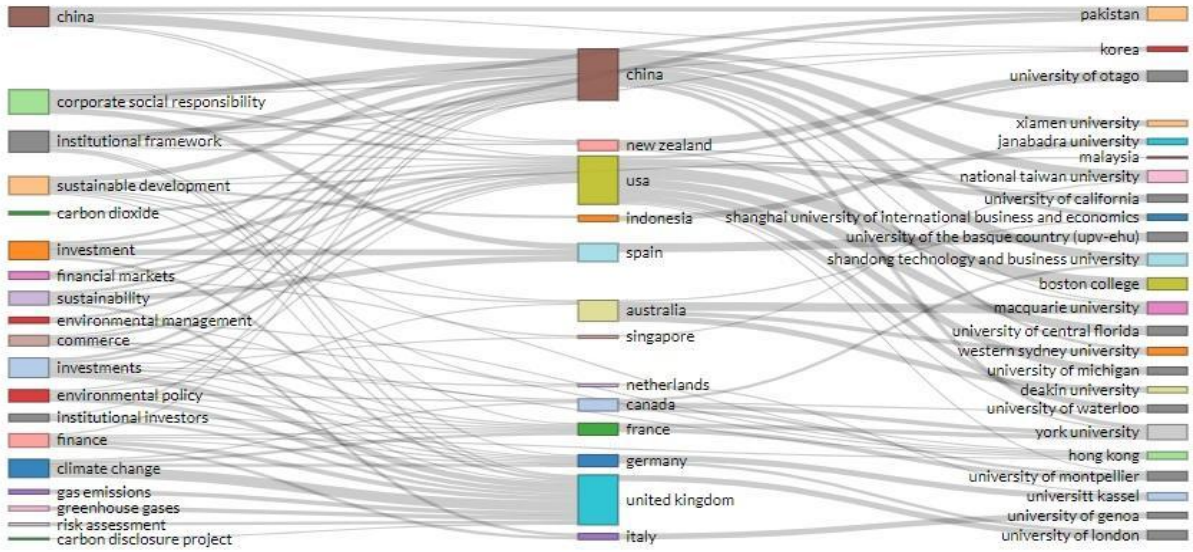

Figure 3. *Three-fold analysis of investor and sustainability disclosure*

Figure 3 shows the three-fold analysis of investor and sustainability disclosure publications. The keywords of all related factors are named on the left side of an image. The right side of the image represents the top affiliations universities' names and nations of interest in the middle. The figure represents that the UK is the most affiliated country and is also concerned with other countries: China, the USA, and Australia. The top-rated keywords used in the article are CSR, institutional framework, investments, sustainable development, and climate change. These all are significant contributions to our research topic.

Table 2. Top ten journals according to source impact

Source	h_index	g_index	m_index	TC	NP	PY_start
Corporate Social Responsibility and Environmental Management	7	9	0.7	228	9	2012
Business Strategy and The Environment	3	5	0.428	59	5	2015
Management Decision	3	4	0.272	179	4	2011
Behavioral Research in Accounting	3	3	0.272	109	3	2011
Journal of Cleaner Production	3	3	0.3	82	3	2012
Sustainability (Switzerland)	2	4	0.667	23	4	2019
Contemporary Accounting	2	3	0.4	85	3	2017

Research Sustainability Accounting, Management and Policy Journal	2	3	0.5	19	3	2018
Accounting Review	2	2	0.095	116	2	2001
Climatic Change	2	2	0.143	31	2	2008

Table 2 represents the top ten journals according to the sources. We utilize Bradford Law and source impact to identify the essential journals that publish investor and sustainability in the social sciences. The articles are ranked in Table 2 according to the following criteria: h, m, g-index, net production (NP), total citation (TC), and publication starting year (PY_start).

Table 3. Journal Rankings According to Bradford Law

Journals	**Rank**	**Freq**	**cumFreq**	**Zone**
Corporate Social Responsibility and Environmental Management	1	9	9	Zone 1
Business Strategy and The Environment	2	5	14	Zone 1
Management Decision	3	4	18	Zone 1
Sustainability (Switzerland)	4	4	22	Zone 1
Behavioral Research in Accounting	5	3	25	Zone 1
Chemical Week	6	3	28	Zone 1
Contemporary Accounting Research	7	3	31	Zone 1
Journal of Cleaner Production	8	3	34	Zone 1
Sustainability Accounting, Management and Policy Journal	9	3	37	Zone 2
Accounting Review	10	2	39	Zone 2

In Table 3, we use Bradford Law as a journal ranking. CSR and environmental management provide the resources to publish sustainable and environmental studies (Mahmood et al., 2023). These publications explain the direct or indirect relationship between CSR and CFP variables. Further, it explains that CSR positively correlates with CF across the countries. In other publications, Uyar et al. (2021) explain that boards of directors are concerned about CSR activities in the healthcare sector or firm performance. Further, it explains that females

contribute more to firm performance than male CEOs with dual responsibility. CSR committees or female directors are not replaceable with each other. Another publication by Cheffi et al. (2021) explains the correlation among CSR antecedents, CSR practices, or firm uncertainty among the stakeholder pressures in SMEs in the UAE. The data was collected from 117 SMEs. After analysis of data, CSR antecedent positive related to SME and stakeholder pressure had no effect on CSR practices with the significant benefit of SME.

