ENVIRONMENTAL SOCIAL AND GOVERNANCE PERFORMANCE IN BANKING SECTOR: A BIBLIOMETRIC STUDY

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Abstract

Financial sector needs special attention pertaining to incorporation of the ESG criteria. Economic and financial issues coupled with climate change would have negative impact on the stability of financial institutions. This research paper attempts to synthesize and summarise scholarly articles published in Scopus database on ESG domain with reference to banking sector using bibliometric analysis. The objective of this review paper is to understand from past literature the trajectory of studies in the domain of ESG. There is a substantial growth in frequency of publication in the year 2022 along with annual growth of around 30 percent during 2015-2023. Bibliometric with MS-Excel, R-Studio and VOS-viewer were used to identify and analyze research trends related to the number of studies, research fields, authors, nations, institutions, and keywords. The important keywords identified in the bibliometric analysis were sustainability, corporate social responsibility, sustainable finance, banks performance.

Keywords: *Environment Social Governance, Banking Sector, Bibliometric Analysis, Sustainable Development Goals.*

JEL Classification: P27, G20, G21

1. Introduction

The United Nations Conference on Environment and Development also known as 'Earth Summit' held in Rio de Janeiro in 1992 to United Nations Summit on Sustainable Development, held in New York in 2015. The gravity with which, the subject of sustainable development had been pursued is evident from the fact that seventeen Sustainable Development

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Goals (SDG) which was conceived during United Nations Summit on Sustainable Development was formalised during COP21 held in Paris in 2015, came to be known as The Paris Agreement (The United Nations, 2023). With the inception of SDGs, that includes SDG 13 dedicated to climate action it has become legally incumbent upon organisations to incorporate ESG activities as part of their core activities. Financial sector being the most crucial sector of an economy, needs special attention pertaining to incorporation of the ESG criteria as it has been recognized that economic and financial issues coupled with climate change would have negative impact on the stability of financial institutions (Ozili, 2020).

This research paper attempts to synthesise and summarise scholarly articles using bibliometric analysis. The bibliometric analysis gives insight about the current trends such as annual growth rate, productivity of author/intuitions/journal, citation analysis, level of collaboration, and trending topic with the help of keywords analysis that all culminate to find research gap and thus the future agenda could be recommended.

2. Material and Methods

The study uses Preferred Reporting Items for Systematic and Meta-Analysis Reviews (PRISMA) protocol which is the guideline setting standards to conduct review study (Rethlefsen, et al., 2021). This methodology was developed to assure transparency, replicability and quality of review process (Shamseer, et al., 2015). The data has been extracted from Scopus database using keywords ESG and Bank*. The documents both research articles and review papers within the subject areas business, social science, economics, and energy published in English were included that returned 133 documents. The search strategy has been mapped in the Figure 1. The remaining 133 documents were thoroughly read and the papers were manually excluded which were unrelated/remotely related to the study of ESG in banking sector as they were acting as an outlier. After the final exclusion of documents, authors remained with 102 documents. The bibliometric analysis of 102 documents was done using Excel and VOS-viewer software.

Box 1. Boolean Operation for Data Extraction

(TITLE-ABS-KEY (*esg*) AND TITLE-ABS-KEY (*bank**)) AND (LIMIT-TO (DOCTYPE , *"ar"*) OR LIMIT-TO (DOCTYPE , *"re"*)) AND (LIMIT-TO (SUBJAREA , *"BUSI"*) OR LIMIT-TO (SUBJAREA , *"ECON"*) OR LIMIT-TO (SUBJAREA , *"SOCI"*) OR LIMIT-TO (SUBJAREA , *"ENER"*)) AND (LIMIT-TO (LANGUAGE , *"English"*))

