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Mapping the Literature on Environmental, Social, Governance, and Bank Performance: A Bibliometric and Content Analysis

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ABSTRACT

This study identifies gaps in existing research and proposes ten potential studies based on the most influential publications from the past 5 years. The study employs bibliometric citation analysis and orange data mining tools to review and analyze 253 documents from Scopus-indexed publications, complemented by content analysis. The analysis highlights a rising focus on the interplay between ESG factors and bank performance within sustainable finance, evidenced by increasing publications and citations. Leading contributors include "Sustainability (Switzerland)" and "Corporate Social Responsibility and Environmental Management." China leads in publication volume, with Amina Buallay as the most influential author. Cluster analysis using the latent Dirichlet allocation model identifies six primary themes. Research gaps are identified, and ten future research directions are proposed based on key publications from the past 5 years. This research uncovers relatively unexplored clusters with potential for future investigation, providing deeper insights into the advancement of research using statistical data on keyword occurrences with the Orange application. This study relies solely on the Scopus database and specific keywords, which may limit comprehensiveness. Future research should incorporate additional databases and explore individual ESG subthemes in greater depth to provide a more holistic understanding of ESG factors and bank performance.

Keywords: Environmental, Social, and Governance, Bibliometric Analysis, Scopus, VOSviewer, Biblioshiny, Orange Data Mining
JEL Classifications: G21, M14, Q56, L25

1. INTRODUCTION

The pressing issue of global climate change necessitates coordinated efforts across multiple sectors, with the financial industry, particularly banking, playing a crucial role. Consequently, this urgency has heightened public expectations for companies to prioritize environmental, social responsibility, and ethical considerations. Stakeholders are increasingly advocating for sustainable practices that encompass environmental, social, and governance (ESG) principles, significantly impacting both the environment and society (Chen and Xie, 2022).

Banks act as intermediaries, channeling funds from the public to sectors in need of investment, thereby playing a vital role in economic development. Recently, the Basel Committee, a key regulatory body, has recognized climate change as a substantial concern for financial institutions due to its potential economic and financial repercussions. Despite the rapid growth of emerging markets, dissatisfaction persists regarding ESG disclosures in banks' annual reports (Dissanayake et al., 2020).

Moreover, investors are increasingly adopting sustainable practices that prioritize ESG impacts in their investment decisions (Chen and Xie, 2022). This emphasis on ESG criteria is gaining significant traction globally, with ESG investments doubling from 2019 to 2020 as investors integrate these considerations into their strategies and corporate frameworks (Luo, 2022). Efforts are ongoing to encourage the integration of ESG principles into investment decisions and business models (Khan, 2022; Murè et al., 2021). Thus, synthesizing existing ESG literature is essential to understand current trends and identify areas for further research.

Previous literature reviews on ESG have explored various aspects, predominantly mapping the ESG landscape across different companies (Jain and Tripathi, 2023). Specifically, these reviews have examined themes such as ESG risks (Ziolo et al., 2020), the influence of ESG on firm performance (Khan, 2022), and the relationship between governance and ESG (Gao et al., 2021). However, no comprehensive analysis exists on the potential for in-depth research on ESG and its impact on performance specifically within the banking sector. Furthermore, the benefits of ESG initiatives on performance are notably significant in the banking sector compared to non-bank sectors (Cardillo et al., 2022). In response to this gap, this study employs a bibliometric analysis to map ESG literature within financial institutions, systematically reviewing articles published in reputable journals. Consequently, the research aims to identify underexplored clusters with potential for future investigation and assess opportunities for advancing in-depth research based on keyword occurrences.

To achieve this, bibliometric analysis provides a quantitative framework for understanding scientific communication, delineating research areas, central themes, and relationships within clusters and networks (Sánchez-Riofrío et al., 2015). This method proves invaluable for managing vast scientific datasets, identifying knowledge gaps, uncovering emerging trends, and generating new research avenues (Donthu et al., 2021).

Using 253 documents from the Scopus database spanning 2010 to 2023, this research addresses the following questions:

- RQ1: What are the current trends in ESG and bank performance in terms of publications, citations, authors, journals, and countries?
- RQ2: What is the intellectual structure of ESG and bank performance research, and what are the emerging topics in this field?
- RQ3: What are the primary concepts, research gaps, and future research directions for the ESG and bank performance domain?

Ultimately, the findings highlight ESG as a rapidly expanding field within sustainable finance, evidenced by increasing publications and citations. Leading journals include "Sustainability (Switzerland)" and "Corporate Social Responsibility and Environmental Management." The United States leads in ESG paper publications, with Amina Buallay emerging as the most influential author. The study identifies highly cited articles and delineates four major thematic clusters through bibliographic cluster analysis. Additionally, potential future research directions are explored using data mining software Orange.

The structure of this article is as follows: Section 2 details the methods, screening process, and data analysis tools employed. Section 3 presents the results of the bibliometric analysis, including trends in publications and citations, prominent journals, leading countries, and influential authors. Section 4 outlines the cluster analysis conducted through document bibliography merging. Section 5 discusses the research gaps and key questions identified. The final section summarizes the study's conclusions and acknowledges its limitations.

2. RESEARCH METHODS

Literature reviews have traditionally utilized various techniques such as structured reviews, theory-based reviews, model development reviews, bibliometric reviews, and content analysis. This research integrates bibliometric review and content analysis to achieve its objectives. The bibliometric analysis classifies previous studies into types of reviews, including descriptive, systematic, and meta-analysis reviews (Martínez-Climent et al., 2018). This approach is widely used to identify research clusters by mapping citations within previously published documents (Zupic and Čater, 2015).

