

Mapping Environmental, Social and Governance in Finance Domain Using Systematic Review, Bibliometrics and Content Analysis

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Abstract:

More institutional investors and funds have adopted a variety of Environmental, Social, and Governance (ESG) investment techniques over the past few years, resulting in a rise in the prevalence of various forms of sustainable finance. Currently, the number of ESG-related documents is expanding rapidly. This study aims to comprehend the global trends in research on the ESG and Finance domain. The bibliometric insights suggest that there is growing interest in this topic since 2012, which can be seen in the increase in the number of publications. A total of 165 research papers on ESG and its impact on finance were analysed using VOSviewer. The study maps the domain of ESG in Finance and explores its various sub-topics. The study also proposes a research agenda for future researchers working in the field of ESG in the finance domain.

Keywords: Environmental, Social, and Governance (ESG), Financial Performance, Bibliometric Analysis, Content Analysis.

INTRODUCTION

The relentless pursuit of progress is an inherent characteristic of human society. The company's development and society as a whole presented the world with a multitude of opportunities and challenges. The global discourse has once again centered around the theme of sustainable and holistic development. The global community has recognized the urgent need to address the escalating challenges of sustainable development in various domains, including the environment, society, and the financial market. Its introduction into the corporate world gave rise to several concepts, including social performance, environmental, social, and governance standards (ESG), and socially responsible investment (SRI) to mention a few (Khemir, 2019). An increasing number of investors and companies are turning towards ESG (environmental, social, and governance) in addition to climate-related data and technologies to make their investment decisions (Gao et al., 2021). In response to the 2008 financial crisis, corporate managers have initiated a range of reforms in corporate governance since the early 2010s, with the primary objective of restoring investors' confidence in the capital market. The increasing pace of global economic recovery over the past decade is accompanied by a parallel rise in social and environmental issues attributed to corporate activities (Gao et al., 2021). Along with the conventional management objective of generating profit through superior product quality or clever marketing, sustainable management emphasizes management accountability and ethical management. Additionally, sustainable management takes into account how it advances the public's interest in environmental preservation and social advancement. More institutional investors and funds have adopted a variety of Environmental, Social, and Governance (ESG) investment techniques over the past few years, resulting in a rise in the prevalence of various forms of sustainable finance. The ability of ESG investing to generate societal benefits while maintaining financial returns comparable to those of conventional portfolios remains uncertain, a more comprehensive evaluation of the potential of ESG to enhance long-term value by integrating a diverse range of non-financial data would be advantageous for further assessment (Orlitzky, Schmidt, & Rynes, 2003).

The overall amount of ESG papers is currently rising quickly. As a result, it's essential to classify and summarise the relevant literature before examining the state of ESG research. This is because it might be challenging for researchers who are new to ESG research to comprehend the field's past successes and emerging trends rapidly. To help researchers interested in this area get started right away, this study will summarise the key directions in the ESG literature. This study explains the following research questions (RQ).

RQ1 What are the current publication trends in ESG in Finance by various research constituents, i.e., author, countries, and journals?

RQ2 Which publication has the most significant impact in the domain?

RQ3 Which keyword/ combination of keywords was most commonly used in the domain?

RQ4 How many theme-based clusters from the documents are found? And analyse the clusters' insight.

1.1. Need of Bibliometric and Content Analysis

The primary approach employed in this study is the bibliometric method, which is utilized to examine the performance and structure of the literature material available on environmental, social, and governance (ESG) topics. Bibliometric analysis is very convenient for interpreting and visualizing all knowledge of a particular field as it handles large unstructured data. A review of the research literature can be measured through the frequency of citations it has received, while scientific mapping techniques can visually represent the organization and changes within the subject. To attain these research objectives, this article analyses the literature as Citation, Keyword Co-occurrence analysis, and Bibliographical Coupling. Citation, co-citation, and bibliographic coupling primarily serve as indicators of the relevance of the literature and the degree of similarity observed among its thematic elements. Citation analysis is a valuable instrument for researchers to efficiently analyze the impact of journals, papers, as well as authors within a specific field. On the other hand, co-citation analysis clarifies the complicated links among multiple papers by representing them as connections among various ethnic groups through computational methods, thereby directly illustrating the connections among documents. Keyword co-occurrence analysis primarily investigates the resemblance among terms and connects the prominent areas of research within a subject by examining the interconnections across keywords (Gao et al., 2021).

A systematic literature review (SLR), bibliometric analysis, and content analysis are complementary methodologies often employed in academic research to provide a comprehensive understanding of a particular field of study. An SLR involves the methodical identification, evaluation, and synthesis of existing research on a specific topic, offering a structured overview of the literature. Bibliometric analysis, on the other hand, quantitatively examines the patterns, trends, and relationships within the literature, such as citation networks and publication outputs, thereby providing insights into the impact and development of research over time. Content analysis, both qualitative and quantitative, delves into the substance of the literature, analyzing themes, concepts, and patterns within the text to interpret and understand the underlying messages and knowledge structures. When used together, these methods provide a robust framework: the SLR ensures a comprehensive and unbiased selection of literature, bibliometric analysis quantifies the influence and connections within the research, and content analysis provides a deep, interpretive understanding of the content, leading to a richer, more nuanced synthesis of the field (Tranfield et al., 2003; Zupic & Čater, 2015).

