


A BIBLIOMETRIC ANALYSIS OF MANDATORY CORPORATE SOCIAL RESPONSIBILITY USING RSTUDIO: BASED ON SCOPUS DATABASE

Wasi Yazdani ^A, Lamaan Sami ^B, Mohd Shamim Ansari ^C



ARTICLE INFO	ABSTRACT
<p>Article history:</p> <p>Received 04 October 2022</p> <p>Accepted 27 December 2022</p>	<p>Purpose: CSR in India has been the focus of many researchers. This paper aims to map the intellectual structure of mandatory CSR research, identifying influential authors and journals, current and evolving issues, and future research direction.</p>
<p>Keywords:</p> <p>Corporate Social; Responsibility; Mandatory CSR; Bibliometric Analysis; RStudio; Biblioshiny.</p>	<p>Design/Methodology/Approach: Using the RStudio package, a bibliometric analysis of 130 articles is conducted in mandatory CSR by extracting data from the Scopus database for ten years (2012-2022).</p>
	<p>Findings: The main results show the first article was published in 2012, and over 85% of articles have been published in the last five years. In 2021, 33 articles were published; in 2022, it published 34 articles, a new peak. The result shows that "Social Responsibility Journal" is the most productive journal, and 2021 is the most productive year; Bhattacharyya A, Kansal M, Rahman ML, and Ray S is the most contributing author.</p> <p>Practical implications: This article is to analyze the prominent trends in the journal concerning papers, authors, institutions, nations, journals, subjects, and keywords. The results of this study will help readers obtain a complete comprehension of the publication.</p> <p>Originality: Since CSR was made mandatory in 2014 in India and other countries, hardly any study has done a bibliometric analysis on mandatory CSR.</p> <p>Limitations: Scopus is the only source of the database used; other databases like the web of science, google scholar, etc., are not considered. The data is available only for ten years; from 2012 to 2022, only the keyword "mandatory CSR" is used for 130 articles</p>
<p>Doi: https://doi.org/10.26668/businessreview/2022.v7i6.744</p>	

UMA ANÁLISE BIBLIOMÉTRICA DA RESPONSABILIDADE SOCIAL CORPORATIVA OBRIGATÓRIA USANDO RSTUDIO: BASEADA NO BANCO DE DADOS SCOPUS

RESUMO

Objetivo: a RSE na Índia tem sido o foco de muitos pesquisadores. Este trabalho visa mapear a estrutura intelectual da pesquisa obrigatória de RSE, identificando autores e periódicos influentes, questões atuais e evolutivas, e a direção futura da pesquisa.

Design/Methodologia/Aprovativa: Usando o pacote RStudio, uma análise bibliométrica de 130 artigos é realizada em RSE obrigatória, extraíndo dados da base de dados Scopus por dez anos (2012-2022).

Conclusões: Os principais resultados mostram que o primeiro artigo foi publicado em 2012, e mais de 85% dos artigos foram publicados nos últimos cinco anos. Em 2021, foram publicados 33 artigos; em 2022, foram publicados 34 artigos, um novo pico. O resultado mostra que o "Social Responsibility Journal" é a revista mais

^A Research Scholar at the Department of Commerce, Aligarh Muslim University, Aligarh, India.

E-mail: wasiyazdani0820@gmail.com Orcid: <https://orcid.org/0000-0001-7253-1845>

^B Assistant Professor at the Department of Commerce, Aligarh Muslim University, Aligarh, India.

E-mail: dr.lamaamsami@gmail.com Orcid: <https://orcid.org/0000-0002-9911-5523>

^C Associate Professor at the Department of Commerce, Aligarh Muslim University, Aligarh, India.

E-mail: drshamimansari@gmail.com Orcid: <https://orcid.org/0000-0003-1177-1575>

produtiva, e 2021 é o ano mais produtivo; Bhattacharyya A, Kansal M, Rahman ML, e Ray S é o autor que mais contribui.

Implicações práticas: Este artigo tem como objetivo analisar as tendências proeminentes da revista no que diz respeito a artigos, autores, instituições, nações, periódicos, assuntos e palavras-chave. Os resultados deste estudo ajudarão os leitores a obter uma compreensão completa da publicação.

Originalidade: Desde que a RSE foi tornada obrigatória em 2014 na Índia e em outros países, praticamente nenhum estudo fez uma análise bibliométrica sobre a RSE obrigatória.

Limitações: Scopus é a única fonte da base de dados utilizada; outras bases de dados como a web da ciência, google scholar, etc., não são consideradas. Os dados estão disponíveis apenas por dez anos; de 2012 a 2022, apenas a palavra-chave "RSE obrigatória" é usada para 130 artigos.

Palavras-chave: Responsabilidade Social Empresarial, RSE Obrigatória, Análise Bibliométrica, RStudio, Biblioshiny.

ANÁLISIS BIBLIOMÉTRICO DE LA RESPONSABILIDAD SOCIAL OBLIGATORIA DE LAS EMPRESAS MEDIANTE RSTUDIO: A PARTIR DE LA BASE DE DATOS SCOPUS

RESUMEN

Objetivo: La RSE en la India ha sido objeto de atención de numerosos investigadores. El objetivo de este artículo es trazar un mapa de la estructura intelectual de la investigación obligatoria sobre RSC, identificando autores y revistas influyentes, temas actuales y en evolución, y la futura dirección de la investigación.

Diseño/metodología/enfoque: Utilizando el paquete RStudio, se realiza un análisis bibliométrico de 130 artículos en RSE obligatoria extrayendo datos de la base de datos Scopus durante diez años (2012-2022).

Resultados: Los principales resultados muestran que el primer artículo se publicó en 2012, y más del 85% de los artículos se han publicado en los últimos cinco años. En 2021, se publicaron 33 artículos; en 2022, publicó 34 artículos, un nuevo máximo. El resultado muestra que "Social Responsibility Journal" es la revista más productiva, y 2021 es el año más productivo; Bhattacharyya A, Kansal M, Rahman ML, y Ray S es el autor que más contribuye.

Implicaciones prácticas: El objetivo de este artículo es analizar las tendencias más destacadas de las revistas en cuanto a artículos, autores, instituciones, naciones, revistas, temas y palabras clave. Los resultados de este estudio ayudarán a los lectores a obtener una comprensión completa de la publicación.

Originalidad: Desde que la RSE se hizo obligatoria en 2014 en la India y otros países, casi ningún estudio ha realizado un análisis bibliométrico sobre la RSE obligatoria.

Limitaciones: Scopus es la única fuente de la base de datos utilizada; no se tienen en cuenta otras bases de datos como web of science, google scholar, etc. Los datos solo están disponibles para diez años; de 2012 a 2022, solo se utiliza la palabra clave "mandatory CSR" para 130 artículos.

Palabras clave: Responsabilidad social de las Empresas, RSE Obligatoria, Análisis Bibliométrico, RStudio, Biblioshiny.

INTRODUCTION

In recent years, Corporate Social Responsibility (CSR) has played an increasingly central role based on the voluntary integration of social and environmental issues in business management. CSR is a commitment to act ethically beyond legal compliance. According to the contemporary definition of CSR (corporate social responsibility), companies should consider the social interests of the community's residents when making routine business decisions. According to Mohr and Webb (2005), customers prefer to purchase from businesses aware of their social responsibilities. Building a company's reputation with bankers, investors, and government officials through CSR helps the company obtain market funding (Spicer 1978). Further, companies involved in practices that fulfil and exceed the regulatory compliance norms

are subject to less scrutiny and granted *carte blanche* by national and local government agencies. Following the financial crisis in 2008, academics and practitioners have become increasingly interested in corporate social responsibility (CSR). It will incorporate ethical, social, and environmental considerations into management decisions. A business firm can influence social and economic value creation through CSR activities (Agrawal and Sahasraanam, 2016).

CSR is a successful approach that, broadly understood, refers to a company's commitment to promoting massive economic, socio-cultural, and ecological safety and security through corporate practices, CSR policies, and resources (Du et al., 2011). Over the years, Corporate Social Responsibility has grown from a benevolent characteristic to an obligation and a mandatory requirement (Carroll, 2008), becoming a fruitful corporate model that offers a relative advantage in various ways (Porter and Kramer, 2006). CSR emphasizes the interrelationships between the environment and society, the stakeholder perspective, ethical behaviour, and volunteerism (Behringer and Szegedi 2016). According to Dyllick and Muff (2016), CSR only concentrates on micro-level eco-efficiency and win-win business methods. Although CSR has many definitions (Dahlsrud, 2008), the three economic, social, and environmental components form the foundation of CSR in Sustainable Development (Zhang et al., 2019). European Commission (2001) defined "CSR as a concept whereby companies integrate social and environmental concerns in their business operations and their interaction with their stakeholders on a voluntary basis" (Martinuzzi *et al.*, 2011, Murashima, 2020).

World Business Council for Sustainable Development (WBCSD) (2000) define "CSR as the continuing commitment by businesses to behave ethically and contribute to economic development while improving the quality of life of the workforce and their families as well as of the local community and society at large" (Bokhari, 2017). An extensive definition was put forward in 1983 by AB Carroll "Corporate Social Responsibility involves the conduct of a business so that it is economically profitable, law-abiding, ethical and socially supportive" (Maqbool & Zameer, 2018). According to Freeman (1984), an organization is responsible for "every group or individual who can affect or is affected by the organization's goals." The study's theme of corporate social responsibility is chosen because of its importance in India's current business environment. A contemporary analysis of KPMG International, the United Nations Environmental Programme (UNEP), the Global Reporting Initiative (GRI), and the Centre for Corporate Governance in Africa found that approximately 400 sustainability reporting instruments have been implemented globally and, more than two-thirds of which are mandatory rules and regulations. There have been several recent developments in legislating CSR, such as the due diligence strategy in France.

In India and Mauritius, the philanthropy approach, the general duty approach under company law in Indonesia and China, and the governance structure approach in South Africa (Lin, 2020). For countries with mandatory CSR spending/reporting regulations, i) CSR reporting is required in France for publicly traded companies' annual reports. ii) Investors and state-owned businesses in Denmark are required to report on CSR in their yearly financial reports. iii) Mandatory reporting by state-owned companies in Sweden. iv) Natural resource-based companies in Indonesia must set aside funds for CSR initiatives, which must be carried out in accordance with legal requirements. v) Disclosure of CSR practices or activities is required in Malaysia for companies listed on Bursa Malaysia (Mittal and Jain, 2015). Within Mauritius, according to the current CSR initiative (starting in October 2019), every profitable company must establish a CSR fund equal to 2% of its chargeable income from the year prior, with at least 75% of that fund allocated to the Ministry of Finance (Lin, 2020).