According to the Journal of Business Strategy and Environment, another publication by Ferrer et al. (2020) explains that Sustainability disclosure reporting impacts financial analysts or firm performance (Mubeen et al., 2024). After data analysis, the conclusion is a positive impact on financial analysts or EPS (Mardini & Elleuch Lahyani, 2022). Further, in the publication of Qureshi et al. (2020) in this paper explains that gender diversity in the board of directors and disclosure of sustainability disclosure reporting (environmental, social, and governance) has an impact on firm value. The conclusion of this paper, says that the female board of directors can enhance the firm value using sustainability disclosure reporting. The representation of the female board of directors also has a favorable influence on stakeholder trust or sustainability disclosure performance. According to the journal of Sustainability (Switzerland), we see the article published by (Ivic et al., 2021). This article explains the sustainable development in European mining companies. Mining companies have negatively affected the environment but it is important and beneficial for the economy. The result of these publications explains that the working of mining companies was under pressure from internationally or European government While we see the positive trend on stakeholder engagement and health and safety.

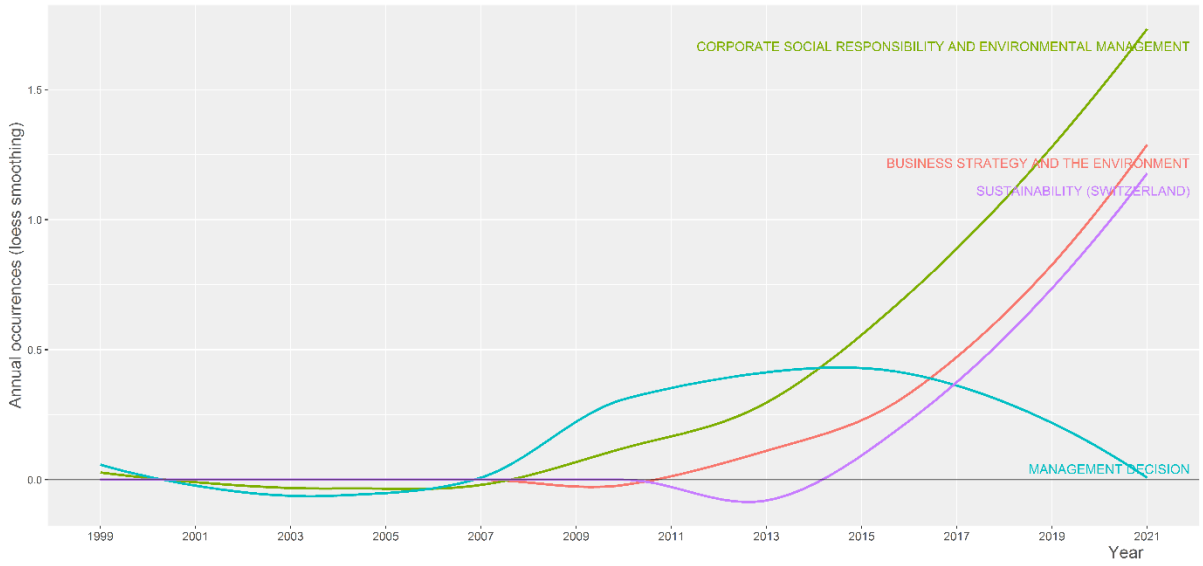

Figure 4. *Source Growth*

In figure-4 represents the source growth of journal publications. Now, by using the losses smoothing technique, plot all the number of publications locally weighted through regression analysis, draw a smooth line between the number plots, or also draw scatter plots. Through the annual occurrence losses, the smoothing technique will provide information on the annual publication times (Pellegrinelli et al., 2020).

We can use the graph to analyze that since 2008, there have been increases in the publication of CSR and environmental management towards the year 2021. It is the core source of investor and sustainability disclosure in social science. Starting years show an almost straight line, explaining that a normal number of journals were published. The second one is a business strategy and environment we can see that there has been an increase in publications from the year 2011 towards 2021. The third one is Sustainability (Switzerland) from the year of 1999 to 2010, showing the normal number of publications number, and from the year of 2011, there has been decreasing face we can see and after that, the decreasing period from the year of nearly 2015 has a positive increase throughout the year 2021. The last one is management decisions, which show an increasing or decreasing pattern between the years 2017 to 2021. In 2021, there is a total decline in the numbers.

Table 4. *Most globally cited article*

Articles Titles	Total Citations	TC per Year	Normalized TC
The informational contribution of social and environmental disclosures for investors	131	11.909	2.0662
When firms talk, do investors listen? The role of trust in stock market reactions to corporate earnings announcements	119	17	2.3531
Do Investors Value Sustainability Reports? A Canadian Study	104	10.4	2.1153
Retail Investors' Perceptions of the Decision-Usefulness of Economic Performance, Governance, and Corporate Social Responsibility Disclosures	89	8.091	1.4038

Impact of Wikipedia on market information environment, evidence on management disclosure and investor reaction	84	9.333	1.9535
Hyperlinking Unaudited Information to Audited Financial Statements: Effects on Investor Judgments	79	3.762	1
Institutional investor influence on global climate change disclosure practices	73	7.3	1.4847
Investor reactions to environmental saints corporate and sinners: an experimental analysis	73	3.174	1
Does voluntary carbon reporting meet investors' needs?	70	7	1.4237
Firm Characteristics, Industry Context, and Investor Reactions to Environmental CSR: A Stakeholder Theory Approach	68	9.714	1.3446

Table 4 includes the elements of the top 10 globally cited articles in investor and sustainability disclosure in the field of social sciences and total citations, TC per year, and Normalized TC. The first article was published by (Cormier et al., 2011); this article was published in the year 2011. According to the article, the disclosure of social or environmental information may reduce the information asymmetry between investors or managers and have a substituting or complementary effect on this information. The study from Pevzner et al. (2015). The second highly cited article explains that firm financial disclosure may affect the investor's perception of corporate earnings. This information has a significantly favorable effect on investor reactions.

