MULTIDISCIPLINARY SCIENTIFIC RESEARCH
BJMSR VOL 9 NO 6 (2024) P-ISSN 2687-850X E-ISSN 2687-8518
Available online at https://www.cribfb.com
Journal homepage: https://www.cribfb.com/journal/index.php/BJMSR
Published by CRIBFB, USA

GREEN BANKING EVOLUTION: MAPPING THE STATE-OF-THE-ART OF LITERATURE

Liyana Ab Rahman [(a)] *Siti Marlia Shamsudin* [(b)] *Maslinawati Mohamad* [(c)1] *Hairul Suhaimi Nahar* [(d)]

[(a)]*Lecturer, Faculty of Accountancy, Universiti Teknologi MARA Perak Branch, Tapah Campus, Perak, Malaysia; E-mail: liyana748@uitm.edu.my*
[(b)] *Lecturer, Faculty of Accountancy, Universiti Teknologi MARA Perak Branch, Tapah Campus, Perak, Malaysia; E-mail: sitim008@uitm.edu.my*
[(c)] *Senior Lecturer, Faculty of Accountancy, Universiti Teknologi MARA, Selangor Branch, Puncak Alam Campus, Selangor, Malaysia; E-mail: masli856@uitm.edu.my*
[(d)] *Assistant Professor, Faculty of Business Administration, Tabuk University, Tabuk, Kingdom of Saudi Arabia; E-mail: hbinnahar@ut.edu.sa*

ARTICLE INFO

Article History:

Received: 26th July 2024
Reviewed & Revised: 26th July to 10th December 2024
Accepted: 11th December 2024
Published: 16th December 2024

Keywords:

Bibliometric Analysis, Citation Network, Green Banking, Scopus, Systematic Literature Review.

JEL Classification Codes:

G21, Q56, Q58

Peer-Review Model:

External peer review was done through double-blind method.

ABSTRACT

The urgency to address environmental degradation and climate change has placed significant pressure on financial institutions to adopt sustainable practices. As a primary facilitator of economic activity, the banking sector can mitigate its environmental impact through green banking initiatives. However, despite the increasing importance of sustainable finance, research on the trends, key contributors, and development of green banking still needs to be completed and expanded. This study addresses such issues by investigating the evolution of the green banking literature over an extended period from 1996 to 2021 to map the field's intellectual structure. Adopting an established bibliometric approach, this study uses a bibliometric analysis to identify research trends, publication patterns, key authors, and gaps in green banking. A dataset of 115 documents was sourced from the Scopus database, covering areas such as economics, finance, and environmental science. Using tools such as Harzing's Publish or Perish and VOSviewer, citation and co-authorship networks were examined along with keyword co-occurrences. The results show that green banking research has grown exponentially, with most contributions from Asia, particularly Malaysia. The analysis identified nine research clusters, highlighting key themes such as sustainable development and corporate social responsibility. Furthermore, the findings reveal limited collaboration between researchers and suggest that more cross-country studies are needed to enhance global understanding of green banking practices. Overall, this study provides the first comprehensive bibliometric review of green banking, offering insights for researchers and policymakers into this growing field's current state and future directions.

INTRODUCTION

The urgency of tackling the repercussions of global warming and climate change, such as ecological degradation and sea level rise, has increased significantly in recent decades. One of the key drivers of climate change is the constant increase in atmospheric carbon dioxide (CO2) content, mainly caused by human activity. This challenge becomes particularly difficult in developing nations, where economic revenue relies heavily on a few large corporations, many of which are significant polluters (Li, 2023). Given its role in meeting clients' credit and investment needs, the bank has taken steps to become a more ecologically responsible institution by implementing green banking (GB) practices. Chowdhury and Dey (2016) described GB as a banking activity highlighting social, ecological, and environmental concerns to conserve nature and natural resources. Triodos Bank first introduced GB through its initiatives and launched the “Green Fund” to fund environmentally friendly projects in 1990 (Yadav & Pathak, 2013). Following their footsteps, banks worldwide have begun taking green initiatives in their banking activities. In 2008, the global financial crisis that struck the world compelled the bank to improve its reputation and restore credibility by encouraging banks to engage in sustainable activities such as incorporating environmental protection, social responsibility, and financial gain into their banking operations (Torre Olmo et al., 2021). Thus, the concept of GB has increased in popularity and has become a reality with the opening of the first Green Bank on Mt. Dora, Florida, USA, in 2009 (Deepa & Karpagam, 2018). GB received significant attention in 2012, with the International Finance Corporation (IFC) establishing the Sustainable Banking Network (SBN) governed by

[1]Corresponding author: *ORCID ID: 0000-0001-8050-1515*

https://doi.org/10.46281/bjmsr.v9i6.2261

To cite this article: Rahman, L. A., Shamsudin, S. M., Mohamad, M., & Nahar, H. S. (2024). GREEN BANKING EVOLUTION: MAPPING THE STATE-OF-THE-ART OF LITERATURE. *Bangladesh Journal of Multidisciplinary Scientific Research*, *9*(6), 31-46. https://doi.org/10.46281/bjmsr.v9i6.2261

banking authorities and organisations from developing nations. This regulatory body promotes the adoption and development of GB among developing countries following international best practices (Bukhari et al., 2019).

Prior research on GB shows that the bank plays a vital role in reducing the environment's harmful effects by reducing carbon footprint in their internal banking operation and through financing activities in environmentally friendly and green initiatives projects (Bukhari et al., 2019; Uddin & Ahmmed, 2018; Deepa & Karpagam, 2018). Currently, most banking transactions can be performed electronically, including e-statements, emails, Internet banking, SMS banking, mobile banking, and Automated Teller Machines (ATM), to reduce paper usage, solid waste, and energy consumption (Julia & Kassim, 2020). In addition to preserving the environment, these practices improve banks' financial performance by increasing operating efficiency, reducing the likelihood of manual errors and operational risks, and cutting costs. In terms of financing activities, the bank should be selective by evaluating the client's project's economic and environmental risk, providing credit facilities to those who meet the environmental protection criteria, and fostering the client's green project by granting comparatively lower interest rates and more extended payback period (Khairunnessa et al., 2021; Julia & Kassim, 2020). The United Nations (UN) introduced the Principles for Responsible Banking (UNEP Finance Initiative) in September 2019. This voluntary framework allows banks to commit to increasing their financial support for economically viable activities that are both socially and environmentally sustainable (Torre Olmo et al., 2021).

However, might have negative implications. Its transition to a low-carbon economy and information technology (IT) to replace manual operations requires continuous innovation owing to the advancement of current technology. The successful implementation of the system also depends on the gadget used, Internet connection, and willingness to adopt environmentally friendly banking services. Additionally, security concerns and cyber risks undermine the benefits of green practices for banks. Banks are also subject to financing-related risks, such as transition, physical, and liability risks, if the client's project pollutes the environment and threatens sustainable living (Khairunnessa et al., 2021). Consequently, the bank will face legal and reputation risks and a loss of public trust as the bank triggers the client's environmentally harmful activities through loans. Thus, by the notion of GB, banks must include a specific section on environmental preservation in credit agreements (Nasution et al., 2021). For instance, Brazil, Bangladesh, China, India, and Indonesia have issued mandatory regulatory guidelines on green activities and disclosure (Bose et al., 2018).

Recent research by Najera-Sánchez (2020) has limited its scope to descriptive bibliometric analysis and covered a shorter analysis period between 2008 and 2019. This study is unique in that it comprehensively examines GB's intellectual structure by employing bibliometric analysis, social network analysis, systematic literature review, and content analysis to assess the state of past GB studies and respond to the established RQs. The coverage period from 1996 to early 2021 chosen in this study allows this study to depict GB's research evolution and trends. This period also included the global financial crisis 2018 and the Covid-19 pandemic. The empirical results highlight the scope and quality of current GB knowledge, systematically unveiling the omissions, shortcomings, and hurdles to knowledge growth in the field. The findings primarily add to the existing body of knowledge by offering a detailed grasp of the field's current state and showcasing prospective research routes and areas for future research. The results provide a valuable and up-to-date reference for policymakers, regulators, central banks, and practitioners planning and funding GB projects.

The need to preserve nature and scarce resources for current and future generations has led scholars worldwide to explore GB. This study conducted a bibliometric analysis using data from 115 documents in the Scopus database. The analysis employed tools like Harzing's Publish or Perish and VOSviewer to examine citation networks and co-authorship trends. Thus, this study outlines the core area and current GB dynamics and suggests avenues for future research by identifying the domain's intellectual structure and publication patterns using bibliometric analysis. This is the first study to combine a systematic literature review, bibliometric analysis, social network analysis, and content analysis on GB. Accordingly, this study addresses the following research questions (RQs).

RQ1: What is the current status of GB publications?
RQ2: What are the present publication trends in the GB literature?
RQ3: Who is the most productive contributor to GB research?
RQ4: What are the most influential articles on GB?
RQ5: What are the authorship patterns of publications on GB?
RQ6: What is the current status of collaboration in the GB literature?
RQ7: Which GB themes are most popular among researchers?
RQ8: How can we characterise the present-day conceptual structure of GB studies?
RQ9: What types of issues limit GB research?
RQ10: Which areas of the GB require further investigation?

The remainder of this paper is organised as follows. The following section provides a brief description of GB, followed by a Materials and Methodologies section that outlines the strategy used to find GB-related data in published literature, including the suitable analytical methodologies used. The empirical results, including the functional analysis results, are presented next. The report continues with a discussion of the findings' ramifications.