Background of Mandatory CSR in India

The Ministry of Company Affairs (MCA) issued the first CSR at the policy level in 2009 when it issued the Corporate Social Responsibility Guidelines (Sarkar & Sarkar, 2015). In December 2009, the first proposal was made for voluntary CSR in the new companies act 2013. The first proposal was made for mandatory CSR in the new companies act 2013 in July 2011. These rules were approved in February 2014 (Dharmapala & Khanna, 2018). Following that, Section 135 of the Companies Act of 2013 was introduced in India to make CSR expenditure and disclosure mandatory for select companies, thus complicating the regulatory environment for CSR by requiring both social responsibility expenditure and reporting (Sarkar & Sarkar, 2015). The CSR requirement of section 135 of the Companies Act 2013 becomes effective for firms under the threshold limits from the fiscal year 2014-15 (Dharmapala & Khanna, 2018). Under the Companies act 2013, every company must spend on CSR under section 135, which took effect on April 1, 2014.

Under section 135, all companies must spend if they fulfil any of the three criteria - having a turnover of Rs 1000 crores or above, a net worth of Rs 500 crores or above, and a net profit of Rs 5 crores or above during the immediately preceding financial year. All the companies shall spend at least 2% of the average net profit during the immediate three preceding financial years to implement CSR policy and projects under Schedule VII of the new Companies Act (Verma & Kumar, 2014, Dharmapala & Khanna, 2016, Gatti *et al.*, 2018, Sinha, 2021). The Companies (Amendment) Act 2019 incorporated subsection (7) of section 135; if a company fails to spend this amount, the company shall get a minimum penalized with the fine

of Rs 50,000, but not more than Rs 25,00,000. Every officer who defaults shall be liable to pay a minimum fine of Rs 50,000 but may extend to Rs 5,00,000 or three years of punishment in jail, or both (Bhattacharyya and Rahman, 2019, Sinha, 2021). In 2021, the provision made it a civil offence in Section 135(7) of the new Companies Act, substituted by the Companies (Amendment) Act, 2020. It states that in case of violation of the CSR provisions, the company shall be required to pay a fine double the amount needed to be transferred to the particular fund or unspent CSR amount or 1,00,00,000, whichever is less.

Every officer who defaults shall be punished with a fine of one-tenth of the amount needed to be transferred to a particular fund or the remaining CSR amount required to spend or 2,00,000, whichever is less (Sinha, 2021). Under section 135 of the Companies Act, the company must spend the money for CSR in the local and surrounding areas. Expenditure on activities not listed in Schedule VII would not be considered CSR spending. Companies are allowed to collaborate on CSR projects and programs with other organizations. Similarly, a company can establish a section 8 company, society, or trust for charitable purposes. Section 135 of the new Companies Act allows firms to formulate a committee for CSR on the board, draft CSR policy, and spend a minimum of 2% on average net profit in the immediate past three years on CSR policy.

Bibliometric Analysis

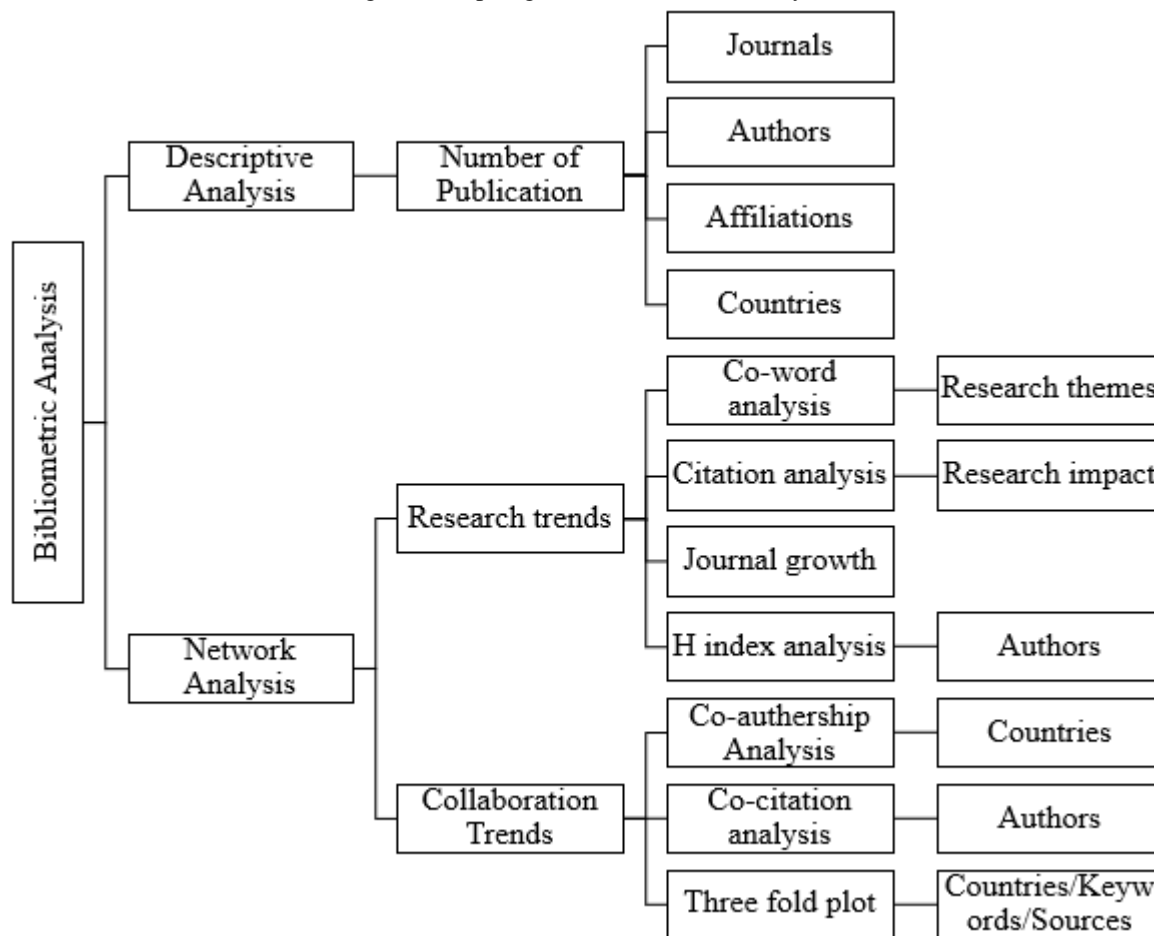
The production of scientific papers had increased dramatically, as had their accumulation in bibliometric databases (Sancho, 1990). Bibliometrics is a strategy that makes it possible to learn about the past, comprehend the present, and suggest future directions (Lezama-Nicolás *et al.*, 2018, Hassan *et al.*, 2021). Bibliometrics study is a cross-disciplinary field that applies mathematical and statistical approaches to statistically examine all types of knowledge bearers (Shahzad *et al.*, 2021). It's a multidisciplinary knowledge system that includes mathematics, statistics, quantification, and philology. The essential measuring items are the number of articles (several publications, specifically journal articles and journal citations), the number of authors (individuals or groups), and the amount of vocabulary (different document findings, most of which are thesauruses), etc. (Gao *et al.*, 2021). In contrast to the conventional structured approach, the bibliometric technique may deal with significant publications to create a scientific framework of research themes (Zupic and Cater, 2014).

There are two types of bibliometric approaches "performance analysis and graphic mapping" (Noyons *et al.*, 1999). "Performance analysis aims to examine the impact of the citations of systematic and scientific work produced by several research participants

(researchers, departments, universities, and countries)" (Yu and Shi, 2015). Graphic mapping is used to highlight the structure and traits of the systematic and scientific fields. It is a structural representation of the relationships between various areas, topics, ideas, authors, and records (Munoz *et al.*, 2014). According to Benckendorff and Zehrer, 2013, there are two categories of bibliometric techniques, i.e. relational and evaluative. The relational method deals with knowledge building using analysis of bibliographic coupling, co-authorship, co-citation, and co-word (Koseoglu, 2016). whereas the evaluative method uses to measure productivity, for example, the number of publications, impact factors, and other types of descriptive data, to define intellectual progress (Benckendorff, 2009; Benckendorff and Zehrer, 2013; Hall, 2011). The present study on mandatory corporate social responsibility focuses more on pertinent academic research papers than on creating novel ideas. In order to identify and work together on the current data for evaluation, bibliometric analysis has been used. This research strives to produce literary work, and it uses only credible journals as sources. In pursuance of bibliometric study, it came to my knowledge that there is a scares literature covering mandatory CSR.

Various researchers have reviewed the evidence to address many essential features of compulsory CSR. A deep study with the bibliometric analysis method was applied to find the research gap and trends in mandatory CSR. The primary goals of this bibliometric study are to analyze research trends, knowledge structure, and authorship collaboration and demonstrate intellectual growth based on the number of publications. The following model in Figure 1 depicts the network topology of bibliometric study and anticipated results. This article uses a bibliometric analysis of mandatory CSR to create a comprehensive knowledge of this mandatory CSR and explore the evolution of hot spots in the mandatory CSR field. The software package in RStudio, i.e. (Biblioshiny), is applied to analyze trends and interpret the patterns in the evidence using the Scopus database to achieve the study's goals. It allows for identifying essential tips in the evolution of the mandatory CSR field and comprehending and interpreting networks and patterns. The following is the summary of the rest of the article: In the Methodology section, we first go through the specifics of the data collected and the software used. After that, statistical data will be presented for the network analysis of the co-country and co-author. Finally, we summarised the key findings before discussing the study's limitations and recommending further research.

Figure 1: Topologies for bibliometric analysis



METHODOLOGY

Source of Data

This study extracts the data from the Scopus database with the key term title-abs-key ("mandatory csr") and (limit-to (subjarea , "busi") or limit-to (subjarea , "econ") or limit-to (subjarea , "soci") or limit-to (subjarea , "envi") or limit-to (subjarea , "arts")) and (limit-to (language , "english")). A total of 137 studies have been found for the keyword ("mandatory CSR") from 2012 to 2022 without any limit. Following the dataset of 130 documents covering 2012 - 2022 collected for the study (September 09, 2022) as shown in figure 2. Out of 130, 105 are articles, 2 are books, 19 are book chapters, 2 are conference papers, and 2 are review papers.