Adopting a study design as proposed by Hassan et al. (2021), this research proceeded through three stages. The initial phase involved developing the research query. In the subsequent phase, the SALSA (Search, Appraisal, Synthesis, and Analysis) technique was employed to locate pertinent literature. Finally, bibliometric analysis was conducted to fulfill the research aims. Figure 1 outlines the procedural steps adopted in this investigation.

Publications were sourced from the Scopus database, with the SALSA method applied for literature identification. To achieve the research objectives and ensure a thorough document search, the established SALSA method (Papaioannou et al., 2010) was utilized, encompassing Search, Appraisal, Synthesis, and Analysis. Initially, a comprehensive search was conducted using various keywords to encompass all relevant documents. The search query used was TITLE-ABS-KEY (environment* AND social AND governance OR sustainab* AND bank AND performance), resulting in a total of 324 documents.

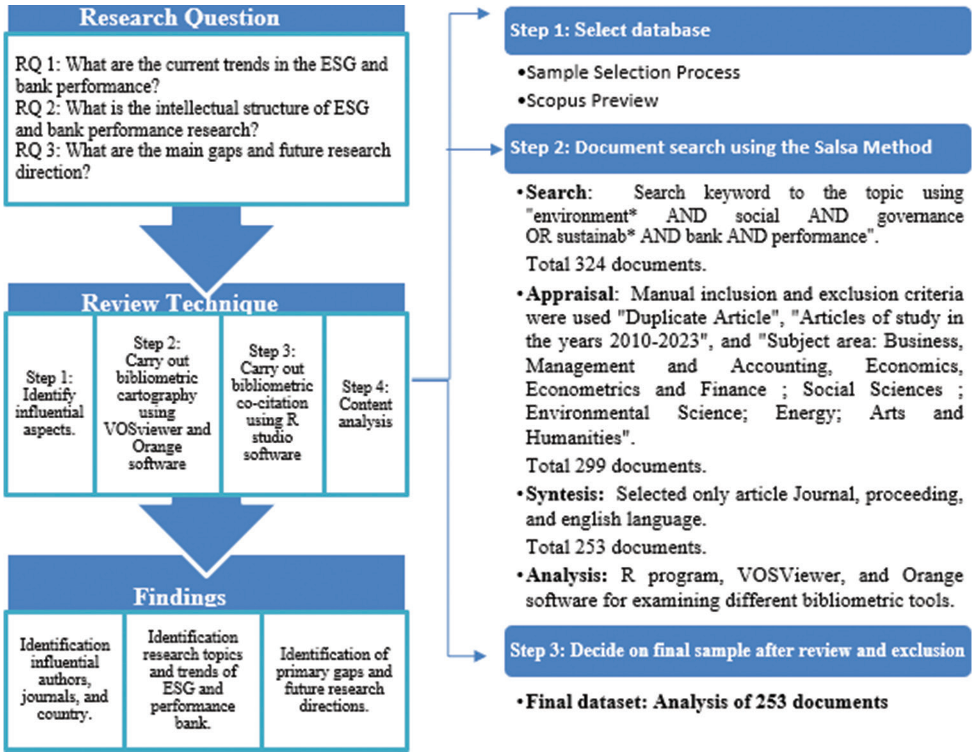
Subsequently, the gathered data were assessed based on predefined inclusion and exclusion criteria to ensure precision:

- Duplicate articles
- Articles published between 2010 and 2023
- Subject areas: Business, Management and Accounting, Economics, Econometrics and Finance, Social Sciences, Environmental Science, Energy, Arts, and Humanities.

In the synthesis phase, an analytical framework was constructed using the dataset. This study included articles published in both journals and conference proceedings. Further refinement was conducted by filtering for publications in English. The final stage of publication search utilized the query title-abs-key (environment* and social and governance or sustainab* and bank and performance) 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") or limit-to (subjarea, "ener")) and (limit-to (srctype, "j") or limit-to (srctype, "p")) and (limit-to (language, "english")), resulting in a final total of 253 documents.

For the bibliometric analysis, this study used the R program via Biblioshiny to calculate publication frequency, citations, journal

Figure 1: Research design



distributions, author contributions, country affiliations, and identify research trends. VOSviewer was employed to visualize theme clusters, while Orange data mining software mapped topic structures and analyzed keyword occurrences (Aria and Cuccurullo, 2017; Baker et al., 2020; Biancone et al., 2020; Hassan et al., 2021; Rusydiana, 2021). Content analysis identified influential authors, journals, and countries, explored research topics and trends in ESG and bank performance, and highlighted key gaps for future research.

3. RESULTS AND DISCUSSION

The results of this study offer a detailed bibliometric analysis of the literature on ESG and bank performance, presenting key findings from various analytical dimensions. The analysis covers publication trends, influential authors, and significant research themes, highlighting the progress and focal points in this domain from 2010 to 2023.

3.1. Findings of Bibliometric Analysis

This section reviews ESG and bank performance research from 2010 to 2023, highlighting key publication trends, influential authors and journals, and significant research topics. It identifies growing interest and areas for further study, particularly in emerging markets and specific ESG components.

3.1.1. Trends in publication and citation

Table 1 summarizes key information regarding the dataset utilized in this study. It includes 219 articles sourced from journals and 12 articles from conference papers, highlighting a predominant focus on journal publications. Notably, 31 articles were authored by a single individual, underscoring a high degree of collaboration in ESG and bank performance research across the remaining 86.5% of articles.

