Fintech for Sustainability in Business and Economics Research: Trends and Future Agendas

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Research Article

Abstract

Purpose: *Fintech for sustainability is pivotal for business and economics as it harnesses technology to drive environmentally and socially responsible practices while enhancing economic efficiency and growth. This paper discusses the research trends and future research implications of fintech in sustainable economic operations.*

Methods: *This study extracted scholarly articles from the Scopus database and adopted the PRISMA framework and bibliographic analysis to uncover publication trends, research, affiliation, geographical circumstances, keywords trends, thematic trends, and bibliographic coupling to assess current practices and pinpoint future research directions of fintech to adopt the wider sustainability practices in business and economy.*

Results*: Steady progress has been made in developing fintech applications to achieve sustainability. There is notable research collaboration in both developing and developed economies. Recent keyword trends indicate a growing interest in sustainability and digital transformation. The thematic map demonstrates that the digital economy is a well-established topic. However, there is a need for new research in financial technology-based climate solutions to address significant sustainability gaps. This study identified the impact of emerging financial technologies on sustainability as a widely researched area. We suggested the connection between sustainability and the fintech ecosystem, sustainable financial inclusion, open fintech innovation, and fintech stability as potential areas for future research to expedite fintech adoption in sustainability goals.*

Implications: *Researchers, regulators, and policymakers can utilize the conclusions drawn from the research questions to craft a distinctive framework outlining strategic approaches and actionable plans for developing fintech policies that facilitate faster adoption of sustainability practices.*

Keywords: Fintech, Financial technology, Sustainability, Bibliometric analysis, Future research.

1. Introduction

Innovative technologies such as blockchain, big data, and AI contribute to increased transparency, effectiveness, and the incorporation of the excluded population into the financial sector for sustainable economic growth (Zhang-Zhang et al., 2020). This technology combination minimizes the bearing effects of technology on the environment and contributes to promoting green investment within the framework of

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ESG criteria (Macchiavello & Siri, 2020). New technologies and solutions are vital for developing proper and sustainable solutions for people with disabilities; nevertheless, regulatory standards and consumer protection are essential so that these advancements do not harm data privacy and accessibility, creating a just and sustainable society (Macchiavello & Siri, 2020). As seen, through the promotion of sustainable finance, fintech can help to accomplish the SDGs and dramatically contribute towards changing the economy to be sustainable and friendly to the environment.

The collaboration of fintech and sustainability to solve environmental issues within the framework of advanced financial technologies is a significant breakthrough in the modern economy. Fintech for sustainability can be achieved through improving access to financial services, effectiveness in resource utilization, and encouragement of sustainable investments. Digital platforms and blockchain technologies promote a more transparent and efficient completion of transactions and eradicate the emissions of greenhouse gases from banking operations (Kou et al., 2021; Sabuj et al., 2019). By utilizing big data and AI, fintech firms can help by offering information on sustainable ways to conduct business and monitor the environmental effects of investment, resulting in more responsible financial actions (Addy et al., 2024; Saha et al., 2024). This transformation helps the economy and ensures that the financial systems are in harmony with sustainable development goals, indicating the importance of fintech in building a sustainable environment.

Fintech has emerged as a pivotal enabler for sustainable development and financial inclusion (Franco & Rubalcaba, 2021; Ahammed & Sabuj, 2018). Recent research highlights the growing synergy between fintech and sustainability practices (Ellili, 2023). Numerous studies underscore fintech's positive influence on financial inclusion, reaching unbanked populations, and driving economic development and demonstrate the potential of fintech to create a more inclusive and sustainable financial landscape, instilling hope for a more equitable future(Setiawan et al., 2021; Okoli & Tewari, 2021; Barata, 2019; Azman & Zabri, 2022; AIS, 2018). Moreover, banks and other financial institutions should adopt inclusive strategies to attain sustainable development by leveraging fintech innovations like mobile banking, crowdfunding, and digital payments that improve access to financial services and alternative financing (Baker et al., 2023; Lan & Giang, 2021; Rahman, 2023; Alhammad, 2022; Luo et al., 2022; Abdikeev et al., 2018). However, challenges remain, such as technological barriers, financial literacy, and the need for sustainability focus in fintech (Franco & Rubalcaba, 2021). In this regard, governments should enhance information infrastructure, support fintech startups, enable regulatory sandboxes, and drive financial innovation to reach unbanked populations (Setiawan et al., 2021). Moreover, policymakers are encouraged to create conducive environments for fintech growth while addressing challenges through interdisciplinary collaboration and global cooperation (Afjal, 2023).

There is a considerable gap in the existing bibliometric review on the connection between fintech and sustainability. While prior work has explored diverse subthemes of fintech and sustainability separately, there still needs to be more comprehensive research exploring the primary areas of interest, prolific authors, organizations, and geographic locations of the scholarly publications on fintech and sustainability. Also, since fintech and sustainability are two dynamic fields, there is a high likelihood of new research gaps and opportunities in this field in the future. A bibliometric analysis that addresses these aspects would help give an account of the current state of knowledge and help define the broad directions for research, furthering the understanding of how fintech can be leveraged to support sustainability goals. To fill these research gaps, the current paper aims to conduct a comprehensive bibliometric analysis of the current literature on fintech and sustainability.

This study of bibliometric research on fintech for sustainability in business and economics offers significant implications for researchers, regulators, and policymakers by providing a comprehensive understanding of the evolving landscape and its impact on sustainable development. For researchers, our bibliometric

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analysis highlights that significant strides have been made in developing fintech applications to further sustainability goals. Recent keyword trends show increasing interest in sustainability and digital transformation. The thematic map shows that the digital economy is a well-established topic. However, more research is needed in financial technology-based climate solutions to address significant sustainability gaps. This study identifies the impact of emerging financial technologies on sustainability as a widely researched area. Regulators and policymakers can gain a strong perspective on how fintech can drive sustainable economic growth, inform policy decisions, and implement frameworks that promote green finance initiatives. We suggest that the connection between sustainability and the fintech ecosystem, sustainable financial inclusion, open fintech innovation, and fintech stability are potential areas for future research recommendations that can shape regulatory and policy strategies to harness the full potential of fintech for sustainable development.

2. Literature Review

The existing literature provides compelling evidence to support the potential of a robust fintech ecosystem in driving a solid financial inclusion framework, thereby fostering long-term sustainable development for the economy. Senyo et al. (2022) argue that fintech, through mobile money and other innovations, could be a powerful driver of financial inclusion in many African nations and other developing countries, given the right approach. Ferrata (2019) stated the impact of fintech and a digital approach to financial inclusion in achieving different Sustainable Development Goals set out by the United Nations. An interesting approach to examining the role of fintech in achieving financial inclusion was applied by Heng and Tok (2022). In the first stage of the study, they identified that compared to traditional measures, fintech has a stronger correlation with financial inclusion. In the next phase, this study concluded that while fintech is vital in mitigating the class and rural divide, it alone cannot significantly narrow the gender divide. The study suggested that fintech's role must be accompanied by initiatives to mitigate the gender divide.

Several studies have highlighted that fintech benefits firms with increased financial performance and sustainability. Baker et al. (2023) also looked at the effects of fintech on the financial performance of banks, and they noted that there are positive effects of fintech on total deposits and net profits. The authors opined that banks must embrace strategies that will enhance sustainable development. Luo et al. (2022) analyzed the impact of fintech innovation on enterprise transformation in China. They established that fintech innovation enhances real enterprises' total factor productivity and helps transform the real economy and its sustainable development. According to Setiawan et al. (2021), optimizing fintech adoption enhances access to finance with formal financial institutions concerned for vulnerable groups, such as the unbanked farmers in rural Indonesia. In their study, Demir et al. (2022) examined the association between fintech, financial access, and income disparity through a quantile regression analysis. They concluded that financial technologies support financial inclusion, positively and partially confining income inequality to affluent nations. Fintech innovations enable digital payments that support sustainable practices. This technology includes platforms that reward consumers for eco-friendly behaviors or enable donations to environmental causes through digital transactions (Deng et al., 2019; Varga, 2018). Green fintech incorporates environmental, social, and governance (ESG) criteria into risk management frameworks. Fintech facilitates digital transactions that can track and offset carbon footprints (Sergeeva et al., 2023; Macchiavello et al.,2022). Companies can integrate carbon accounting into their payment systems, allowing consumers to calculate and offset their carbon emissions through transactions. It helps financial institutions and investors assess the sustainability performance of their portfolios and make informed decisions.

To support and encourage the expansion of fintech, academics have offered suggestions to policymakers and governing bodies. Zetzsche and Anker (2022) investigated the dark setting of sustainable finance regulation. They concluded that regulators should apply innovative regulation tools in this domain, including sandboxes, innovation hubs, and waiver programs for early adopters. The authors advocated for interdisciplinary approaches to improve the knowledge base among intermediaries and supervisors to

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implement sustainable finance properly. Afjal (2023) conducted a bibliometric analysis on applying digital financial services within fintech to improve financial inclusion and economic development to foster the policymaker for framing the environment favorable for fintech growth and integration. The author further proposed that future research should explore such topics as the effects of digital financial services on marginalized groups, innovative financing models, and the prospects of digital finance for financial inclusion and development.