2. METHODS

2.1. **Selection of Database:** Multiple research papers have posited that the Scopus database would be appropriate for doing bibliometric analysis (Aksnes & Sivertsen, 2019; Farrukh, Raza, Meng, & Wu, 2022). In comparison with the WOS database, the Scopus database offers greater convenience for exporting data (Nawaz et al., 2020). Manual actions are necessary when utilizing the Web of Science (WOS) platform to extract a quantity of over 500 publications. Additionally, the Scopus database provides a broader coverage of papers within the domain of business and management (Aksnes & Sivertsen, 2019; Farrukh et al., 2022). Hence, when doing bibliometric analysis, Scopus was more appropriate than the Web of Science library.

2.2. **Search Terms and Data Cleaning:** The extraction started with ESG (environmental, social and governance) in the title, abstract, and keywords in the Scopus database, records that are identified through it were 8,168 documents. Further, as the objective of the study is to connect the term with the finance field the search ESG “AND” Finance is made, this cut down the number of articles to 513 in a database within the time range of 2009 to 2023. The motive of this study is to provide the overall trend of ESG terms in the Finance field; therefore, there was no limit to the period. The subject area was limited to “Economics, Econometrics and Finance”, “Business, Management and Accounting”, “Social Science”, “Environmental Science”, “Computer Science” and “Arts and Humanities”. These fields were selected so that a proper understanding of the overall topic including environmental science can be obtained. For further cleaning of data, language was limited to “English” only and articles with open access were selected. After the final cleaning of data i.e., removing duplicates, and excluding some studies after screening them, the number of remaining articles is 164. The bibliometric analysis conducted in this study encompasses two main components: bibliometric performance as well as bibliometric network analysis (Aria & Cuccurullo, 2017). The objective of the performance analysis is to determine the key components of literature, such as the most influential institutions, countries, authors and journals along with articles. The conceptual framework, such as Scientific mapping is the visualization of literature data to effectively demonstrate the research dynamics and structural aspects of a certain topic (Farrukh et al., 2022). After conducting bibliometric analysis content analysis is also conducted in this study on 164 articles which then further are classified in 5 different clusters according to the themes. This gives an extended insight into the recent trends in the field of ESG and Finance domain.

2.3. **Software:** VOSviewer was employed to analyze the collaboration network involving countries, associations, and authors. VOSviewer is the software application utilized to visualize and examine the bibliometric network that arises after the search is carried out (Mostafa Hatami, Sabour, Haj Babaei, & Nematollahi, 2022). A bibliometric network is comprised of nodes and connections. In the bibliometric network, visualization is done using VOSviewer, the nodes are arranged in a two-dimensional space based on the strength of their relationships. Nodes that exhibit strong links are positioned near one another, whilst nodes with weaker associations are situated at greater distances from one another. The tool arranges the nodes to form a cluster based on their respective colours. A cluster refers to a collection of strongly interconnected nodes. In a network, every node is allocated to a cluster, where the wider the cluster of the node its level of significance increases (Karagiannopoulou, Sariannidis, Ragazou, Passas, & Garefalakis, 2023; Rodriguez-Rojas, Clemente-Almendros, El Zein, & Seguí-Amortegui, 2022; Van Eck & Waltman, 2014).

3. RESULT

3.1. Growth Trend

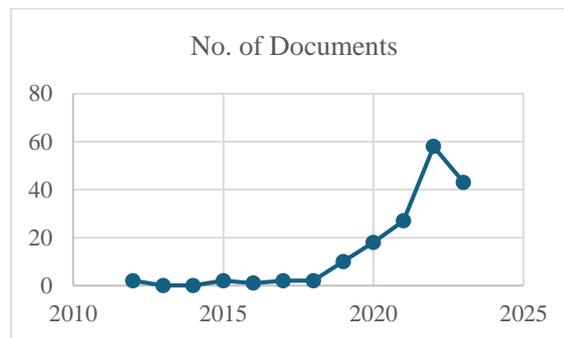


Figure 1 Growth Trend of Publications

In Figure 1 publications about ESG research in the field of Finance from 2012 through 2023 are shown. The outcomes provided in this analysis demonstrate a consistent and notable increase in the frequency of publications about environmental, social, and governance (ESG) issues. As depicted in Figure 1 there has been a consistent upward trend in the quantity of papers about environmental, social, and governance (ESG) subjects connecting to the finance area since 2018. The annual publishing figures about environmental, social, and governance (ESG) domains exhibited a consistent status before the year 2017. To add the amount of research papers has drastically improved from only 2 in 2018 to 58 in 2022. In the timeline of just four years, the articles on this topic have multiplied nearly 29 times. On the other hand, the increasing amount of ESG articles shows the significance of the topic in academia to a certain extent (Kotula, 2019; Tarmuji, Maelah, & Tarmuji, 2016). This phenomenon exhibits a strong correlation with the international community's focus on matters of business social responsibility and the preservation of the environment. This observation also indicates an increasing scholarly interest in the subject of ESG, hence affirming the significance of studying the topic addressed in this study.