The study of Berthelot et al. (2012) explains the relation among sustainability disclosure and investor perceptions in Canadian firms. Shareholders demand that type of information for analysis of firm positions or companies published. Cohen et al. (2011) this article explain that retail investors prefer social, nonfinancial, CSR, corporate performance disclosure, and economic or governance performance. Retail investors are taking information positively used in current or future perceptive. Xu and Zhang (2013) publish in 2013 the Wikipedia provide the environmental information for the investor in the financial market. Wikipedia publishes all information and investor may react adversely to bad news so that Wikipedia improves our environmental information. Hodge (2001) hyperlinking provide the audited or unaudited

financial statements. Investors use the audited hardcopy information to analyze firm potential earnings by low creditability of unaudited information. Cotter and Najah (2012) institutional investor concern about the disclosure of climate change using the sample of worldwide. Positive effect of Institutional investor on climate or social disclosure.(Arslan, Chengang, et al., 2022) explain the relation among the investor or corporate environmental disclosure. The disclosure of corporate environmental disclosure or environmental management reflects the investor investment decision making while the firm disclosed bad news of corporate disclosure the investor may react negatively or strongly to the news. An investor may react to new according to their preference (Gerged et al., 2023). Sullivan and Gouldson (2012) demand and ask companies to publish such types of reporting on climate change and greenhouse emissions, and businesses plan to invest in the publishing of such types of reporting. If companies do not publish, investors are discouraged and disappointed. Cordeiro and Tewari (2015) explain that the Investor reacts positively to CSR or corporate environment for long-term or short-term return by using the 500 US-ranked companies data analysis. Investor reaction may contribute to the firm size or market perspective, while the positive response of investors the firm valued ranked or more cash flow expected in the future.

Table 5. *Most frequent words*

Keywords plus		**Authors Keywords**	
Words	**Occurrences**	**Words**	**Occurrences**
Climate Change	7	Investors	222
Investments	7	CSR	200
Investment	6	Disclosure	194
Sustainable Development	5	Firms	146
Carbon Dioxide	4	Environmental	141
Corporate Social Responsibility	4	Corporate	118
Environmental Policy	4	performance	115
Finance	4	Investor	105
Gas Emissions	4	Social	100
Sustainability	4	Study	100

Table 5 represents the most repeated words used in investor and sustainability disclosure under social sciences. Table 5 has 4 portions including the keywords plus authors keywords or another is abstract or titles or possible occurrence of words used in our article.

We have a list of all of them, but the most commonly used word is climate change in the field of social sciences. People use keywords to find the exact topic easily in social science studies. We also have the authors' keywords; the top of the list is investor. They represent the board topic area, and we have to use all these keywords, including investments, CSR, sustainability development, environmental policy, etc., in the investor and sustainability disclosure study.

Table 6*. Most frequent words in the abstract and title*

Abstract		**Titles**	
Words	**Occurrences**	**Words**	**Occurrences**
Investors	54	Corporate social responsibility	19
Corporate	37	Institutional investors	11
Investor	34	Disclosure	9
Disclosure	32	China	7
Social	29	Stakeholder engagement	6
Responsibility	22	Sustainability reporting	6
Environmental	21	Environmental disclosure	5
Evidence	16	Sustainable development	5
Institutional	16	Firm value	4
CSR	15	Investors	4

Table 6 displays abstract or title words used in the study. We have the top words of the title is corporate social responsibility according to the title we describe the abstract, and they may explain the summary of an article they have the top words used according to the title word is investors. The title represents the article name, the existence of an article, while making the title of an article we are concern about the uniqueness of title representation

Figure 5. *Word Cloud*

Figure 5 represents the Word Cloud of all keywords used in the literature. The cloud word shows the frequency of words. The high-frequency words shown in the figures with more in size.

Institutional investor or disclosure word size is larger than the remaining words and has a high-frequency word in the literature of social science, and both are more useable words (Sarwar & Khan, 2022). This effect of disclosure research is mainly conducted in Chinese companies. The literature is about social science, so why is all research conducted from a social science perspective? The high-frequency keywords included in the literature are sustainability development, sustainability reporting, stakeholder engagement, environmental disclosure, firm value, investor, etc. The study about sustainability disclosure or investor reactions. Some studies were conducted on climate change disclosure between investor protections, so climate change was used as a keyword in the literature. CSR disclosure is a keyword that describes the company's strength in being a CSR activity. Environmental policy or sustainability is also a keyword in the social science literature. This may explain the companies' sustainability reporting strategies or benefit investor perception. Investors are curious about that type of reporting. All these keywords are helping to identify the new issues faced by every company regarding the topic. We conclude the keywords used in the social science literature using the global literature.