3. Methodology

Bibliometric analysis is a quantitative method utilized to examine various facets of scholarly literature, encompassing publications, citations, authors, journals, and institutions (Mourao & Martinho, 2020). This systematic approach involves collecting and analyzing bibliographic data to reveal discernible patterns, trends, and interrelationships within a specific field. Bibliometric analysis significantly contributes to advancing scientific knowledge, cultivating collaborative endeavors, and navigating future research initiatives (Bhuiyan et al., 2024). This investigation culled historical scholarly articles on fintech and sustainability from the Scopus database on May 28, 2024. The Scopus database gathered all previous academic research papers on how financial technology (Fintech) affects sustainability. Agrawal et al. (2023) mention that the Scopus database is a trustworthy resource for research in this field. The review process is outlined in Table 1, following the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines. The review process involved five steps: identifying research questions, selecting search databases and keywords, screening relevant documents, conducting bibliometric and content analysis, and systematically analyzing the results (Donthu et al., 2021; Saha et al., 2024; Yesmin et al., 2019).

Table 1: Methodology Development

Steps	**Descriptions**
Step 1: Identify Research Questions	-What are the fundamental academic research interests, trends, evolving research ideas, and geographical research implications of fintech's impact on sustainability in business and economics fields? -What is the future research direction regarding the challenges and possible research questions?
Step 2: Select search databases and keywords	Database: Scopus Search Keywords: Fintech and Sustainability
Step 3: Screen relevant documents	Identification: 1286 documents TITLE-ABS-KEY(("Fintech" OR "Financial technology") AND ("Sustain*")) Screening: 459 documents Applying Inclusion and Exclusion criteria Eligibility: 187 documents Title and Abstract screening. Full-Text screening: 104 documents Defining scope, relevant, and context
Step 4: Conduct bibliometric and content analysis	104 relevant documents were selected for bibliometric analysis in VosViewer and Biblioshiny
Step 5: Analyze the results	Present key findings on research trends, top researchers with the highest publications and country affiliation, top keywords and keyword trends, and future direction for new research possibilities

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In conducting our study focused on fintech and sustainability, we utilized a combination of Boolean keywords within the title, abstract, and keyword fields in Scopus: TITLE-ABS-KEY (("Fintech" OR "Financial technology") AND ("Sustain*")). This initial search provided us with 1286 documents from the Scopus database. We then proceeded to the screening phase, employing inclusion and exclusion criteria to refine our search results for relevant scholarly works in our analysis. Our search was further filtered to subject areas encompassing economics, econometrics, finance, business management, accounting, and social sciences. We restricted our analysis to the English language and final papers while including only one journal in our search process. As a result of applying our inclusion and exclusion criteria, we obtained 459 documents for further screening. Our next step involved a meticulous analysis of each paper's title, abstract, keyword, and conclusion to ensure alignment with the theme of our research on the fintech effect on sustainability. This phase led us to select 187 papers for the final screening phase. Subsequently, we conducted a thorough full-text screening analysis of the remaining 187 documents, assigning a score of 0 to articles deemed out of scope that did not fit into the framework of our study. It is worth noting that the discarded articles were primarily related to the price index of green bonds, cyber security fraud on Greentech, algorithm trading, the COVID-19 impact on green financing, and the price connectedness between green farming and the technology market. Our overarching objective is to incorporate documents examining financial technologies' impact and significance on sustainability across society, organizations, and economics. After this extensive evaluation process, we identified 104 papers suitable for final bibliometric analysis. This study used the VOSviewer and Biblioshiny R packages to extensively analyze our bibliographic review.

4. Bibliometric Analysis

4.1 Summary Statistics:

The fintech and sustainability bibliometric analysis was conducted on 104 documents from 72 sources published from 2016 to 2023. The average citations per document from Scopus were 20.36, with 431 author's keywords and 6619 cited references. Among 320 authors participating in this study, 104 papers were published; 10 were single-authored, and 94 were collaborative. The annual production growth is 68.77%. 33.65% of authors are international; the co-authorship per document is 3.24.

4.2 Publication Over Time

Figure 1 shows the increasing number of publications on fintech and sustainability from 2016 to 2023, indicating steady progress in research.

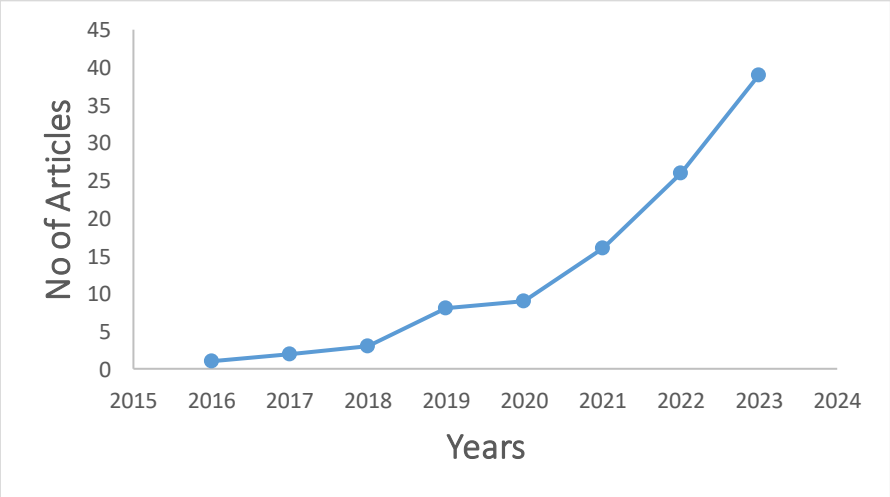

Fig. 1: Publication Over Time

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The early stages, from 2016 to 2018, marked the incorporation of fintech with sustainability ideas. A significant growth in annual publication numbers was observed from 2021 to 2023, possibly driven by technological advancement in digital finance, green finance solutions, blockchain, and increased funding for sustainable innovation (Kwong et al., 2023; Islam et al., 2024).

4.3 The Most Cited Publications

Table 2 shows the top ten cited articles. It is interesting to note that the top two articles have the same number of citations, which indicates their equal influence. These two articles are Arner et al. (2020) titled "Sustainability, FinTech, and Financial Inclusion," published by the European Business Organization Law Review, and Demir et al. (2022) named "Fintech, Financial Inclusion, and Income Inequality: A Quantile Regression Approach," published by European Journal of Finance. The third most cited article, "How should we understand the digital economy in Asia? Critical Assessment and Research Agenda" by Li et al. (2020), is also quite significant, with 163 citations. Notably, the three most cited documents were published after the beginning of 2022.

Table 2: The Most-Cited Publications

Authors	Title	Year	Source Title	Total Citation
Arner D.W.; Buckley R.P.; Zetzsche D.A.; Veidt R.	Sustainability, FinTech, and Financial Inclusion	2020	European Business Organization Law Review	217
Demir A.; Pesqué-Cela V.; Altunbas Y.; Murinde V.	Fintech, financial inclusion, and income inequality: a quantile regression approach	2022	European Journal of Finance	217
Li K.; Kim D.J.; Lang K.R.; Kauffman R.J.; Naldi M.	How should we understand the digital economy in Asia? Critical assessment and research agenda	2020	Electronic Commerce Research and Applications	163
Pizzi S.; Corbo L.; Caputo A.	Fintech and SMEs sustainable business models: Reflections and considerations for a circular economy	2021	Journal of Cleaner Production	139
Saha K.; Dey P.K.; Papagiannaki E.	Implementing circular economy in the textile and clothing industry	2021	Business Strategy and the Environment	81
Setiawan B.; Nugraha D.P.; Irawan A.; Nathan R.J.; Zoltan Z.	User innovativeness and fintech adoption in Indonesia	2021	Journal of Open Innovation: Technology, Market, and Complexity	78
Rabbani M.R.; Bashar A.; Nawaz N.; Karim S.; Ali M.A.M.; Rahiman H.U.; Alam M.S.	Exploring the role of Islamic fintech in combating the aftershocks of COVID-19: The open social innovation of the Islamic financial system	2021	Journal of Open Innovation: Technology, Market, and Complexity	76
McKillop D.; French D.; Quinn B.; Sobiech A.L.; Wilson J.O.S.	Cooperative financial institutions: A review of the literature	2020	International Review of Financial Analysis	74
Luo S.; Sun Y.; Yang F.; Zhou G.	Does fintech innovation promote enterprise transformation? Evidence from China	2022	Technology in Society	66
Naveed K.; Watanabe C.; Neittaanmäki P.	Co-evolution between streaming and live music leads the way to the sustainable growth of the music industry – Lessons from the US experiences	2017	Technology in Society	63

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4.4. University Affiliation

Figure 2 reports that the University of Pavia, University Bosowa, and Kingdom University have the highest contributions, each publishing 6 papers on Fintech and sustainability. These universities are spread across Italy, Indonesia, Bahrain, Singapore, Malaysia, Bulgaria, the Czech Republic, the United Arab Emirates, and Jordan, indicating a global focus on fintech and sustainability research. This trend makes a presumption that the research in this field has mainly been conducted in some Asian and European countries only (Ellili, 2023).