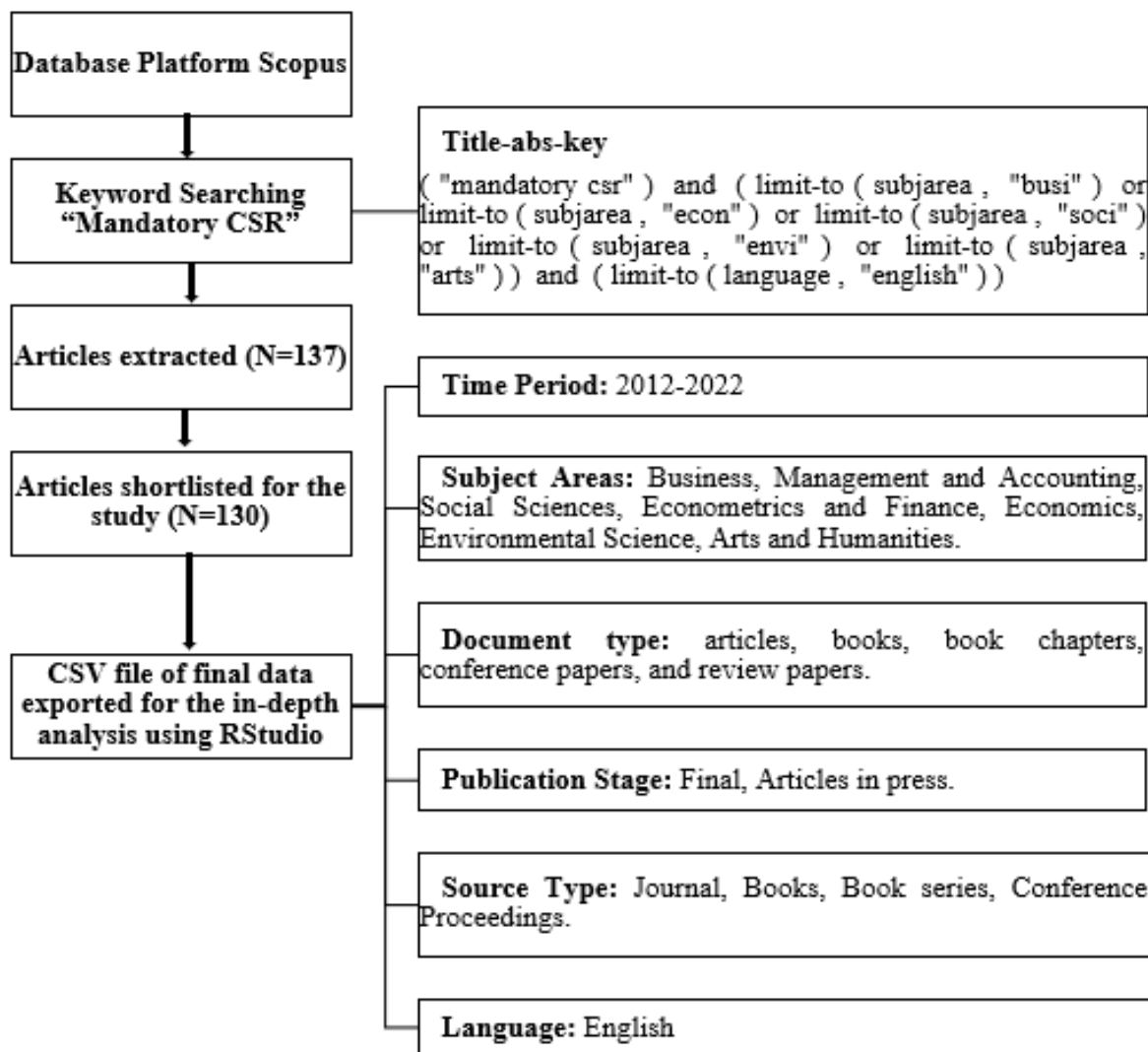
The Scopus database has been taken into consideration for the following reasons, i.e. Few researchers state that the Scopus database is wider coverage and more acceptable for bibliometric research (Feng et al., 2017; Nawaz *et al.*, 2020; Aksnes and Sivertsen, 2019; Farhan and Iqbal, 2021). The database of Scopus is more appropriate for exporting data than

the Web of Science (Nawaz *et al.*, 2020). Cobo *et al.* (2011) discovered that Scopus database is a well-organized indexed that can export publication data and metadata for several research arenas. The Scopus database also contains all bibliographic information about the author, journals, citations, and other information used in the analysis. Figure 2 shows the details of the database selection.

Analytical Tool

According to Aria, M., & Cuccurullo, C (2017), "Bibliometric: An R-tool for comprehensive science mapping analysis". According to Dervis (2019), "R is open-source software, which means that it operates in an integrated environment that consists of open libraries, open algorithm, and open graphic software". Biblioshiny in RStudio is free software that has been used for this analysis. RStudio can provide visual representations of existing literature and present graphs illustrating hotspots, research networks, and rising trends (Gao *et al.*, 2021). Compared to other open-access software of a similar nature, such as VOS viewer, its emphasis is not just on viewing the information but also on presenting the result in a more accurate and statistically reasonable way (Shoeb *et al.*, 2022). Figure 2 presents the flowchart of database selection.

Figure 2: Flowchart of database selection



RESULTS AND ANALYSIS

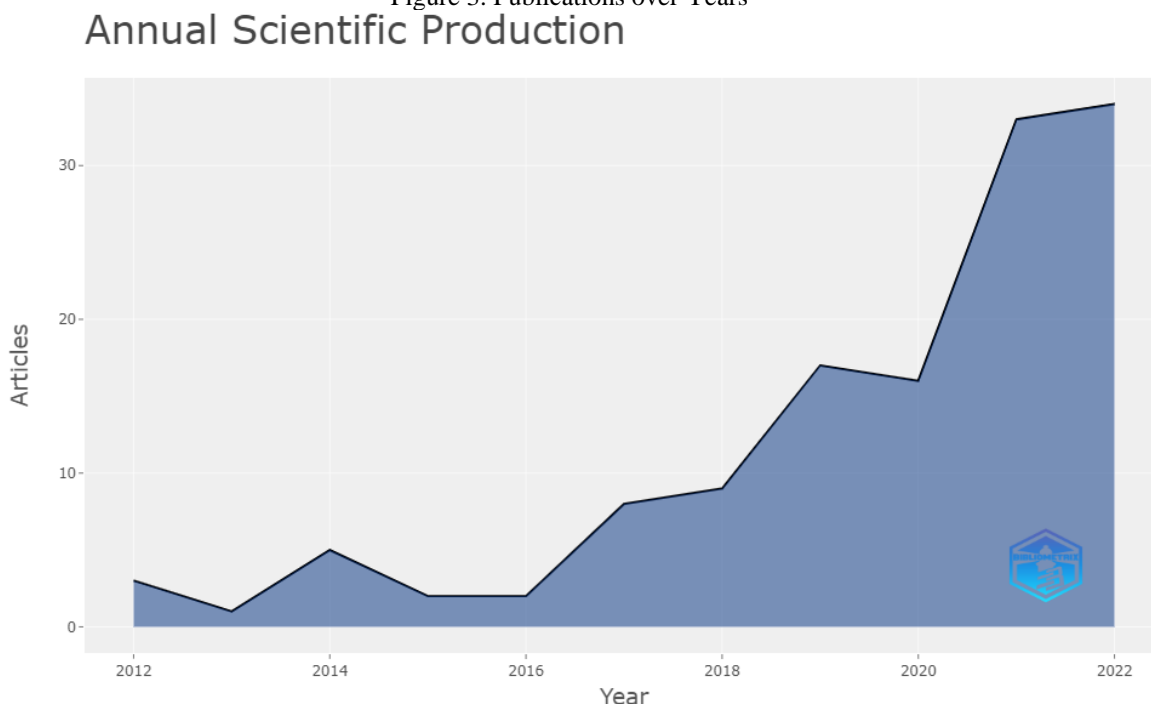
Publication Trends

Table 1 indicates the publication history of the number of articles published per year, covering a period from 2012 to 2022. It depicts the mean total citation per article and the mean total citation per year. The publication and citation trends are shown through the number of articles per year and the mean total citation per year. The average citation per article was highest at 58.89 in 2018. To analyze the trends of "mandatory CSR", the numerous publications over the years are summarised and depicted in Figure 3 and Table 1. As per the collected data, it is found that the first article was published in the year 2012, and more than 85% of articles has published in recent five years. After CSR was made mandatory in India in 2014, publications show an increasing trend from 2017, and the maximum number of articles is 34 published in 2022. also, in 2021, 33 articles were published.

Table 1. Details about the Publication and Citation trends

Year	N	Mean TC per Article	Mean TC per Year
2012	3	17	1.70
2013	1	12	1.33
2014	5	7.2	0.90
2015	2	16	2.29
2016	2	15.5	2.58
2017	8	22.5	4.50
2018	9	58.89	14.72
2019	17	15.88	5.29
2020	16	7.38	3.69
2021	33	5.73	5.73
2022	34	1.29	

Figure 3. Publications over Years



Citation Trends

Figure 4 shows the average citation per year from 2012 to 2022 in the mandatory CSR. In 2018 mandatory CSR articles published are highly cited papers with an average citation per year of 14.72, which means the articles are considered highly impressive, also depicted in table 2. However, the number of average citations per year has decreased after 2018 due to the unsatisfactory quality of the research output produced annually in this field. The regular increase in the number of articles demonstrates the importance of CSR and shows that scholars are increasingly engaged in the topic (Gao *et al.*, 2021). A Sankey diagram showing the connections between authors, keywords, and countries is shown in Figure 5.

The countries are on the (right side) of the plot, the keywords are in the (middle row), and the sources are on the (left side). Each of the twenty examples highlighted prominent terms

such as corporate social responsibility, CSR, mandated CSR, mandatory CSR disclosure, financial performance, firm performance, etc., along with the authors' names and nations. The author observed that most of the articles published in the social responsibility journal and meditari accountancy research are in Indian and Chinese studies. Generally, India focuses on corporate social responsibility and India. China also focuses on corporate social responsibility, and almost all these countries cover all the fields.