3.2. Significant Countries in ESG term in Finance field Research

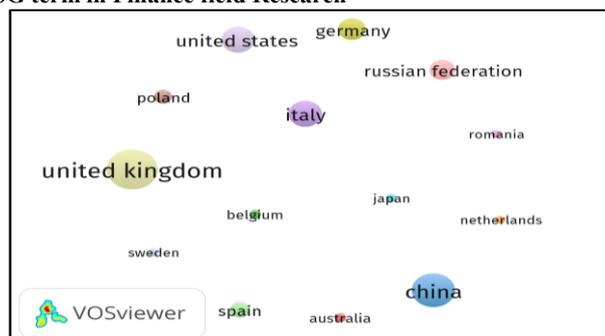


Figure 2 Significant Countries in ESG term in Finance field Research

This section focuses on an analysis of the countries that have demonstrated high levels of productivity and influence in the realm of Finance and ESG. Currently, during recent decades, a total of 32 nations and territories have made noteworthy contributions to the field of Finance ESG research. ESG-themed studies have been published by nations that are developing as well as developed. According to Figure 2, the leading nations in terms of paper publication are the United Kingdom, United States, Italy, Australia, Japan, Belgium, Sweden, Netherlands, Spain and Germany. All of these countries are conventionally classified as developed nations. The United Kingdom has demonstrated exceptional productivity in this particular sector, as evidenced by the publication of 26 publications. Nevertheless, it is noteworthy that emerging economies, such as China, Poland, and Romania, have commenced their exploration of the environmental, social, and governance (ESG) and finance domains.

3.3. Bibliographic Coupling of Countries

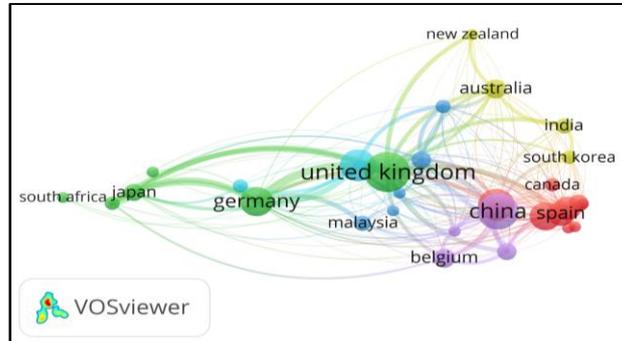


Figure 3 Bibliographic Coupling of Countries

Bibliographic coupling serves as a metric for evaluating the degree of similarity among research materials, hence facilitating the examination of commonalities across various research initiatives (Gu, Meng, & Farrukh, 2021). Bibliometric coupling is observed within the context of countries when an article originating from two distinct countries refers to a third document in their respective publications. This exemplifies the utilization of comparable literary works in the periodicals of several nations, with a shared emphasis on a specific focal point (Kashi & Shah, 2023). The outcome depicted in Figure 3 is derived from the minimal value observed within each country. The outcomes of the bibliographic coupling analysis of countries are depicted by a circle, with each representing a specific country. Additionally, different colours are utilized to signify distinct clusters. The outcome reveals a total of five clusters. Nations with the same colour are likely to prioritize or confront similar challenges. Moreover, based on the variation in cluster numbers, it may be deduced that the environmental, social, and governance (ESG) changes in the field of Finance encountered by various nations exhibit heterogeneity in their disparities. The biggest cluster (Red) consists of countries like Brazil, Canada, Hungary, Italy, Poland, Romania, Russia, Spain and Taiwan.