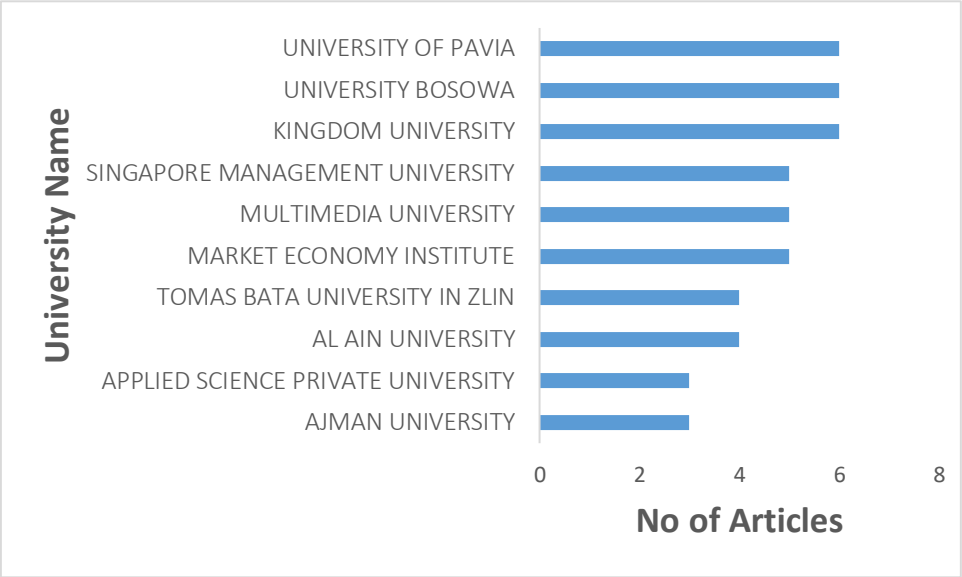

Fig. 2: Article Affiliation

4.5 Author's Country Collaboration

Figure 3 shows the top 10 countries where authors have collaborated on articles. China has the most collaborations within a single country, with 8 articles.

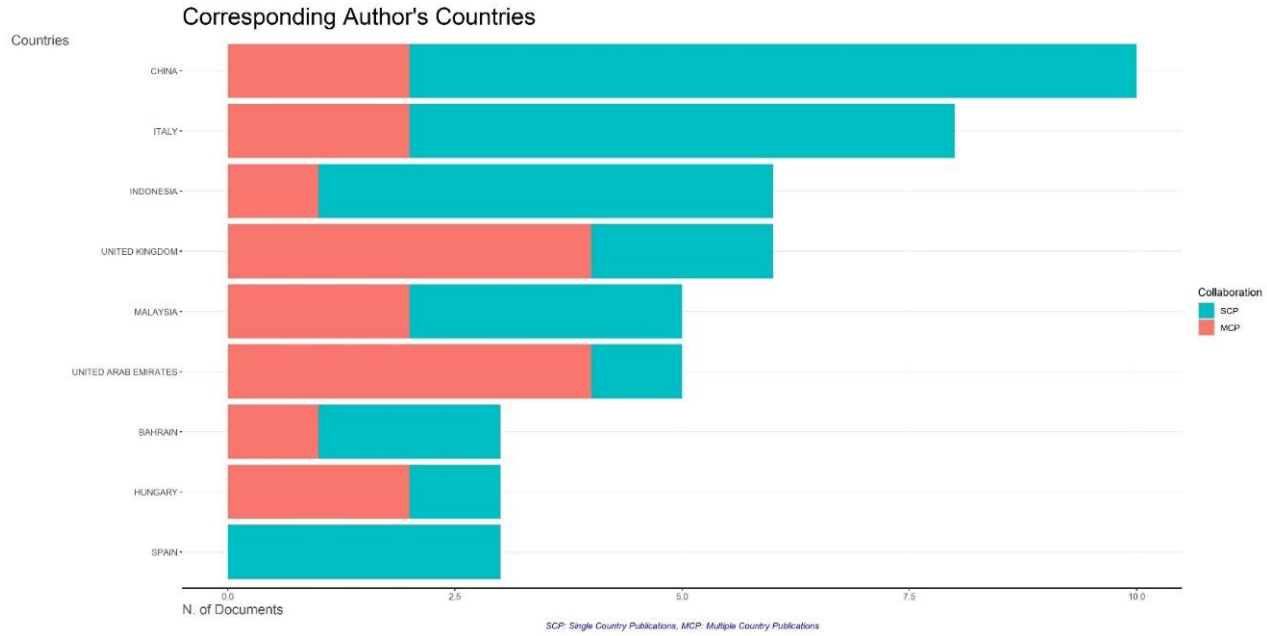

Fig. 3: Author's Country Collaboration

In multiple-country publications, the United Kingdom and the United Arab Emirates are tied for the lead with 4 articles. Other top single-country contributors include Italy, Indonesia, the UK, and Malaysia. The

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United Arab Emirates has the highest ratio of multiple-country publications, with 80% of its contributions. Spain is the only country that has yet to participate in multiple-country publications.

4.6 Country Collaboration Map

The map in Figure 4 displays a map that visually represents international collaborations among authors worldwide (Liu et al.,2005). The thickness of the connectors on the map represents how often authors from different countries work together. The darker lines indicate a higher number of publications between the countries. Surprisingly, all the connecting lines on the map have the same thickness and color intensity, indicating that all the connections, including China-USA, Indonesia-Hungary, Indonesia-Malaysia, Malaysia-UK, UAE-Jordan, and UK-Australia, have the same frequency with 2 publications.

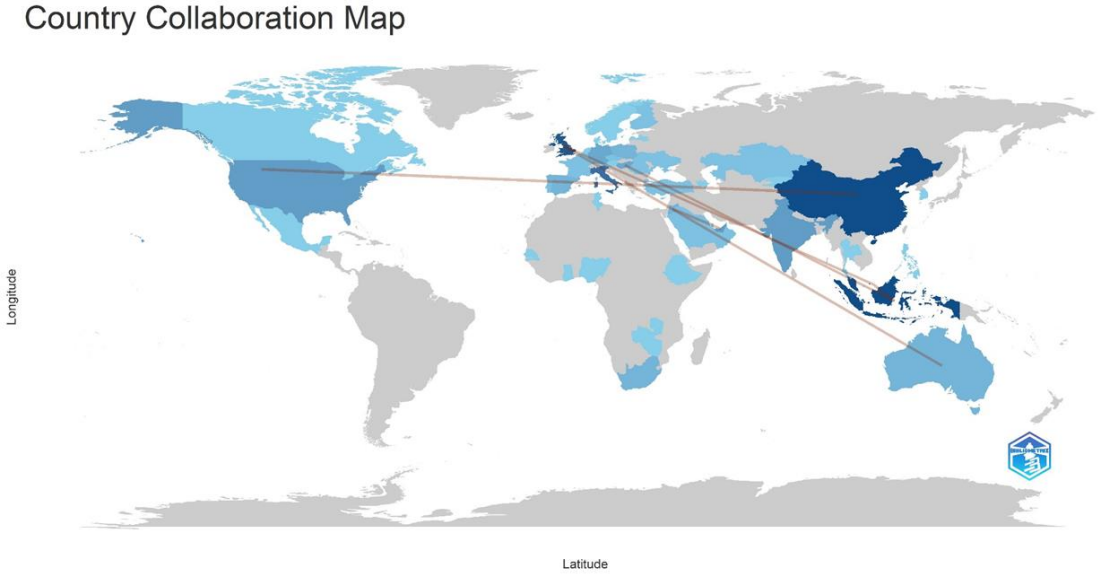

Fig. 4: Countries Collaboration Map

4.7 Publications and Citations by Countries

Table 3 shows the top ten countries that published articles on fintech and sustainability research and the countries with the most citations.

Table 3: Publications and Citations by Countries

Country	Articles	Country	Citation
China	10	United Kingdom	565
Italy	8	Italy	228
United Kingdom	6	Hong Kong	217
Indonesia	6	China	166
Malaysia	5	Indonesia	132
United Arab Emirates	5	Hungary	114
Hungary	3	Bahrain	83
Spain	3	Malaysia	64
Bahrain	3	Spain	58
Germany	2	United Arab Emirates	45

It shows the global impact and influences through scientific trends (Waltman& Van Eck, 2013). China is the top country for publishing articles, with 10 publications. Italy follows in second place with 8

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publications. The UK and Indonesia each published 6 papers, while Malaysia and the UAE published 5. Hungary, Spain, and Bahrain individually published 3 articles. Germany rounds out the list with 2 publications. Regarding citation count, the United Kingdom is in the top spot with 565 citations. Italy and Hong Kong follow with 228 and 217 citations, respectively. China, Indonesia, Hungary, Bahrain, and Malaysia have 166, 132, 114, 83, and 64 citations, respectively.

4.8 Co-authorship by Countries

Figure 5 provides insight into the research contribution to the development of Fintech and sustainability. Country co-authorship is a network that summarizes different categories of talent to deliver a sound research output (Kumar, 2015). The countries in the clusters are marked with circles. The more papers of a country cited, the greater the circle is. Among the 4 clusters, cluster red consists of 7 countries (Australia, Germany, Poland, South Africa, Spain, United Kingdom, and Vietnam), and most citation belongs to the UK. Then, cluster Green has 5 countries (China, Italy, Singapore, Taiwan, and the United States), and the country with the most citations is China. Cluster Blue comprises 5 countries (Bahrain, India, Jordan, Russian Federation, and United Aram Emirates) where the Russian Federation has the most citations. Lastly, cluster yellow consists of 3 countries (Hungary, Indonesia, Malaysia), and the most cited country is Malaysia.