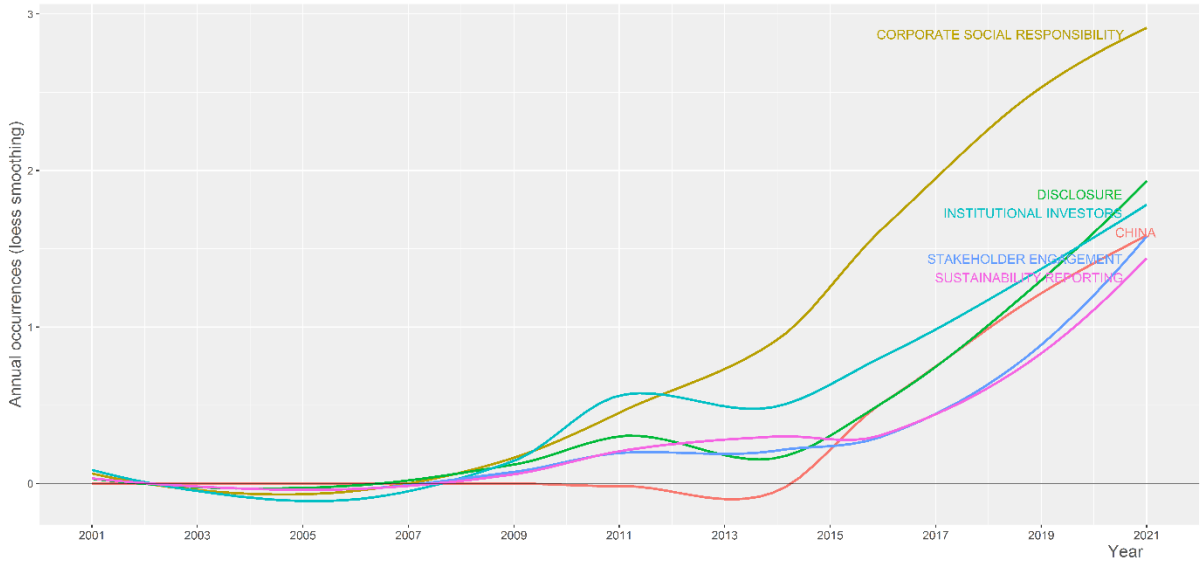

Figure 6. *Word growth over time*

Figure 6 shows word growth in literature over time, including keywords corporate social responsibility, disclosure, institutional investor, china, stakeholder engagement, and sustainability reporting from 2001 to 2021.

From 2007 to 2009, the corporate social responsibility keyword grew towards 2021. This means the CSR keyword has been highly used in the literature over the years, and CSR research has grown. Between 2007 and 2011, the disclosure keyword slowly grew, and the growth line declined between 2011 and 2013. From 2013, the disclosure keyword rapidly grew towards 2021. Institutional investor keywords started to grow in 2007, but after 2011, there was a slight decrease in this keyword, and it again grew from 2014 to 2021. China's keyword decreased the growth line from 2011 to 2014 and grew after 2014 to 2021. Stable growth in stakeholder engagement or sustainability reporting keywords from 2007 to 2015, but after 2015, it started growing fast.

Main Authors, Affiliations, Institutions, and Countries

In the social sciences, this section provides information about key writers, associations, organizations, and nations of sustainability literacy and investors. We list the ten important authors who have had a significant impact on sustainability disclosure. Table 6 includes the names of ten core authors based on the h-index.

Table 6. *Top 10 Authors impact in investor and sustainability disclosure literature*

Author	h_index	g_index	m_index	TC	NP	PY_start

Cho Ch	3	3	0.6	33	3	2017
Sullivan R	2	3	0.143	97	3	2008
Aibar-Guzmn B	2	2	1	21	2	2020
Aibar-Guzmn C	2	2	1	21	2	2020
Cotter J	2	2	0.2	75	2	2012
Garcia-Snchez Im	2	2	1	21	2	2020
Griffin Pa	2	2	0.4	60	2	2017
Hahn R	2	2	0.286	102	2	2015
Najah Mm	2	2	0.2	75	2	2012
Pfeifer S	2	2	0.143	27	2	2008

Table 6 shows the information on the impact of the top ten authors. CHO CH is the number one author on the list, providing an h-index number. Cho and Patten (2007) Explain that the firm disclosed the environmental information as a role of legitimacy. Also, explain that we analyze from different perspectives (environmental sensitive versus non-environmental) and find that companies' non-litigation information varies between the groups but is disclosed only for the legitimizing tool. da Silva Monteiro and Aibar-Guzmán (2010) explain that large businesses disclose environmental information in an annual report in Portugal. Companies want to develop ecological disclosure practices and how factors affect the extent of environmental disclosure practices. Using the 2002-04 sample, there is low disclosure of information. However, after the year, there has been an increasing trend of information disclosure, which positively impacts a listed company.

García-Sánchez, Aibar-Guzmán, et al. (2020) explain the relation among CEO managerial ability and sustainability disclosure expected that direct or indirect nature. The direct relation among CEO ability and CSR disclosure: disclosing accurate CSR information will positively impact stakeholder engagement. CEO is manageable with the sustainability strategies, and the mediating effect of CSR is improved.

García-Sánchez, Rodríguez-Ariza, et al. (2020) explain the connection among institutional investors and the alignment of company social duty strategies with company objectives. By analyzing the data using the sample, we conclude the positive relationship between investor and CSR disclosure activities with common achievable goals of the firm. Brown et al. (1987) Explain the affiliation among extraordinary returns and 5 opportunity proxies for evaluating the market of sudden quarterly earnings. Our result suggests that we look at 3 techniques that

reduce, to an unknown degree, the size mistakes problem. Our techniques look more (less) powerful at lowering size mistakes for small (large) companies and recent (non-recent) forecasts.

Clarkson et al. (2015) explain that information on greenhouse gas emissions is helpful for investors' perceptions, or they may check the equity value. There is an unfavorable relation among firm greenhouse gas emissions and equity value. The result of the study is that investors analyze the carbon disclosure project amount, which equally suggests that the equity value reflected GHG other than CDP. GHG imposed an implied discount on market capitalization.

Cotter and Najah (2012)) both authors define the impact of climate change disclosure on institutional investors globally. The result of the articles is that there has been a favorable relation among investors and climate disclosure, as shown by publishing a CDP report or taking questions to conclude the final result.