LITERATURE REVIEW

GB is related to ethical, sustainable, or environmentally friendly banking (Kurowski et al., 2022; Nenavath, 2022). This notion has been implemented in many nations and has evolved into a new way of conducting banking operations while addressing environmental issues without creating any harm (Arumugam & Chirute, 2018). Green has been adopted to preserve clean and healthier environments to sustain natural resources and future generations (Masukujjaman et al., 2016). Omar and Amran (2017) asserted that companies must be more responsible and transparent toward sustainability and environmental issues. GB is an eco-socially reliable banking framework that leads to riskless banking and supports activities

that can save the environment (Abuseif et al., 2023; Arumugam & Chirute, 2018). As the government commonly controls the banking system, the government is responsible for formulating legal policies to address environmental issues by providing clear guidelines and sufficient motivation for financial institutions to contribute to a greener world and increase environmental awareness (Nenavath, 2022; Miah et al., 2021). When financial institutions' contributions to protecting the environment are well recognised and appreciated, they feel encouraged and continue to participate in the future.

Over the years, the adoption of GB has been extensively discussed in the literature (Najera-Sanchez, 2020; Islam & Das, 2013). The banking industry is vital to economic growth (Ruan et al., 2023; Zhou & Zhang, 2023; Rachman & Saudi, 2021). Therefore, minimising the negative environmental impact of economic growth is critical. Najera-Sanchez (2020) asserted that the banking industry is vital in channeling funds and making investment and lending decisions. Miah et al. (2021) argued the significant role played by the banking industry in preserving and maintaining the green environment. Therefore, GB is critical for risk reduction and long-term sustainability.

Society has also been increasingly concerned about safe products and services for the environment and expects businesses to show their environmental responsibilities by implementing green policies (Rodrigues et al., 2023; Miah et al., 2021). They will choose a brand with a good sustainability record, causing going to green practice to become no longer an option but necessary. Consistent with the green concept, many companies have created energy-efficient products and services that can help sustain and slow the consumption of natural resources. To obtain a competitive edge, banks can demonstrate their dedication to their corporate social responsibility (CSR) initiatives and educate consumers about their sustainability credentials. Adopting a proper green framework and strategy facilitates this practice. Companies will remain competitive and sustainable in the global market if they become eco-friendly, as consumers are increasingly attracted to businesses with solid green credentials.

Prior research suggests that consumers perceive eco-friendly banks as high in value and are most likely to choose the GB approach over non-green banks. Ibe-Enwo et al. (2019) and Rodrigues et al. (2023) found that when consumers choose which bank to keep their money in, the concern is whether the services offered could improve their well-being and preserve the environment. Thus, in response to banking customers' need for banks to provide better economic, social, and environmental services, the banking industry has evolved towards GB in its operations and financial services to demonstrate its dedication to sustainable banking. Practising GB creates a competitive advantage, creating a green image for the bank's brand, thus retaining customer loyalty. Banks would also gain a positive image through marketing strategies that show customers how to protect their environment. This effort indicates that banks are committed to protecting the environment through operations, services, and socially responsible activities. This indirectly helps strengthen relationships with stakeholders, and most importantly, customers feel confident buying their products or services

eGB approach primarily adopts operational techniques that do not harm the environment compared with the conventional banking approach (Islam & Das, 2013). Arumugam and Chirute (2018) provided seven activities that should be maintained in the banking system to reflect GB. These are online banking, green accounts, green financing, power-saving equipment, green debits, credit cards, paperless transactions, and mobile banking. Most banks have transformed their day-to-day banking operations to decrease paper usage and depend more on electronic transactions than paperwork. Reduced paper usage indirectly prevents more trees from being chopped down. Miah et al. (2021) found that some banks adopted green policies like black-and-white printing instead of color printing. Islam and Das (2013) and Al Mulla and Nobanee (2020) highlighted green activities that are possible for internal operations that include a paperless banking system, sharing files electronically instead of paper memos, using online communication, using paper on both sides for internal consumption, using energy-saving bulbs and video conferencing instead of physical travel.

Most banks have also moved toward digital systems, such as mobile banking and online systems, instead of manual transactions to save energy and paper (Mirza et al., 2023). Curcio et al. (2023) and Al Mulla and Nobanee (2020) find that the online banking system positively affects environmental sustainability. Through online banking, customers can enjoy online payments, money transfers, and bank accounts anytime, anywhere. Customers can use credit cards instead of cash when shopping. Masukujjaman et al. (2016) suggest that banks must engage in energy-saving innovation and technology involving installing renewable energy technology like solar panels to reduce carbon footprint. Green technology investment requires significant initial investment and often becomes a major complexity. However, even though the initial costs of adoption are substantial, they are worthwhile in terms of environmental protection, long-term cost savings, and boosting operating profit and productivity in bank operations.

Banks have a social responsibility to limit their influence on the environment through their decisions due to their significant role in offering loans, investments, and various financial services. Some banks offer green loans that provide financial assistance with lower interest rates for environmental benefits such as renewable energy, sustainable housing, and recycling projects. In contrast, some banks have implemented a green lending policy that limits approval to environmentally friendly projects. Accordingly, a project that could harm the environment would be rejected or charged with a higher interest rate (Omar & Amran, 2017). According to Miah et al. (2021), certain banks in Oman decline to approve vehicle financing for vehicles exceeding three years of age because the newer models come with environmentally friendly technologies that could help save the environment.

Additionally, banks could demand that developers build eco-friendly residences or energy-efficient homes and ensure compliance with environmental regulations to approve their loan applications. Prior literature suggests that banks should be more lenient in approving projects that adopt green technology (Zhou & Zhang, 2023; Xiang et al., 2023; Miah et al., 2021). In short, when a bank supports a green project that protects the environment, it also encourages the development of green financing and boosts the economy. GB practices also have a positive impact on investors' perceptions. Investors become eco-conscious, and investment decisions are not only based on high returns and low risk but also on whether the company is socially ethical. Arumugam and Chirute (2018) suggested that GB encourages environmentally responsible

investments by conveying a thought that promotes more ethical and proactive behaviour on the part of banks. Al Mulla and Nobanee (2020) found that preferences for environmental commitment highly influence investment decisions. Green investing is becoming increasingly popular as companies discover multiple benefits from efficiently addressing issues associated with sustainability. Some stakeholders are willing to abandon some investment returns in exchange for environmental benefits. Companies are keen on investing in green innovation because of the prolonged impact of eco-efficiency standards. Reducing the ecological impact maximises the return on investment, minimises risk, and enhances firm value. The bank contributes to CSR initiatives by participating in GB, leading to a better social life, improving the environment, and achieving its objective.

MATERIALS AND METHODS

Research within a scientific field plays a pivotal role in shaping its structural characteristics. Bibliometric analysis helps assess the research structure of a particular field (Castriotta et al., 2019). Bibliometric analysis is a forward-thinking and meticulous approach to research and analyse scientific evidence. The combination of bibliometric and social network analyses enables the identification of the research area and critical topics (Tunger & Eulerich, 2018). Bibliometric analysis effectively helps discover current trends and potential research areas (Li et al., 2017). This study combines bibliometric analysis with a thorough review of the GB literature. Other relevant analyses include citations, co-citations, keyword co-occurrences, PageRank, and co-authorship. These findings align with those from earlier research (e.g., Persson et al., 2009), where widely-used software tools like Harzing's Publish or Perish, VOSviewer, and Excel were employed to conduct the analyses.

First, this study searched and obtained past publications on GB from Scopus on 8 October 2021. As shown in Figure 1, the search for data relied on the article's title related to GB. The data were chosen subject to the areas of economics, econometrics, and finance ("ECON"); social sciences ("SOCI"); business, management, and accounting ("BUSI"); environmental science ("ENVI"); and arts and humanities ("ARTS"). The query retrieved 115 documents related to GB, which was the basis for performing bibliometric analysis, citation analysis, and frequency computations. Figure 1 shows the process flow involved in searching for data from Scopus. VOSViewer software was used to conduct bibliometric analysis, while Harzing Publish or Perish software was used to generate the citation metrics. Microsoft Excel was used to compute the frequencies, design charts, and graphs.