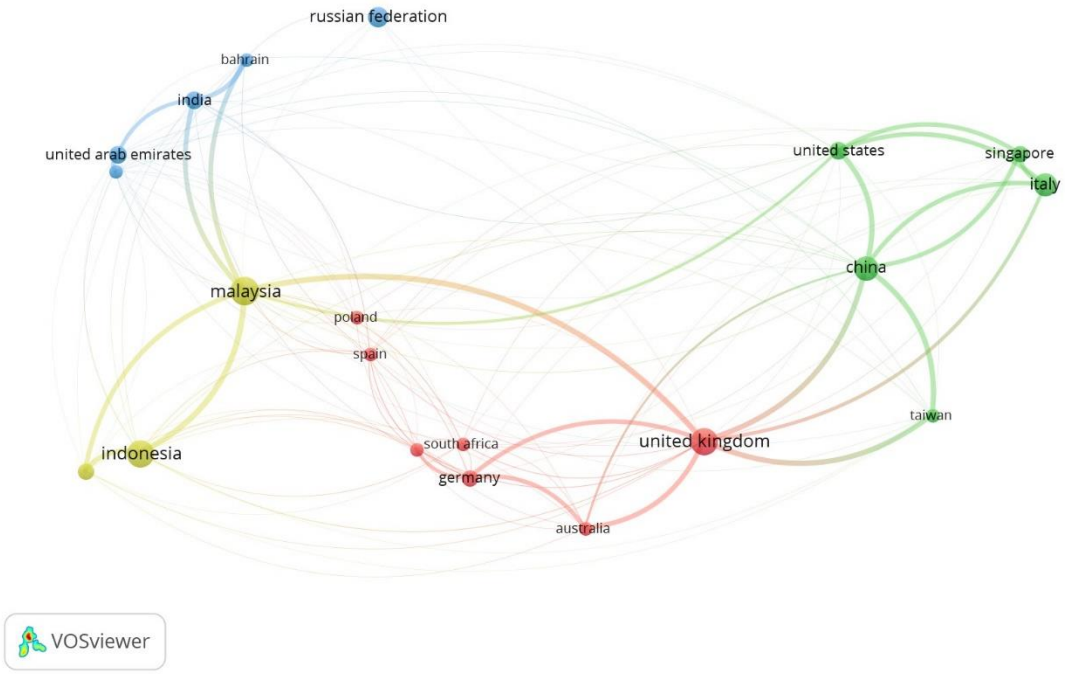

Fig. 5: Co-authorship by Countries

4.9 Article Sources

Table 4 introduces us to the top 10 sources of the article based on the years 2017 to 2023. Journal of Open Innovation, with an h-index of 6 and a g-index of 8, and Journal of Risk and Financial Management, with an h-index of 4 and a g-index of 6, rank in the top position with 8 publications in fintech and sustainability. In terms of citations, the Journal of Open Innovation has the most, with 302 citations. After that, the European Business Organization Law Review, Electronic Commerce Research and Applications, Journal of Cleaner Production, and International Review of Financial Analysis have citations of 234, 204, 157, and 103, respectively.

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Table 4: Articles Sources

Sources	h-index	g-index	TC	NP	PY_start
Journal of Open Innovation: Technology, Market, and Complexity	6	8	302	8	2021
Journal of Risk and Financial Management	4	6	43	8	2019
Journal of Islamic Monetary Economics and Finance	4	4	45	4	2019
Banks and Bank Systems	2	4	20	4	2018
Cogent Economics and Finance	3	3	20	3	2022
Electronic Commerce Research and Applications	2	2	204	2	2017
European Business Organization Law Review	2	2	234	2	2020
Finance Research Letters	2	2	14	2	2023
Finance: Theory and Practice	2	2	10	2	2021
International Journal of Economics and Business Administration	2	2	18	2	2019

4.10 Articles and Citations by Authors

Table 5 exhibits the top authors' affiliation, number of citations, publications, h-index, g-index, and publication year. This table reflects the author's contribution to this field (Lariviere et al., 2009). Among all the authors, Kauffman RJ ranks in the top position with 3 publications, both g-index and h-index of 3. The author also has 220 citations, the highest one on the list. In the measure of citation, Nathan RJ, Nugraha DP, and Setiawan B score the second position with 108 citations.

Table 5: Articles and Citations by Authors

Authors	Affiliation	h_index	g_index	TC	NP	PY_start
Kauffman Rj	Singapore Management University, Singapore	3	3	220	3	2017
Azman Nhn	School of Management, University Sains Malaysia, Malaysia;	2	2	9	2	2020
Dudin Mn	Market Economy Institute, Russian Academy of Sciences, Moscow, Russian Federation;	2	2	10	2	2021
Galazova Ss	Department of Economics, North Ossetia State University, Vladikavkaz, Russian Federation;	2	2	18	2	2019
Giudici P	Department of Economics and Management, University of Pavia, Italy	2	2	13	2	2023
Masron Ta	Department of Economics, University Putra Malaysia, Malaysia	2	2	7	2	2020
Nathan Rj	Faculty of Business, Multimedia University, Malaysia.	2	2	108	2	2021
Nugraha Dp	Doctoral School of Economic and Regional Sciences, The Hungarian University of Agriculture and Life Sciences, Hungary.	2	2	108	2	2021
Rabbani Mr	Department of Economics and Finance, University of Bahrain, Bahrain.	2	2	82	2	2021
Setiawan B	Doctoral School of Economic and Regional Sciences, Hungarian University of Agriculture and Life Sciences, Hungary.	2	2	108	2	2021

4.11 Keyword Occurrence

We employ the Bibliometric software to analyze the keyword occurrence to draw a tree map of the 15 most frequent keywords in Figure 6. These keywords in a tree map show that Fintech stands out as the most

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significant, as evidenced by 46 times (39%), confirming this as the most used term in the literature. Sustainability is the second most frequently used keyword with 13 times(11%), pointing to a further shift in focus on sustainable solutions within the fintech sector. Sustainability in fintech refers to enhancing value in the financial sectors through combining finance and ESG (Chen et al., 2019). Financial inclusion and technology appeared highly relevant 10 times (8%) and 9 times (8%) of the total keywords. Fintech is essential in expanding financial inclusion by delivering banking services to needy communities (Philippon, 2019). Among them, blockchain and digital transformation occur 5 times (4%), suggesting shared implications for the emerging world of fintech.

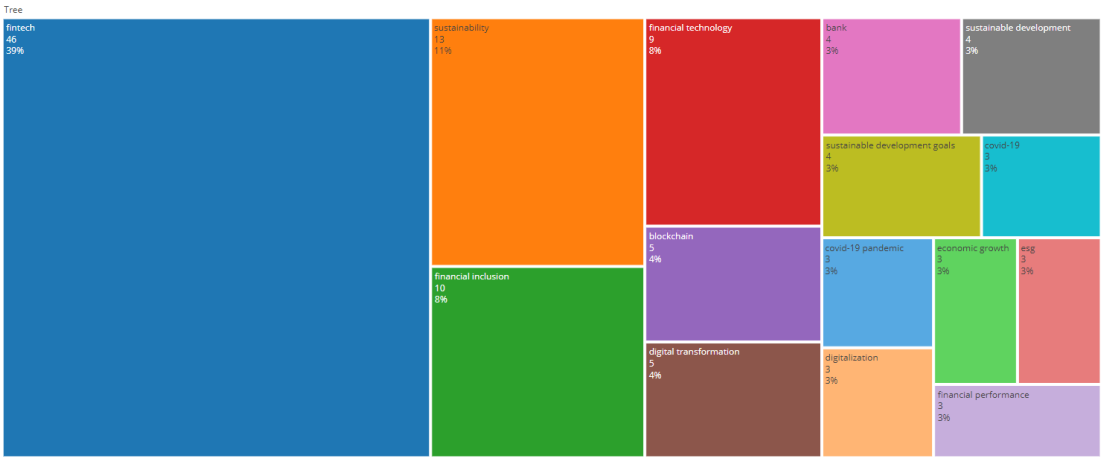

Fig. 6: Keyword occurrence

4.12 Keyword Trends

VOSviewer analyzes the trend topics in fintech literature to determine the trend of keywords between 2021 and 2023, as shown in Figure 7.

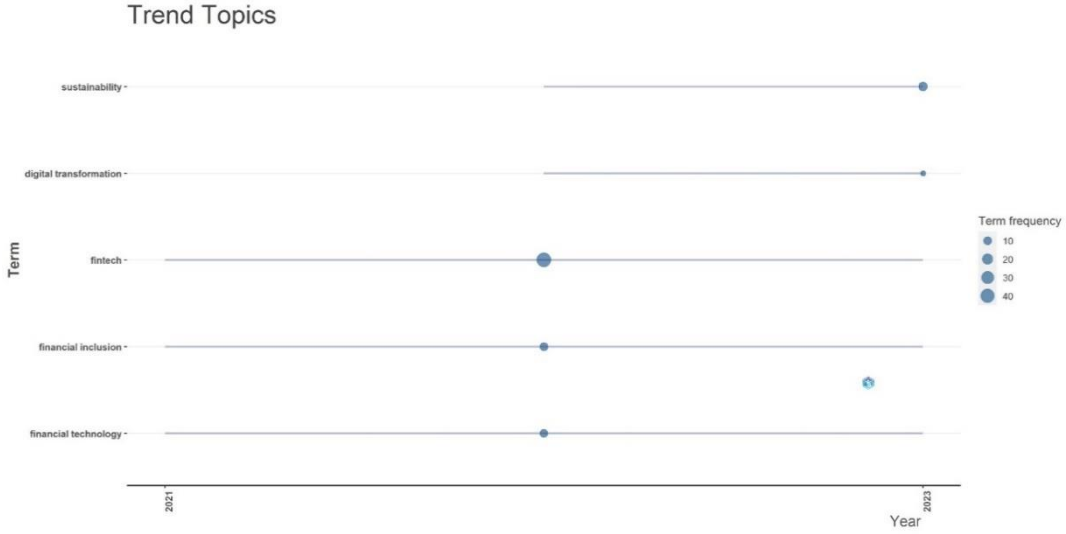

Fig. 7: Keyword Trends

Fintech was the most dominant keyword for the period between 2021 and 2023. The fintech industry has steadily grown due to technological enhancements and customer demands (Lee & Shin, 2020). Other keywords, such as financial inclusion and financial technology, were also essential relevant topics for this period. Sustainability and digital transformation started to gain popularity in 2022 and continued until 2023.