Figure 4. Number of Average Citation per year

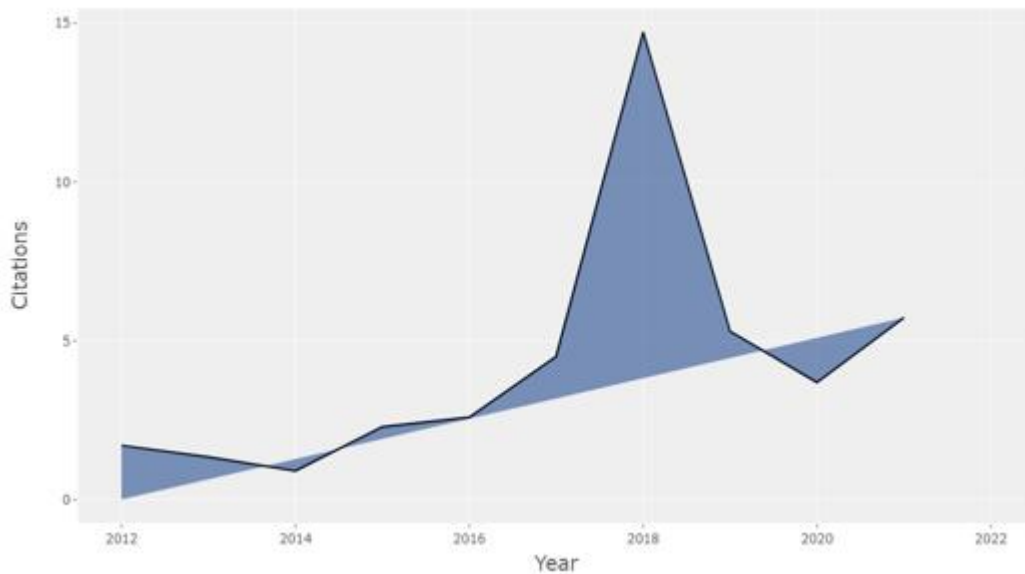
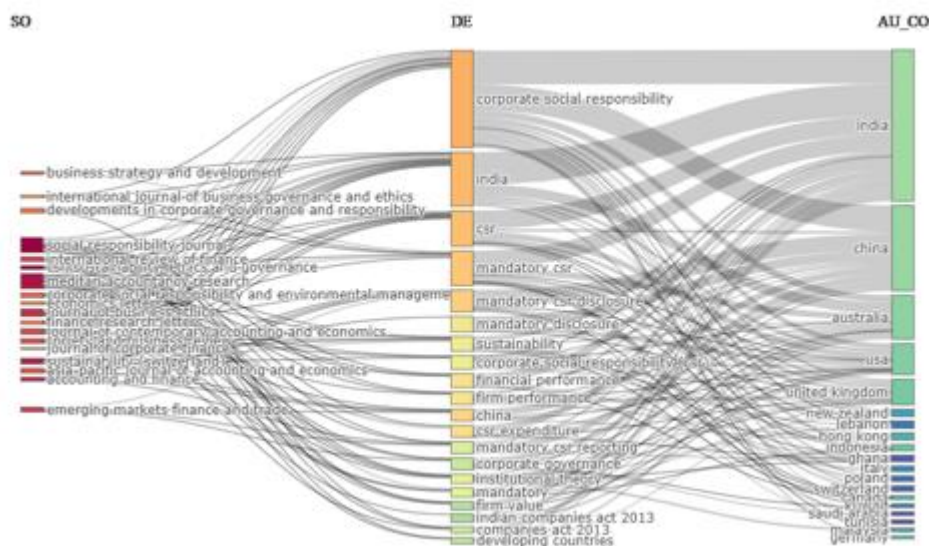


Figure 5. Three Fold Plot



Source of Publication

Table 2 explains the distribution of various most effective journals and shows the top 20 journals that have published articles on the theme of mandatory CSR. The figure shows that the most productive journal is "Social Responsibility Journal", which is top with a score of nine articles. CSR Sustainability Ethics and Governance has second with a score of 7 articles "Meditari Accountancy Research" in the third position with a score of 6 articles. This table depicts most of the journals that published two or three papers; The Social Responsibility Journal, CSR Sustainability Ethics and Governance, Meditari Accountancy Research, which is regarded as one of the essential sources of publications on corporate social responsibility policies.

Table 2. Most Relevant Sources based on the theme

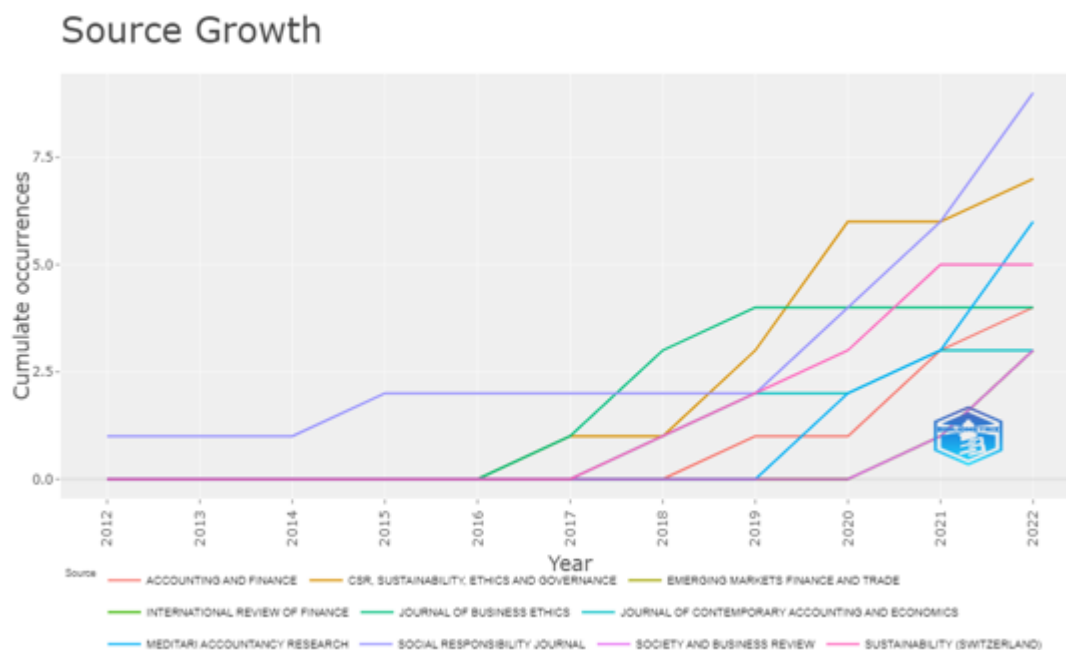
Sources	Articles
Social Responsibility Journal	9
CSR Sustainability Ethics and Governance	7
Meditari Accountancy Research	6
Sustainability (Switzerland)	5
Accounting and Finance	4
Journal of Business Ethics	4
Emerging Markets Finance and Trade	3
International Review of Finance	3
Journal of Contemporary Accounting and Economics	3
Society And Business Review	3
Asia-Pacific Journal of Accounting and Economics	2
Business Strategy and Development	2
Corporate Social Responsibility and Environmental Management	2
Development-Oriented Corporate Social Responsibility	2
Developments in Corporate Governance and Responsibility	2
Economics Letters	2
Finance Research Letters	2
Global Business and Organizational Excellence	2
International Journal of Business Governance and Ethics	2
Journal of Corporate Finance	2

Sources Growth

Applying Locally Estimated Scatterplot Smoothing (LOESS), a regression analysis technique that draws a slick line through a scatterplot to show the variety of publications over time. It is evidenced in figure 6, which is based on the analysis, the growth of the top ten journals is considered. This figure depicts that Social Responsibility Journal published a higher number of articles from the beginning, and in 2022 it published the maximum number of articles. From 2019 onwards, Social Responsibility Journal and CSR Sustainability Ethics and Governance

show a rapid increase in publication. Furthermore, the *Meditari Accountancy Research and Sustainability* (Switzerland) also issued six and five articles in the current year, respectively. Despite the other journals' consistent rise in articles over the previous few years, this may point to the establishment of a field of interdisciplinary research study.

Figure 6. Growth of the Sources



Affiliation, Productions, and Author's Country Analysis

Figure 7 shows the twenty most pertinent associations of authors with the universities in the field of CSR. The Hasanuddin University and the Renmin University of China contributed the most with six articles. Deakin University contributed the second most with five articles, and Management Development Institute, Mangalore University, and Shandong University are the third most contributor articles. Figure 8 depicts the country-wise analysis in this field. The darkest area denotes the most productive fertile, while the lightest area denotes the least productive. India is where research is both plentiful and fruitful, with a frequency score of 112. USA, China, Australia, United Kingdom and Indonesia are more focused on researching mandatory CSR. Figure 9 depicts the country collaboration; single-country proportions define intra-country tendencies; hence, the collaboration between different countries has been described as a percentage of one-country publications. SCP stands for Single co-author papers, and MCP stands for Multiple co-author papers (Dhingra and Kaur, 2021). Figure 9 shows that in terms of intra-country collaboration, India received 27, but in terms of inter-country collaboration, it only received 7. At the same time, China and Australia got second, and the

USA got third in inter-country collaboration. China and the United Kingdom got second and third highest Intra country collaboration, respectively.