Figure1. Flowchart of Search Strategy
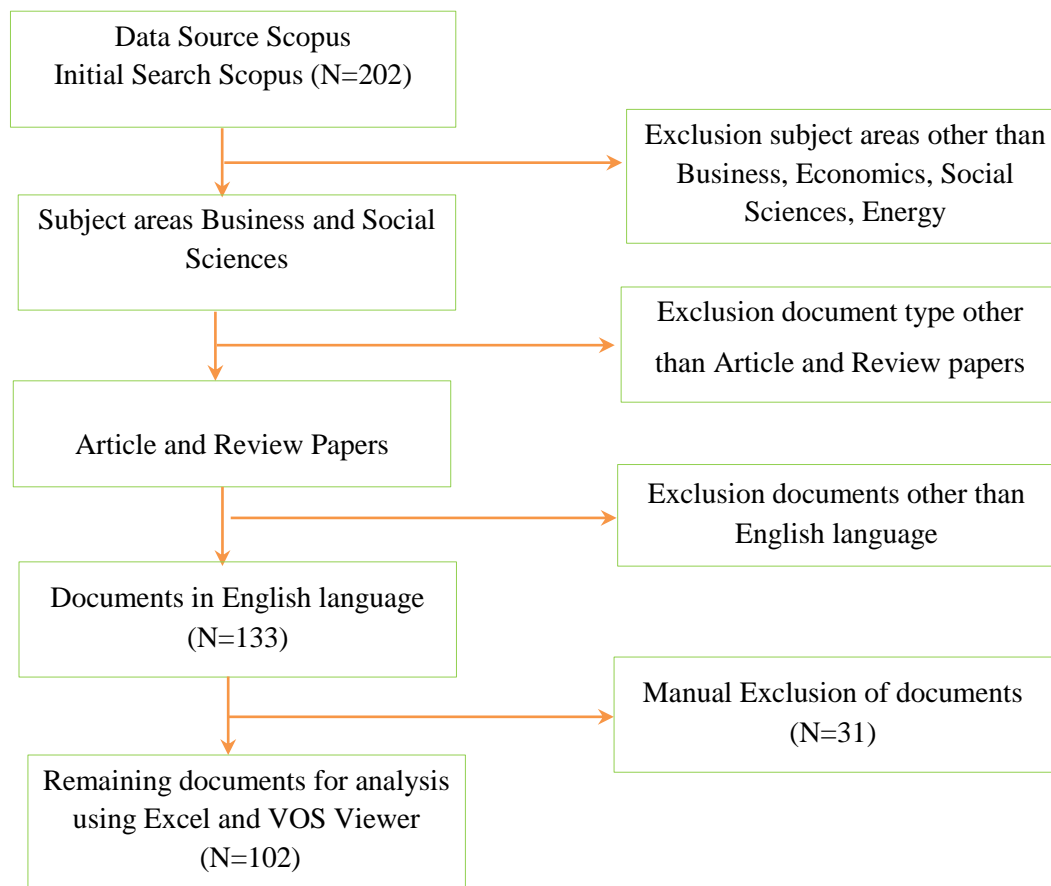
3. Result and Discussion

The result of bibliometric analysis answers the following research questions which are classified into five sub-sections as follows: i) Descriptive statistics, ii) Co-authorship Analysis which is further divided into sub-sections, iii) Keyword Analysis, iv) Author and Citation Analysis v) Journal's Publication Contribution.

3.1 Document Analysis

Publications were collected using the electronic Scopus database, a comprehensive and interdisciplinary bibliographic database. The bibliometric analysis summary is presented in Table 1. Basic details of which are as follows, the studies from 2015 to 2023 were selected. Out of the 202 documents in result; 102 articles were found useful for the study and analyzed using VOS-viewer, which were published in total of 64 different journals. The study in this area has observed the annual growth of 29.68 percent.

In context to the contents from the documents, the average number of citations per article which is determined by adding up all the times an author's writings have been referenced in other writings, dividing that amount by the total number of articles the author has produced which is this case is 10.56. By using Keywords Plus, extra search terms are taken from article titles that authors have cited in their references and footnotes which accounted for 161 while summation of author's keywords were 375. An aggregate of 256 researchers have contributed in to similar studies, whereas a publication with only one author were 12. Average number of authors devoted for each publication is 2.84 whilst the international collaboration or co-authorship consists of 30.39 percent. The maximum number of publications comes out in year 2022.