Table 1: General information

Description	Criteria	Results
Main information about data	Timespan	2010:2023
	Sources (Journals, books, etc.)	154
	Documents	253
	Annual growth rate %	37,7
	Document average age	3,25
	Average citations per doc	20
	References	28735
Document	article	219
Types document	conference paper	12
contents	Keywords Plus (ID)	568
Authors	Author's Keywords (DE)	784
Authors collaboration	Authors	659
	Authors of single authored docs	31
	Single-authored docs	32
	Co-authors per doc	2,91

Mapping scientific operations involves conducting citation analysis, which examines the interconnections between publications by analyzing references from one publication to another (Appio et al., 2014). Citation analysis proves valuable for identifying influential publications and can also aid in identifying thematic clusters, as referenced (Hjrlan, 2013). In research fields, the number of citations received by a publication serves as a measure of its importance or impact, as noted in the reference (Stremersch et al., 2007).

Figure 2 illustrates the annual publication count of 231 articles published from 2010 to 2023, average citations per year, and citation years. The number of publications saw an average annual growth rate of 14%. The most notable increases in publication numbers were observed in 2019 and 2023. This trend is consistent with the doubling of ESG investment observed from 2019 to 2020 (Luo, 2022). In 2019, a significant intervention occurred in the company's ESG activities when Larry Fink, CEO of BlackRock, the world's largest investment company, announced a policy to exclusively invest in companies that generate social impact (Krishnamoorthy, 2021). Furthermore, the impact of COVID-19 on society underscored the importance of initiatives aimed at enhancing ESG activities. The trend in average article citations per year appears stable, suggesting that older publications tend to accumulate more citations over time.

3.1.2. Most influential author

Table 2 summarizes the top 10 most productive authors in ESG, and bank performance research based on their h-index, total citations, total publications, and year of first publication on this topic. Amina Buallay emerges as the most productive author across all criteria, with 4 articles, an h-index of 4, total citations amounting to 359, and a publication history beginning in 2019. Antonia P. Iannuzzi has also published 4 articles, but their first article appeared in 2015.

Buallay's most cited article, with 208 citations, examined the impact of ESG factors on the performance of 235 banks in the European Union (Buallay, 2019). The findings indicate a positive impact of ESG on operational, financial, and market performance. Another notable study by Birindelli et al. (2018), with 106 citations, analyzed the impact of board composition on ESG performance in 108 listed banks in Europe and the United States. The study found that gender diversity, board size, and the presence of a CSR committee positively correlate with ESG performance, while board independence has a negative impact. Gender diversity was identified as having the most significant effect, emphasizing the importance of achieving gender balance on boards.

Figure 3 highlights the top ten contributors to ESG and bank performance research from 2010 to 2023. Antonia Patrizia Iannuzzi has been a consistent presence from 2015 to 2022, focusing on CSR (Birindelli et al., 2015; Dell'Atti et al., 2017), governance (Dicuonzo et al., 2022), and ESG in bank performance (Birindelli et al., 2018). Since 2019, Amina Buallay has produced the highest number of articles and citations, focusing on the impact of ESG factors on financial, operational, and market performance in developed countries. Notably, ESG studies in emerging markets remain relatively limited.

Table 2: Author impact

Author	H index	Total Citations	Total production	Impact start
Amina Buallay	4	359	4	2019
Antonia P. Iannuzzi	4	223	4	2015
Guler Aras	3	117	3	2017
Abu Bakkar Siddik	3	69	3	2021
Mashiyat Tasnia	3	136	3	2019
Tezcan N	3	117	3	2017
Olaf Weber	3	155	3	2015
Giuliana Birindelli	2	141	2	2015
Stefano Dell'atti	2	180	2	2017
Khaled Hussainey	2	29	3	2018

3.1.3. Most productive journal

Table 3 presents the top 10 impactful publishing sources on the theme of ESG and bank performance. Sustainability, published by MDPI, leads with 28 articles, an h-index of 10, and a total of 474 citations. Meanwhile, Corporate Social Responsibility and Environmental Management, published by John Wiley, has the highest impact in terms of total citations, with 545 citations across 8 articles. The cited article in this journal focused on the impact of CSR on bank's reputation, ultimately benefiting financial performance (Forcadell and Aracil, 2017). Furthermore, ESG activities can mitigate bank risk (Gangi et al., 2019), and increase bank profitability (Brogi and Lagasio, 2019).

3.1.4. Most influential country

Table 4 presents data on the top 15 countries contributing to ESG and bank performance research. China leads with 30.04% of total publications, followed by Italy (28.46%), Malaysia (24.90%), the USA (17.39%), and the UK (15.02%). These countries represent both developed and emerging markets. In terms of citations, Germany holds the highest average citations per article (202), followed by the UK (31.65), Spain (28.40), and Italy (26.26). This suggests that articles from developed countries tend to have a greater impact. The most productive authors in this domain are Amina Buallay from the UK and Antonia Patrizia Iannuzzi from Italy.