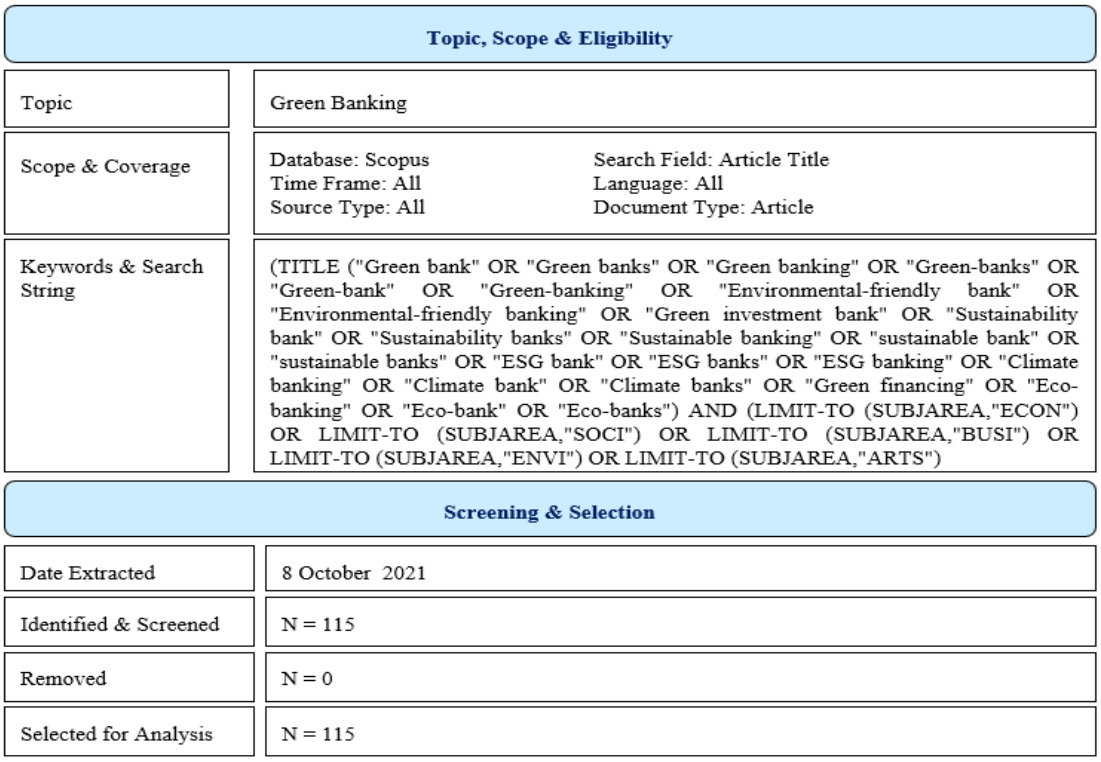

Figure 1. Flowchart of processes involved. Modified from PRISMA (Moher et al., 2009)

RESULTS AND DISCUSSIONS

Documents Profiles

This section answers RQ1 (*What is the current status of GB publication?*) The results are shown in Tables 1–4. Table 1 shows the frequency of total publications according to the document type. This indicates that more than two-thirds (83,72.17%) of the 115 documents were articles, 14 (32.92%) were conference papers, and 9 (8.38%) were book chapters. Five (4.35%) documents were review articles, three (2.61%) were books, and one (0.87%) was a note. As presented in Table 2, these documents were sourced from journals (94,81.74%), books (9,7.83%), conference proceedings (8,6.96%), and book series (4,3.48%).

Table 1. Document Type

Document Type	Total publication	Percentage (N=115)
Article	83	72.17%
Conference Paper	14	12.17%
Book Chapter	9	7.83%
Review	5	4.35%
Book	3	2.61%
Note	1	0.87%

Table 2. Source Type

Source type	Total publication	Percentage (N=115)
Journal	94	81.74%
Book	9	7.83%
Conference Proceeding	8	6.96%
Book Series	4	3.48%

Table 3 shows the languages used in the documents related to GB, with almost all documents written in English (113:98.26%) and the remaining documents (2:1.74%) written in Russian.

Table 3. Languages

Language	Total publication	Percentage (N=115)
English	113	98.26%
Russian	2	1.74%

In terms of subject area, Table 4 reports the distribution of 115 documents into several areas, with documents listed in more than one subject area. The majority of documents appeared under Economics, Econometrics, and Finance (58:50.53%), followed by Social Sciences (54:46.96%), Business, Management, and Accounting (45:39.13%), Environmental Science (42:36.525%), and Arts and Humanities (5:4.35%).

Table 4. Subject Area

Subject	Total publication	Percentage
Arts and Humanities	5	4.35%
Business, Management, and Accounting	45	39.13%
Economics, Econometrics and Finance	58	50.43%
Environmental Science	42	36.52%
Social Sciences	54	46.96%

The answers to RQ2 (*What are the present publication trends in GB literature?*) are reported in Figure 2 and Table 5, illustrating the publication trends by utilising the total publications by year, country, journal, contributing author, and organisation.

Publications by Year

Figure 2 illustrates the relevant data on research trends related to GB. The first GB publication was published in 1996, entitled "Sustainable Banking with the Poor," written by L. Bennett and C.E. Cuevas. This article has garnered references from 25 publications over 25 years. A publication pause occurred when another GB document was published in 2008. Before 2014, the publication rate ranged from one to three publications annually. However, in 2014, the number of publications increased to four (4) and increased exponentially to fourteen in 2018. Despite the modest number of GB papers recorded each year, the total citations from 2016 were impressive, especially in 2018, when the total citations stood at 168. The comprehensive findings regarding the publications and their cumulative citations over the 25 years are presented in Table 5.

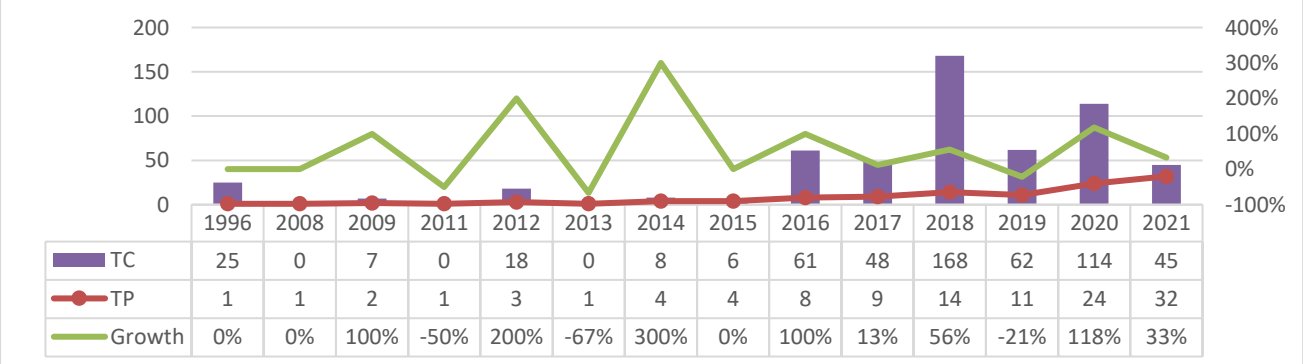

Figure 2. Total Publications and Citations by Year

Table 5. Year of Publication

Year	TP	%	NCP	TC	C/P	C/CP	h	g
1996	1	0.87%	1	25	25.00	25.00	1	1
2008	1	0.87%	1	0	0.00	0.00	0	0
2009	2	1.74%	2	7	3.50	3.50	1	2
2011	1	0.87%	1	0	0.00	0.00	0	0
2012	3	2.61%	3	18	6.00	6.00	2	3
2013	1	0.87%	1	0	0.00	0.00	0	0
2014	4	3.48%	4	8	2.00	2.00	2	2
2015	4	3.48%	4	6	1.50	1.50	2	2
2016	8	6.96%	8	61	7.63	7.63	5	7
2017	9	7.83%	9	48	5.33	5.33	4	6
2018	14	12.17%	14	168	12.00	12.00	6	12
2019	11	9.57%	11	62	5.64	5.64	4	7
2020	24	20.87%	24	114	4.75	4.75	7	10
2021	32	27.83%	32	45	1.41	1.41	4	5

Notes. TP, total number of publications; NCP, number of cited publications; TC, total citations; C/P, average citations per publication; C/CP, average citations per cited publication; h, h-index; g, g-index.

Publishing Activity by Country

This portion addresses RQ3 *(Which contributors are the most prolific in GB research?)* by examining the findings from observations in nations that have published GB-related research. As shown in Table 6, which lists the top 10 countries contributing to GB publications, Malaysia has the highest contribution (21:18.26%), while Bangladesh and India share the second position (14:12.17%). A global map in Figure 3 illustrates each country's aggregate number of publications.

Table 6. Top 10 Countries Contributed to the Publications

Country	Total publication	Percentage
Malaysia	21	18.26%
Bangladesh	14	12.17%
India	14	12.17%
United Kingdom	10	8.70%
China	8	6.96%
Pakistan	8	6.96%
Spain	7	6.09%
Australia	5	4.35%
Indonesia	5	4.35%
United States	5	4.35%

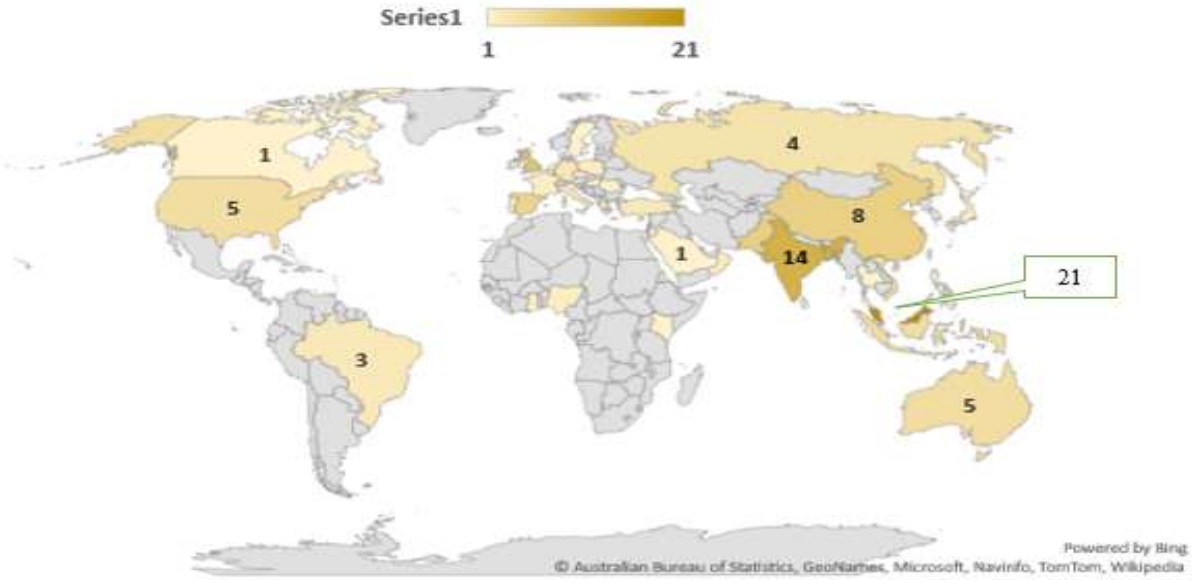

Figure 3. Publications by Countries

Publishing Activity by Journal

RQ3 is further answered by analysing the journal's publishing activity, in which the documents can be traced to 84 different journals. The top 10 most active source titles in GB publications are tabulated in Table 7, including information on SCImago Journal Rank (SJR), which effectively measures weighted citations received by the series. The results suggest that Sustainability Switzerland is the most active journal publishing GB articles (11:9.57%), followed by the International Journal of Green Economics (7:6.09%) and Environment Development and Sustainability (6:5.22%).