Table 1 Descriptive Statistics

| Description	Results
Timespan	2015:2023
Sources (Journals, Books, etc.)	64
Documents	102
Annual Growth Rate (%)	29.68
Average citations per year per doc	1.81
Average citations per documents	10.56
Keywords Plus	161
Author's Keywords	375
Authors	256
Authors of single-authored documents	12
Single-authored documents	13
Authors per Document	2.51
Documents per Author	0.40
International Co-authorships (%)	30.39
Maximum number of Publication (64)	2022

Source: Author's analysis

3.2 Co-authorship (Author-wise)

Co-authorship refers to the collaboration between two or more authors in the production of a scholarly work, such as a research article or a book. Co-authorship is an important aspect of bibliometric analysis because it provides insights into the patterns and dynamics of scholarly communication. Co-authorship can be measured in various ways, such as counting the number of authors on a publication or analyzing the relationships between authors. The most common

measure of co-authorship is the number of authors on a publication, which is referred to as the "authorship count." This measure provides an indication of the level of collaboration between authors and can be used to compare the productivity of different individuals or research groups. Another way to measure co-authorship is to analyse the co-authorship networks between authors. Co-authorship networks are created by linking authors who have collaborated on one or more publications, and they can be used to identify patterns of collaboration within and between research fields. Co-authorship networks can also be used to identify key players in a research field and to track the evolution of research collaborations over time. In our study, we have focused on collaboration in one or more publication as depicted in figure 2. Out of 102 selected articles, Nasrallah n. has common connection with red and blue cluster (El Khoury, Nasrallah, & Alareeni, 2023), (El Khoury, Nasrallah, & Alareeni, 2023), (Mohamed Buallay, Al Marri, Nasrallah, Hamdan, Barone, & Zureigat, 2021). Similarly in case of blue and green cluster Buallay has collaborated on two articles (Mohamed Buallay, Al Marri, Nasrallah, Hamdan, Barone, & Zureigat, 2021), (Buallay, Fadel, Al-Ajmi, & Saudagaran, 2020). We can use this network to identify key players in the group, such as Nasrallah and Buallay, who have collaborated on multiple papers. We can also observe the extent of collaboration between the authors, as Buallay have collaborated on more papers than others, and thus we can examine the potential for future collaborations based on the connections in the network.

Figure 2 Co-Authorship Networks of Authors
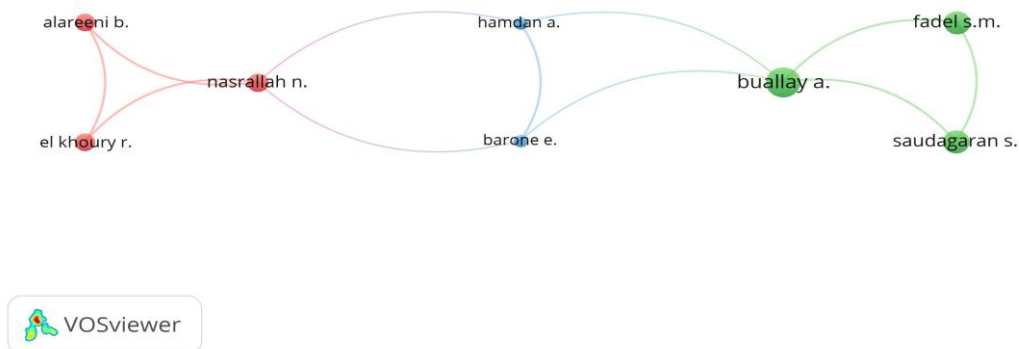
3.3 Co-authorship (Organization-wise)

Co-authorship with special reference to organization refers to the collaboration between two or more authors who are affiliated with the same organization, such as a university, research institution, or corporation. This type of co-authorship is particularly relevant in the analysis of organizational networks, as it provides insights into the collaborative patterns and productivity of research groups within an organization. It can be used to evaluate the research performance of an organization, and to compare the productivity and impact of different research groups within the organization. By analysing co-authorship patterns within an organization, researchers can gain insights into the collaborative dynamics and productivity of research groups, and identify opportunities for future collaborations and research initiatives. In figure 2 the red cluster is strongly connected to the green cluster, in which Department of Accounting and Information Systems, Sulaiman Al Rajhi University, Saudi Arabia, Department of Accounting and Finance, Notre Dame University, Louaize, Zouk Mosbeh, Lebanon, College of Business, Arts and Social Sciences, Brunel University London, London, United Kingdom have collaborated in single articles and also on multiple articles together. College of Business and Finance, Ahlia University, Manama, Bahrain in the green cluster has also teamed with different authors during the year 2021 and again in the years 2020 and 2022 from Brunel University, London, United Kingdom. Their major contribution has been in banking sector and its sustainability reporting, financial performances indicator and ESG.