Figure 7. Relevant Affiliations

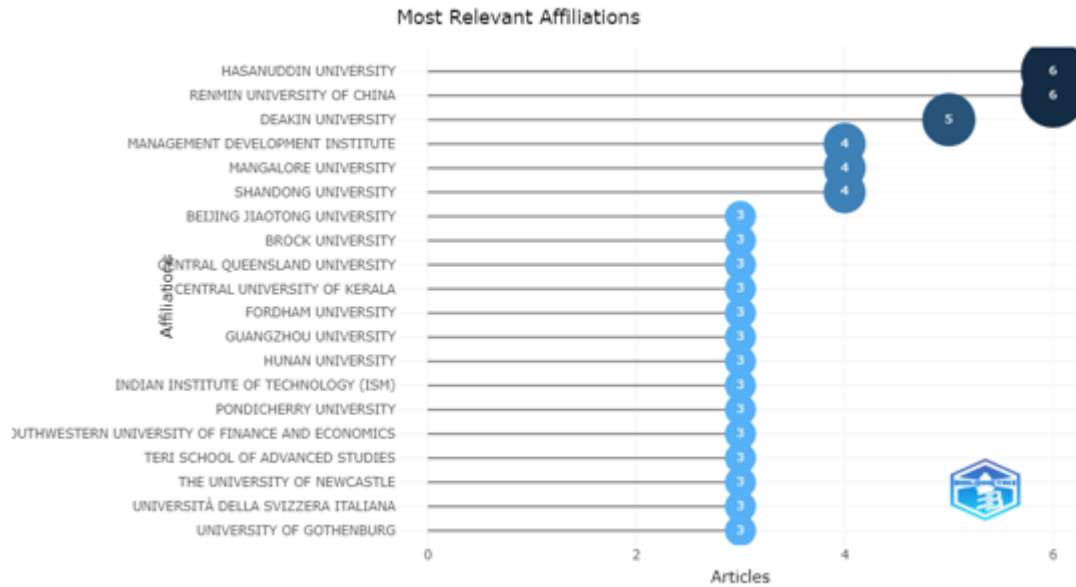
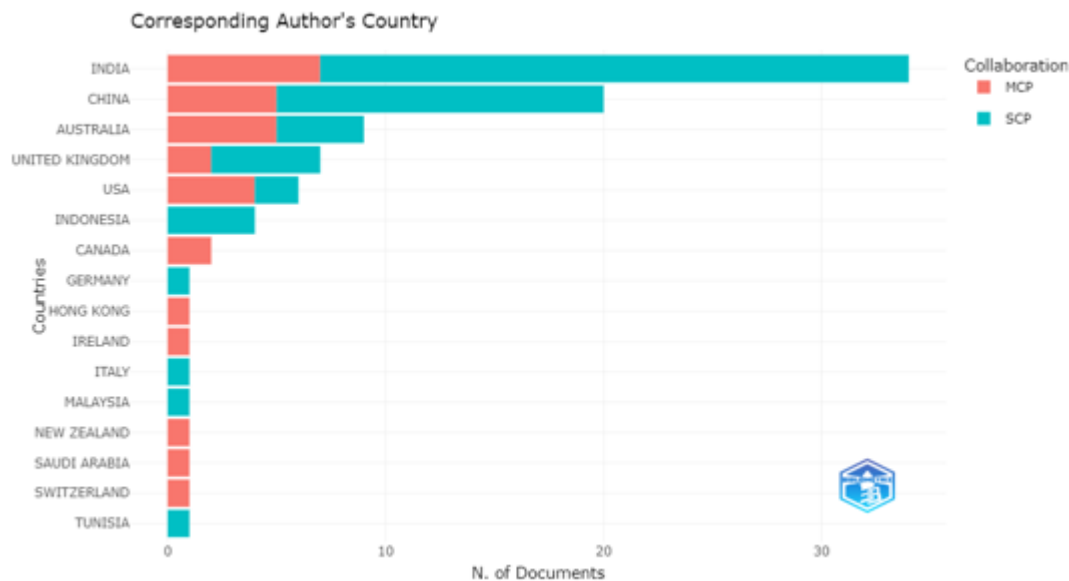


Figure 8. Country Scientific Production

Country Scientific Production



Figure 9. Visual representation of countries and collaboration index



Author's Contribution

Table 3. represents the authors who have produced the most prominent work and have the most articles published in the field of mandated CSR. Bhattacharyya A, Kansal M, Rahman ML, and Ray S were the most effective authors with the maximum number of articles in this field. However, Jadiyappa N, Mallikarjunappa T, Yu L, and Oware KM are the second most productive authors with three published articles each, and the other 60 per cent of authors produced a maximum of two papers each.

Based on the H-index, Figure 10 displays the top 20 authors in the field of CSR. The H-index is used to indicate the calibre of a journal based on performance and citation impact. H index clearly defines the highest value, such as the specified author or journal publishing articles that have been cited at least h times. A journal's excellent quality and quantity could be better represented by the H-index (Shoeb *et al.*, 2022). Bhattacharyya A, Rahman ML, and Kansal M is the most contributing author with the highest H-index with a score of three. It indicated the top author's publications over the years on this theme recently. The majority of journals have an H index of two only. Figure 11. Displayed the leading author's publications over the years, which shows the article published per year and citation received per year in the theme. Bhattacharyya A, Rahman ML, Jadiyappa N, Mallikarjunappa T, Oware KM, and Huang H are the top authors in the mandatory CSR with a high score citation. In 2022, only three authors, Mallikarjunappa T, Oware KM, and Huang H, published the most cited articles.

Table 3. Most Relevant Authors

Authors	Articles	Articles Fractionalized
Bhattacharyya A	4	1.83
Kansal M	4	1.25
Rahman ML	4	2.33
Ray S	4	3.50
Jadiyappa N	3	0.87
Mallikarjunappa T	3	1.33
Oware KM	3	1.33
Yu L	3	0.83
Bansal M	2	1.50
Bird R	2	0.67
Duppati G	2	0.67
Garg A	2	0.83
Gupta PK	2	0.83
Huang H	2	0.53
Jain A	2	0.50
Joshi M	2	0.50
Kumar S	2	0.67
Mitra N	2	0.83
Mukherjee A	2	0.67
Nair R	2	0.53

Figure 10. Most Contributing Authors

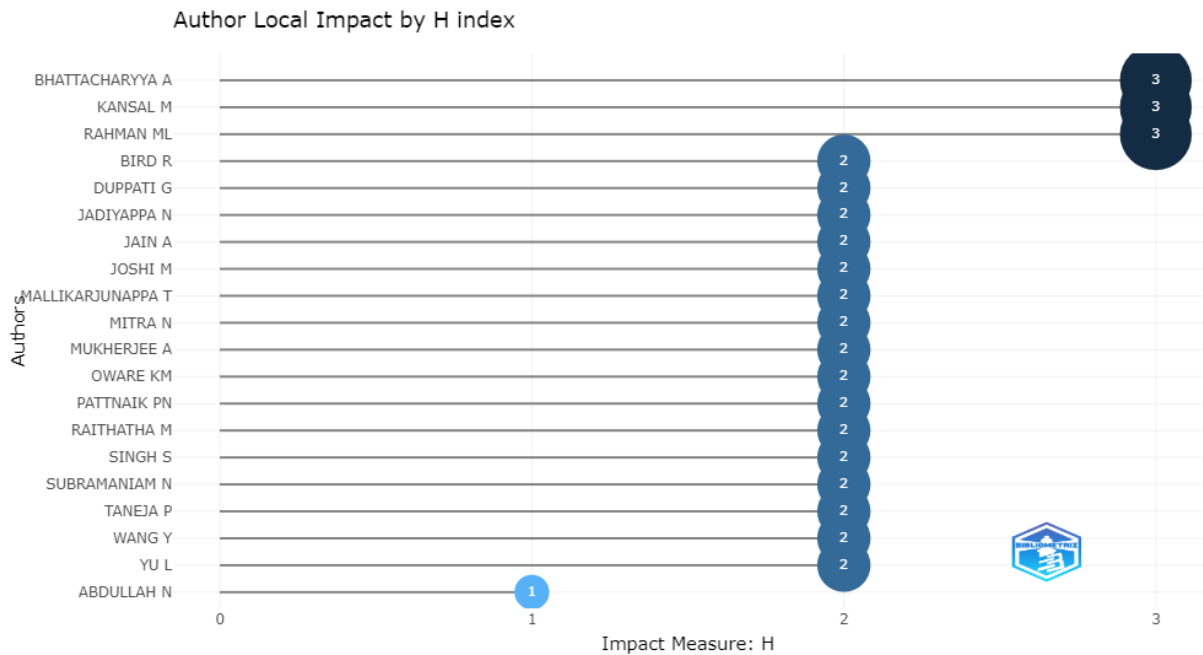
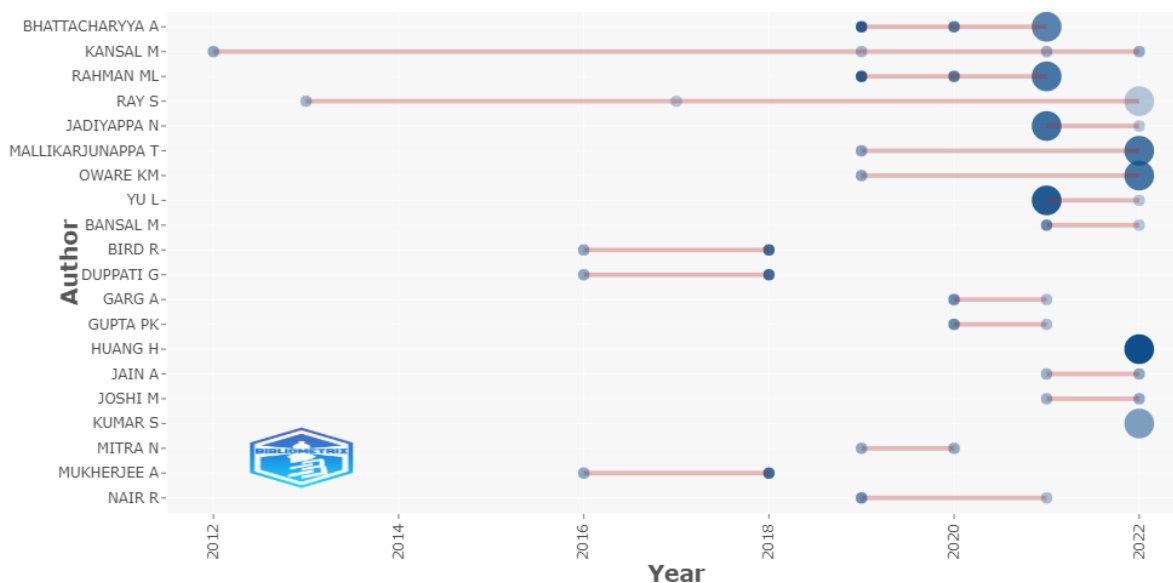


Figure 11. Top Author's Production over time
Top-Authors' Production over Time



Citation Analysis

Figure 12. shows that Hong Kong published the maximum papers in CSR with the most cited documents. Subsequently, India and China are the second and third most cited countries. Hong Kong received the highest 341 citations, whereas India and China received 195 and 178 citations. Only four countries received more than 100 citations remainings companies received less than 100 citations. Further, figure 13 shows the top 20 cited journals in the area of CSR, out of which the Journal of Business Ethics is the top-cited source with the highest number of citations, i.e. 542. Subsequently, the Journal of Management Review and the Strategic Management Journal are the top second and third cited journals, respectively. Only eight journals received more than 100 citations, and the remainings are below the 100 citations.