Table 7. Most Active Source Title

Source Title	TP	Percentage (N= 115)	BQ 2020	SJR 2020
Sustainability Switzerland	11	9.57%	Q2	0.33
International Journal of Green Economics	7	6.09%	Q3	0.22
Environment Development and Sustainability	6	5.22%	Q2	0.6
International Journal of Asian Business and Information Management	3	2.61%	Q2	0.18
E3s Web of Conferences	2	1.74%	-	0.2
Finance Research Letters	2	1.74%	Q1	1.34
Finance Theory and Practice	2	1.74%	N/A	N/A
IOP Conference Series Earth and Environmental Science	2	1.74%	-	0.18
Journal of Islamic Marketing	2	1.74%	Q2	0.52
Journal of Sustainable Finance and Investment	2	1.74%	Q2	0.45

Notes. TP=total number of publications; BQ=Best Quartile; SJR=SCImago Journal Rank

Publishing Activity by Author and Organization

Regarding authors and organisations, 308 authors from 160 different organisations were identified in GB's publication activities. A list of the top ten authors and institutions that significantly influenced GB publications is presented in Table 8. It shows that N. Nisha from the North-South University, Bangladesh, is the most productive author in the GB literature (6: 5.22%), followed by M. Iqbal, who is also from the same institution (5: 4.35%). It is also apparent that North–South University in Bangladesh is the most influential institution, with six (5.22%) publications, followed by Universiti Sains Malaysia in Malaysia, ESIC Business and Marketing School, Madrid in Spain, and Graduate School of Business, Universiti Sains Malaysia, all with five (4.35%) publications.

Table 8. Most Active Authors and Institutions

Author name	TP	Percentage (N=115)	Affiliation	Country
Nisha, N.	6	5.22%	North-South University	Bangladesh
Iqbal, M.	5	4.35%	North-South University	Bangladesh
Amran, A.	4	3.48%	Universiti Sains Malaysia	Malaysia
Bukhari, S.A.A.	4	3.48%	Universiti Sains Malaysia	Malaysia
Hashim, F.	4	3.48%	Universiti Sains Malaysia	Malaysia
Julia, T.	4	3.48%	International Islamic University Malaysia	Malaysia
Kassim, S.	4	3.48%	International Islamic University Malaysia, Institute of Islamic Banking and Finance	Malaysia
Rifat, A.	4	3.48%	North-South University	Bangladesh
Bose, S.	3	2.61%	University of Newcastle	Australia
, H.Z.	3	2.61%	Canberra Business School	Australia

Citation Network Analysis

The answer to RQ4 (*Which articles are the most influential on GB?*) was obtained by examining the citation networks of all 115 documents. Such citation analysis aims to assess the impact of each GB document based on the number of citations (Baker et al., 2020). Harzing's Publish or Perish software was used to perform citation analysis; the results are presented in Table 9. This shows 562 citations over 25 years (1996–2021). The average number of citations per year was 22 and the average number per document was 5.

Table 9. Citation Metrics

Metrics	Data
Papers	115
Citations	562
Years	25
Cites/Year	22.48
Cites/Paper	4.89
Authors/Paper	2.68
h-index	13
g-index	18

The results further identified that the most cited article, '*From sustainability accounting to a green financing system: Institutional legitimacy and market heterogeneity in a global financial cent*er' by A.W. Ng, published in 2018, received 40 citations. The average number of citations per year was 13 and the average number per author was 40. Table 10 showcases the most frequently cited publications concerning GB.

Utilising VOSViewer software, a network map was generated to illustrate the connections among the cited documents. Figure 4 presents the network map of citations by document, where the citation count for the documents was set to one. Among the 115 documents, 76 surpassed the threshold and generated eight clusters on the network map. The largest circle, Bose et al. (2018), with 38 citations, had five links to other GB-related publications. The second-largest circle is H. Sun et al. (2020), boasting 20 citations and establishing four links to other publications in the network.

Table 10. Highly Cited Articles

Authors	Title	Year	Source	Cites	Cites/ Year	Cites/ Author
A.W. Ng	From sustainability accounting to a green financing system: Institutional legitimacy and market heterogeneity in a global financial center	2018	Journal of Cleaner Production	40	13.33	40
S. Bose, H.Z. , A. Rashid, S. Islam	What drives green banking disclosure? An institutional and corporate governance perspective	2018	Asia Pacific Journal of Management	38	12.67	10
O. Weber, B. Feltmate	Sustainable banking: Managing the social and environmental impact of financial institutions	2016	Sustainable Banking: Managing the Social and Environmental Impact of Financial Institutions	26	5.2	13
L. Bennett, C.E. Cuevas	Sustainable Banking with the poor	1996	Journal of International Development	25	1	13
F.J. Forcadell, E. Aracil	Sustainable banking in Latin American developing countries: Leading to (mutual) prosperity	2017	Business Ethics	22	5.5	11
D. Carlucci, F.A.F. Ferreira, G. Schiuma, M.S. Jalali, N.J.S. AntÃ³nio	A holistic conception of sustainable banking: Adding value with fuzzy cognitive mapping	2018	Technological and Economic Development of the Economy	21	7	4
H. Sun, M.R. Rabbani, N. Ahmad, M.S. Sial, C. Guping, M. Zia-Ud-din, Q. Fu	CSR, co-creation and green consumer loyalty: Are green banking initiatives important? A moderated mediation approach from an emerging economy	2020	Sustainability (Switzerland)	20	20	3
C. Zhixia, M.M. Hossen, S.S. Muzafary, M. Begum	Green banking for environmental sustainability-present status and future agenda: Experience from Bangladesh	2018	Asian Economic and Financial Review	20	6.67	5
K. Kumar, A. Prakash	Developing a framework for assessing the sustainable banking performance of the Indian banking sector	2019	Social Responsibility Journal	17	8.5	9
S. DÃrry, C. Schulz	Green financing interrupted. Potential directions for sustainable finance in Luxembourg	2018	Local Environment	16	5.33	8