3.4. Bibliographic Coupling Authors

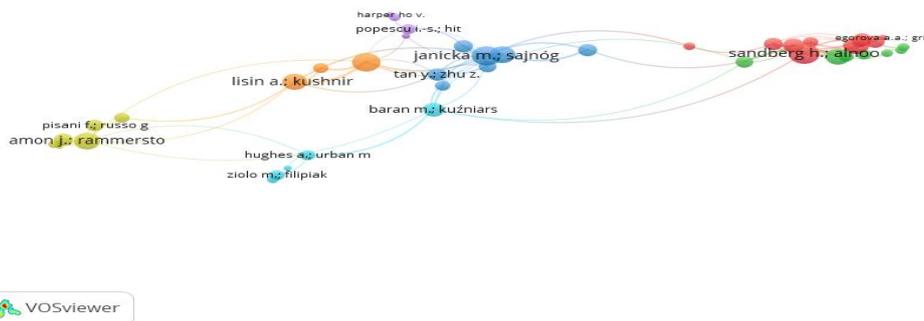


Figure 4 Bibliographic Coupling Authors

The theory of bibliographic coupling posits that clusters of the same colour indicate a shared research field (Kumar, 2015; Newman, 2004). The database has a total of 165 authors. Following the establishment of a minimum requirement of one publication and a minimum number of citations of the author to be 5, there remain a total of 57 authors that satisfy this criterion. The findings depicted in the above figure illustrate the extent of collaboration and interconnectedness observed among authors within the realm of Environmental, Social, and Governance (ESG) studies in the field of finance. The red, blue, and orange clusters collectively account for approximately 50% of all the cluster sizes in the figure, indicating that they represent the primary areas of research about energy conservation. Within a group of authors who follow a similar topic, the individual whose circle is larger in the network signifies a more substantial contribution to their respective research field. One notable example is the author Sandberg h., who possesses the largest circle within the red cluster with a link strength of 19. This indicates that he has made the most significant contributions in terms of bibliographic coupling.

3.5. Productive Journals with Higher Documents

Table 1 Productive Journals with Higher Documents

Journals	Documents	Citations
sustainability (switzerland)	32	385
business strategy and the environment	7	307
e3s web of conferences	5	31
Energies	5	24
journal of sustainable finance and investment	5	89
frontiers in environmental science	4	8
procedia computer science	4	20
international journal of environmental research and public health	3	14
review of finance	3	14
accounting, economics and law: a convivium	2	15
australasian accounting, business and finance journal	2	27
environment and planning a	2	1

The collection contains a total of 165 papers, which were published across 97 different publications. The journals that have greater quantities of documents are being presented. Table 1 presents a comprehensive overview of the 18 most prominent academic journals that have published a substantial number of papers related to Environmental, Social, and Governance (ESG) and its connection with Finance topics. Of the papers that were discovered, 52% have been published in the aforementioned journals.

Among the aforementioned journals, Sustainability (Switzerland) stands out as the most prolific, having published a total of 32 papers with a citation count of 385. On the other hand, Business Strategy and the Environment journal has a total of 307 citations for 7 publications only, which can suggest the quality of the publication. These findings demonstrate the prominent status of these journals within the ESG and Finance domain.

3.6. Influential Documents by Citations

Table 2 Influential Documents by Citations

Title	Journal	Year	Cited by
Do Environmental, Social, and Governance activities improve Corporate Financial Performance?	Business Strategy and the Environment	2019	247
How Media Coverage of Corporate Social Irresponsibility Increases Financial Risk	Strategic Management Journal	2017	193
Conceptualising the Contemporary Corporate Value Creation Process	Accounting, Auditing and Accountability Journal	2017	127
Impact of environmental, social, and governance information on economic performance: Evidence of a corporate 'sustainability advantage' from Europe	Sustainability (Switzerland)	2019	97
Green Innovation and Finance in Asia	Asian Economic Policy Review	2021	84
Opening the market for impact investments: The need for adapted portfolio tools	Entrepreneurship Research Journal	2015	59
The effect of ESG rating events on corporate green innovation in China: The mediating role of financial constraints and managers' environmental awareness	Technology in Society	2022	55
How to design more sustainable financial systems: The roles of environmental, social, and governance factors in the decision-making process	Sustainability (Switzerland)	2019	44
Sustainable finance in Japan	Journal of Sustainable Finance and Investment	2020	41
Sustainable development, ESG performance and company market value: Mediating effect of financial performance	Business Strategy and the Environment	2022	40
Boosting sustainability and financial performance: the role of supply chain controversies	International Journal of Production Research	2019	40
ESG issues among fund managers-factors and motives	Sustainability (Switzerland)	2016	37

Table 2 presents a collection of highly cited papers, which are listed above. The study offered in these papers combines a vast range of study content, including the examination of the connections between environmental, social, and governance (ESG) factors and organizations financial performance, encompassing the firm's market performance, corporate value creation, Green Innovation, and Finance, ESG ratings and investment. Additionally, these papers explore strategies for achieving sustainable growth inside companies through the integration of ESG principles. The focal point of these scholarly articles revolves around corporate disclosure, encompassing the realms of ESG disclosure and comprehensive company-wide reports. Furthermore, numerous scholarly articles concentrate on examining a certain nation or geographic area, such as Japan, China, Europe, and Asia. It is noteworthy to mention that the journal Sustainability (Switzerland) and Business Strategy and the Environment have published numerous publications that have garnered significant citation rates. Furthermore, it is noteworthy that all papers with a high citation count were published after 2015, with a significant portion of them being published after 2019. This observation indicates that the topic of environmental, social, and governance (ESG) Finance subjects is still in its early developmental phase, and it can be anticipated that the number of research papers about ESG in this field will experience substantial growth in the coming years.