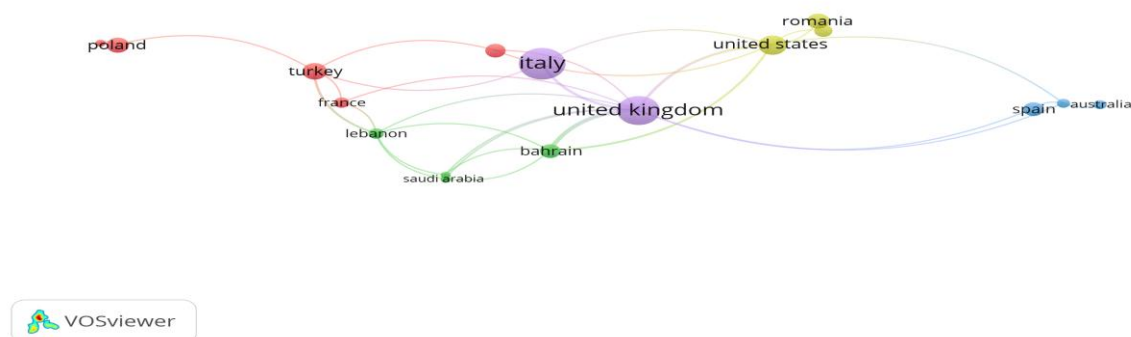Figure 3 Co-authorship Network of Organization
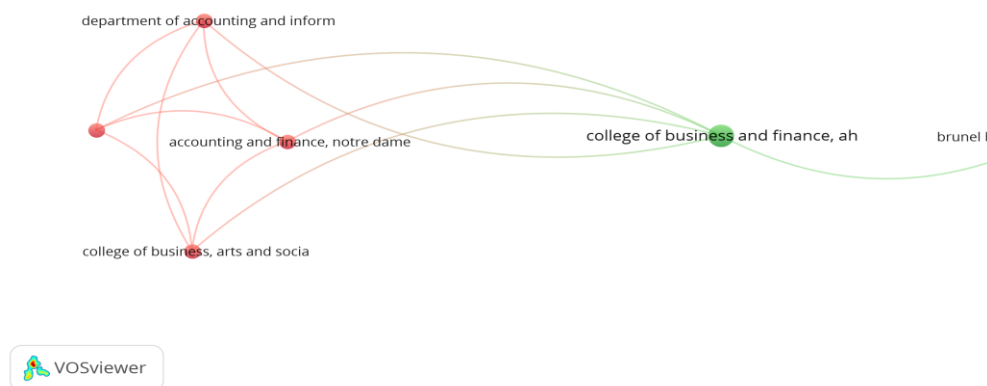
3.4 Co-authorship (Country-wise)

Co-authorship in bibliometric analysis refers to the collaboration of authors from different countries in producing a scientific publication. It is an important indicator of international collaboration in research, and it can provide insights into the extent of scientific cooperation between countries. One way to analyze co-authorship with reference to countries is to use co-authorship networks. Co-authorship networks represent the relationships between authors and their collaborations, and they can be visualized using network graphs. In these graphs, authors are represented by nodes, and collaborations between authors are represented by edges.

To analyze co-authorship with reference to countries, it is important to identify the countries of the authors involved in each collaboration. One common approach is to use the country affiliations of the authors as reported in the publication. Co-authorship networks can also provide insights into the topics and disciplines that are most likely to attract international collaboration. In this study, total of 13 countries were found linked in cross-country co-authorship network. Major contributions were done by Italy, United Kingdom, United States, Poland, Romania, Turkey and Spain, followed by some countries with comparatively lesser collaboration like France, Lebanon, Saudi Arabia, Bahrain and Australia. The analysis shows that developed nations and bigger economies such as United States, Italy, and United Kingdom etc. have significantly higher level of collaborations compared to some other developed and developing nations with smaller economies. There are several constraints that can result in lesser co-authorship with reference to countries in Bibliometric analysis in this study some prominent barriers may be due to Language differences can be a significant barrier to international collaboration in research. Researchers especially from countries like Bahrain, Saudi, and Lebanon who do not speak the same language may have difficulty communicating and collaborating effectively and the next possible difference can be due to political differences between countries that can also limit international collaboration in research. Researchers may face difficulties obtaining visas or permits to travel to other countries or may face restrictions on the types of research they can conduct. Also, Cultural differences can also be a significant barrier to international collaboration in research. Researchers from different countries may have different values, beliefs, and ways of working that can make collaboration difficult as seen in

figure 4 the diverse set of countries with different culture and practices might have different perspective towards ESG and Banking.