Table 7. *Top countries in terms of publications and citations*

Region	Freq	Country	Total Citations	Average Citations	Article
USA	52	Canada	306	61.20	
China	37	USA	219	21.90	
Australia	16	United Kingdom	116	16.57	
UK	15	Netherlands	107	35.67	
Spain	14	Australia	92	15.33	
Germany	8	Spain	79	11.29	
Canada	7	New Zealand	73	73.00	
Indonesia	6	Denmark	49	49.00	
Pakistan	6	Switzerland	48	48.00	
France	5	Korea	23	7.67	

Table 7 shows the two types of data: one side is regions and frequency, and the other side is countries with citations. According to frequency top of the countries USA, China, and Australia published most documents in the social sciences field and are top-ranked countries; according to the citations, Canada is better than the USA citation because the USA published 52 documents with 219 citations, and Canada published 7 documents with 309 total citations.

The United Kingdom falls in the third number with 116 citations and the Netherlands with 107 citations at fort positions. It means positions are different according to total citations.

Table 8. *Most Relevant Affiliations*

Affiliations	Articles
Macquarie University	3
National Taiwan University	3
University of Otago	3
York University	3
Boston College	2
Deakin University	2
Janabadra University	2
Shandong Technology and Business University	2
Shanghai University of International Business and Economics	2
University Kassel	2

Table 8 represents the most affiliated university names. First, Macquarie University is at the top of the list and has a significantly strong basis for research on investor and sustainability disclosure. In 2012, 85% of leading Macquarie University research was rated at or above the world standard in the Excellence in Research for Australia 2012 national report. National Taiwan University gained the second position in the table and was established in 1928. They play an equal role in publishing articles in social sciences. The University of Otago is third-affiliated. It scores highly for average research quality, and in 2006, scored the second position, produced by A-rated researchers in New Zealand, only the University of Auckland. York University is another crucial affiliated university in social science research that has solved social-based research issues using methodologies including surveys, quantitative research, and collaboration of both methods. Boston College ranked fifth affiliated and was founded in 1976. Boston College hosts a research library with an estimated 260000 volumes as well as millions of volumes (Archive and open library).

Deakin University is also an essential relevant affiliation university focused on advancing society and culture by strengthening the economy through creative, inter-culture, using approaches to education, arts, and business. Janabadra University initiated in 2020 to organize the Scopus-indexed international journal writing Bimtek and provide the facility for those who want to submit their articles and journals by international Scopus-indexed journals.

Shandong Technology and Business University has 13 research institutes, including Island economics research, enterprise development, and creation research, and the last one is Coal economic research institutes. It was established in 1985 and is only for Finance and Economics University. The Shanghai University of International Business and Economics is affiliated with the Research Base of Innovative Study of Social Sciences, the Shanghai Research Institute for Development Strategies, and the Institute of International Business at SIFT, which is ranked among the top eight research organizations. The Institute of International Business at SIFT is considered a critical research institute among Shanghai's common higher education institutions that study the humanities and social sciences. The last affiliated University, Kassel, focused on the following areas: culture and gender research, environment, climate and nutrition research, national and global social policy, development policy decent work, and so on more areas. The University of Kassel provides the same platform for several research approaches, including scientific centers and research groups.

Table 9. *Corresponding author's country*

Country	Articles	Freq	SCP	MCP	MCP_Ratio
USA	10	0.1493	7	3	0.3
China	9	0.1343	6	3	0.333
Spain	7	0.1045	4	3	0.429
United Kingdom	7	0.1045	3	4	0.571
Australia	6	0.0896	4	2	0.333
Canada	5	0.0746	2	3	0.6
Korea	3	0.0448	2	1	0.333
Netherlands	3	0.0448	0	3	1
Japan	2	0.0299	2	0	0
Malaysia	2	0.0299	1	1	0.5

Table 9 represents the corresponding author's countries' top 10 data. First, the USA published ten articles with 7 SCP or 3 MCP with a ratio of 0.3. Multiple country publications (MCP) means more than one co-author from a foreign nation. China is the second corresponding author country and has published a total of 9 articles, of which 6 are single nation publishing (SCP) and 3 multiple (MCP). Spain is third, and the UK is the fourth corresponding nation publishing the same total articles of 7, but Spain published 4 as SCP and 3 as MCP. Still, the United Kingdom published the opposite of Spain, 3 as SCP and 4 as MCP articles. Australia's

position is fifth of the corresponding country, and it publishes 6 articles, with 4 as SCP and 2 as MCP.

Table 10. *Collaboration network*

From	To	Frequency
Canada	France	3
China	Australia	3
USA	China	3
USA	Hong Kong	3
China	Pakistan	2
China	United Kingdom	2
Germany	Netherlands	2
United Kingdom	Germany	2
United Kingdom	Malaysia	2
USA	Australia	2

Sustainability disclosure is a more concerned global issue in the field of social sciences. Table 10 shows the issues between the countries. We can see that a little bit of collaboration between the countries. Firstly, Canada collaborated with France on 3 articles and so on through the countries of the USA and Hong Kong. China's collaboration with Pakistan in 2 articles, and the rest of the countries follow the same sequence of collaborations between countries.

4. CONCEPTUAL FRAMEWORK

This section follows the conceptual framework by defining the relationship among words (keywords plus). The study is about the social sciences field so we are discussing the co-occurrence network of the most significant keywords and evaluating them combined. These all keywords are related to the topic of investor and sustainability disclosure. Further, we will use the network's words in a map like a bi-dimensional matrix called a thematic map and describe this map through the centrality and density of the network.