Figure 2: Average citation per year

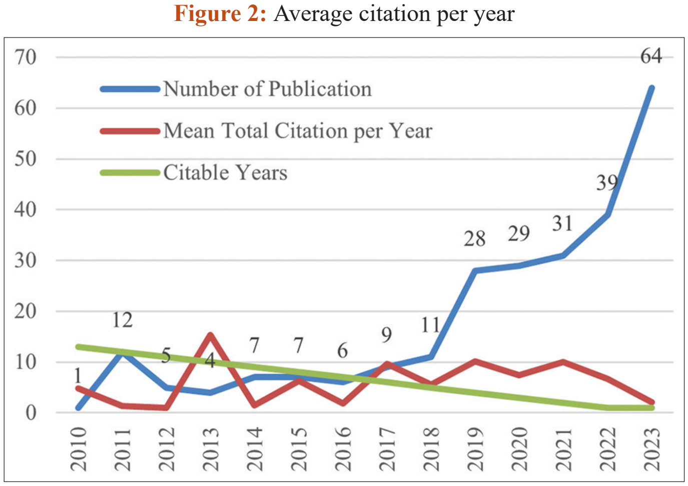


Figure 3: Authors' production over time

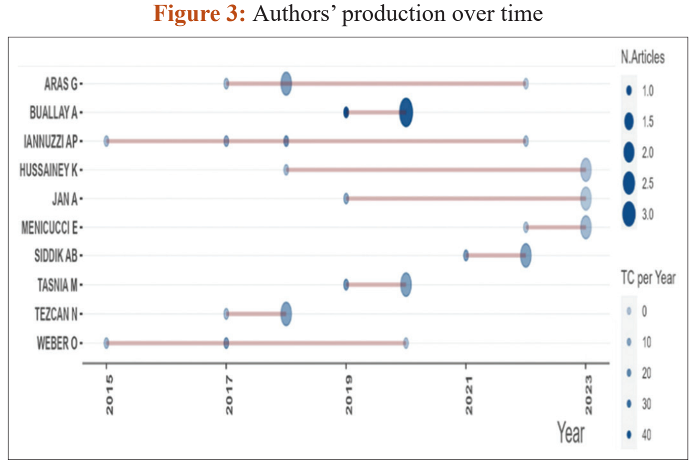


Table 3: Source impact

Journal	H index	Total citations	Total prod.	Impact start	Publisher
Sustainability (Switzerland)	10	474	28	2018	MDPI AG
Corporate social responsibility and environmental management	8	545	9	2017	John Wiley
Journal of Cleaner Production	6	485	7	2018	Elsevier
Banks and bank systems	4	33	4	2016	Business Perspectives
Journal of sustainable finance and investment	4	88	5	2011	Taylor and Francis
Social responsibility journal	4	171	4	2011	Emerald
Journal of business economics and management	3	37	3	2015	Taylor and France
Management of environmental quality	2	291	2	2019	Emerald
Business strategy and the environment	2	105	2	2017	John Wiley
Competitiveness review	2	61	2	2020	Emerald

Table 4: Most contributing countries

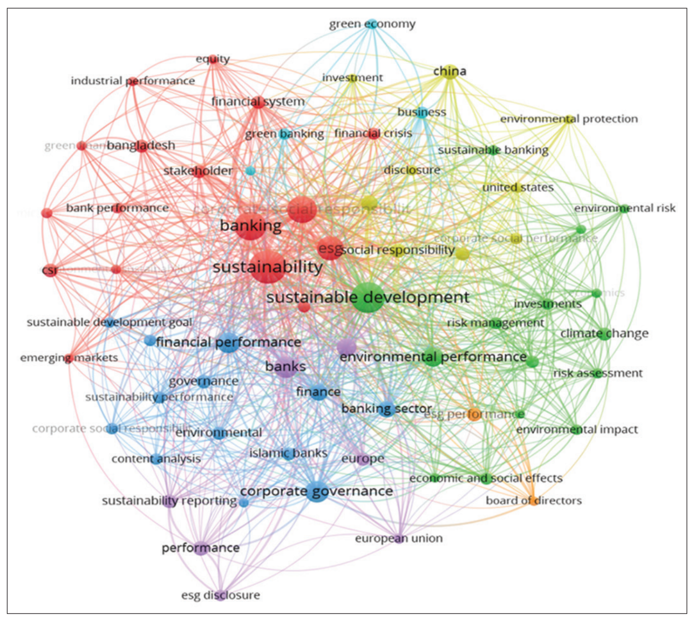
Rank	Country	No. of articles and % (N=253)	TC	AAC	SCP
1	China	76 (30.04)	300	13.64	15
2	Italy	72 (28.46)	499	26.26	17
3	Malaysia	63 (24.90)	430	23.89	10
4	USA	44 (17.39)	168	16.80	6
5	UK	38 (15.02)	538	31.65	10
6	Romania	36 (14.23)	123	17.57	6
7	Pakistan	32 (12.65)	62	8.86	3
8	India	25 (9.88)	138	17.25	6
9	Spain	25 (9.88)	284	28.40	7
10	Turkey	21 (8.30)	132	22.00	4
11	Canada	18 (7.11)	209	23.22	7
12	Indonesia	18 (7.11)	40	6.67	5
13	Bangladesh	17 (6.72)	118	23.00	0
14	France	14 (5.53)	137	22.83	2
15	Germany	11 (4.35)	606	202.00	2

TC: Total citation, AAC: Average article citations, SCP: Single country papers

Table 5: Classification no. of publication in each cluster

Year	Cluster						
	1	2	3	4	5	6	7
2010							
2014						1	
2016	1		1				
2018	2	6	3	1	1	1	1
2020	8	4	6	5	6		
2022	6	5	3	3		2	1
Total	17	15	13	9	7	4	2

Figure 4: Keyword co-occurrence



3.2. Research Topics and Trends of ESG and Performance Bank

This analysis highlights key research themes, trends, and emerging topics in ESG and bank performance, providing insights into the evolving academic focus in this field.

3.2.1. Bibliographic coupling of documents

Figure 4 illustrates a visual representation of keyword co-occurrence in the ESG and bank performance theme. Each node's size indicates the frequency of the respective keyword, while the thickness of the links denotes the strength of co-occurrence between keywords. The proximity between nodes reflects how frequently they co-occur: closer nodes co-occur more frequently, whereas farther nodes indicate less frequent co-occurrence. The visualization employs distinct colors to represent 7 thematic clusters, each delineating interconnected topics within its cluster.