Figure 4 Co-authorship Networks of Countries


3.5 Co-authorship (Department-wise)

Co-authorship with reference to departments/institutions in bibliometric analysis refers to the collaboration of authors from different departments or institutions in producing a scientific publication. It is an important indicator of inter-departmental/institutional collaboration in research and can provide insights into the extent of scientific cooperation between departments or institutions. To analyze co-authorship with reference to departments/institutions, it is important to identify the departments/institutions of the authors involved in each collaboration. One common approach is to use the institutional affiliations of the authors as reported in the publication. This information can be obtained from the author affiliations section of the publication or from databases like Scopus in case of this study.

Once the institutional affiliations have been identified, co-authorship networks can be analyzed to determine the level and patterns of collaboration between departments or institutions. For example, one can calculate the number of collaborations between authors from different departments or institutions, and the number of collaborations within each department or institution. This can help to identify the most active departments or institutions in terms of inter-departmental/institutional collaboration, as well as the departments or institutions that are most isolated in their scientific networks. As per our analysis of this study - Department of Economics

and Management, Università Degli Studi di Pavia, Italy; Department of Accounting and Finance, Notre Dame University–Louaize, Zouk Mosbeh, Lebanon; College of Business and Finance, Ahlia University, Manama, Bahrain; School of Business Quality Management, Hamdan Bin Mohammed Smart University, Dubai, UAE; and College of Business, Arts and Social Sciences, Brunel University London, London, United Kingdom were found to be the highest Co-authorship based institution in the study area of Banking and ESG.

Proposed hypothesis for such high level of collaboration among institutions can be attributed to, i) the research culture of a department or institution can influence the extent to which researchers collaborate with each other. Departments or institutions that prioritize collaboration and have a supportive research culture are more likely to engage in inter-departmental/institutional collaboration, ii) the availability of funding for collaborative research projects can also be a significant factor in promoting inter-departmental/institutional collaboration, and there might also be Common research interests- departments or institutions with similar research interests are more likely to collaborate with each other in this study ESG and its impact on banking industry being the emerging and popular topic at present can said to be another factor.

Figure 5 Co-authorship Networks (Departments/Institutions)
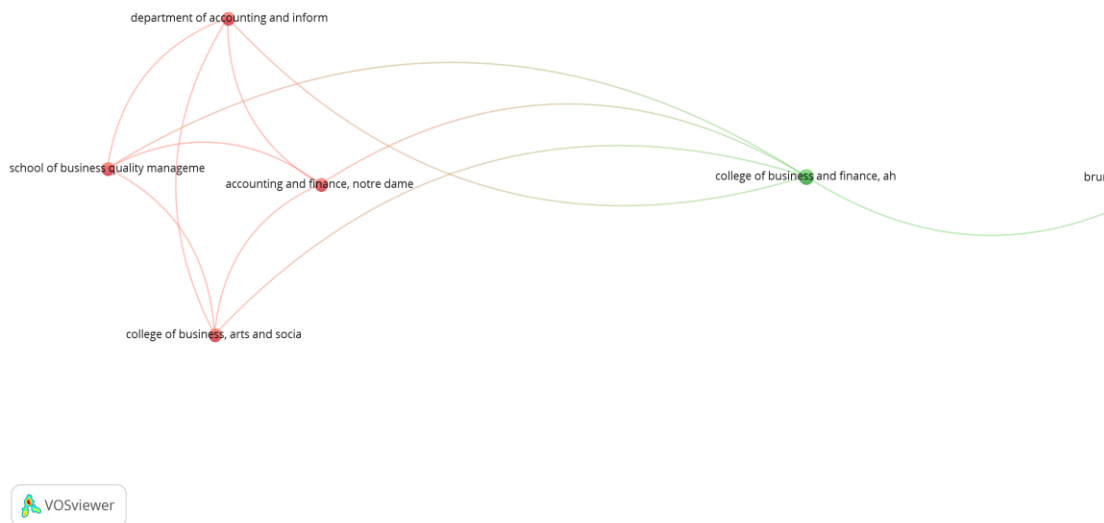
Research topics that require expertise from multiple disciplines may also encourage collaboration between departments or institutions. Also, Departments or institutions that have established communication channels, such as regular meetings or joint seminars, are more likely to engage in inter-departmental/institutional collaboration so there might be high level of communication and thus better collaborations between the different departments of various nations as seen in figure 5.