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4.13 Keyword Co-occurrence

Figure 8 illustrates the analyses of the co-occurrence network of keywords. Each cluster has been highlighted using the keyword mentioned most frequently within it. Gai et al.(2018) found that innovation and blockchain are critical to the decision-making process in fintech. Thakor (2020) states that sustainable development is correlated with attaining other development objectives in fintech.

Cluster (Red): This cluster contains keywords such as financial system, financial crimes, banking, digital transformation, perception, climate change, digitization, and technology adoption.

Cluster (Green): This cluster contains financial technology, China, finance, economic growth, and environmental economics.

Cluster (Blue): This cluster contains innovation, decision-making, and blockchain.

Cluster (Yellow): This cluster includes sustainable development and development goals.

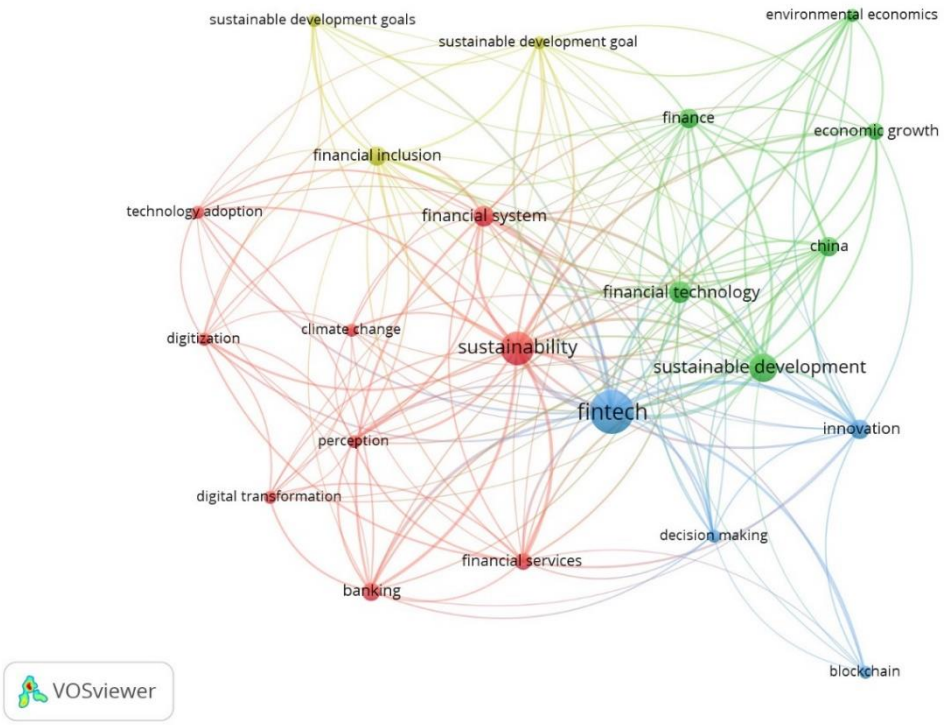

Fig. 8: Keyword Co-occurrence

4.14 Thematical Map

Figure 9 shows a thematic study that uses keyword co-occurrence analysis to unravel the evolution of research themes within a specific field. These themes are categorized into four quadrants: motor, niche, emerging or declining, and basic (Cobo et al., 2011; Saha et al., 2024).

Motor theme: The first quadrant on the upper right side is referred to as a motor theme with high impact and centrality that is adequately studied, well-developed, and central to the field. Keywords in this theme, such as "digital transformation," "economic growth," and "digitalization," are highly developed and serve as basic insights for the fintech field. Digitalization is a key enabler for the fintech industry (Arner et al., 2020). This digitization of financial industries provides a reliable trajectory for further economic growth (Vovchenko et al.,2019).

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Niche theme: The second quadrant in the upper left is a niche theme with high impact but low centrality. The keywords in this quadrant, including "ESG," "sustainable Finance," "FinTech," "blockchain," and "innovation," have significant engagements within the fintech domain. Further research with them could potentially contribute to this field, opening new possibilities for the FinTech industry. The Global FinTech Index identifies ESG as the highest value among thematic indices (Rafiuddin et al., 2023).

Emerging or Declining theme: The third quadrant in the low left is the emerging theme with low centrality and impact. The keywords in this quadrant include "financial inclusion," "sustainable development goal," and "financial literacy." These topics have more scope for future research, or researchers may no longer be interested in examining them.

Basic theme: The fourth quadrant in the bottom right quadrant is named as a primary theme with high centrality and low impact. The topics in this theme include "sustainability, "climate change," "financial technology," and "sustainable development." It is likely noted here that future research could focus on new areas using these shown aspects across the different clusters.

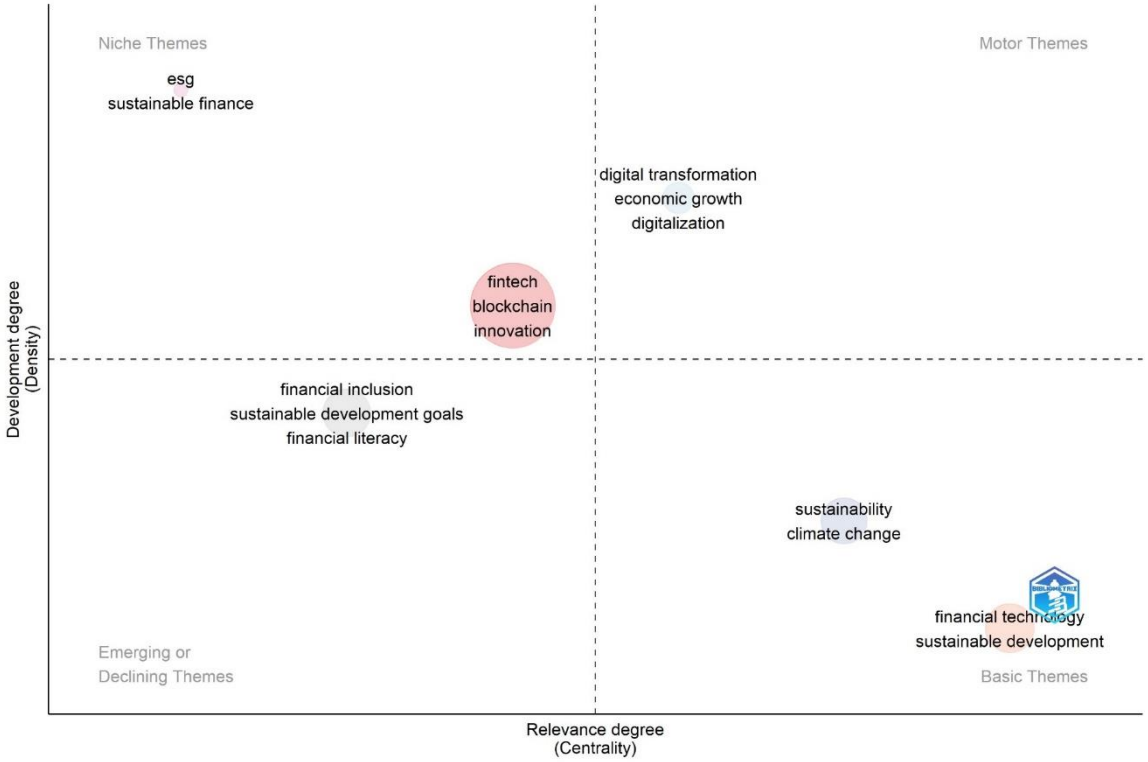

Fig. 9: Thematic Map

4.15 Factorial Analysis

We identify significant themes in red, blue, and green clusters that map the scholarly tradition of articles in a specific subject area, as shown in Figure 10. These clusters assist in arranging all the significant themes into different categories, as they show the keywords that multiple authors have repeatedly used in their studies.

The primary cluster is the financial technologies and sustainability cluster (blue), closest to the map. This cluster refers to the emerging technologies in the finance industry, digitization, sustainable development, and economic growth. The second central cluster is Islamic finance and economics (red). This cluster comprises Islamic finance, economics, blockchain, innovation, and systematic reviews. Leveraging blockchain and innovative tech to advance financial inclusion is crucial for future research (Liu et al., 2023). It covers areas like the principles and methods of finance and economics rooted in Islamic teachings and using elements of technological advancement and systematic approach. The third cluster is the compliance and data cluster (green). This slightly splintered cluster involves ESG, compliance, data, and

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reporting and could be interpreted as the notion of governance and accountability in the sustainability domain. The concept of ESG is dynamic and considered a crucial issue in international financial regulation, while FinTech has the potential to lower the cost of ESG reporting (Duran & Tierney, 2023).