Each cluster in the study is uniquely color-coded, with the largest cluster (red) featuring the keyword "sustainability" and encompassing 17 articles on ESG and bank performance. Despite advancements in sustainability disclosures, specific ESG disclosures in banking remain limited. Table 5 shows the classification of the number of publications in each cluster. The green cluster includes 15 articles on ESG investments and risks, the blue cluster has 13 articles on ESG in Islamic banks, the yellow cluster contains 9 articles on ESG and social responsibility, the purple cluster features 7 articles on ESG in European banks, the light blue cluster includes 4 articles on green banking, and the orange cluster contains 2 articles on ESG and boards of directors. ESG and social responsibility have been extensively studied from 2014 to 2022, evolving from Corporate Social Responsibility (CSR) reporting (Chen and Xie, 2022). However, the relationship between ESG factors and boards of directors, a topic that emerged in 2018, remains under-researched.

3.2.2. Themes

Figure 5 displays the most frequently used keywords in research on ESG and bank performance. Author keywords are the terms authors use to describe their articles. Through keyword network algorithms, researchers can identify different thematic clusters

Figure 5: Thematic evolution

within a specific domain. These clusters can be visualized on a thematic or strategic map.

3.2.3. Niche themes

In the top left quadrant, niche themes include keywords with a strong presence but low relevance. Keywords such as corporate governance, ESG performance, and board of directors are prominent in this cluster. Corporate governance serves as the central theme within this cluster. However, evidence demonstrating a direct link between corporate governance and social and environmental performance remains limited (Claessens and Yurtoglu, 2013). However, corporate governance is intertwined with various governance mechanisms such as the board of directors, ownership structure, and the presence of independent auditors. These mechanisms play crucial roles in shaping corporate practices related to social and environmental performance (Birindelli et al., 2018).

There remains uncertainty in accurately representing and measuring governance in the context of corporate sustainability performance. The composition of the board of directors can significantly influence ESG performance outcomes (Birindelli et al., 2018; Menicucci and Paolucci, 2022). Board gender balance has a positive impact on bank sustainability performance (Jan et al., 2021). Meanwhile, research results (Galletta et al., 2022) show that Research indicates that gender diversity within corporate boards can enhance ESG (Environmental, Social, and Governance) performance, as female directors often contribute to higher social impact initiatives. Moreover, banks employing Islamic governance principles are shown to exhibit greater environmental friendliness compared to conventional banks (Sharmeen et al., 2019). However, the influence of Islamic governance on sustainability performance is still not well understood and warrants further research (Aras et al., 2018).

3.2.4. Motor themes

In the top right corner is the core theme, which serves as the primary driver in ESG and banking research. Keywords within this theme are pivotal in shaping research on ESG and bank performance. Key groups include CSR (Corporate Social Responsibility), sustainable development, and the banking industry.

Sustainability reporting on ESG practices has been found to positively impact banks' financial and market performance (Buallay, 2019). Implementing ESG practices can help mitigate the risk of financial sanctions (Murè et al., 2021). Imposing financial sanctions on banks can damage their reputations and adversely affect their profitability. Nevertheless, various studies have indicated that Environmental, Social, and Governance (ESG) factors have a complex, non-linear influence on a bank's performance (Buallay et al., 2020). Despite the increasing number of studies on the impact of ESG on bank performance, the findings remain inconsistent, indicating a need for further research in this area.

3.2.5. Basic themes

The fundamental themes identified are grouped into two clusters: (1) Sustainability, financial performance, and the banking sector, and (2) governance, banking, and financial crisis. Effective governance frameworks are crucial in managing risk and improving financial outcomes in the banking sector (Kamarudin et al., 2022; Mollah et al., 2017; Srairi et al., 2022). Financial institutions operating under Sharia principles typically encounter fewer risks than conventional ones, with governance in Islamic banks demonstrating resilience during financial crises (Arslan-Ayaydin et al., 2016; Jawadi et al., 2014; Kabir Hassan et al., 2021). However, studies on Sharia compliance remain limited.

Corporate governance research has expanded significantly in both developed and emerging economies, playing a vital role in fostering economic growth and promoting environmental sustainability. The effectiveness of national governance greatly influences how companies adopt sustainable practices. Further investigation is required to thoroughly explore the correlation between governance improvements and environmental priorities.

3.2.6. Emerging or declining themes

In the lower left quadrant, themes are categorized as emerging or declining. Keywords in this quadrant represent areas that are still nascent in research and beginning to develop, or they are part of themes that are already becoming saturated in research. To assess their growth potential, the Orange software analyzes whether these themes are emerging or declining.

Three distinct theme clusters have been identified: (1) Encompassing social responsibility, corporate social performance, and credit risk; (2) focusing on environmental performance, Islamic banks, and social performance; and (3) centered around bank efficiency and stochastic frontier analysis. Statistical analysis of keyword cluster frequencies relative to overall keyword frequencies is utilized to gauge the developmental prospects of these theme clusters. Orange data mining software is employed to track keyword frequencies annually.

3.3. Future Research Directions

The Latent Dirichlet Allocation (LDA) model serves to categorize topic keyword clustering. This method of topic modeling uncovers latent themes within extensive document collections. LDA, as a probabilistic graphical model, excels in estimating the proportion of variables by incorporating the values of other variables into its analysis (Banerjee et al., 2020). Table 6 presents ten topic models derived from the outcomes of Orange data mining software utilizing the LDA model.

Topic trend analysis involves calculating the probabilistic proportion rate of keyword group frequency annually. An increasing trend indicates higher research potential for that topic, while a decreasing trend suggests otherwise. From Figure 6, topics 1, 2, 5, 7, 8, and 10 demonstrate increasing trends, indicating significant research interest compared to other topics. These areas represent promising opportunities for future research endeavors.