Co-Occurrence Network

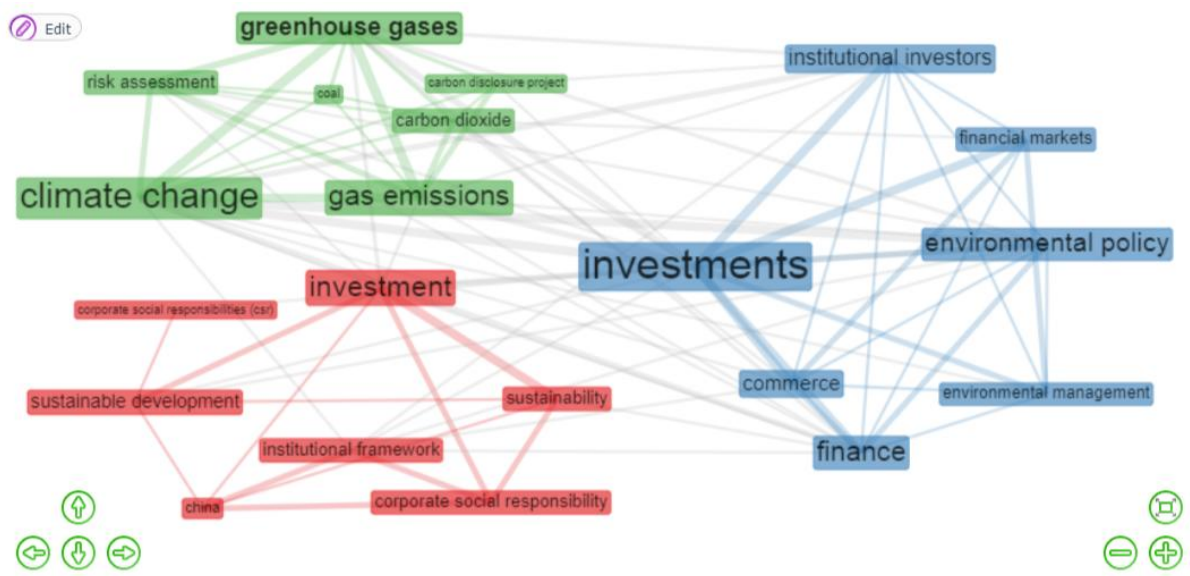

Figure 7*. Co-occurrence network*

The co-occurrence network of the authors' keywords is depicted in Figure 7, created using a similar bibliometric tool, the R-package'biblioshiny'('bibliometrix'). This visualization presents distinct streams of research related to investments, climate change, and greenhouse gases, categorized into clusters of green, red, and blue. The green cluster focuses on the Climate Change, Gas Emissions, and Greenhouse Gases, emphasizing the interconnection of climate-related issues like carbon dioxide and coal. These streams illustrate how environmental concerns such as risk assessment and carbon disclosure projects are integrated into climate change and gas emissions research. This cluster highlights the role of emissions in global climate change discussions, aligning with the ongoing efforts to mitigate greenhouse gas impacts. The red cluster represents a research stream connected to Sustainable Development, CSR, and Investment. This cluster explores the interplay between corporate governance, institutional frameworks, and China's economic context, aligning with the corporate social responsibility debate in sustainability. The focus is on how investment decisions intertwine with sustainable practices and institutional strategies, reflecting the importance of corporate governance in shaping sustainability and CSR initiatives. The blue cluster illustrates the theme of Finance and Investments, connecting to broader areas such as Environmental Policy, Institutional Investors, and Commerce. This cluster explains the relationship between financial markets, commerce, and environmental management, emphasizing how finance is crucial in implementing environmental policies. The strong links between institutional investors and environmental management highlight the critical importance of financial influence in driving corporate and environmental strategies. This co-

occurrence network indicates the integration of financial decisions, climate policy, and corporate governance, and underscores the necessity for interdisciplinary approaches when addressing environmental sustainability and investments. This thematic exploration provides insight into how environmental challenges, investment strategies, and institutional factors coalesce in scholarly discussions.