3.7. Keyword Co-Occurrence

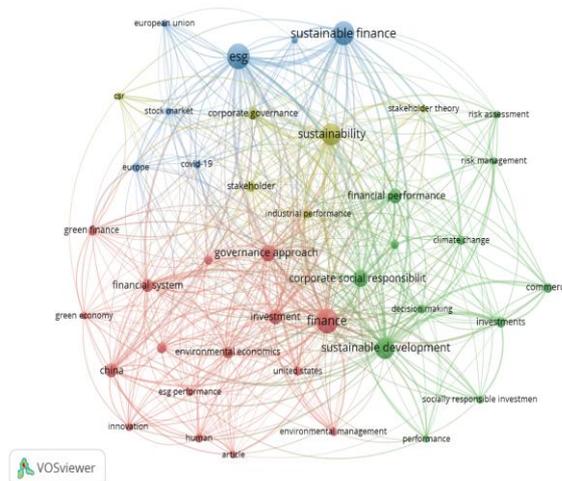


Figure 5 Keyword Co-Occurrence

To understand the prospective areas of future research in the domain of ESG research within the domains of finance, an analysis is conducted regarding the keywords co-occurrence along with the trends of topics. Comerio and Strozzi (2019) Keywords serve as a highly precise and succinct means of introducing an academic essay. Through the process of examining the simultaneous presence of significant terms within a certain domain, researchers can efficiently grasp the prominent areas of study and prospective avenues for future research within the scholarly field (Zhao, 2017). The generation of a term co-occurrence graph is carried out using VOSviewer, as depicted in the above figure. A minimum threshold of 5 occurrences of a keyword was established for analysis out of a total of 933 keywords. Only 41 keywords satisfied this criterion. The magnitude of the circle in this visualization corresponds to the frequency of occurrences of the keyword. The colour of the nodes corresponds to keyword clusters, which often consist of terms that appear together and can be regarded as major study themes within the discipline. Between the years 2009 and 2023, it is seen that the field of Environmental, Social, and Governance (ESG) has been characterized by the emergence of four distinct clusters that are shown in Figure 5 which encapsulate the primary areas of interest and research focus. Such four clusters can be seen in the above figure: The blue cluster shows the topic related to Sustainable finance, ESG Investing and Governance impact. The red cluster mostly revolves around financial systems, green economy, green finance, ESG performance, environmental economics, innovation, and

performance assessment. Yellow cluster mostly revolves around corporate social responsibility, corporate governance, environmental concerns, and sustainability along with risk assessment and risk management. Green cluster primarily addresses the subject of commerce, sustainable development, corporate financial performance, decision-making, climate change, and socially responsible investment.

3.8. Literature classification

Table 3 provides the number of papers in each cluster, along with their respective research focus. There is a total of 164 articles selected for content analysis. To determine the research topic of each cluster, we identify the top 10 most influential research papers in the respective cluster based on the 'citations per year' data provided in the table. Identifying the individual sources that contribute to each cluster can aid in determining the significant ones within the different research domains. The literature is classified among 5 such themes which are listed in Table 3.

Table 3 Literature Classification: Primary 5 Research Cluster (N=164)

Cluster Name	Total Article	Theme of Classifications
Cluster 1	70	ESG & Financial Performance
Cluster 2	9	ESG & Financial Performance using Technology
Cluster 3	19	ESG Disclosures, Ratings & Reporting
Cluster 4	49	ESG Investing, Sustainable Investing, Ethical Investing
Cluster 5	17	Green Finance, Green Bonds, ESG Bonds

Theme 1 includes such articles that studies the relationship between ESG and Financial Performance. It explores the question of how the financial presence of the firm in the market is being affected by ESG disclosures and ratings of the firm. Theme 2 explores the different technological advancements in the field of Finance and the way it is used to study the relationship or impact of ESG on the financial performance of the firm. Theme 3 discusses how the ESG rating and indexes impact the psychology of investors along with the quality of disclosure and ESG reporting. Theme 4 explores how ESG investing and Sustainable investing evolved along with the responses that this kind of investing is getting from investors. Theme 5 includes articles that discuss different avenues for investors which are related to ESG and Green Finance and whether or not those avenues are more profitable than the traditional instruments.

3.8.1. Cluster 1: ESG & Financial Performance

The first cluster as well as the biggest cluster consisting of 70 articles primarily addresses the subject of commerce, sustainable development, corporate financial performance, decision-making, climate change, and socially responsible investment, encompassing several aspects related to environmental management, and financial factors. The use of the ESG evaluation system assists corporations in devising decision-making strategies, thereby influencing the financial performance of multinational enterprises (Eccles, Serafeim, Seth, & Ming, 2013). There is a belief that customers may exhibit skepticism towards a company's commitment to social responsibility, hence undermining the effectiveness of the company's environmental, social, and governance (ESG) strategy. X. Luo and Bhattacharya (2006) and Khan (2019) suggest that enterprises that possess elevated environmental, social, and governance (ESG) ratings within a certain region typically exhibit a greater competitive edge compared to local enterprises. Moreover, these companies sustain their competitive advantages by devising strategic business plans and incentive schemes. Simultaneously, the attainment of a competitive edge enables enterprises to generate profits and sustain the trajectory of growth. Suggestive research area based on the analysis of cluster one for future researcher.