3.3.1. Topic 1: ESG and shariah compliance

From an Islamic perspective, sustainable practices aim to benefit humanity while safeguarding religion, life, intellect, progeny, and property, aligning with Imam al-Ghazali's assertion of protecting al-mabaadi' al-khamsyah (Alkhan and Hassan, 2021). Maqāsid al-shari'a, the five key objectives of Islamic law, emphasize ethical financial practices, including environment-friendly financing (Julia et al., 2016). Islamic banks demonstrate superior sustainable performance compared to conventional banks due to their adherence to Islamic principles, which align with sustainable investment practices (Julia and Kassim, 2020). Despite their significant societal contributions, there is a scarcity of literature addressing sustainable practices within Islamic banks (Tasnia et al., 2021).

Table 6: Topic modelling

Topic	Keywords
1	System, shariah, communities, compliance, prevention, fraud, bribery, corruption, liberia, coastal.
2	Development, sustainable, environmental, sustainability, banking, environment, green, bangladesh, content, economic.
3	Tourism, indicators, capacity, destinations, carrying, reports, systems, american, peru, Colombia.
4	Treatment, wastewater, rehabilitation, network, cycle, life, sewage, structures, religious, trenchless.
5	Measurement, economy, infrastructure, reputation, societal, adaptability, competitive, isolative, advantage, good.
6	Performance, corporate, social, banks, and, responsibility, governance, reporting, analysis, risk.
7	Germany, activities, africa, united, kingdom, conduct, codes, europe, wellbeing, ethical.
8	Topsis, logistics, relational, grey, cultural, cross, credit, for, ideal, laboratory.
9	Management, impact, regulation, the, good, competition, storytelling, societal, china, unified.
10	Decision, making, model, planning, multi, efficiency, panel, models, criteria, dea.

One pillar of Environmental, Social, and Governance (ESG) criteria involves governance measures to enhance performance. Weak governance can foster corruption and hinder sustainable development, whereas ethical governance in Shariah-compliant companies can combat corruption and bolster organizational reputation (Peltier-Rivest, 2018). Emerging themes include environmental performance, Islamic banks, and social performance, indicating a need for further investigation into the correlation between ESG criteria and the performance of Islamic banks.

3.3.2. Topic 2: ESG and bank performance in emerging markets

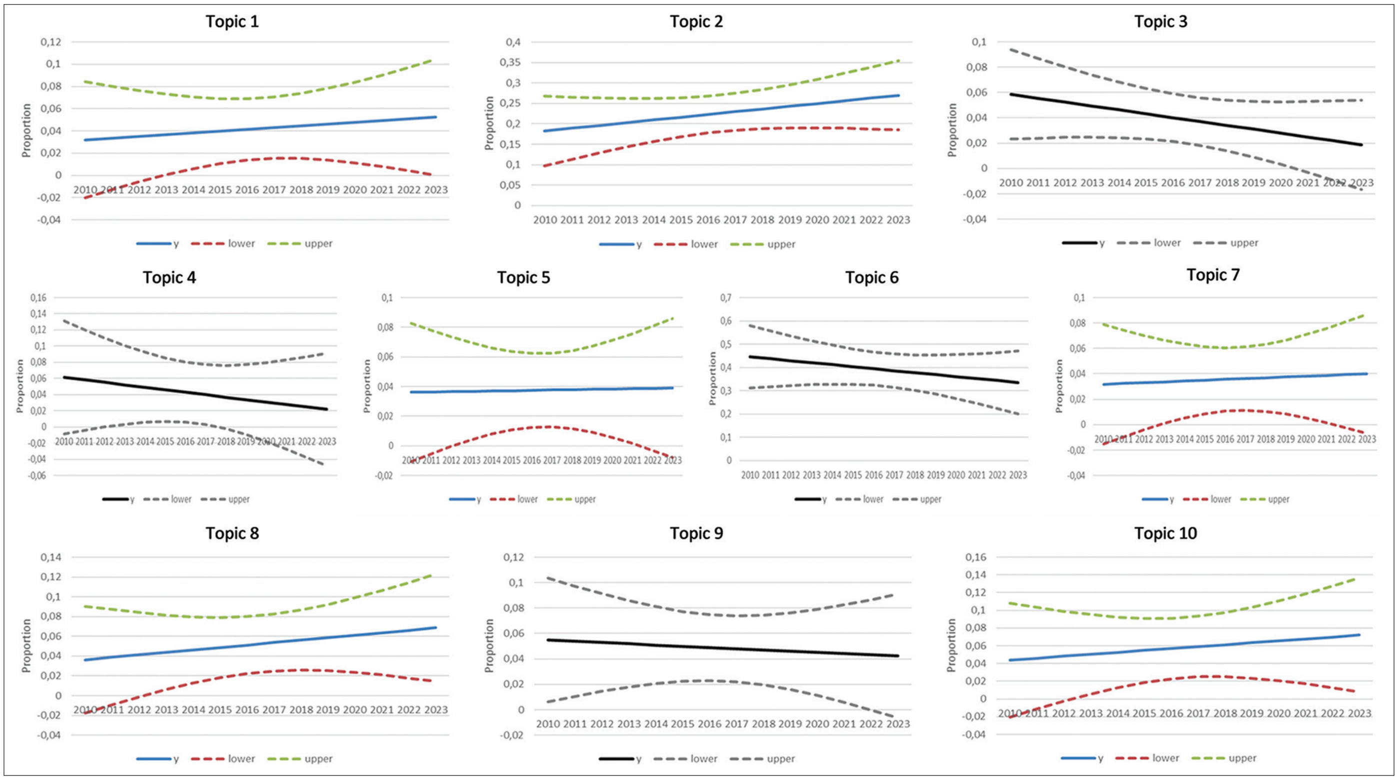
Despite the rapid growth of emerging markets, banks in these regions exhibit low levels of ESG (Environmental, Social, and Governance) disclosure, as indicated by the TOPSIS method (Aras et al., 2018; Lui and Zainuldin, 2022). Enhancing ESG disclosures in banks' annual reports is essential. Existing literature primarily focuses on the impact of ESG on banking performance in European and North American countries, highlighting the need to broaden research to emerging markets (Shakil et al., 2019). Challenges in these markets include understanding sustainability reporting standards and assessing the associated costs and benefits (Dissanayake et al., 2020).