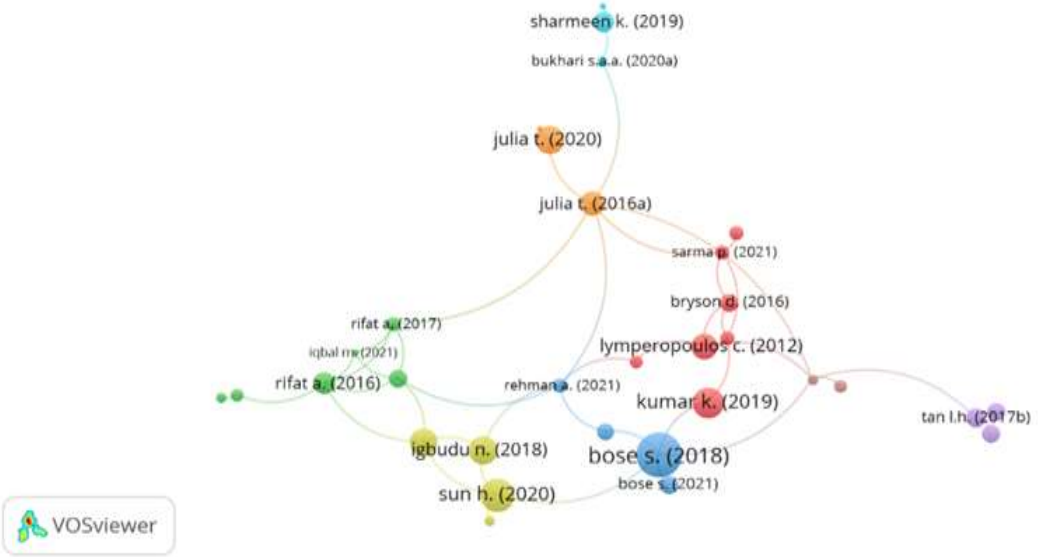

Figure 4. Network Visualization Map of Citation by Documents

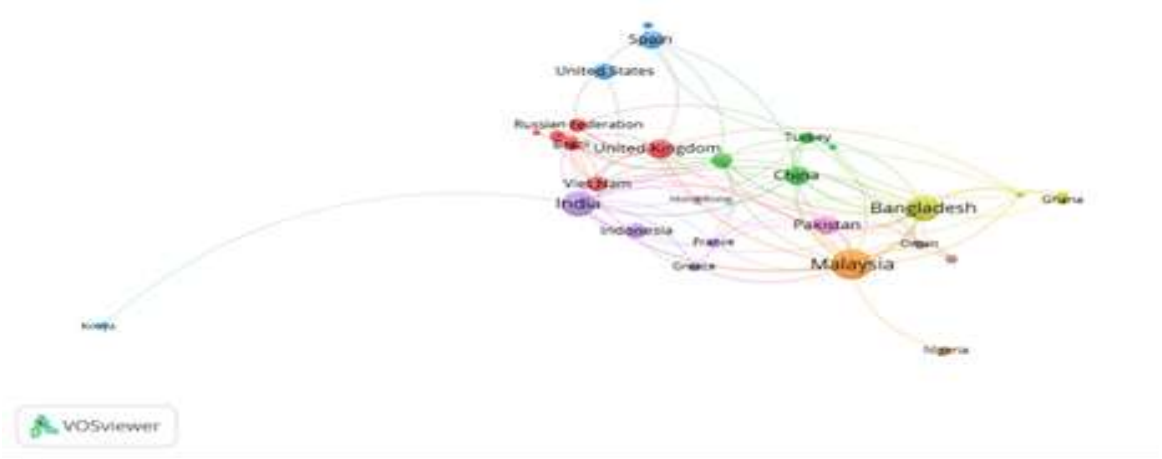

Figure 5. Network Visualization Map of the Citation Based on Countries

Extending further analysis, Figure 5 presents a network visualisation map of citations in the 13% base countries. The analysis sought to investigate references made in publications linked to a specific country. A minimum requirement of at least one document from a country and at least one citation from that country was established to build this network map. This resulted in 39 countries (out of 50) meeting the threshold, generating nine clusters with 98 links. A highly cited country is measured based on each country's link strength with publications from other countries. Based on the map, Malaysia (21 publications) has the most published GB literature cited by others, with 15 links. India had 14 documents cited by other publications and 18 links, followed by Bangladesh, with 14 cited documents and 15 links.

Co-Authorship Analysis

To address RQ5 (What are the authorship patterns of the publication in GB?), an analysis was conducted using MS Excel and Harzing's Publish Perish software. This involved calculating the number of authors per document and identifying the most prolific author in GB publications. Table 11 lists the authors for each of the 115 documents in GB, generating 308 authors with a maximum of seven authors in a single document. According to the frequency calculation, 22 publications (19.13 %) were published by a single author. There were 31 (33.33%) publications with two authors and 36 (31.30%) with three authors.

Table 11. Number of Author(s) Per Document

Authors count	Total publication	Percentage (N=115)
1	22	19.13%
2	31	26.96%
3	36	31.30%
4	20	17.39%
5	2	1.74%
6	2	1.74%
7	2	1.74%

The RQ6 (*What is the current status of collaboration in GB literature?*) was determined by generating a network utilization map of co-authorship among the authors, as shown in Figure 6. A complete counting method and a minimal number of papers and citations of an author (set at 1 for both) were selected for this analysis. These generated 180 authors (out of 268 authors) who met the threshold, with only two clusters reported with 14 links. Each cluster represents the authors' collaboration in their respective GB fields. Bukhari, Hashim, and Amran from Malaysia are prominent authors in terms of collaborators, as shown in Figure 6. The visualisation map further indicates that collaborative efforts across countries are limited.

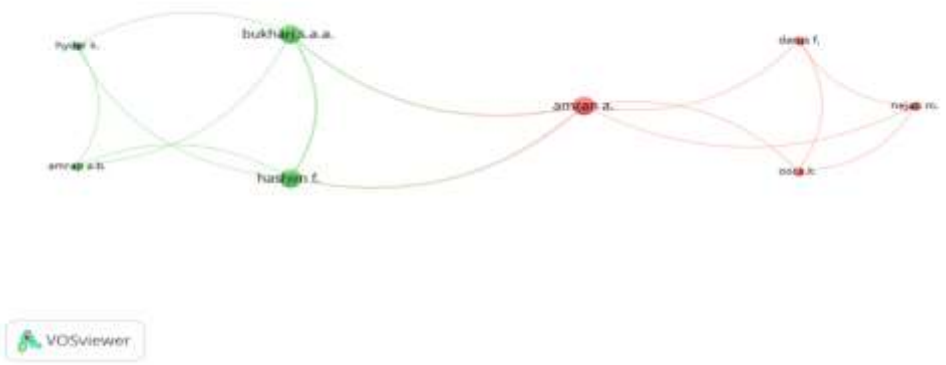

Figure 6. Network Visualization Map of the Co-Authorship of Authors

Keyword and Co-Occurrence Analysis

The answer to RQ7 (*Which themes of GB are most popular among researchers?*) was generated using VOSViewer software, which determined the frequent themes used in GB publications. Based on 115 data points obtained from Scopus, co-occurrence based on the authors' keywords, co-occurrence of title and abstract fields, and co-occurrence of title fields was examined. The co-occurrence of the author keywords network map was generated using the full counting method, and the minimum number of occurrences of a keyword was set to 1. This resulted in 288 keywords that met the threshold (331 keywords). Based on the network visualisation map shown in Figure 7, '*green banking*' is a frequently used keyword in addition to sustainable banking, green financing, climate change, and sustainable development.

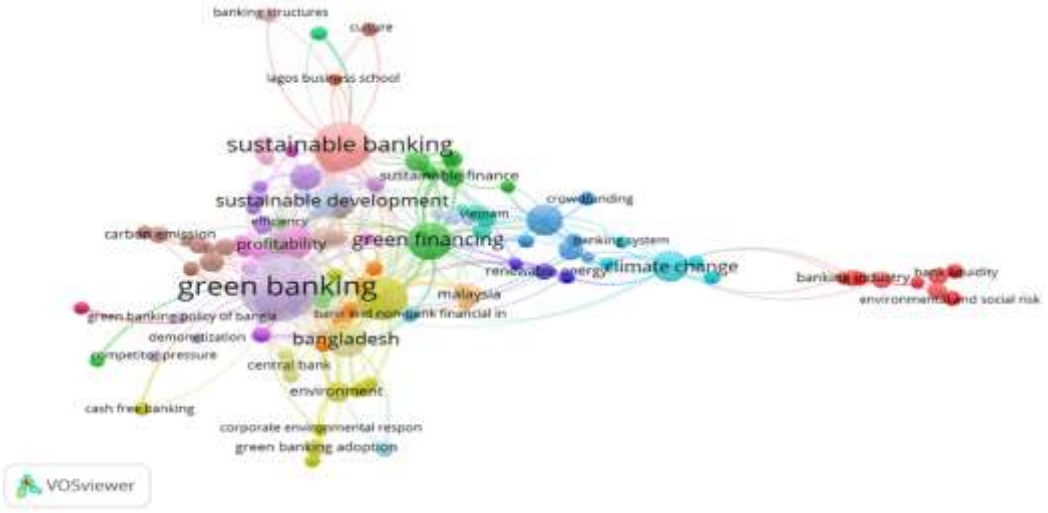

Figure 7: Network Visualization Map of the Co-Occurrence of Author Keywords

The keyword occurrences were further detailed to investigate the number of publications that used the keywords, and the frequency computation was conducted using Microsoft Excel. According to the results presented in Table 12, 'green banking' (32:27.83%) is the most used keyword in GB publications. Other keywords appeared on the network map, such as 'sustainability (26:22.61%), 'banking' 21:18.26%), and 'sustainable development' (18:15.65%).

Table 12. Top Keywords

Keywords	Total publication	Percentage
Green Banking	32	27.83%
Sustainability	26	22.61%
Banking	21	18.26%
Sustainable Development	18	15.65%
Sustainable Banking	17	14.78%
Corporate Social Responsibility	13	11.30%
Bangladesh	10	8.70%
Green Financing	10	8.70%
Climate Change	9	7.83%
Green Economy	8	6.96%
Green Finance	7	6.09%

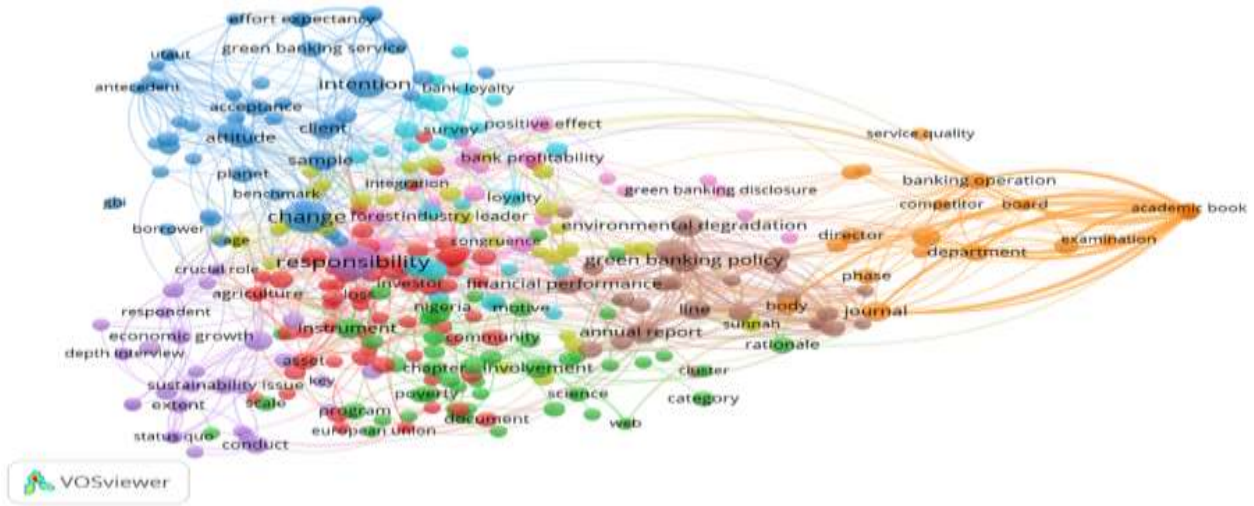

Figure 8. Network Visualization Map of the Co-Occurrence Network Based on Title and Abstract Fields