- 1) To identify and analyze the impact of ESG on financial performance of the firm.
- 2) To find factors that affect strategic business plan as well as investment plans in today's scenario.

3.8.2. Cluster 2: ESG & Financial Performance using Technology

Being the smallest cluster with 9 articles, it received its first publication in 2020. ESG rating organizations have played a crucial role in making sustainability more widely accepted and integrated into the financial business. Historically, they've depended on corporate transparency and human analysis to generate their ratings. However, in recent times, advancements in data scraping and Artificial Intelligence (AI) have diminished the effectiveness of the conventional method. The impact of technology-based alternative ESG ratings is growing in importance, but there is still a lack of in-depth research on their role in sustainable financing (Hughes A et al., 2021). Enterprises' compliance with ESG responsibility is essential for attaining and promoting sustainable growth across society. Nevertheless, the progress of ESG development is hindered by limitations in securing funding and disparities in information availability. On the other hand, the swift advancement of financial technology (fintech) provides valuable support to enhance the quality and effectiveness of ESG development (Du P., et al., 2022 & Kazachenok, O. P., et al., 2023). Investors have increasingly embraced the ESG (Environmental, Social, and Governance) alpha strategy, which focuses on sustainable investments. The ESG disciplines within the realm of scholarly big data represent a valuable alternative dataset that accurately portrays a company's enduring commitment to environmental, social, and governance factors (Chen, Q., & Liu, X. Y., 2020). Suggestive research area based on the analysis of cluster two for future researcher.

- 1) To identify how technological advancement affects ESG ratings.
- 2) To identify different approaches used by investors for searching the sustainable investment options using technology.

3.8.3. Cluster 3: ESG Disclosures, Ratings & Reporting

With 19 articles, it receives its first article in 2020. This cluster deals with the widespread promotion of the sustainability concept, and social disclosures which have gained significance in non-financial reporting, including the energy sector. Several investigations have verified that energy firms have consistently increased the number of social disclosures they provide each year (Czaja-Cieszyńska et al., 2023). Alagpuria, M. (2021) The finance industry is transitioning from a period of ethical investment to a future when all financial institutions will be required to disclose the environmental effects of their investments. This is the initial step towards comprehensive ESG reporting, encompassing Environmental, Social, and Governance aspects. Given that financial reporting relies on data supplied by companies that receive investments it has significant ramifications for non-financial reporting conducted by all major corporations. The timeframe for these legal modifications is limited, as they will bring about a significant overhaul of financial reporting and investment practices (Capizzi., et al., 2021). The European Union Directive on non-financial disclosure is influenced by the concepts of sustainable finance and Environmental, Social, and Governance (ESG) reporting. It acknowledges that using metrics and increasing transparency would encourage internal discussions, promote effective governance, and facilitate dialogue among management, the board, and stakeholders, such as civil society and non-governmental organizations (NGOs). While scholars have extensively studied the limited role of the third sector in shaping the substance of the Directive, there has been insufficient discussion regarding how non-financial actors can utilize ESG reporting, the implications of adopting accounting, non-financial reporting, and corporate governance as advocacy tools (Cerrato & Ferrando, 2020). Suggestive research area based on the analysis of cluster three for future researcher.

- 1) To identify limitations of ESG disclosure and ESG reporting.
- 2) To devise policy recommendations for reducing disparities in ESG disclosure.
- 3) To frame rating methods or criteria for bringing similarity in ESG rating done by different institutes.

3.8.4. Cluster 4: ESG Investing, Sustainable Investing, Ethical Investing

Receiving its first publication in 2012, this cluster is the second largest one, containing 49 articles in total. ESG investment has its association with Sustainable Finance with socially responsible investment (SRI) tactics. This cluster suggests the remarkable increase in the field of Sustainable Finance research aftermath COVID 19 pandemics. A great amount of research in this field is performed in the European Union, where the main aim of the research is to shed light on how ESG investing and Governance approaches can modify the performance of the firm in the stock market (Garrido-Merchan et al., 2023). This leads to the development of the corporate strategy which would help the firm gain stability in investment. The presence of the initial keyword indicates a broad inclination towards investing in sustainable finance options. This is supported by the frequent occurrence of related terms such as sustainable investing, sustainable finance, ESG investing, and corporate strategy in keyword analysis. There exist discernible distinctions between Corporate Social Responsibility (CSR) and Environmental, Social, and Governance (ESG) frameworks (Myklebust, T. 2020). Corporate Social Responsibility (CSR) is a business approach that prioritizes the concerns and welfare of various stakeholders and encompasses a diverse array of groups. The incorporation of environmental, societal, and governance considerations has emerged as a significant component of corporate social responsibility. The concept of Environmental, Social, and Governance (ESG) primarily originates from the standpoint of investors in the capital market, with a specific emphasis on the correlation between corporate social performance and shareholder returns (Aich, S.,2021). These scenarios of corporate social responsibility (CSR) are extensive and may be observed in various domains, including corporate governance, industrial preference, risk assessment, risk management, and sustainability. All of these concerns are interconnected with corporate social responsibility (CSR) initiatives. The application scenarios of Environmental, Social, and Governance (ESG) mostly centre on the capital market, with a particular emphasis on the interactions between investors, stakeholders, and publicly traded companies. Suggestive research area based on the analysis of cluster four for future researcher.