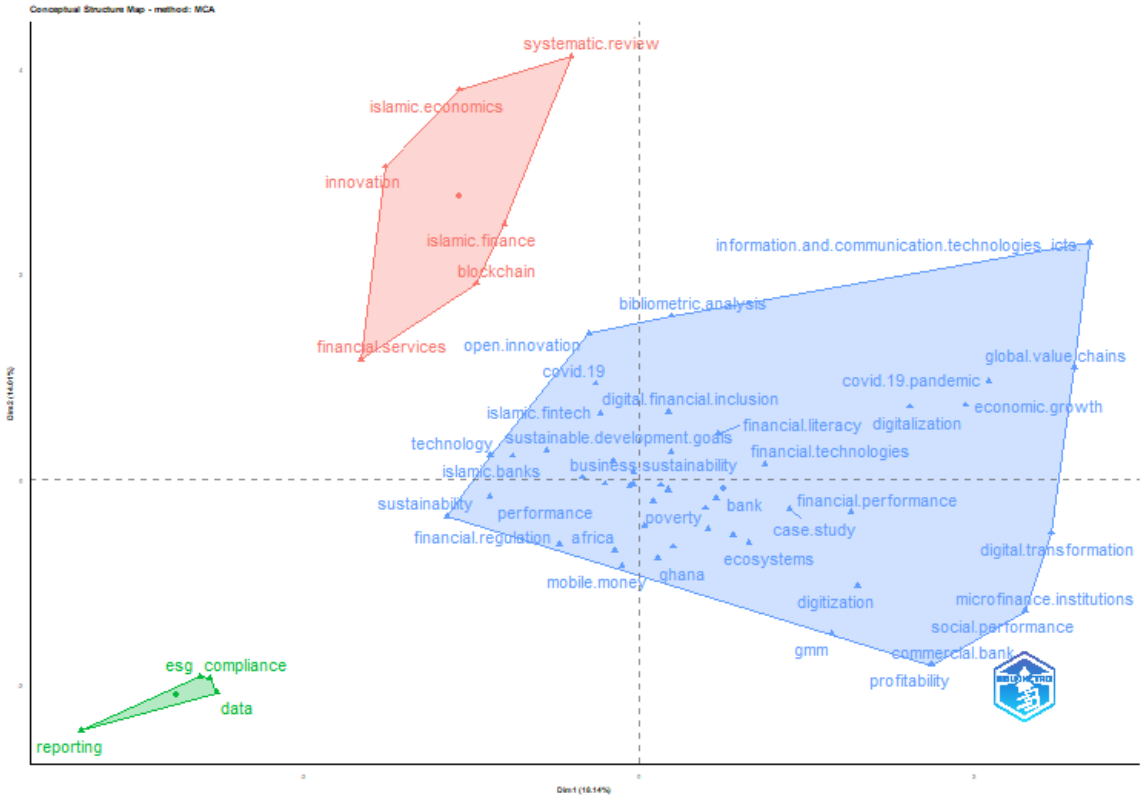

Fig. 10: Factorial Analysis

5. Future Research Implications

The analysis in Figure 11 through bibliometric coupling reveals four critical policy implications that have emerged as crucial considerations for addressing the challenges in the fintech landscape and fostering sustainability within business and economics.

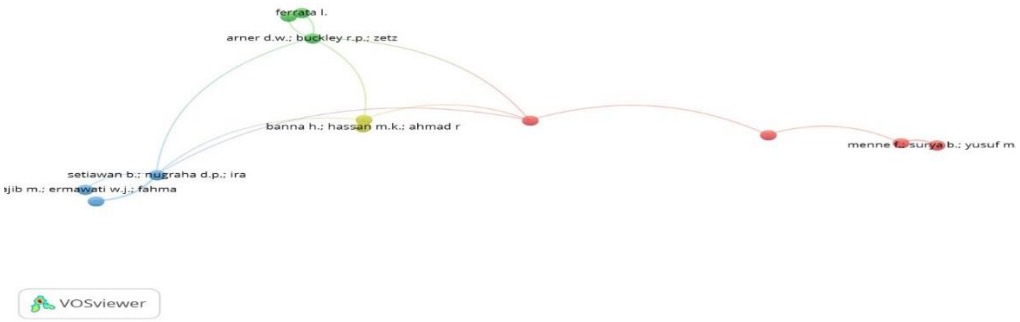

Fig. 11: Bibliometric Coupling

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These policy implications identify challenges and point out future research questions integral to understanding and navigating the complex interplay between financial technology and sustainable practices, with potentially far-reaching implications for various stakeholders.

Table 6: Clusters, Challenges, and Proposed Research Questions

Clusters	Challenges	Proposed Research Questions
Connecting sustainability in the fintech ecosystem	1. Enhancing the potential of human resources 2. Globally, the financial industry is not homogenous. 3. Factors like mobile users, agents, and merchants were excluded. 4. Islamic FI is yet to adopt updated and innovative fintech.	1. Can implementation of Shariah-based fintech empower SMEs? 2. Is there any significant correlation between the business model and fintech sustainability? 3. Does regulation of fintech have any significant association with the sustainability of fintech? 4. Are mobile money agents an essential enabler of financial inclusion or not? 5. What methods can include the unbanked under mobile money services to obtain Fintech sustainability?
Developing a sustainable financial inclusion framework	1. Digital identification might lead to personal data leakage and abuse. 2. Poor communication infrastructure will hamper digital financial infrastructure development. 3. Enhancing financial education, creating an effective consumer protection system, and reducing barriers are challenging. 4. Unavailability of smartphones and uninterrupted internet access	1. How do we address the financial needs of potential unserved segments? 2. What is the aftermath of adopting building blocks such as the taxonomy regulation? 3. How can physical and technological barriers be reduced to enhance financial inclusion? 4. How can regulators increase financial knowledge of potential uses? 5. What strategies can decision-makers implement to secure reliable and technical infrastructures to facilitate financial inclusion?
Facilitation of open fintech Innovation to spur Sustainable development	1. Data collection during COVID-19 constrained the quality of the research. 2. Data from a limited geographical location distorts the true representation of reality. 3. Gaps between developing and developed economies	1. Does MSME's adoption of FinTech impact FinTech adoption by SMEs in Indonesia? 2. Does FinTech adoption by SMEs have a similar effect on a global scale? 3. Is Fintech adoption by Indonesian SMEs affected by open innovation and trust? 4. How much is Fintech adoption affected by government regulation on FinTech?
Ensure stability in fintech for long-term sustainable development.	1. Reduced financial knowledge, tax laws, and inadequate infrastructure prevent low-income households from taking advantage of more financial services. 2. Lack of appropriate consumer protection regulations.	1. How will financial inclusion help create a linkage between the savings and borrowing units? 2. Will initiatives taken by the UN help increase financial inclusion by achieving SGDs?

5.1. Cluster Red: Connecting Sustainability in Fintech Ecosystem

Cluster red includes articles exploring the potentiality and impact of fintech under both conventional and Islamic financial ecosystems in driving financial inclusion, performance, value, and sustainability. Incorporating sustainability into the Fintech ecosystem involves more than just developing environmentally friendly financial products; it also entails encouraging a sustainable culture within the financial sector. Using technology, data, and inventive business models, fintech can significantly improve society and the environment by using technology, data, and inventive business models. Senyo et al. (2022) note how fintech, such as mobile money, is driving financial inclusion in Ghana and put forward theoretical propositions covering areas such as innovation, collaboration, legalization, protection, and

sustainable practices in fintech that can help drive financial inclusion in many other African and developing countries. Merello et al. (2021) identify that company and board size, CSR reports, and RepTrak positively drive the sustainability profile of FinTech firms. However, how much value the fintech business gains from a high degree of sustainability is still being determined. Menne et al. (2022) conclude that adopting Shariah fintech by small and medium enterprises would enhance their performance, growth, and sustainability. This transformation will boost economic growth, improve people's welfare, and close the socioeconomic divide between Sharia and conventional business, enhancing the fintech ecosystem.

5.2. Cluster Green: Developing Sustainable Financial Inclusion Framework

Cluster Green delves into FinTech's role in achieving the Sustainable Development Goals (SDGs) and provides insights on how regulators should approach sustainable finance strategy, particularly fintech. A sustainable financial inclusion framework promotes equity in financial services and environmental and social well-being. Underserved people can receive financial services through digital banking, microfinance, and agent networks. Ferrata (2019) investigates in his studies whether financial inclusion through fintech can assist in achieving several SDGs and concludes with positive remarks regarding its impact in recent years. Arner et al. (2019) also take the stance that fintech can help achieve balanced growth as envisioned by the UN in their SDGs. They have further suggested the development of four pillars encompassing areas such as a convenient system to create digital identity and connecting government services and financial markets through the electronic payment system. Zetzsche & Anker-Sørensen (2022) suggested how regulators should approach the new sustainable finance Strategy and fintech and that regulators support the early adopters.