Empirical evidence on the correlation between ESG activities and bank performance in developing countries remains inconclusive. Some studies suggest higher ESG engagement leads to improved financial performance (Tawfik et al., 2021; Weber, 2017), while others indicate banks with stronger Corporate Social Responsibility (CSR) performance experience lower debt costs and healthier financial performance (Du and Li, 2023). In developing countries, research shows a linear relationship between environmental and social performance and financial performance, but governance performance does not significantly impact financial outcomes (Lameira et al., 2013; Shakil et al., 2019). Additionally, findings suggest a non-linear relationship between ESG factors and bank value, with lower levels of ESG activities positively influencing bank value in emerging markets (Azmi et al., 2021; Mohamed Buallay et al., 2023).

3.3.3. *Topic 5: ESG and non-financial performance*

Most previous studies focus on the connection between ESG (Environmental, Social, and Governance) factors and firm financial performance, with relatively few exploring the impact on non-financial metrics (Jain and Tripathi, 2023). Further research could examine how ESG performance influences non-financial aspects such as employee performance or intellectual capital (Hoang et al., 2020). While intellectual capital has been studied concerning economic and social sustainability, there is a scarcity of research on environmental sustainability in this context (Massaro et al., 2018). Future studies could explore the role of Green Human Resource Management (GHRM) in promoting sustainable practices within organizations (Mousa and Othman, 2020).

Figure 6: Trend topics



ESG activities confer a competitive advantage to companies (Dal Mas, 2018; Mukherjee and Sen, 2019). Publicly disclosing ESG performance can mitigate regulatory compliance risks and enhance reputation, adding value to intellectual capital (Murè et al., 2021). ESG's impact on non-financial performance is more pronounced in the banking sector than in the non-bank sector (Karyani and Perdiansyah, 2022). Although intellectual capital is crucial for sustaining long-term value (Beretta et al., 2019), studies show contradictory findings regarding its relationship with sustainable investment. Some research indicates no impact of environmental activities on intellectual capital efficiency, while social and governance disclosures negatively affect it (Aslam and Haron, 2021; Reboredo and Sowaity, 2022; Rossi et al., 2021)

3.3.4. Topic 7: ESG and bank performance in developed countries

Environmental, social, and governance (ESG) factors have a nuanced influence on the performance of 235 EU banks (Buallay, 2019). Transparent environmental practices correlate with stronger financial performance and market value, indicating that environmentally responsible initiatives enhance investor confidence. Conversely, greater transparency in corporate governance practices is linked to lower returns on assets and equity but enhances market value, suggesting that strong governance is valued despite lower immediate returns. In contrast, corporate social responsibility disclosures show no significant effect on financial or market performance, highlighting a gap in the perceived value of social initiatives among stakeholders.

Research conducted by (Buallay, 2020) examined the impact of ESG reporting on 932 manufacturing companies and 530 banks across 80 countries, finding that ESG factors positively influence operational, financial, and market performance in manufacturing but negatively impact these metrics in banking. In the Middle East and North Africa (MENA) region, ESG practices positively impact financial and operational performance but negatively affect market performance (Buallay et al., 2020).

Research conducted by Brogiand Lagasio (2019) found a positive relationship between ESG and profitability in American banks, with credit risk negatively affecting profitability and larger bank size positively influencing it. Contrarily, ESG factors weaken bank performance in developed countries, as shown in a study of 882 banks post-2008 financial crisis (Buallay et al., 2020). These mixed findings challenge stakeholder and legitimacy theories, highlighting the need for further research to understand the complex ESG-bank performance relationship across regions.

3.3.5. Topic 8: ESG, credit risk, and bank performance

Risk management in banking faces challenges in fostering sustainable performance, yet effective ESG performance can reduce the cost of equity, indirectly mitigating risk through environmental protection, social responsibility, and governance (Chen et al., 2023; Luo, 2022). This impact is more pronounced in financial companies compared to non-financial ones (Cardillo et al., 2022). Despite growing empirical research on banks' ESG performance, there remains a gap in understanding its specific impact on bank credit risk (Bannier et al., 2022).

Credit risk, the primary factor initiating financial risk in banks, can arise from borrowers' financial difficulties, economic instability, and market fluctuations (Chakroun and Gallali, 2021). Banks engaging in ESG investments experience lower credit risk, as environmental factors help mitigate reputational, financial, and