Figure 12. Most Cited Countries

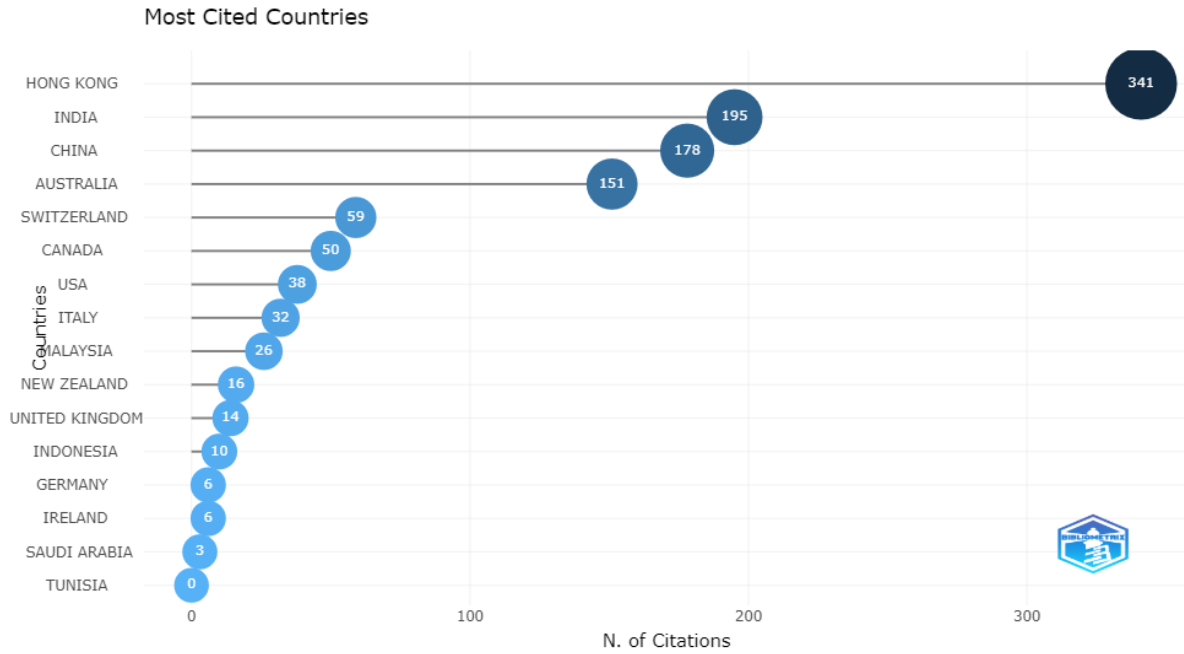
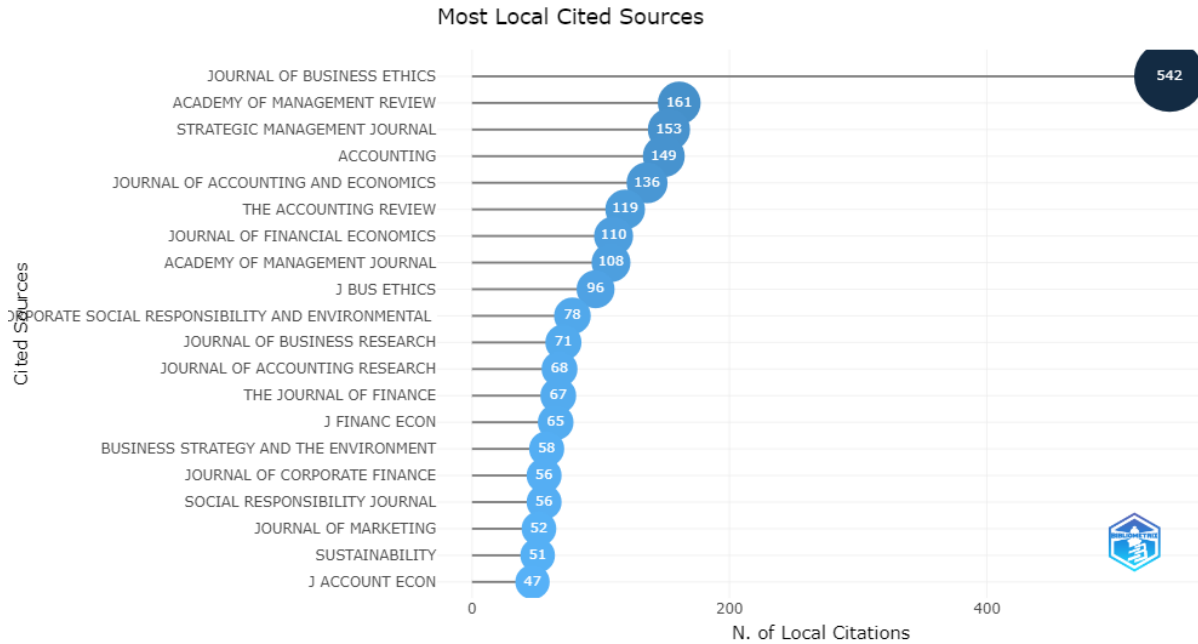


Figure 13. Most Local Cited Sources

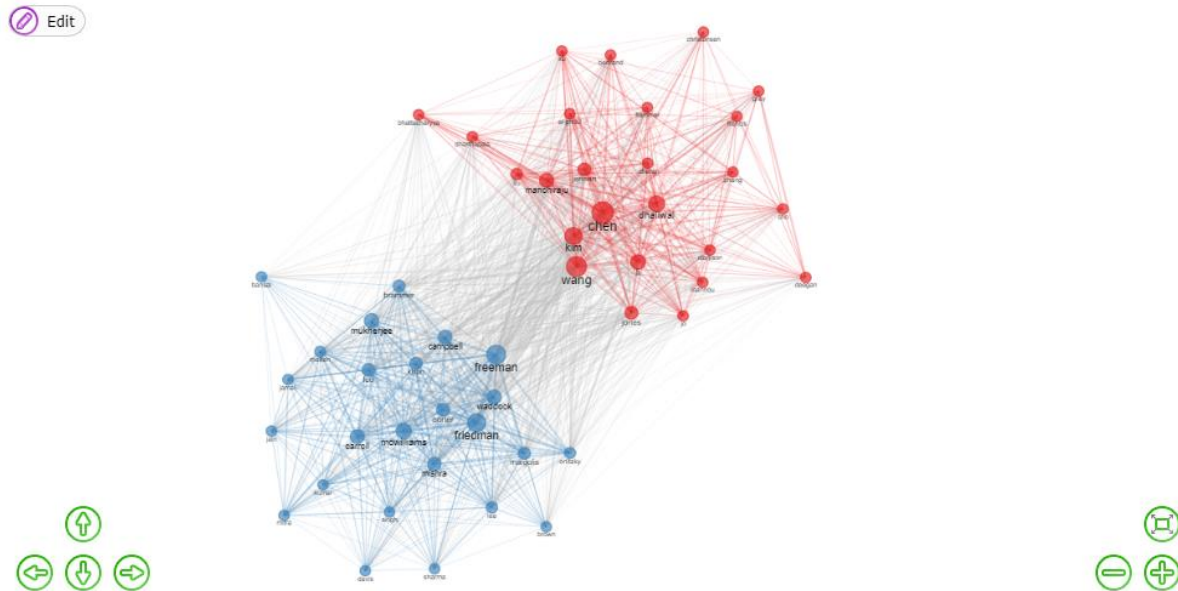


Cluster Analysis Authors Co-citation

The primary three approaches to mapping scientific knowledge are the co-citations network, the co-occurrence network, and bibliographic couplings (Hassan *et al.*, 2021). To determine whether a research article or publication significantly impacts the literature, it uses particular articles and author number of citations. The knowledgeable structure of any literature is analyzed through the co-citation network, which gauges the references included in all the

designated articles (Small, 1973). Figure 14 Demonstrates the co-citation of authors of 50 articles and the interconnection of the cited authors. The results are based on the Scopus database from 2012 to 2022, and it has formed three clusters of networks, which have published many highly cited analyses.

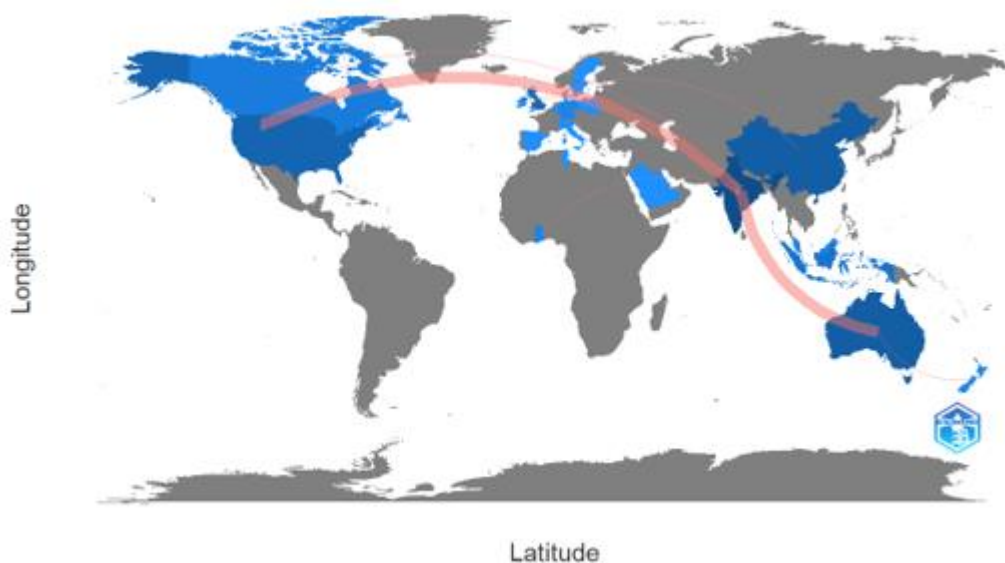
Figure 14. Authors Co-citation Cluster Analysis



Country-Specific Collaboration

Figure 15. Indicated that country-specific collaboration shows that India, Australia, and the USA have highly collaborated. Other countries like Canada, Ghana, and the United Kingdom are less collaborative; the remaining countries are less collaborative, except India.