Figure 8 shows the network visualisation map of a term co-occurrence network based on the title and abstract fields used in the GB publications. Based on the text data, binary counting was chosen, with the minimum number of occurrences of a term set to two occurrences. This resulted in 553 terms meeting the threshold (out of 2,757 terms). From the 328 terms, 60% (the default setting) were identified as pertinent, forming nine thematic clusters. These themes were derived from analysing the title and abstract fields. Cluster 1 shows the agriculture sector, community, financial crisis, financial market, and features. Cluster 2 shows the environmental impact, advancement, financial benefit, indirect impact, and lending. Acceptance, behavioural intention, borrower, carbon emissions, environmental friendliness, and customer intention are listed in Cluster 3, whereas Cluster 4 shows the best practices, competitive advantage, economic benefits, green banking guidelines, and regulations. Cluster 5 consists of ability, availability, green banking products, a green economy, and energy efficiency: Cluster 6 lists bank loyalty, customer perception, environmental aspects, green behaviour, and seriousness. Cluster 7 contains banking operations, friendly lending policies, competitors, and a comprehensive understanding. Cluster 8 compares conventional banks, green banking performance, green banking policies, green performance, transparency, and Islamic banks. Cluster 9 consists of advantages, bank profitability, green banking disclosure, regulatory setting, and significant impacts.

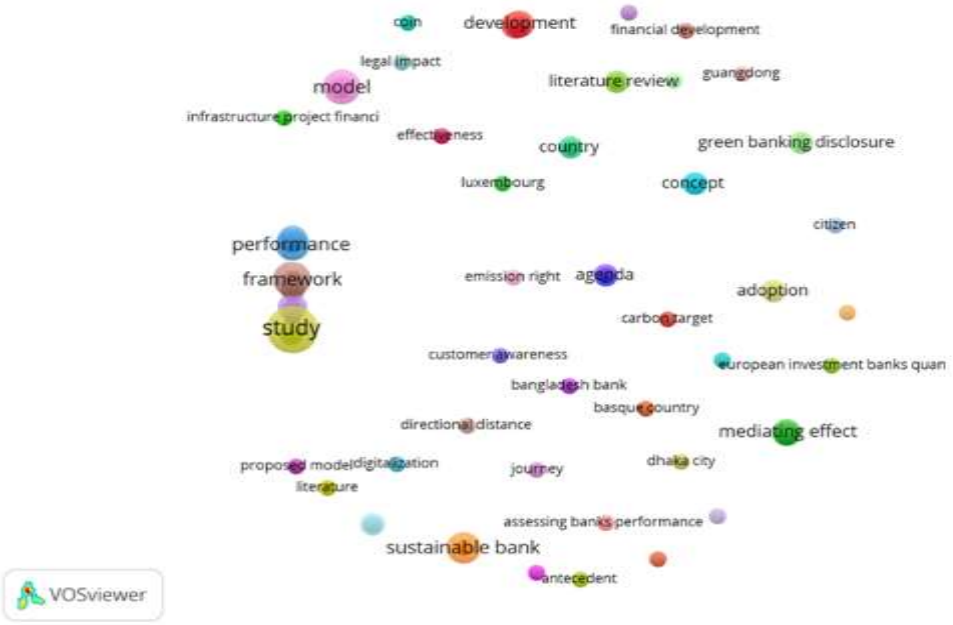

Figure 9. Network visualisation map of a term co-occurrence network based on title fields (Binary Counting).

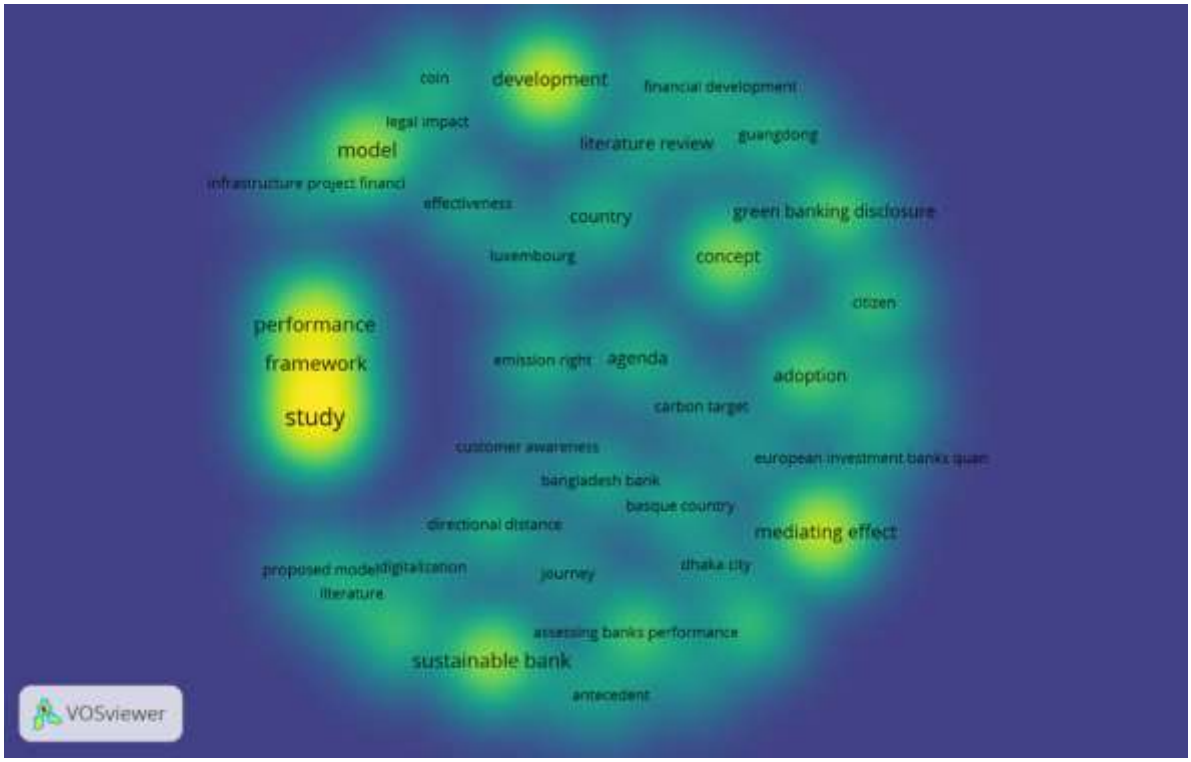

Figure 10. Density Visualization Map of a Term Co-Occurrence Network Based On Title Fields (Binary Counting)

Figure 10 shows the focus of GB publications, marked in yellow. The higher the yellow colour density, the higher the concentration. Based on the 115 papers gathered from Scopus, the framework, performance, development, and case study are the main topics of publications associated with GB. The terms with a lower density, such as effectiveness, sustainable banks, digitalisation, and assessing bank performance, suggest that fewer studies have been conducted and explored in the context of GB.

Literature Classification

The RQ8 (*What is the current intellectual framework for GB research?*) examined the scholarly framework of GB research by applying content analysis techniques. The findings previously discussed show that 78 out of 115 GB documents were referenced together by other publications within the network, resulting in the formation of nine distinct groupings. These are elaborated on below.

Cluster 1: Agriculture Sector, Community, Financial Crisis, Financial Market, and Feature.

Cluster 1 focuses on the most impactful GB-related sectors: agriculture, renewable energy sources, and other environmentally friendly sectors. Client-created pollution hurts climate change, jeopardizes community health, and affects the image and reputation of the banks. The banking industry's image, profitability, and risk of failure were severely affected by the 2008 financial crisis. As a result, numerous financial institutions turned to a GB strategy to restore public confidence. Previous studies documented consistent results of rapid development in GB, suggesting its significant acceptance in the financial market. Miroshnichenko and Mostovaya (2019) document green loans' rapid development and expansion due to their flexible provision and availability conditions. A separate investigation by Najera-Sanchez (2020) highlighted the swift progression of research examining how banks' sustainability initiatives impact their competitive edge. This results from setting up a statistical description of the principal features of sustainable banking research. The articles in this cluster share a common focus on GB development.

Cluster 2: Environmental Impact, Advancement, Financial Benefit, Indirect Impact, and Lending.

The documents under this cluster discuss how banks implement GB practices to reduce the negative environmental impact. As for internal operations, the advancement of technology has replaced the traditional banking system. Most banking transactions can be done online, thus benefiting the bank in cost savings. Initial studies sought to ascertain how financial institutions manage their banking operations' direct and indirect effects on society and the environment (Weber & Feltmate, 2016). This grouping centres on the idea that financial institutions should reassess their credit policies to avoid disadvantaging those involved in environmental pollution.

Cluster 3: Acceptance, Behavioral Intention, Borrower, Carbon Emission, Environmentally Friendly, and Customer Intention.

The documents in this cluster share a common focus on the customer's behavioural intentions and willingness to embrace GB strategies and regulations. According to research by Miroshnichenko and Mostovaya (2019), several key factors influence borrowers' decision-making regarding green loans. These factors include reputational considerations, societal and equity pressures, regulatory requirements, the availability of alternative funding sources, credit profiles, accessibility, and capital prerequisites. Thus, to reduce carbon emissions and be an environmentally friendly institution, banks must investigate factors affecting the customers' intention to use GB products (Manolas et al., 2017).