3.6 Keywords Analysis

In bibliometric analysis, occurrence of words refers to the number of times a specific word or phrase appears in a set of documents. This can be useful in identifying the most common or significant themes or concepts within a particular field or body of literature. Word occurrence analysis can be performed using various techniques, such as keyword analysis or co-word analysis. Keyword analysis involves identifying the most frequent keywords or terms within a set of documents, while co-word analysis involves identifying pairs or groups of words that tend to appear together. In our study we have used the co-word analysis to understand the pair of words that come together forming a cluster altogether.

Figure 6 Keywords Network
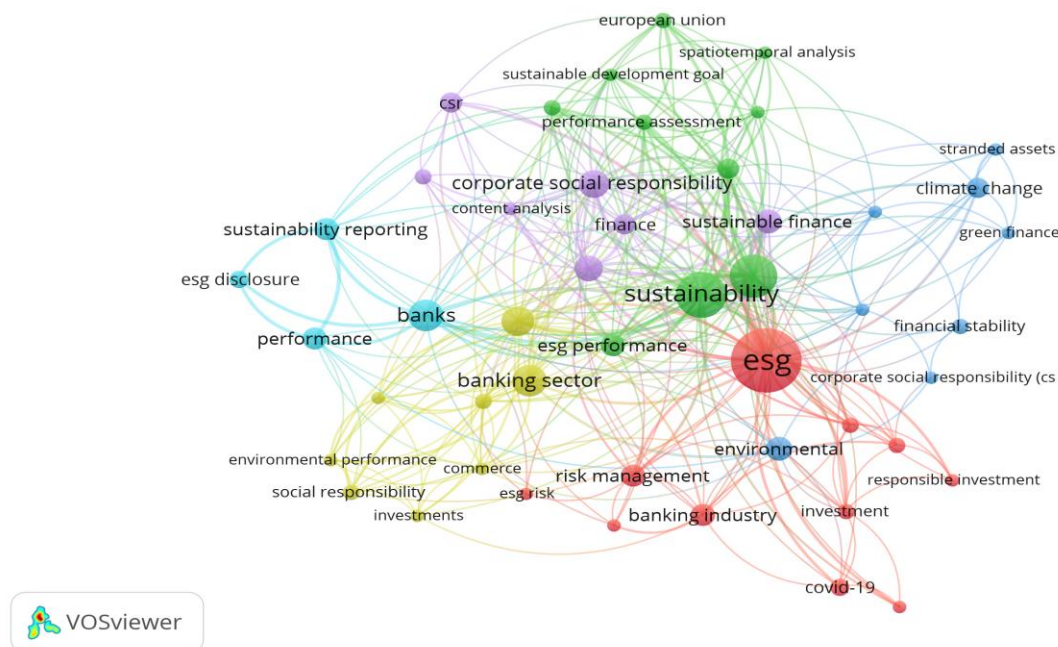
The clusters are identified by 5 colours as seen in figure 6 representing different co-word occurrence like purple cluster with major words like corporate social responsibility, finance and sustainable finance. Green cluster showing major words occurred like sustainability, performance assessment and ESG performance. Blue cluster on other hand showed the cluster link related to finance like the green finance, financial stability etc. While red cluster mainly focus on ESG and its relative impact to banking industry, risks, and investments. Light blue cluster highlighted factors associated with banks like performance, disclosure, and reporting. Lastly, yellow cluster represented inter-linkages of words kike banking sectors and ESG performance.

3.7 Author and Citation Analysis

Table 2 presents the top 10 most cited articles with the citation scores of the authors. The paper with highest citation (78) is authored by (Birindelli, et al, 2018) that explores impact of diversity in board of directors on ESG performance. The themes of highest cited works could be broadly classified into following categories i) impact of ESG on bank's performance, ii) impact of diversity in board of directors on banks' performance, iii) CSR dimensions, iv) impact of ESG on bank's risk taking. On analysing the trend, we find that Impact of ESG on Bank's Performance is most frequent researched theme but there are newer themes that have emerged with equal level of citation indicating increased interest in these new topics. It gives us an insight into the emerging and trending topics.