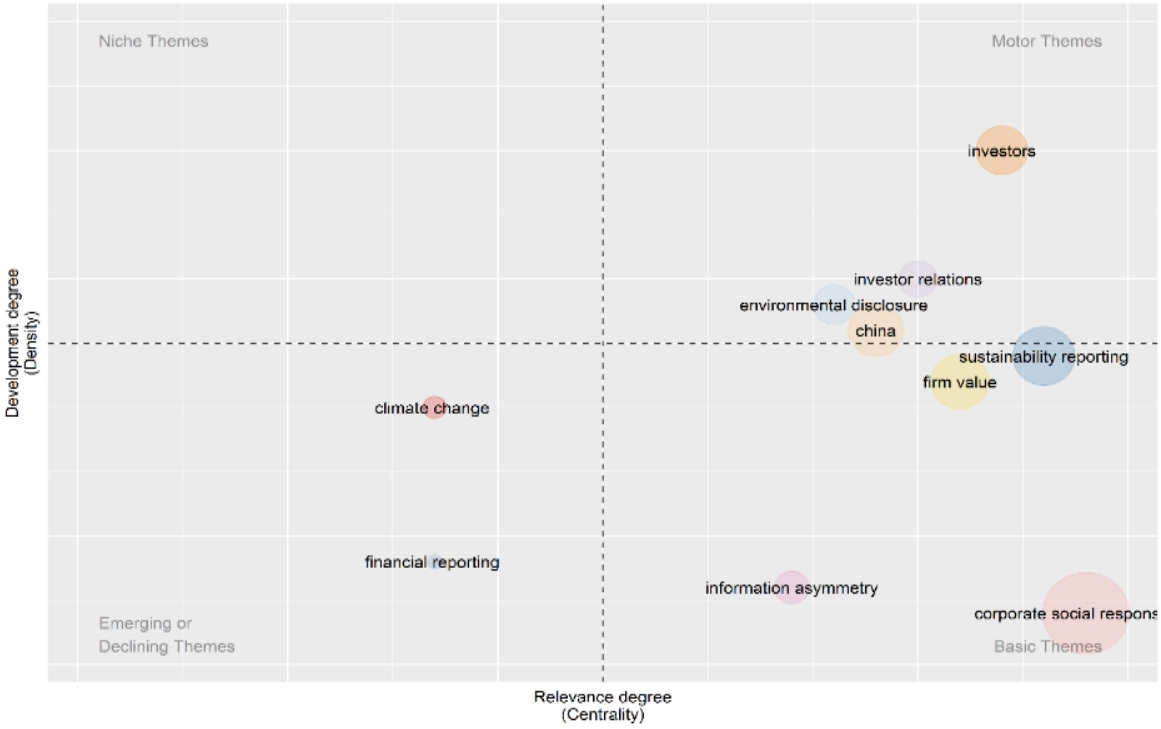

Figure 8. *Thematic Map.*

Thematic Map

The thematic map presented in Figure 8 groups research themes based on density (y-axis) and centrality (x-axis), illustrating four categories: niche themes, motor themes, emerging or declining themes, and basic themes. In the upper-right quadrant, known as motor themes, we see keywords such as Investors**,** Investor Relations**,** Environmental Disclosure**,** Sustainability Reporting**,** China, and Firm Value. These themes are highly central and developed, indicating that they are critical and growing areas of research in the field. Sustainability reporting and investors highlight the increasing focus on the relation among financial markets and environmental responsibilities, especially in the context of China. These themes drive the literature on corporate environmental performance and investor decision-making (Xu & Zhang, 2013). There are no themes in the upper-left quadrant, labelled niche themes. Niche

themes typically represent highly specialized but less central areas of research, meaning they are well-developed but may not significantly impact the broader field at present. In the lower-right quadrant, labelled basic themes, we see Corporate Social Responsibility and Information Asymmetry**.** These themes are central to the research field but have lower density, indicating they are well-established yet require further exploration for growth. Corporate social responsibility has been a fundamental topic for a long time (Elmagrhi et al., 2019; Sarfraz et al., 2020), while information asymmetry connects directly to financial reporting and transparency, suggesting it plays a foundational role in the discussions of environmental reporting and sustainability. In the lower-left quadrant, labeled emerging or declining themes, Climate Change and Financial Reporting are found. These themes have low centrality and density, indicating that while they are essential to the field, their relevance or significance could be growing or fading. The presence of financial reporting in this quadrant highlights the ongoing but fluctuating interest in connecting financial performance with sustainability and environmental issues (Pham & Tran, 2020). Climate change is a critical issue in broader environmental discussions, but in the specific context of this research, it may represent an evolving or relatively undeveloped area ((Mardini & Elleuch Lahyani, 2022). This thematic map outlines the current state of research related to environmental sustainability, investment, and corporate governance, providing insight into how these fields are interconnected and where further exploration is necessary.

Thematic Evolution

Alongside the theme map, Figure 9 shows the thematic progression (parent 12), which illustrates the historical advancement of sustainability disclosure literature. The records of topic issues and their history are depicted using the key words and thematic progression. Three time segments and "biblioshiny" are used to create the theme development. In light of the higher illustration of topic progression, segmentation is based largely on the authors' subjective judgement this time. The years 1999–2016 make up the first part, followed by 2017–2019 in the second and 2020–2021 in the third. All these themes are being evaluated.