Figure 15. Country-Specific collaboration



Authors Keywords Co-occurrence network

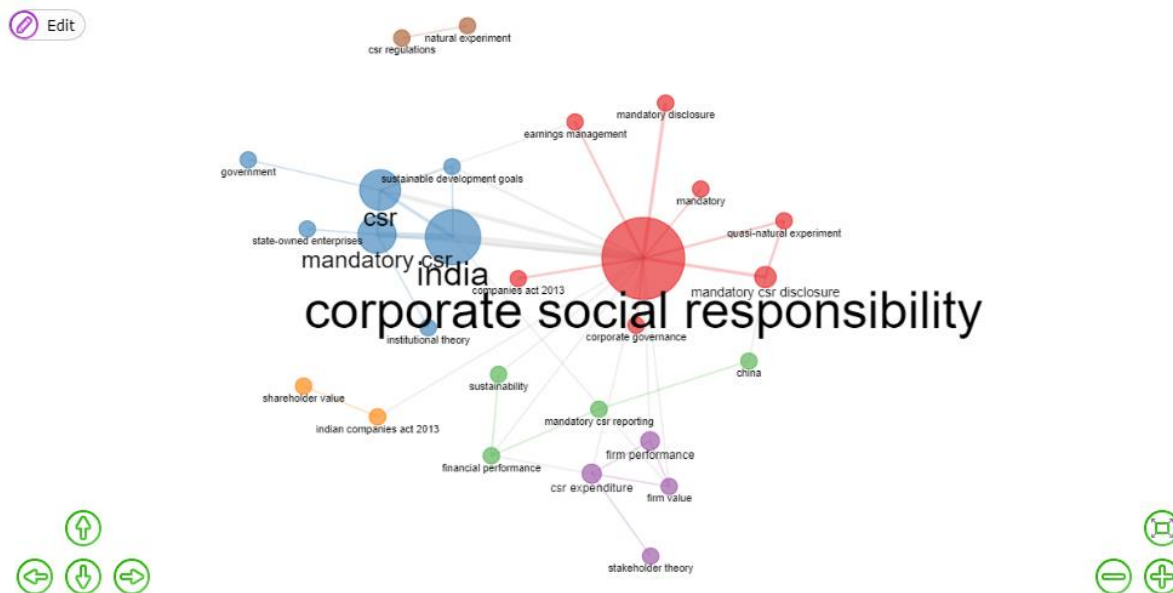
To find out the research gap or directions of future research in the field of mandatory CSR, we analyzed the co-occurrence of the author's keywords. The most conceptualized introduction to an academic research article is keywords. Researchers can quickly determine the research hotspots and directions of future research for an academic field by studying the co-occurrence network (Gao *et al.*, 2021). In this article, a keywords co-occurrence network is presented in figure 16; the data shows five groups represented by red, blue, green, purple, and yellow.

These colours represent different clusters; their distance indicates relatedness; words represent the vertex, and the node's size is proportional to its frequency. The red cluster highlights corporate social responsibility and mandatory CSR disclosure. The blue cluster is dominated by CSR, mandatory CSR, and India; the green cluster indicates mandatory CSR reporting and firm performance; the purple cluster denotes firm performance and CSR expenditure, and the yellow cluster indicates shareholder value and the Indian companies act 2013. Keyword co-occurrence analysis develops a network of themes and their relationships in a scientific field.

Themes and keywords with a high betweenness value significantly influence development in the mandatory CSR field. Such words connect various other research topics (Ye *et al.*, 2020). Figure 16 shows a substantial difference in ranking based on the occurrence and betweenness; the keywords "corporate social responsibility" and "mandatory CSR" offered

the highest betweenness among all others, i.e. 222.76 and 45, respectively, followed by the keywords "CSR" and "CSR expenditure" (25) among all.

Figure 16. Co-occurrence Network



CONCLUSIONS AND DISCUSSIONS

The study aims to present the bibliometric analysis of the scientific literature published on mandatory CSR. It will also give a holistic picture of mandatory CSR to discover the knowledge map. Bibliometric analysis detects the key trends of mandatory CSR and research patterns of scientific areas or journals. As a result, the research article intends to determine the publication trend of mandatory CSR from 2012 to 2022 and provide valuable data to the researchers and stakeholders of CSR. A bibliometric analysis of 130 articles is conducted in mandatory CSR by extracting data from the Scopus database using the Biblioshiny in the RStudio software package. The first article appeared in 2012; approximately 85% of the articles were published within the last five years. The number of publications has steadily increased since CSR became mandated in India in 2014, reaching 33 in 2021 and the maximum of 34 articles published in 2022. The mandatory CSR articles published in 2018 are highly cited papers, with an average annual citation of 14.72, suggesting that the articles are highly remarkable. The "Social Responsibility Journal," which has produced nine papers, is the most productive. From the beginning, the Social Responsibility Journal published more articles, and in 2022, it published the most. In this theme, Hong Kong is the most cited country. As a result,

India and China are the second and third most cited countries, respectively. Hong Kong had the most citations (341), followed by India and China, with 195 and 178, respectively.

The Journal of Business Ethics, with 542 citations, is the most frequently cited source. The Journal of Management Review and the Strategic Management Journal are the top second and third cited journals, respectively. Bhattacharyya A, Kansal M, and Rahman ML have the highest H-index of all the contributing authors. Bhattacharyya A, Kansal M, Rahman ML, and Ray S are the authors with the most published articles in the field of mandatory CSR. On the other hand, Jadiyappa N, Mallikarjunappa T, Yu L, and Oware KM are the second most prolific authors, with three published articles each; the other 60 per cent generated only two papers each. To summarise, this bibliometric analysis adequately represents the status of mandatory CSR development by visualizing emerging trends and presenting focused themes. It's also helpful in determining the knowledge base and identifying future research directions in this field.

LIMITATIONS AND FUTURE DIRECTIONS

This bibliometric analysis also has some restrictions, such as the data being taken exclusively from the Scopus database on September 09, 2022. This study does not consider data from other databases, such as Google Scholar or the Web of Science. These sources of databases could also be applied for further research. The data collected from the sources is limited to the following subject area (i.e. Business, Management and Accounting, Economics, Econometrics and Finance, Social Sciences, Environmental Science, Arts and Humanities) and also limited to only the English language.

As a result, it is possible that the findings and interpretations would be different if the data had been obtained from other databases or had been gathered later (Zemigala, 2019). The keyword we used in this article is only "mandatory CSR", and other keywords could be included in future studies. There is some methodological bias in the bibliometrics packages used in this study. Thus, we had to specify some standards and parameters so that future researchers might use different tools and techniques like Cite space, VOS viewer, etc. In addition, there are only 130 documents included in the sample because any more than that would not provide an appropriate representation of the mandatory CSR. Some themes and topics, such as corporate governance and sustainability, are unexplored or underexamined in this field. It would be excellent to observe how these themes and topics should make CSR more real so that researchers can examine them for future research. This bibliometric analysis demonstrates that

although this field of study is still in its nascent stage, it is evolving at a moderate rate, with an average range of publications, authors, and locations.

REFERENCES

- Agrawal, A., & Sahasranamam, S. (2016). Corporate social entrepreneurship in India. *South Asian Journal Of Global Business Research*, 5(2), 214-233. <https://doi.org/10.1108/sajgbr-12-2014-0098>
- Aksnes, D., & Sivertsen, G. (2019). A Criteria-based Assessment of the Coverage of Scopus and Web of Science. *Journal Of Data And Information Science*, 4(1), 1-21. <https://doi.org/10.2478/jdis-2019-0001>
- Aria, M., & Cuccurullo, C. (2017). Bibliometrix: An R-tool for comprehensive science mapping analysis. *Journal Of Informetrics*, 11(4), 959-975. <https://doi.org/10.1016/j.joi.2017.08.007>
- Bird, R., Duppati, G., & Mukherjee, A. (2016). Corporate social responsibility and firm market performance: a study of Indian listed companies. *International Journal of Business Governance And Ethics*, 11(1), 68. <https://doi.org/10.1504/ijbge.2016.076351>
- Bhattacharyya, A., & Rahman, M. (2019). Mandatory CSR expenditure and firm performance. *Journal Of Contemporary Accounting & Economics*, 15(3), 100163. <https://doi.org/10.1016/j.jcae.2019.100163>
- Bokhari, A. (2017). Universities" Social Responsibility (USR) and Sustainable Development: A Conceptual Framework. *International Journal of Economics And Management Studies*, 4(12), 8-16. <https://doi.org/10.14445/23939125/ijems-v4i12p102>
- Benckendorff, P. (2009). Themes and Trends in Australian and New Zealand Tourism Research: A Social Network Analysis of Citations in Two Leading Journals (1994–2007). *Journal Of Hospitality And Tourism Management*, 16(1), 1-15. <https://doi.org/10.1375/jhtm.16.1.1>
- Benckendorff, P., & Zehrer, A. (2013). A NETWORK ANALYSIS OF TOURISM RESEARCH. *Annals Of Tourism Research*, 43, 121-149. <https://doi.org/10.1016/j.annals.2013.04.005>
- Bian, J., Liao, Y., Wang, Y., & Tao, F. (2021). Analysis of firm CSR strategies. *European Journal Of Operational Research*, 290(3), 914-926. <https://doi.org/10.1016/j.ejor.2020.03.046>
- Behringer, K., & Szegedi, K. (2016). The Role Of CSR In Achieving Sustainable Development – Theoretical Approach. *European Scientific Journal*, ESJ, 12(22), 10. <https://doi.org/10.19044/esj.2016.v12n22p10>
- Carroll, A. (2009). A History of Corporate Social Responsibility. *The Oxford Handbook Of Corporate Social Responsibility*, 19-46. <https://doi.org/10.1093/oxfordhb/9780199211593.003.0002>
- Carroll, A. B. (1983). Corporate social responsibility: Will industry respond to cutbacks in social program funding? *Vital Speeches of the day*, 49(19), 604-608.
- Cobo, M., López-Herrera, A., Herrera-Viedma, E., & Herrera, F. (2011). Science mapping software tools: Review, analysis, and cooperative study among tools. *Journal Of The American*