- 1) To identify tactics used by organisation for being sustainable.
- 2) To identify factors of sustainable investing that can affect risk capacity of firm in share market.

3.8.5. Cluster 5: Green Finance, Green Bonds & ESG Bonds

With 17 articles, Cluster 5 emerges in 2020. The subjects in this particular cluster mostly revolve around financial systems, green economy, green finance, ESG performance, environmental economics, innovation, and performance assessment. In light of the ongoing progress in the capital market, listed firms must possess a conscientious understanding of ESG (Environmental, Social, and Governance) information. By actively fulfilling their social and environmental obligations with the help of finding a new financial system or an economy with green financing options, these organizations may effectively foster long-term sustainable development (Niyazbekova, S.,2021). Moreover, in this cluster, China contributes most to ESG performance assessment and Green Finance (Tolliver, C., 2021). Suggestive research area based on the analysis of cluster five for future researcher.

- 1) To identify effect green finance on the financial performance of firm.
- 2) To identify the preferences of investors towards green bonds and ESG bonds and their place in the capital market.

Table 4 The Lead Papers of each Cluster: Citation per year measure

Cluster1		Cluster2		Cluster3		Cluster4		Cluster5	
Reference	CPY	Reference	CPY	Reference	CPY	Reference	CPY	Reference	CPY
Xie J., Nozawa W., Yagi M., Fujii H., Managi S.	63	Zhou G., Liu L., Luo S.	41	Schumacher K., Chenet H., Volz U.	11.25	Popescu I.-S., Hitaj C., Benetto E.	13.33	Tolliver C., Fujii H., Keeley A.R., Managi S.	39.66667
Tan Y., Zhu Z.	56.5	Hughes A., Urban M.A., Wojcik D.	8.67	Tettamanzi P., Venturini G., Murgolo M.	11	Liang H., Sun L., Teo M.	8	Niyazbekova S., Jazykbayeva B., Mottaeva A., Belousova E., Suleimenova B., Zueva A.	12.33
Kolbel J.F., Busch T., Jancso L.M.	33.43	Cao Y., Zhai J.	4	Cort T., Esty D.	9.25	Brandstetter L., Lehner O.M.	7.55	Mejia-Escobar J.C., Gonzalez-Ruiz J.D., Duque-Grisales E.	6.75

Taliento M., Favino C., Netti A.	23.2	Brusseau J.	2	Ngo T., Le T., Ullah S., Trinh H.H.	5	Mousa M., Saleem A., Sagi J.	7.5	Prajapati D., Paul D., Malik S., Mishra D.K.	6
Kim S., Li Z.	21.67	Du P., Huang S., Hong Y., Wu W.	2	Saini N., Singhania M., Hasan M., Yadav M.P., Abedin M.Z.	5	Schoenmaker D., Schramade W.	7	Pisani F., Russo G.	5.33
Adams C.A.	20.43	Li W., Pang W.	2	Alamillos R.R., de Mariz F.	4.5	Przychodzen J., Gomez-Bezares F., Przychodzen W., Larreina M.	5.37	Meng X., Shaikh G.M.	4
Sandberg H., Alnoor A., Tiberius V.	18	Kazachenok O.P., Stankevich G.V., Chubaeva N.N., Tyurina Y.G.	1	Bruno M., Lagasio V.	4.33	Baines J., Hager S.B.	5	Grishunin S., Bukreeva A., Suloeva S., Burova E.	3
Sciarelli M., Cosimato S., Landi G., Iandolo F.	17	Chen Q., Liu X.-Y.	1	Armstrong A.	4	Starks L.T.	5	Wang X., Elahi E., Khalid Z.	2.5

A total of 164 articles are chosen for the content analysis of the generated clusters. The quantity of citations for an article serves as a reliable measure of its level of popularity. Nevertheless, the age of an article has an impact on its citations. Citations per year (CPY) can be regarded as an additional metric for assessing the importance of a publication within a specific academic field. It might be seen as a more dependable measure in comparison to total citations, as it eliminates the impact of the publication's age. Hence, it can be regarded as a valid measure of the significance of the research to the existing body of literature. Research advances with time. Consequently, the earlier papers may not accurately depict the current level of research. Gaining a comprehension of these papers assists researchers in obtaining substantial knowledge regarding the present intellectual framework of the ESG and Financial Performance literature, and offers guidance for future research endeavours.