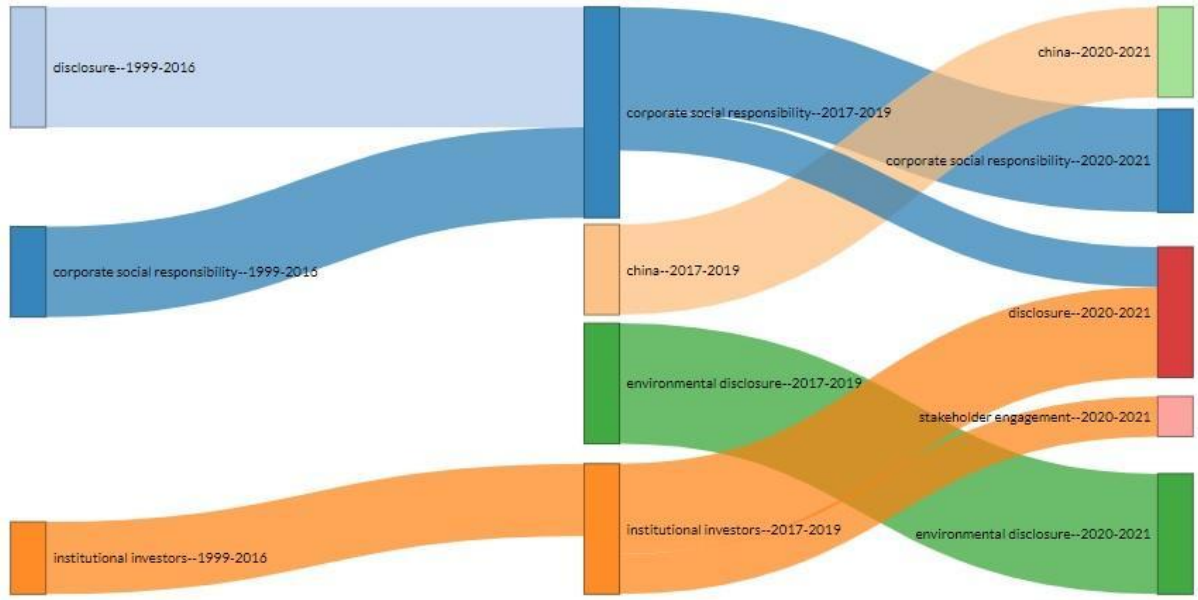

Figure 9. *Thematic Evolution*

In the first segment from the year, from 1999 to 2016 the disclosure topics were used most in the social science literature and stopped studies in coming the years. From the year 1999 to 2016 CSR increased the number of studies on the topic but in 2016 there was a low study on CSR and the years 2017-2021 again started the increasing number of studies on this topic due to the highest importance. Institutional investors from the year 1999 to 2016 have a significant role but low studies were conducted.

Regarding the literature first segment shows the main topics that represent the main issues throughout the years. Institutional investors follow the increasing trend through the year from 2017-2021 and also increase the importance of the topic. The second segment includes two new topics China and environmental disclosure from the years 2017-2019. China has less importance than environmental disclosure, but next year, 2020-2021, increase the importance of these topics. The last segment from the years 2020-2021 introduces new topics including stakeholder engagement or disclosure again started being studied in the literature on investor and sustainability disclosure.

5. CONCLUSION

This study highlights important aspects of the investor and sustainability literature. These influential aspects will have an impact on mainstream research in the future. Our findings of the study include CSR and Environmental Management, Business Strategy and The Environment, and Sustainability (Switzerland) are the top three journals in sustainability

literature and we have a total top ten journals we considered. We found some significant keywords for achieving our objectives: institutional investor, commonly used in authors' keywords, titles, and abstracts. Cho Ch and Aibar-Guzmn B are both authors who have had a significant impact on sustainability literature. We found top affiliated university is Macquarie University under the literature which has significantly published documents at the international level. The USA also published articles but had more citations about a total of 306. We find corresponding authors' countries, including the USA, which published a total of 10 articles (SCP 7, MCP 3). The remaining countries also played an important part in publishing articles; China and Spain scored second and third. The main collaboration of analysis is in among Canada and France with a frequency of 3. China additionally collaborated with Australia, Pakistan, and the United Kingdom with a frequency of 3 and 2. This reseearch highlights the growing importance of sustainability disclosure in shaping investor decisions. As ESG factors become central to investment strategies, companies that engage in transparent reporting are better positioned to attract investors and sustain long-term value. Sustainability disclosures not only provide critical non-financial information but also promote corporate accountability, aligning firms with stakeholder expectations. The analysis reveals regional differences in disclosure practices, with countries like the USA showing a strong correlation between comprehensive reporting and enhanced firm valuation, while regions such as the Middle East demonstrate room for growth in CSR practices. Future research should focus on standardizing sustainability reporting frameworks to meet the diverse needs of stakeholders, thereby fostering stronger investor relations and promoting corporate responsibility. Collaboration between regulatory bodies and accounting networks is crucial to enhance the effectiveness of sustainability reporting and its influence on investor decisions globally. This approach will ensure companies contribute to broader environmental and social goals while maintaining competitiveness in the investment landscape.

Future Agendas

Based on the analysis of the current trends and key themes in the relationship between investor pressure and sustainability disclosure, several future research directions can be outlined. First, future research could focus on comparing the effectiveness of mandatory sustainability disclosures versus voluntary reporting. This could involve examining regulatory environments, like those in the European Union, where sustainability reporting is required, against regions with more voluntary frameworks. Second, research could explore integrating emerging technologies such as blockchain and artificial intelligence to improve

sustainability disclosures' transparency and accuracy. For example, blockchain could enhance traceability in the supply chain, providing more reliable environmental data. Thirdly, analyzing how investor sentiment toward sustainability disclosures impacts firm performance over the long term would provide valuable insights into the relation among transparency and corporate success. This could include a longitudinal study across different industries and regions. Fourth, future studies could focus on sector-specific sustainability disclosure practices, such as examining industries with high environmental impacts (e.g., oil and gas, manufacturing) to better understand how investor pressure influences ESG disclosures and performance. Fifth, a cross-country comparative study focusing on investor pressure's role in driving sustainability disclosures in developed versus developing economies could provide more nuanced insights. This research could identify global trends and regional variations in investor influence on corporate transparency. Sixth, Research could examine the growing role of institutional investors (e.g., pension funds and mutual funds) in integrating ESG criteria into their investment strategies. Investigating how these investors drive sustainability disclosure and the consequent impact on corporate policies would be beneficial. Seventh, future research could focus on how companies engage with various stakeholders, including investors, communities, and regulatory bodies while preparing sustainability reports. Understanding this interaction could shed light on the motivations behind disclosure practices. These directions would advance the understanding of how sustainability disclosures interact with investor behavior, regulatory frameworks, and corporate strategies.

Study limitation

This study has two limitations that should be taken into account. It's possible that the listed companies in our sample don't accurately reflect all Chinese enterprises. Furthermore, our results might not hold true in nations with information environments and investor protection that differ from China. Second, we don't look at the reporting quality of CSR disclosures; we just look at whether they are required. To demonstrate the connection between CSR disclosures and CSR report quality, future research might look for a more thorough indicator of CSR report quality.

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