Table 7: Future research directions

No.	Future research topics	Total citations per year	References
1	Future research could explore the role of Green Human Resource Management (GHRM) within the framework of Corporate Social Responsibility (CSR) principles. Additionally, examining mediating factors like Organizational Citizenship Behaviors (OCBs) could help ascertain how GHRM contributes within the banking service sector.	52.75	Mousa and Othman, 2020
2	Factors beyond financial performance, such as audit committee characteristics, earnings management practices, and corporate governance structures, can significantly influence the disclosure of sustainability reports.	41.60	Buallay, 2019
3	Future research could focus on identifying the impact of crises on individual ESG (Environmental, Social, and Governance) performance metrics.	30.33	Bătae et al., 2021
4	Identify activities that can enhance bank value and analyze the long-term impact of ESG activities on banks in emerging markets.	24.67	Azmi et al., 2021
5	Explore the long-term performance implications of integrating sustainability factors into portfolio strategy and investment analysis.	21.60	Nizam et al., 2019
6	Future research could investigate the mediating role of governance committees and CSR committees in the relationship between ESG and bank financial performance. This approach would provide insights into how these committees influence the effectiveness of ESG initiatives on financial outcomes.	21.20	Brogi and Lagasio, 2019
7	Future research could evaluate additional corporate governance mechanisms, such as committee structure, board independence, and gender diversity, on environmental issues within banks. Surveys could be conducted to understand customer perceptions of banks' environmental practices. Additionally, future studies could distinguish between the effects of banks' internal environmental initiatives and operational practices from the impact of their environmentally friendly lending practices.	19.00	Gangi et al., 2019
8	Future research could explore how ESG performance is influenced by board characteristics in emerging markets. Additionally, it could incorporate other ESG scores, such as Bloomberg's ESG score, to provide a more comprehensive analysis.	17.67	Birindelli et al., 2018
9	Future research could examine the moderating effect of board characteristics on the relationship between ESG and bank financial performance. Additionally, studies could compare the impact of ESG on the performance of Islamic banks versus conventional banks.	16.60	Shakil et al., 2019
10	Future research could investigate which specific Corporate Social Responsibility (CSR) actions are most effective in generating value. For example, studies could focus on the impact of employee satisfaction programs on shareholder value.	16.60	Miralles-Quirós et al., 2019

regulatory risks (Höck et al., 2020). Research indicates that creditworthiness strengthens the relationship between ESG practices and credit risk (Brogi et al., 2022). Both Shariah-compliant and conventional banks benefit from sustainable activities, with Shariah-compliant banks achieving greater risk reduction at higher ESG scores (Kabir Hassan et al., 2021). However, findings on individual ESG factors and credit risk are mixed (Bannier et al., 2022; Hassan et al., 2023).

3.3.6. Topic 10: ESG and bank efficiency

In recent years, ESG disclosures have gained attention from academics and governments worldwide (Broadstock et al., 2021; Friede et al., 2015; Krueger et al., 2021; Luo, 2022). ESG activities positively impact the performance of both conventional and Islamic banks (Alam et al., 2022), reducing the risk of financial sanctions and enhancing long-term performance (Murè et al., 2021; Nizam et al., 2019). Additionally, ESG practices lower the cost of equity, improve cash flows, and boost overall bank performance (Barko et al., 2022; Lins et al., 2017).

Bank performance is typically evaluated based on profitability (el Tiby, 2011; Karim et al., 2010; Sufian, 2012), soundness (Erol et al., 2014; Rashid and Jabeen, 2016; Wanke et al., 2017), and efficiency (Hadad et al., 2011; Kamarudin et al., 2022; Rosman et al., 2014). While substantial evidence links ESG factors to financial performance ratios, research on the relationship between ESG and bank efficiency remains scarce (Khan, 2022; Tasnia et al., 2021). Efficiency is crucial for performance and competitiveness in banking (Kamarudin et al., 2019). Various methods, including parametric approaches like SFA, DFA, and TFA, and non-parametric methods like DEA, measure banking efficiency.

The theme cluster in topic 10 addresses the emerging relationship between ESG and bank efficiency, highlighting the need for further research. Analyzing the ten most cited documents on ESG and bank performance from 2018 to 2023, this study identifies research gaps and future directions, summarized in Table 7.

4. CONCLUSION

This study undertakes a comprehensive scientometric analysis of literature on ESG (Environmental, Social, and Governance) and bank performance, systematically reviewing articles published in reputable journals from 2010 to 2023. By addressing three pivotal research questions, the study elucidates the trajectory of research within this domain, highlights key contributors, and identifies potential avenues for future inquiry.

The body of research on ESG and bank performance has exhibited significant growth, averaging a 14% annual increase, with notable surges in 2019 and 2023. Influential publications predominantly originate from developed countries, underscoring the greater impact of research from these regions. Amina Buallay emerges as a leading author, while the journal "Sustainability" published by MDPI stands out as the primary source of impactful articles. Germany leads in citation counts, reflecting its substantial contributions to the field.

Trends in ESG and bank performance reveal seven thematic clusters, with themes such as ESG and board of directors being the least explored. This thematic diversity highlights both well-established areas and emerging topics, providing a nuanced understanding of the field's evolution. The use of keyword co-occurrence and network algorithms to visualize these clusters aids in distinguishing between niche, driving, foundational, and emerging or declining themes.

Future research opportunities are identified through keyword cluster analysis using the Latent Dirichlet Allocation (LDA) model. Six key topics are proposed for further investigation: ESG and Shariah compliance, ESG and bank performance in emerging markets, ESG and non-financial performance, ESG and bank performance in developed countries, ESG, credit risk, and bank performance, and ESG and bank efficiency. These topics are derived from the most cited documents globally, indicating their critical relevance and potential for future contributions to the literature.

This study provides crucial insights into the current research landscape of ESG and bank performance, offering valuable guidance for academics, practitioners, and policymakers. The findings suggest that enhanced ESG disclosures can foster sustainable growth, particularly within the banking sector. Regulators can leverage these insights to develop policies that promote comprehensive ESG reporting, thereby driving sustainable performance.

However, this research is not without limitations. The reliance on the Scopus database and a specific set of keywords may limit the comprehensiveness of the review. Future studies should consider incorporating additional databases, such as the Web of Science (WoS), and exploring individual ESG subthemes in greater depth. Moreover, future research directions could be refined based on keyword co-occurrence visualizations, providing a more targeted approach to advancing the field.

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