Society For Information Science And Technology, 62(7), 1382-1402.
<https://doi.org/10.1002/asi.21525>

Cano, V. (1999). Bibliometric overview of Library and Information Science Research in Spain. *Journal Of The American Society For Information Science*, 50(8), 675-680.
[https://doi.org/10.1002/\(sici\)1097-4571\(1999\)50:8<675::aid-asi5>3.0.co;2-b](https://doi.org/10.1002/(sici)1097-4571(1999)50:8<675::aid-asi5>3.0.co;2-b)

Dhingra, L., & Kaur, S. (2021). A Bibliometric Analysis of CSR in India After Companies Act 2013. *Journal of Education*, Vol. : XXIII, No. :8(II)

Du, S., Bhattacharya, C., & Sen, S. (2011). Corporate Social Responsibility and Competitive Advantage: Overcoming the Trust Barrier. *Management Science*, 57(9), 1528-1545.
<https://doi.org/10.1287/mnsc.1110.1403>

Dyllick, T., & Muff, K. (2015). Clarifying the Meaning of Sustainable Business. *Organization & Environment*, 29(2), 156-174. <https://doi.org/10.1177/1086026615575176>

Dahlsrud, A. (2008). How corporate social responsibility is defined: an analysis of 37 definitions. *Corporate Social Responsibility And Environmental Management*, 15(1), 1-13.
<https://doi.org/10.1002/csr.132>

Dharmapala, D., & Khanna, V. (2016). The Impact of Mandated Corporate Social Responsibility: Evidence from India's Companies Act of 2013. *SSRN Electronic Journal*.
<https://doi.org/10.2139/ssrn.2895986>

Dharmapala, D., & Khanna, V. (2018). The impact of mandated corporate social responsibility: Evidence from India's Companies Act of 2013. *International Review of Law And Economics*, 56, 92-104. <https://doi.org/10.1016/j.irl.2018.09.001>

European Commission (2001) • social-responsibility.at. social-responsibility.at. (2022). Retrieved June 12 2022, from <https://www.social-responsibility.at/definitions/european-commission-2001/>.

Feng, Y., Zhu, Q., & Lai, K. (2017). Corporate social responsibility for supply chain management: A literature review and bibliometric analysis. *Journal Of Cleaner Production*, 158, 296-307. <https://doi.org/10.1016/j.jclepro.2017.05.018>

Farhan, M., & Iqbal, M. K. (2021). Twenty years of sustainable supply chain: past trends and future research suggestions. *International Journal of Business and Psychology*, 3(1), 1-16.

Gatti, L., Vishwanath, B., Seele, P., & Cottier, B. (2018). Are We Moving Beyond Voluntary CSR? Exploring Theoretical and Managerial Implications of Mandatory CSR Resulting from the New Indian Companies Act. *Journal Of Business Ethics*, 160(4), 961-972.
<https://doi.org/10.1007/s10551-018-3783-8>

Global Reporting Initiative, *Carrots and Sticks: Global Trends in Sustainability Reporting Regulation and Policy*, at 10, 12 (2016), <https://www.globalreporting.org/resource/elibrary/Carrots%20and%20Sticks-2016.pdf> [https://perma.cc/JMA5-MKJP].

Hassan, M., Alshater, M., Mumu, J., Sarea, A., & Azad, M. (2021). Bibliometric analysis of the Journal of Islamic Accounting and Business Research : Ten years review. *COLLNET*

Journal Of Scientometrics And Information Management, 15(1), 63-88.
<https://doi.org/10.1080/09737766.2021.1934603>

Khediri, K. (2021). CSR and investment efficiency in Western European countries. *Corporate Social Responsibility And Environmental Management*, 28(6), 1769-1784.
<https://doi.org/10.1002/csr.2151>

Koseoglu, M. (2016). Growth and structure of authorship and co-authorship network in the strategic management realm: Evidence from the Strategic Management Journal. *BRQ Business Research Quarterly*, 19(3), 153-170. <https://doi.org/10.1016/j.brq.2016.02.001>

Lin, L. W. (2020). Mandatory corporate social responsibility legislation around the world: Emergent varieties and national experiences. *U. Pa. J. Bus. L.*, 23, 429.

Lezama-Nicolás, R., Rodríguez-Salvador, M., Río-Belver, R., & Bidosola, I. (2018). A bibliometric method for assessing technological maturity: the case of additive manufacturing. *Scientometrics*, 117(3), 1425-1452. <https://doi.org/10.1007/s11192-018-2941-1>

Lee, J., Graves, S., & Waddock, S. (2018). Doing good does not preclude doing well: corporate responsibility and financial performance. *Social Responsibility Journal*, 14(4), 764-781.
<https://doi.org/10.1108/srj-03-2017-0044>

Michael Hall, C. (2011). Publish and perish? Bibliometric analysis, journal ranking and the assessment of research quality in tourism. *Tourism Management*, 32(1), 16-27.
<https://doi.org/10.1016/j.tourman.2010.07.001>

Mallah, M., & Jaaron, A. (2021). An investigation of the interrelationship between corporate social responsibility and sustainability in manufacturing organizations: an empirical study. *International Journal Of Business Performance Management*, 22(1), 15.
<https://doi.org/10.1504/ijbpm.2021.112125>

Mohr, L., & Webb, D. (2005). The effects of corporate social responsibility and price on consumer responses. *Journal Of Consumer Affairs*, 39(1), 121-147.
<https://doi.org/10.1111/j.1745-6606.2005.00006.x>

Mittal, A. & Jain, A., 2015, 'Indian Companies Act, 2013 – Changing the face of CSR in India', *Journal of Business and Management Dynamics* 5(1), 5 pages. <http://dx.doi.org/10.4102/jbmd.v5i1.14>

Maqbool, S., & Zameer, M. (2018). Corporate social responsibility and financial performance: An empirical analysis of Indian banks. *Future Business Journal*, 4(1), 84-93.
<https://doi.org/10.1016/j.fbj.2017.12.002>

Murashima, M. (2020). Do investors' reactions to CSR-related news communication differ by shareholder? An empirical analysis from Japan. *Corporate Governance: The International Journal of Business In Society*, 20(5), 781-796. <https://doi.org/10.1108/cg-11-2019-0346>

Moral-Muñoz, J., Cobo, M., Peis, E., Arroyo-Morales, M., & Herrera-Viedma, E. (2014). Analyzing the research in Integrative & Complementary Medicine by means of science mapping. *Complementary Therapies In Medicine*, 22(2), 409-418.
<https://doi.org/10.1016/j.ctim.2014.02.003>

Martinuzzi, A., Krumay, B., & Pisano, U. (2011). Focus CSR: The new communication of the EU commission on CSR and national CSR strategies and action plans. *European Sustainable Development Network (ESDN), Quarterly Report No, 23*.

Noyons, E., Moed, H., & Luwel, M. (1999). Combining mapping and citation analysis for evaluative bibliometric purposes: A bibliometric study. *Journal Of The American Society For Information Science, 50(2)*, 115-131. [https://doi.org/10.1002/\(sici\)1097-4571\(1999\)50:2<115::aid-asi3>3.0.co;2-j](https://doi.org/10.1002/(sici)1097-4571(1999)50:2<115::aid-asi3>3.0.co;2-j)

Nawaz, K., Saeed, H. A., & Sajeel, T. A. (2020). Covid-19 and the State of Research from the Perspective of Psychology. *Int. J. Bus. Psychol, 2*, 35-44.

Porter, M. E., & Kramer, M. R. (2006). Strategy & Society: The link between competitive advantage and corporate social responsibility. *Harvard business review, 84(12)*, 78-92. 10.1108/sd.2007.05623ead.006

Small, H. (1973). Co-citation in the scientific literature: A new measure of the relationship between two documents. *Journal Of The American Society For Information Science, 24(4)*, 265-269. <https://doi.org/10.1002/asi.4630240406>

Shoeb, M., Aslam, A., & Aslam, A. (2022). Environmental Accounting Disclosure Practices: A Bibliometric and Systematic Review. *International Journal Of Energy Economics And Policy, 12(4)*, 226-239. <https://doi.org/10.32479/ijeep.13085>

Spicer, B. H. (1978). Investors, corporate social performance and information disclosure: An empirical study. *Accounting review, 94-111*.

Shahzad, I., Farrukh, M., Wu, Y., & Trunk, N. (2021). Human systems management: A retrospective of 40 years. *Human Systems Management, 40(1)*, 15-30. <https://doi.org/10.3233/hsm-200999>

Sarkar, J., & Sarkar, S. (2015). Corporate Social Responsibility in India—An Effort to Bridge the Welfare Gap. *Review Of Market Integration, 7(1)*, 1-36. <https://doi.org/10.1177/0974929215593876>

Verma, A., & Kumar, C. (2014). An Analysis of CSR Expenditure by Indian Companies. *Indian Journal of Corporate Governance, 7(2)*, 82-94. <https://doi.org/10.1177/0974686220140201>

World Business Council for Sustainable Development (2000) • social-responsibility.at. social-responsibility.at. (2022). Retrieved June 12 2022, from <https://www.social-responsibility.at/definitions/world-business-council-for-sustainable-development-2000/>.

Ye, N., Kueh, T., Hou, L., Liu, Y., & Yu, H. (2020). A bibliometric analysis of corporate social responsibility in sustainable development. *Journal Of Cleaner Production, 272*, 122679. <https://doi.org/10.1016/j.jclepro.2020.122679>

Yu, D., & Shi, S. (2015). Researching the development of Atanassov intuitionistic fuzzy set: Using a citation network analysis. *Applied Soft Computing, 32*, 189-198. <https://doi.org/10.1016/j.asoc.2015.03.027>

Zemigala, M. (2019). Tendencies in research on sustainable development in management sciences. *Journal Of Cleaner Production*, 218, 796-809.
<https://doi.org/10.1016/j.jclepro.2019.02.009>

Zhang, D., Morse, S., & Ma, Q. (2019). Corporate Social Responsibility and Sustainable Development in China: Current Status and Future Perspectives. *Sustainability*, 11(16), 4392.
<https://doi.org/10.3390/su11164392>

Zupic, I., & Čater, T. (2014). Bibliometric Methods in Management and Organization. *Organizational Research Methods*, 18(3), 429-472.
<https://doi.org/10.1177/1094428114562629>