Table 2 Most Cited Articles

S. No.	Authors	Title	Citations
1	Birindelli G., Dell'Atti S., Iannuzzi A.P., Savioli M.	Composition and activity of the board of directors: Impact on ESG performance in the banking system	78
2	Nizam E., Ng A., Dewandaru G., Nagayev R., Nkoba M.A.	The impact of social and environmental sustainability on financial performance: A global analysis of the banking sector	77
3	Brogi M., Lagasio V.	Environmental, social, and governance and company profitability: Are financial intermediaries different?	76
4	Miralles-Quirós M.M., Miralles-Quirós J.L., Hernández J.R.	ESG performance and shareholder value creation in the banking industry: International differences	68
5	Capelle-Blancard G., Petit A.	The Weighting of CSR Dimensions: One Size Does Not Fit All	57

6	B?tae O.M., Dragomir V.D., Feleag? L.	The relationship between environmental, social, and financial performance in the banking sector: A European study	52
7	Miralles-Quirós M.M., Miralles-Quirós J.L., Redondo-Hernández J.	The impact of environmental, social, and governance performance on stock prices: Evidence from the banking industry	46
8	Di Tommaso C., Thornton J.	Do ESG scores effect bank risk taking and value? Evidence from European banks	44
9	Azmi W., Hassan M.K., Houston R., Karim M.S.	ESG activities and banking performance: International evidence from emerging economies	43
10	El Khoury R., Nasrallah N., Alareeni B.	ESG and financial performance of banks in the MENAT region: concavity–convexity patterns	39

Source: Authors Compilation

3.8 Journal's Publication Contribution

Table 3 brings out the journals in the domain of ESG in banking sector that have published maximum number of articles in descending order. The *Sustainability* emerges as the top most journal with highest number of publications (16 publications), which 31 percent of the total of top fourteen journals.

Table 3: Top Sources of Publication

S.No.	Journal	No. of Articles
1	Sustainability	16
2	Corporate Social Responsibility Environment Management	05
3	Journal of Sustainable Finance & Investment	04
4	Journal of Risk Management Financial Institutions	04
5	Energies	03
6	Financial Responsibility Literature	03
7	Banks Bank Syst.	03
8	Responsible International Business Finance	02
9	Journal of Cleaner Production	02
10	International Journal of Financial Economics	02
11	International Journal Productivity Performance Management	02
12	Global Business Review	02
13	Amfiteatru Economic Journal	02
14	Competitive Review	02

Source: Author's Compilation

The Journal, *Corporate Social Responsibility and Environmental Management* stands at second position but with only one-third publication as compared to *Sustainability*. At third position there

are two journals, each with same frequency of publication *namely Journal of Sustainable Finance & Investment* and *Journal of Risk Management in Financial Institutions*. One reason is that this is a niche journal, focusing primarily on *recent technological development* that engages the domain waste, waste management, industrial waste. Similarly, *International Journal of Scientific and Technology Research* is another niche journal which explains its comparative low production of published work.

4. Conclusion

The objective of this review paper is to understand from past literature the trajectory of studies in the domain of ESG with special reference to banking sector. There is a substantial growth in frequency of publication in the year 2022 (64 articles) along with annual growth of around 30 percent during 2015-2023. Average citations stand at 11 percent while average citation per year per document is quite low, this has happened because of peaked number of publications in year 2022 that have increased the average citation of documents. The authors with maximum collaborations are Nasrallah and Buallay. Italy, United Kingdom, United States, Poland, and Romania are the top five countries with significantly higher level of collaborations. The level of collaborative work is typical of review and bibliometric study. Hence, it can be concluded that large number of documents are review paper. But, top five cited works are empirical in nature and impact of ESG on Bank's Performance is the most frequent researched theme. It gives a competitive advantage to the author's working on empirical papers.

Finally, the keywords analysis, gives us the insight into emerging themes/hot spots of the emerging topics. These are sub-areas of ESG such as green finance, financial stability, risk assessment, disclosure, and reporting. This sets the agenda for future research; the future research may look into the following aspects: green investments and bank's performance, ESG activities and banks' stability, ESG disclosure and reporting and banks risk assessment etc.

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