5.3. Cluster Blue: Facilitation of Open Fintech Innovation to Spur Sustainable Development

Cluster Blue focuses on the papers that explore how the enablement of open innovation in fintech is rapidly playing a significant role in accelerating financial inclusion by connecting businesses to unbanked people. Open innovation allows for the continuous development of fintech, allowing businesses to reach out to all levels of people, including people with minimal financial literacy, thus evolving financial access on a scale never seen and, in turn, promoting sustainable development. In their studies, Nugraha et al. (2022) identified that capitalizing on a large number of smartphone users and the rapid development of fintech has allowed for significant growth in the financial inclusion of SMEs. Furthermore, the limited mobility during the pandemic has enhanced and fast-tracked the adoption of FinTech by SMEs. The study also identifies that even lower levels of financial literacy did not become a barring factor in the adoption of fintech by SMEs. Setiawan et al. (2021) determined that the user's attitude is the most critical contributor, and financial literacy was the least essential factor in adopting fintech. The findings of these two studies can be important for developing countries with lower financial literacy rates. The study has suggested that the government should focus on developing ICT infrastructure to encourage the growth of fintech innovations. Najib et al. (2021) focused on the sustainability of small businesses. They identified that factors such as "knowledge, safety perceptions, performance expectations, social influence, facilitation conditions, and price values" influence fintech adoption. The study pointed out that lack of access to financing sources is a significant problem for small businesses and concluded the positive impacts of adopting fintech by small businesses in enhancing their financial access, operational capacity, and overall sustainability.

5.4. Cluster Yellow: Ensure Stability in Fintech for Long-Term Sustainable Development

Cluster Yellow investigates fintech as an effective tool to promote long-term sustainable development. The stable adoption of fintech can arm the economy with the necessary versatility and adaptability to

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combat severe impediments to sustainable development, such as income inequality and global crises. Demir et al. (2020) concluded in their work that fintech, through enhancing financial inclusion, can contribute to reducing income inequality and, in turn, promote sustainable development, especially for countries with relatively higher incomes. The study has further pointed out that policies must ensure enhanced financial access is followed by enhanced usage to reduce income inequality. Fintech can play a pivotal role in achieving these two steps. Banna et al. (2021) focus on the role of digital finance or fintech in the Islamic Banking sector to combat the economic crisis during the COVID-19 pandemic period. They identify that the emphasis on fintech enhances growth, stability, and sustainability while at the same time lowering risk in Islamic Banks.

6. Conclusion, Limitations, and Future Study

This study attempts to find research trends of fintech in the sustainability field by applying bibliometric analysis. The study noticed a steady increase in the publication trend, but significant growth can be observed after 2020. We observe that the top two most cited journals are focused on financial inclusion, emphasizing that fintech brings sustainability through serving the unbanked population. University of Pavia, University Bosowa, and Kingdom University published the most papers. These universities are spread worldwide, ensuring global interest in fintech and sustainability. Keyword trends show that sustainability and digital transformation started to gain popularity in 2022 and continued until 2023. Keyword co-occurrence analysis identifies four main clusters: sustainability, sustainable development, fintech, and financial inclusion. The thematic map shows that digital transformation, economic growth, and digitalization are well-established topics, whereas new research can be extended to sustainability, climate change, and financial technology. Based on the factorial analysis, digitization through emerging financial technologies and their impact on sustainability is a mainly extensively researched area. The bibliometric coupling identifies connecting sustainability in the fintech ecosystem, sustainable financial inclusion, open fintech innovation, and stability in fintech for future research direction to bring faster adoption of fintech in sustainability goals.

Bibliometric research on fintech for sustainability has important implications for researchers, regulators, and policymakers. It systematically analyzes publication trends, key themes, and influential studies in this emerging field. For researchers, it identifies gaps in the literature and fosters interdisciplinary collaboration. Regulators can use this research to understand the changing regulatory landscape of fintech and sustainability, while policymakers can gain insights into how fintech can drive sustainable economic growth. This type of research provides a data-driven foundation for evidence-based decision-making and strategic planning in pursuing sustainability through fintech innovations.

Despite its utility in mapping academic landscapes and identifying influential works, bibliometric analysis faces several limitations that can impact the research outcomes of our study. First, the research looks at articles in the Scopus database and has specific rules to include them. However, using the Web of Science and a more focused method might give better results. Bibliometric methods often fail to capture interdisciplinary and practical research applications, limiting their applicability in real-world scenarios. The rapid pace of technological and methodological advancements in Fintech and sustainability can also render bibliometric findings quickly outdated. Future studies on fintech for sustainability should focus on integrating emerging financial technologies with sustainable development goals to create a more inclusive, transparent, and efficient economic system.

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REFERENCES

Abdikeev, N. M., Bogachev, Y. S., & Melnichuk, M. V. (2018). Identifying the factors that contribute to sustainable development of the national economy. *European Research Studies Journal*,21(2), 411-225. https://doi.org/10.35808/ersj/1011

Addy, W. A., Ofodile, O. C., Adeoye, O. B., Oyewole, A. T., Okoye, C. C., Odeyemi, O., & Ololade, Y. J. (2024). Data-driven sustainability: How fintech innovations are supporting green finance. *Engineering Science & Technology Journal*, *5*(3), 760-773. https://doi.org/10.51594/estj.v5i3.871

Afjal, M. (2023). Bridging the financial divide: a bibliometric analysis on the role of digital financial services within FinTech in enhancing financial inclusion and economic development. *Humanities and Social Sciences Communications*, *10*(1), 1-27. https://doi.org/10.1057/s41599-023-02086-y

Agrawal, R., Agrawal, S., Samadhiya, A., Kumar, A., Luthra, S., & Jain, V. (2024). Adoption of green finance and green innovation for achieving circularity: an exploratory review and future directions. *Geoscience Frontiers*, *15(4)*, 101669. https://doi.org/10.1016/j.gsf.2023.101669

Ahammed, A., & Saha, S.(2018). Firm-specific financial determinants of non-performing loan in the banking sector of developing countries: Evidence from the listed commercial banks in Bangladesh. *Journal of Economics and Business*,*1*(4). . https://doi.org/10.31014/aior.1992.01.04.49

AIS, D. (2018). Firm-specific Financial Determinants of Non-Performing Loan in the Banking Sector of Developing Countries: Evidence from the Listed Commercial Banks in Bangladesh. *Journal of Economics and Business*, *1*(4), 555–563. https://doi.org/10.31014/aior.1992.01.04.49

Alhammad, M. M., Tan, C., Alsarhani, N., & Zolkepli, I. A. (2022). What impacts backers' behavior to fund reward-based crowdfunding projects? A systematic review study. *Pacific Asia Journal of the Association for Information Systems*, *14*, 90-110. https://doi.org/10.17705/1pais.14207

Arner, D. W., Buckley, R. P., Zetzsche, D. A., & Veidt, R. (2020). Sustainability, FinTech, and financial inclusion. *European Business Organization Law Review*, *21*, 7-35.

Azman, N. H. N., & Zabri, M. Z. M. (2022). Sharīʿah-compliant fintech usage among microentrepreneurs in Malaysia: An extension of UTAUT model. *Journal of Islamic Monetary Economics and Finance*, *8*(2), 305-324.

Baker, H., Kaddumi, T. A., Nassar, M. D., & Muqattash, R. S. (2023). Impact of financial technology on improvement of banks' financial performance. *Journal of Risk and Financial Management*, *16*(4), 230. https://doi.org/10.3390/jrfm16040230

Banna, H., Hassan, M. K., Ahmad, R., & Alam, M. R. (2021). Islamic banking stability amidst the COVID-19 pandemic: The role of digital financial inclusion. *International Journal of Islamic and Middle Eastern Finance and Management*, *15*(2), 310-330. https://doi.org/10.1108/imefm-08-2020-0389

Barata, A. (2019). Strengthening national economic growth and equitable income through sharia digital economy in Indonesia. *Journal of Islamic Monetary Economics and Finance*, *5*(1), 145-168. https://doi.org/10.21098/jimf.v5i1.1053

Callon, M., Courtial, J. P., Turner, W. A., & Bauin, S. (1983). From translations to problematic networks: An introduction to co-word analysis. *Information (International Social Science Council)*, 22(2), 191-235.

Chen, M. A., Wu, Q., & Yang, B. (2019). How valuable is FinTech innovation? *The Review of Financial Studies*, *32*(5), 2062-2106. https://doi.org/10.1093/rfs/hhy130

Cobo, M. J., López-Herrera, A. G., Herrera-Viedma, E., & Herrera, F. (2011). Science mapping software tools: Review, analysis, and cooperative study among tools. *Journal of the American Society for Information Science and Technology*, *62*(7), 1382-1402. https://doi.org/10.1002/asi.21525

Demir, A., Pesqué-Cela, V., Altunbas, Y., & Murinde, V. (2020). Fintech, financial inclusion, and income inequality: a quantile regression approach. *The European Journal of Finance*, *28*(1), 86-107.

Deng, X., Huang, Z., & Cheng, X. (2019). FinTech and sustainable development: Evidence from China based on P2P data. *Sustainability*, *11*(22), 6434. https://doi.org/10.3390/su11226434

Ding, J., Li, L., & Zhao, J. (2024). How does fintech prompt corporations toward ESG sustainable development? Evidence from China. *Energy Economics*, *131*, 107387.

Donthu, N., Kumar, S., Mukherjee, D., Pandey, N., & Lim, W. M. (2021). How to conduct a bibliometric analysis: An overview and guidelines. *Journal of Business Research*, *133*, 285-296. https://doi.org/10.1016/j.jbusres.2021.04.070

Duran, R. E., & Tierney, P. (2023). Fintech data infrastructure for ESG disclosure compliance. *Journal of Risk and Financial Management*, *16*(8), 378. https://doi.org/10.3390/jrfm16080378

Ellili, N. O. D. (2023). Is there any association between FinTech and sustainability? Evidence from bibliometric review and content analysis. *Journal of Financial Services Marketing*, *28*(4), 748-762. https://doi.org/10.1057/s41264-022-00200-w

Ferrata, L. (2019). Digital financial inclusion–an engine for "leaving no one behind". *Public Sector Economics*, *43*(4), 445-458.