Cluster 4: Best Practices, Competitive Advantage, Economic Benefit, Green Banking Guidelines, and Regulations.

Cluster 4 focuses on GB's best practices that provide a competitive advantage over their non-sustainable bank counterparts. In order to ensure that GB practices give advantages in terms of economic and environmental benefits, regulatory authorities play a vital role in forming GB guidelines or policies for adoption (Ng, 2018; Bukhari et al., 2019) and enforcing GB disclosure (Bose et al., 2018).

Cluster 5: Ability, Availability, Green Banking Product, Green Economy, and Energy Efficiency.

This cluster demonstrates the banks' ability to provide GB products to customers. Support for a green economy also depends on the availability of energy-efficient equipment, improvement of online financing, integration of ecological hazards with primary risks, and alternative perspectives on strategy development (Islam et al., 2014). A supportive regulatory environment, stakeholders, a knowledgeable workforce, and green capabilities are necessary to adopt GB practices successfully.

Cluster 6: Bank Loyalty, Customer Perception, Environmental Aspect, Green Behavior, and Seriousness.

This cluster emphasises the banks' green image, significantly increasing bank loyalty. In addition to its environmental aspects, banks need to focus on customer perception while receiving GB services. The articles in this cluster share a common theme: they examine the commitment of bank staff to environmentally friendly practices and their dedication to implementing green behaviour in the workplace. These areas are fundamental to creating awareness among the bank's employees and clients to ensure financial, social, and environmental benefits.

Cluster 7: Banking Operation, Friendly Lending Policy, Competitor, and Comprehensive Understanding.
In this cluster, the literature provides a comprehensive understanding of what influences banks' adoption of GB practices in their banking operations. The pressure received by banks from internal and external parties, including competitors, has triggered them to implement more socially and environmentally friendly lending policies (Tan et al., 2017).

Cluster 8: Comparison, Conventional Bank, Green Banking Performance, Green Banking Policy, Green Performance, Transparency, and Islamic Bank.
Most of the literature in this cluster compares the green performance of Islamic banks to that of conventional banks. This cluster relies on the idea that Shariah-compliant GB policies improve GB performance in terms of reputation (Bose et al., 2018) while preserving faith, intelligence, and wealth circulation (Julia & Kassim, 2020).

Cluster 9: Advantages, Bank Profitability, Green Banking Disclosure, Regulatory Setting, and Significant Impact.
This cluster focuses on the advantages of GB in terms of bank profitability. Initially, researchers attempted to identify factors contributing to bank profitability, such as sustainable banking practices (Torre Olmo et al., 2021), GB policy, capital adequacy, non-performing loans (NPL), bank efficiency, and bank liquidity. GB disclosures also increase towards (Torre Olmo et al., 2021). Thus, regulatory guidance is vital for enhancing GB disclosures (Bose et al., 2018).

Impediments to Current Research
The answers to RQ9 (*What kinds of issues obstruct GB research?*) were obtained using a systematic review and content analysis to identify several factors that impede the growth of GB literature. As GB is a new phenomenon and is still evolving, research needs to be improved by the scarcity of available data, particularly when assessing the effective implementation of GB practices. Most banks are in the initial stages of GB adoption, and regulatory authorities are still working on proper policy guidelines. The results presented earlier also revealed a need for more academic collaboration among scholars locally and globally in the GB area. Therefore, more international academic cooperation is necessary to contribute to the creation of a widely acknowledged GB framework.

Acceptance of the bank's clients is critical for successfully implementing GB practices. The analysis results presented earlier also reveal a need for more research on client demographics that needs to be improved. Most research has focused on client perception and factors influencing clients' behavioural intentions toward GB, such as reliability, privacy, responsiveness, empathy, and information quality (Rifat et al., 2016). Therefore, future research must focus on client demographics, such as education and professional backgrounds. Highly educated clients are usually aware of how climate change affects society and the environment. This demographic information will help banks tackle clients by using GB products.

Another area for improvement in GB research is the need for more theoretical and practical frameworks for GB adoption that can be used globally to ensure uniformity and consistency. This framework is essential for banks to identify the factors that can positively influence and facilitate the adoption of GB (Bukhari et al., 2019). Finally, the need for a proper framework for assessing any risks associated with GB hinders the growth of its literature despite continuing progress. Though the impact of GB practices may differ across countries due to geographical factors, research is needed to measure the green financing risks so that banks can take precautions such as restricting financing policies.

Avenues for Future Research
Finally, this section answers RQ10 (*What areas of GB require further investigation?*). Below are some research gaps that future scholars can address: There is a need for future studies on a proper framework or model for GB adoption, performance, and risk. Existing conceptual studies are more on the preliminary stage of implementation, such as examining the bankers' attitude towards the adoption of GB initiatives (Rifat et al., 2016), client views and perception towards GB products (Rifat et al., 2016; Manolas et al., 2017), motivating banks to move toward a sustainable banking operating system (Tan et al., 2017; Laskowska, 2018) and exploring the phenomenon of the adoption of sustainability financing (Ng, 2018). Although a recent study proposed GB best practices for adoption (Bukhari et al., 2019) and designed a policy framework to address the relevant Sustainable Development Goals (SDG) objectives (Sinha et al., 2021), comprehensive studies addressing GB adoption and implementation are still needed. Future research is expected to urge regulatory authorities to develop regulations and enhance GB disclosure as a part of annual reporting.

Previous findings also revealed that most current GB studies focus on a single country setting. Consequently, there is a demand for studies spanning multiple nations to gain a deeper insight into the characteristics of GB practices implemented by various countries in order to achieve alignment in policies. Future studies on other corporate governance mechanisms that influence GB are also needed to monitor the functions of the monitoring body to ensure content enforcement of GB practices. Moreover, additional studies should examine how GB practices affect other performance metrics, given that Torre Olmo et al. (2021) assert that conventional factors influencing bank profitability fail to account for the enhanced earnings of sustainable banks. They propose considering non-tangible competitive advantages, including brand perception, client retention, diminished reputational hazards, and ethical considerations.

CONCLUSIONS

This study offers an inclusive scientific mapping analysis of global literature on GB from 1996 to early 2021. This is a crucial resource for academics, government officials, financial backers, and regulatory bodies as it offers a vital understanding of GB studies' character and progression. This research utilised various analytical approaches, encompassing

the examination of publication trends, mapping of citation and collaborative networks, analysis of co-occurrence and co-citation patterns, bibliometric evaluation, comprehensive literature review, and in-depth content assessment.

Research indicates eco-friendly banking practices contribute to a green reputation, customer trust, and client retention (Ibe-Enwo et al., 2019), leading to higher profitability (Torre Olmo et al., 2021). Although various authors contribute to the literature globally, the present study must identify collaboration among authors from different countries. This study identifies several impediments to advancing knowledge in this area and provides future research directions for further investigation. Even with the contributions outlined above, this study has limitations related to the inclusion of publications up to early 2021 only and the possibility of exploring additional forms of analytics, such as page rank analysis.

Author Contributions: Conceptualization, L.A.R., S.M.S., M. M. and H.S.N.; Methodology, M. M.; Software, L.A.R.; Validation, L.A.R., S.M.S., M. M. and H.S.N.; Formal Analysis, L.A.R., S.M.S., M. M. and H.S.N.; Investigation, L.A.R.; Resources, L.A.R.; Data Curation, L.A.R.; Writing –Original Draft Preparation, L.A.R., S.M.S., M. M. and H.S.N.; Writing –Review & Editing, L.A.R., S.M.S., M. M. and H.S.N.; Visualization, L.A.R., Supervision, M. M.; Project Administration, M. M.; Funding Acquisition, L.A.R., S.M.S., and M. M. Authors have read and agreed to the published version of the manuscript.

Institutional Review Board Statement: Ethical review and approval were waived for this study because the research does not involve vulnerable groups or sensitive issues.

Funding: DUCS-Faculty Grant Scheme (600-UiTMSEL PI. 5/4 (098/2022); Universiti Teknologi MARA (UiTM), Malaysia.

Acknowledgments: This work was supported by the Faculty of Accountancy, Universiti Teknologi MARA, Selangor Branch, Puncak Alam Campus, Selangor, Malaysia, through the DUCS Grant Scheme.

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: The data presented in this study are available on request from the corresponding author. The data are not publicly available due to restrictions.

Conflicts of Interest: The authors declare no conflict of interest.

REFERENCES

Abuseif, M., Jamei, E., & Chau, H. W. (2023). Simulation-based study on the role of green roof settings on energy demand reduction in seven Australian climate zones. *Energy and Buildings*, 286, 112938.

Al Mulla, S., & Nobanee, H. (2020). Green banking: A mini-review. https://dx.doi.org/10.2139/ssrn.3539125

Arumugam, D., & Chirute, T. (2018). Factors determining the adoption of green banking amongst commercial banks in Malaysia. *Electronic Journal of Business and Management*, *2*(3), 50–62.