3.9 Papers published in the past years

Table 5 Yearly Publications Cluster wise

Year	Cluster1	Cluster2	Cluster3	Cluster4	Cluster5
2012	1	0	0	1	0
2013	0	0	0	0	0
2014	0	0	0	0	0
2015	0	0	0	2	0
2016	0	0	0	1	0
2017	2	0	0	0	0
2018	1	0	0	1	0

2019	7	0	0	3	0
2020	5	1	5	6	1
2021	8	1	5	5	6
2022	26	2	6	17	4
2023	20	5	3	13	6
Total	70	9	19	49	17

As depicted in Table 5, the number of publications in ESG, and Financial Performance research has been on the rise. 127 articles have been published in the last three years. This indicates that there is an increasing level of interest and activity in study within this field. This section provides supplementary analysis and observations derived from the examination of 164 research publications. Upon examining the number of articles within the aforementioned clusters, it is evident that Cluster 1 has the highest number of publications, with Cluster 4 following closely behind. Reading between the lines, ESG remains the prime focus of research on Financial Performance since 2012.

4.DISCUSSION

Bibliometric analysis is a methodology employed to ascertain the primary patterns within research domains or journals. Hence, the primitive motive of this research is to ascertain the trajectory of ESG research publications in the field of Finance spanning from the years 2009 to 2023, thereby furnishing significant insights for ESG researchers and stakeholders. Consequently, the objective of this study is to ascertain the researchers about trends as well as topics which have potential in this domain, to analyze patterns and to furnish valuable insights to scholars engaged in cognate fields. The research conducted on the subject of environmental, social, and governance (ESG) in the Finance field is now in its early stages (Escrig-Olmedo, Fernández-Izquierdo, Ferrero-Ferrero, Rivera-Lirio, & Muñoz-Torres, 2019). However, over the past 15 years, it has experienced significant growth and has yielded numerous significant research findings. Regarding the writers' nationalities, it is evident that the United Kingdom, the United States, Russia, Italy, China, and Germany have emerged as the primary contributors. It is posited that with the increasing prominence of environmental, corporate social responsibility, sustainable finance, and socially responsible investment attributes on an international scale, there would be a heightened inclination among emerging nations to engage with ESG (Environmental, Social, and Governance) concerns in the Finance field. The field of Environmental, Social, and Governance (ESG) warrants further attention. In addition to generating shareholder value, it is imperative for corporations to actively engage in initiatives that promote environmental sustainability, support sustainable finance, foster gender equality for good governance, and address other pertinent areas of concern. Such endeavours are crucial for enhancing the collective welfare and interests of all stakeholders involved.

In terms of prolific authors, it is noteworthy to mention that Sandberg h., Starks l.t., and Serafeim G. have produced a substantial number of scholarly writings. Each of the individuals has citations of 79, 44, and 41, respectively. An additional noteworthy element is the fact that a cumulative sum of 165 publications disseminated content that is relevant to environmental, social, and governance (ESG) matters in the finance field. The journals that exhibited the highest level of interest in ESG themes are Sustainability (Switzerland), and Business Strategy and the Environment. The examination of relevant literature reveals that contemporary ESG discussions revolve around prominent themes such as Socially Responsible Investment, Green Finance, Corporate Strategy, Financial Performance, and Environmental Management. The disclosure of environmental, social, and governance (ESG) information is currently a prominent area of research within the field of ESG. Research findings suggest a favourable correlation between the measure to which a company's disclosure of environmental, social, and governance (ESG) information and its overall performance (Buallay, Al-Ajmi, & Barone, 2022; Fatemi, Glaum, & Kaiser, 2018). Currently, the extraction and organization of ESG data are predominantly done by rating organizations or stock exchanges (Eccles & Strohle, 2018), such as Bloomberg ESG, MSCI ESG, or Asset4 ESG database. Currently, there does not exist a consolidated, all-encompassing ESG database that is universally applicable. Divergent ESG ratings for a given organization can frequently arise as a result of varying scoring procedures. Many studies mostly concentrate on the connection between environmental, social, and governance (ESG) factors and financial investment returns. Nevertheless, recent findings suggest that ESG considerations may also exert influence on corporate mergers as well as cross-border mergers and acquisitions. Environmental, Social, and Governance (ESG) is a complete analyzing framework that is utilized to evaluate the non-financial performance of corporations. It is worth exploring the potential significance of ESG in the due diligence process of corporate mergers and acquisitions, which necessitates additional investigation. By employing an analysis of keyword co-occurrence and keyword trends, and Content Analysis in conjunction with a comprehensive systematic literature review, we posit that potential avenues for future research in the field of Environmental, Social, and Governance (ESG) should encompass domains such as ESG investing, environmental management, corporate governance, corporate strategy, sustainable finance, stakeholder theory, corporate financial performance, and risk management.

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