Franco-Riquelme, J. N., & Rubalcaba, L. (2021). Innovation and SDGs through social media analysis: Messages from fintech firms. *Journal of Open Innovation: Technology, Market, and Complexity*, *7*(3), 165. https://doi.org/10.3390/joitmc7030165

Gai, K., Qiu, M., & Sun, X. (2018). A survey on FinTech. *Journal of Network and Computer Applications*, *103*, 262-273. https://doi.org/10.1016/j.jnca.2017.10.011

Gianfrate, G., & Peri, M. (2019). The green advantage: Exploring the convenience of issuing green bonds. *Journal of Cleaner Production*, *219*, 127-135.

Islam, J., Saha, S., Hasan, M., Mahmud, A., & Jannat, M. (2024, April). Cognitive Modelling of Bankruptcy Risk: A Comparative Analysis of Machine Learning Models to Predict the Bankruptcy. In *2024 12th International Symposium on Digital Forensics and Security (ISDFS)* (pp. 1-6). IEEE. https://doi.org/10.1109/isdfs60797.2024.10527269

Kou, G., Chao, X., Peng, Y., Alsaadi, F. E., & Herrera Viedma, E. (2019). Machine learning methods for systemic risk analysis in financial sectors.

Kumar, S. (2015). Co-authorship networks: a review of the literature. *Aslib Journal of Information Management*, *67*(1), 55-73. https://doi.org/10.1108/ajim-09-2014-0116

Kwong, R., Kwok, M. L. J., & Wong, H. S. (2023). Green FinTech innovation as a future research direction: a bibliometric analysis on green finance and FinTech. *Sustainability*, *15*(20), 14683.

Lan, V., & Giang, N. (2021). Bank's brand, social influence, and its impact on the decision on using mobile banking services of individual customers: An empirical study. *Accounting*, *7*(4), 925-932. https://doi.org/10.5267/j.ac.2021.1.015

Larivière, V., Gingras, Y., & Archambault, É. (2009). The decline in the concentration of citations, 1900–2007. *Journal of the American Society for Information Science and Technology*, *60*(4), 858-862.

Lee, I., & Shin, Y. J. (2018). Fintech: Ecosystem, business models, investment decisions, and challenges. *Business Horizons*, *61*(1), 35-46.

Li, K., Kim, D. J., Lang, K. R., Kauffman, R. J., & Naldi, M. (2020). How should we understand the digital economy in Asia? Critical assessment and research agenda.(2020). *Electronic Commerce Research and Applications*, *44*, 1-16. https://doi.org/10.1016/j.elerap.2020.101004

Liu, A., Urquía-Grande, E., López-Sánchez, P., & Rodríguez-López, Á. (2023). Research into microfinance and ICTs: A bibliometric analysis. *Evaluation and Program Planning*, *97*, 102215. https://doi.org/10.1016/j.evalprogplan.2022.102215

Liu, X., Bollen, J., Nelson, M. L., & Van de Sompel, H. (2005). Co-authorship networks in the digital library research community. *Information processing & management*, *41*(6), 1462-1480. https://doi.org/10.1016/j.ipm.2005.03.012

Luo, S., Sun, Y., Yang, F., & Zhou, G. (2022). Does fintech innovation promote enterprise transformation? Evidence from China. *Technology in Society*, *68*, 101821. https://doi.org/10.1016/j.techsoc.2021.101821

Macchiavello, E., & Siri, M. (2020). Sustainable Finance and Fintech: Can Technology Contribute to Achieving Environmental Goals? *European Banking Institute Working Paper*, *71*. https://doi.org/10.2139/ssrn.3672989

Menne, F., Surya, B., Yusuf, M., Suriani, S., Ruslan, M., & Iskandar, I. (2022). Optimizing the financial performance of SMEs based on Sharia economy: Perspective of economic business sustainability and open innovation. *Journal of Open Innovation: Technology, Market, and Complexity*, *8*(1), 18.

Merello, P., Barberá, A., & De la Poza, E. (2022). Is the sustainability profile of FinTech companies a key driver of their value?. *Technological Forecasting and Social Change*, *174*, 121290. https://doi.org/10.1016/j.techfore.2021.121290

Najib, M., Ermawati, W. J., Fahma, F., Endri, E., & Suhartanto, D. (2021). Fintech in the small food business and its relation with open innovation. *Journal of Open Innovation: Technology, Market, and Complexity*, *7*(1), 88. https://doi.org/10.3390/joitmc7010088

Nugraha, D. P., Setiawan, B., Nathan, R. J., & Fekete-Farkas, M. (2022). FinTech adoption drivers for innovation for SMEs in Indonesia. *Journal of Open Innovation: Technology, Market, and Complexity*, *8*(4), 208.

Okoli, T. T., & Tewari, D. D. (2021). Does the adoption process of financial technology in Africa follow an inverted U-shaped hypothesis? An evaluation of Rogers's diffusion of innovation theory. *Asian Academy of Management Journal of Accounting and Finance*, *17*(1), 281-305. https://doi.org/10.21315/aamjaf2021.17.1.10

Philippon, T. (2019). On Fintech and financial inclusion (No. w26330). *National Bureau of Economic Research*. https://doi.org/10.3386/w26330

Rabbani, M. R., Bashar, A., Nawaz, N., Karim, S., Ali, M. A., Rahiman, H. U., & Alam, M. S. (2021). Exploring the role of Islamic Fintech in combating the aftershocks of COVID-19: The open social innovation of the Islamic financial system. *Journal of Open Innovation: Technology, Market, and Complexity*, *7*(2), 136. https://doi.org/10.3390/joitmc7020136

Rahman, A. A. A., Rahiman, H. U., Meero, A., & Amin, A. R. (2022). Fintech innovations and Islamic banking performance: post-pandemic challenges and opportunities., *Banks and Bank Systems*, 18(4),281-292.

Sabuj, S., Arif, A., & Momotaz, B. (2019). Audit Expectation Gap: Empirical Evidence from Bangladesh, SSRG. *International Journal of Economics and Management Studies*, *6*(5), 32-36.

Sabuj, S., Arif, A., & Momotaz, B. (2019). Audit Expectation Gap: Empirical Evidence from Bangladesh. *International Journal of Economics and Management Studies*, *6*(5), 32-36. https://doi.org/10.14445/23939125/ijems-v6i5p106

Saha, S., Bishwas, P. C., Das, U., & Arshi, A. S. Is Fintech Just an Innovation? Impact, Current Practices, and Policy Implications of Fintech Disruptions.

Saha, S., Bishwas, P. C., Das, U., & Arshi, A. S. (2024). Is Fintech Just an Innovation? Impact, Current Practices, and Policy Implications of Fintech Disruptions. *International Journal of Economics, Business and Management Research*, *8*(4),174-193. https:// doi.org/10.51505/IJEBMR.2024.8412

Saha, S., Hasan, A. R., Islam, K. R., & Priom, M. A. I. (2024). Sustainable Development Goals (SDGs) practices and firms' financial performance: The moderating role of country governance. *Green Finance*, *6*(1), 162-198. https://doi.org/10.3934/gf.2024007

Saha, S., Hasan, A. R., Mahmud, A., Ahmed, N., Parvin, N., & Karmakar, H. (2024). Cryptocurrency and financial crimes: A bibliometric analysis and future research agenda. *Multidisciplinary Reviews*, *7*(8), 2024168-2024168. https://doi.org/10.31893/multirev.2024168

Senyo, P. K., Karanasios, S., Gozman, D., & Baba, M. (2021). FinTech ecosystem practices shaping financial inclusion: The case of mobile money in Ghana. *European Journal of Information Systems, 31*(1), 112-127.

Sergeeva, S., Gladilina, I., Bulochnikova, N., Shichkin, I., Kochetkov, E., & Filonova, A. (2023). Impact of green fintech solutions on achieving ESG principles. *Revista Gestão & Tecnologia, 23*(1), 335-345.

Setiawan, B., Nugraha, D. P., Irawan, A., Nathan, R. J., & Zoltan, Z. (2021). User innovativeness and fintech adoption in Indonesia. *Journal of Open Innovation: Technology, Market, and Complexity, 7*(3), 188.

Thakor, A. V. (2020). Fintech and banking: What do we know? *Journal of financial intermediation*, *41*, 100833. https://doi.org/10.1016/j.jfi.2019.100833

Varga, D. (2018). Fintech: supporting sustainable development by disrupting finance. *Budapest Management Review*, *8*(11), 231-249.

Vovchenko, N. G., Galazova, S. S., Sopchenko, A. A., & Dzhu, O. S. (2019). Fintech ecosystem as an instrument of sustainable development provision. International *Journal of Economics and Business Administration,7*, 147-155. https://doi.org/10.35808/ijeba/379

Waltman, L., & van Eck, N. J. (2013). A systematic empirical comparison of different approaches for normalizing citation impact indicators. *Journal of Informetrics, 7*(4), 833-849. https://doi.org/10.1016/j.joi.2013.08.002

Zetzsche, D. A., & Anker-Sørensen, L. (2022). Regulating sustainable finance in the dark. *European Business Organization Law Review*, *23*(1), 47-85. https://doi.org/10.1007/s40804-021-00237-9

Zhang-Zhang, Y., Rohlfer, S., & Rajasekera, J. (2020). An eco-systematic view of cross-sector fintech: The case of Alibaba and Tencent. *Sustainability, 12*(21), 8907. https://doi.org/10.3390/su12218907