Baker, H. K., Pandey, N., Kumar, S., & Haldar, A. (2020). A bibliometric analysis of board diversity: Current status, development, and future research directions. *Journal of Business Research*, *108*, 232-246. https://doi.org/10.1016/j.jbusres.2019.11.025

Bose, S. H. Z., Rashid, A., & Islam, S. (2018). What drives green banking disclosure? An institutional and corporate governance perspective. *Asia Pacific Journal of Management*, *35*, 501–527. https://doi.org/10.1007/s10490-017-9528-x

Bukhari, S. A. A., Hashim, F., & Amran, A. (2019). Determinants of green banking adoption: A theoretical framework. *KnE Social Sciences*, *3*(22), 1–14. https://doi.org/10.18502/kss.v3i22.5041

Castriotta, M., Loi, M., Marku, E., & Naitana, L. (2019). What's in a name? Exploring the conceptual structure of emerging organizations. *Scientometrics*, *118*(2), 407–437. https://doi.org/10.1007/s11192-018-2977-2

Chowdhury, M. A. A., & Dey, M. (2016). Green banking practices in Bangladesh. *The Cost and Management*, *44*(2), 34–39.

Curcio, D., Gianfrancesco, I., & Vioto, D. (2023). Climate change and financial systemic risk: Evidence from US banks and insurers. *Journal of Financial Stability*, *66*, 101132. https://doi.org/10.1016/j.jfs.2023.101132

Deepa, P., & Karpagam, C. R. (2018). A study on customer's awareness on green banking in selected public and private sector banks with reference to Tirupur. *International Journal of Advanced Research and Development*, *3*(1), 58-63.

Ibe-Enwo, G., Garanti, Z., & Popoola, T. (2019). Assessing the relevance of green banking practices on bank loyalty: The mediating effect of green image and bank trust. *Sustainability*, *11*(17), 4651. https://doi.org/10.3390/su11174651

Islam, M. A., Yousuf, S., Hossain, K. H., & Islam, M. R. (2014). Green financing in Bangladesh: Challenges and opportunities - A descriptive approach. *International Journal of Green Economics*, *8*(1), 74 – 91. https://doi.org/10.1504/IJGE.2014.064469

Islam, M. S., & Das, P. C. (2013). Green banking practices in Bangladesh. *IOSR Journal of Business and Management*, *8*(3), 39-44. https://doi.org/10.9790/487X-0833944

Julia, T., & Kassim, S. (2020). Green banking. In Banking and Finance. IntechOpen. https://doi.org/10.5772/intechopen.93294

Khairunnessa, F., Vazquez-Brust, D. A., & Yakovleva, N. (2021). A review of the recent developments of green banking in Bangladesh. *Sustainability*, *13*(4), 1904. https://doi.org/10.3390/su13041904

Kurowski, Ł., Rutecka-Góra, J., & Smaga, P. (2022). Is knowledge on climate change a driver of consumer purchase decisions in Poland? The case of grocery goods and green banking. *Journal of Cleaner Production*, *369*, 133444. https://doi.org/10.1016/j.jclepro.2022.133444

Laskowska, A. (2018). Green banking as the prospective dimension of banking in Poland. *Ecological Questions*, *29*(1), 129–135. https://doi.org/10.12775/EQ.2018.011

Li, Y. (2023). Role of banking sector in green economic growth: empirical evidence from South Asian economies. *Economic Change and Restructuring*, *56*(4), 2437-2454. https://doi.org/10.1007/s10644-023-09499-4

Li, C., Wu, K., & Wu, J. (2017). A bibliometric analysis of research on haze during 2000–2016', *Environmental Science and Pollution Research*, *24*(32), 24733–24742. https://doi.org/10.1007/s11356-017-0440-1

Manolas, E., Tsantopoulos, G., & Dimoudi, K. (2017). Energy saving and the use of "green" bank products: the views of the citizens. *Management of Environmental Quality: An International Journal*, *28*(5), 745–768. https://doi.org/10.1108/MEQ-05-2016-0042

Masukujjaman, M., Siwar, C., Mahmud, M. R., & Alam, S. S. (2016). Bankers' perception of green banking: Learning from the experience of Islamic banks in Bangladesh. *Malaysian Journal of Society and Space*, *12*(2), 144-153. Retrieved from https://ejournal.ukm.my/gmjss/article/view/17745

Miah, M. D., Rahman, S. M., & Mamoon, M. (2021). Green banking: The case of commercial banking sector in Oman. *Environment, Development and Sustainability*, *23*, 2681-2697. https://doi.org/10.1007/s10668-020-00695-0

Miroshnichenko, O. S., & Mostovaya, N. A. (2019). Green loan as a tool for green financing. *Finance: Theory and Practice*, *23*(2), 31-43. https://doi.org/10.26794/2587-5671-2019-23-2-31-43

Mirza, N., Umar, M., Afzal, A., & Firdousi, S. F. (2023). The role of fintech in promoting green finance, and profitability: Evidence from the banking sector in the euro zone. *Economic Analysis and Policy*, *78*, 33-40. https://doi.org/10.1016/j.eap.2023.02.001

Moher, D., Liberati, A., Tetzlaff, J., Altman, D. G., & PRISMA Group*, T. (2009). Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *Annals of internal medicine*, *151*(4), 264-269. https://doi.org/10.7326/0003-4819-151-4-200908180-00135

Najera-Sanchez, J. J. (2020). A systematic review of sustainable banking through a co-word analysis. *Sustainability*, *12*(1), 278. https://doi.org/10.3390/su12010278

Nasution, A. H., Nasution, B., & Saidin, O. K. (2021). Agricultural sector financing to realise green banking in Indonesia. *IOP Conference Series: Earth and Environmental Science*, *782*(3), 032052. https://doi.org/10.1088/1755-1315/782/3/032052

Nenavath, S. (2022). Impact of fintech and green finance on environmental quality protection in India: By applying the semi-parametric difference-in-differences (SDID). *Renewable Energy*, *193*, 913-919. https://doi.org/10.1016/j.renene.2022.05.020

Ng, A. W. (2018). From sustainability accounting to a green financing system: Institutional legitimacy. *Journal of Cleaner Production*, *195*, 585–592. https://doi.org/10.1016/j.jclepro.2018.05.250

Omar, N. B., & Amran, A. (2017). Corporate governance and climate change reporting in Malaysia. *International Journal of Academic Research in Business and Social Sciences*, *7*(12), 222-240.

Persson, O., Danell, R., & Schneider, J. W. (2009). How to use Bibexcel for various types of bibliometric analysis. *Celebrating scholarly communication studies: A Festschrift for Olle Persson at his 60th Birthday*, *5*(2009), 9-24.

Rachman, A. A., & Saudi, M. H. (2021). Green banking and profitability (Banks registered on the Sri-Kehati Index in Indonesia Stock Exchange 2015 - 2019). *Turkish Journal of Computer and Mathematics Education*, *12*(8), 473-486.

Rifat, A., Nisha, N., Iqbal, M., & Suviitawat, A. (2016). The role of commercial banks in green banking adoption: A Bangladesh perspective. *International Journal of Green Economics*, *10*(3-4), 226-251. https://doi.org/10.1504/IJGE.2016.081906

Rodrigues, L. F., Oliveira, A., & Rodrigues, H. (2023). Technology management has a significant impact on digital transformation in the banking sector. *International Review of Economics & Finance*, *88*, 1375-1388. https://doi.org/10.1016/j.iref.2023.07.040

Ruan, S., Wan, G., Le, X., Zhang, S., & Yu, C. (2023). Combining the role of the banking sector and natural resource utilization on green economic development: Evidence from China. *Resources Policy*, *83*, 103671. https://doi.org/10.1016/j.resourpol.2023.103671

Sinha, A., Mishra, S., Sharif, A., & Yarovaya, L. (2021). Does green financing help to improve the environmental and social eesponsibility? Designing SDG framework through advanced quantile modelling. *Journal of Environmental Management*, *292*, 112751. https://doi.org/10.1016/j.jenvman.2021.112751

Tan, L. H., Chew, B. C., & Hamid, S. R. (2017). A holistic perspective on sustainable banking operating system drivers: A case study of Maybank group. *Qualitative Research in Financial Markets*, *9*(3), 240–262. https://doi.org/10.1108/QRFM-12-2016-0052

Torre Olmo, B., Cantero Saiz, M., & Sanfilippo Azofra, S. (2021). Sustainable banking, market power, and efficiency: Effects on banks' profitability and risk. *Sustainability*, *13*(3), 1298. https://doi.org/10.3390/su13031298

Tunger, D., & Eulerich, M. (2018). Bibliometric analysis of corporate governance research in German-speaking countries: Applying bibliometrics to business research using a custom-made database. *Scientometrics*, *117*, 2041–2059. https://doi.org/10.1007/s11192-018-2919-z

Uddin, M. N., & Ahmmed, M. (2018). Islamic banking and green banking for sustainable development: Evidence from Bangladesh. *Journal of Islamic Economics*, *10*(1), 97-114. htttp://dx.doi.org/10.15408/aiq.v10i1.4563

Weber, O., & Feltmate, B. (2016). *Sustainable Banking and Finance: Managing the Social and Environmental Impact of Financial Institutions*. Business & Sustainability Series. University of Toronto Press.

Xiang, Y., Cui, H., & Bi, Y. (2023). The impact and channel effects of banking competition and government intervention on carbon emissions: Evidence from China. *Energy Policy*, *175*, 113476. https://doi.org/10.1016/j.enpol.2023.113476

Yadav, R., & Pathak, G. S. (2013). Environmental sustainability through green banking: A study on private and public sector banks in India. *OIDA International Journal of Sustainable Development*, *6*(8), 37-48.

Zhou, B., & Zhang, C. (2023). When green finance meets banking competition: Evidence from hard-to-abate enterprises of China. *Pacific-Basin Finance Journal*, *78*, 101954. https://doi.org/10.1016/j.pacfin.2023.101954