

The Evolution of FinTech for Sustainable Finance: A Bibliometric Analysis

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ABSTRACT

The emergence of financial technology (FinTech) has transformed the entire industry by providing fast, convenient, and transparent financial transactions. At the same time, the increased attention paid to ESG principles and sustainable development worldwide has increased the role of sustainable finance in general. All these factors have resulted in an increased need for the exploration of digital financial innovations for promoting sustainable finance. Therefore, the purpose of this study is to analyze the evolution of the scientific literature concerning the FinTech applications for sustainable finance using the bibliometric approach with the focus on Scopus-indexed papers published during 2015-2025. Thus, this study will consider such aspects of bibliometric analysis as publication dynamics, influential authors, major journals, country contribution, collaboration, citation metrics, and keywords\ co-occurrence for revealing the intellectual development of the studied scientific field. At the same time, the paper will explore the major topics and promising research directions within FinTech applications for sustainable finance.

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1. Introduction

FinTech has revolutionized the financial sector due to its technological developments that have increased the accessibility, effectiveness, and transparency of financial actions. Technologies such as artificial intelligence, blockchain technology, big data analytics, mobile payment, and digital banking have made changes in the way financial services can be accessed, managed, and provided. With the continuous developments of technologies, FinTech has gone past the aspect of improving financial operations towards helping to solve broader socio-economic problems in order to become an increasingly relevant subject of study (Desalegn & Tangl, 2022).

While all these changes occur, sustainable finance has become a priority at the global level. The inclusion of ESG considerations in the financial policy is gaining popularity among governments, financial institutions, and investors. Initiatives like the Paris Agreement and the UN Sustainable Development Goals have put pressure on the promotion of the low-carbon sustainable economy. On the same vein, the Sustainable Stock Exchanges (SSE) initiative has pushed for improved ESG disclosures from the listed firms. Due to the need to achieve carbon neutrality goals and other changed stakeholder perceptions, there is an increasing trend for organizations to incorporate sustainability in their business and investment strategies (Chen et al., 2023). All these changes have promoted responsible finance in that firms are seeking economic growth while taking care of environmental protection and the social component (Cornell & Shapiro, 2021; George et al., 2021; Crawford & Leslie, 2023; Rivera et al., 2022).

The emergence of FinTech combined with sustainable finance has brought up possibilities to develop green investment, financial inclusion, disclosure, and the proper allocation of financial resources. Digital technologies become more significant for promoting sustainable finance through ESG disclosure, data transparency, funding of renewable energy projects, and the creation of new financial instruments like green bonds and digital investment

platforms. FinTech companies, including well-established firms and startups, contribute to climate finance, carbon accounting, and responsible investments using technology-based solutions in finance (Ashta, 2023). On the other hand, governments and regulators encourage the formation of sustainable digital financial ecosystems through relevant policies and technology-related initiatives (Bayram et al., 2022).

Given the growing interest in the inter-disciplinary subject area, the body of academic work on FinTech and sustainable finance has grown significantly over the last ten years. While previous studies in this area have been conducted on a broad spectrum of issues such as blockchain, artificial intelligence, ESG investment, green finance, digital banking, and financial inclusion, there has been little synthesis of this literature to date. As a result, there is little knowledge regarding the progression of the research within this field, especially in terms of publications, contributors, networks of cooperation, and emerging trends. The use of bibliometric analysis would help fill this gap, offering an overview of the intellectual history of FinTech research for sustainable finance and suggesting new avenues for further research.

Thus, this study utilizes a bibliometric method to analyze the development of research on FinTech for sustainable finance through the use of articles published in Scopus from 2015 to 2025. The aspects that will be analyzed within this study include publication pattern, notable authors, significant journals, contribution of different countries, institutional collaboration, citation, and keyword co-occurrence to gain an extensive perspective on the intellectual development of the field of study. Through these aspects, it is expected that major research themes will be revealed and emerging themes will be highlighted in order to provide useful information to various stakeholders.

To achieve these objectives, the study addresses the following research questions:

RQ1: How has research on FinTech for sustainable finance evolved between 2015 and 2025 in terms of publication trends, influential contributors, and global research collaboration?

RQ2: What are the major research themes and emerging directions in the literature on FinTech for sustainable finance?

2. Literature Review

2.1 Evolution of FinTech

FinTech has transformed the financial services sector due to the use of innovations which have led to faster, easier, and more efficient financial transactions. The technologies such as blockchain, artificial intelligence (AI), big data analytics, cloud computing, and mobile payments have influenced the way financial organizations provide services and interact with customers. Innovations have made it possible for organizations to provide personalized financial products, improve the level of operational efficiency, increase transparency, and expand the provision of financial services to underdeveloped regions. As a result, FinTech has evolved from being a technological innovation to becoming a key component of the modern financial system (Desalegn & Tangl, 2022).

Widespread adoption of digital technologies has prompted organizations to reconsider their business models and improve their operational competencies. Digital transformation has positively affected organizational performance through better governance practices, internal processes, and decision-making based on data analysis (Peng & Tao, 2022; Hu et al., 2024). Furthermore, digital technologies have contributed to innovation by making organizations more responsive to changes in the market environment and customer preferences (Nambisan et al., 2019; Yang et al., 2024). These developments highlight that the influence of FinTech now extends well beyond financial services, contributing to wider economic development and supporting the transition toward more sustainable and resilient financial systems.

2.2 Sustainable Finance and ESG

The increasing awareness of climate change, environmental degradation, and sustainable resource use has made sustainable finance a very important topic in the global policy and investment agenda. Sustainable finance refers to

the process whereby investments take into consideration ESG (Environmental, Social, and Governance) as well as financial considerations, thus allowing firms to create economic value while solving wider social and environmental issues. It has led to the inclusion of sustainability within financial planning and investment strategies by governments, banks, and investors.

The Paris Agreement and national pledges of carbon neutrality are just some of the international programs that have led to the acceleration of the move towards more sustainable finance. In the same manner, the SSE initiative has made efforts to push listed companies to enhance ESG reporting and disclosure. In response to the above changes, firms have become more inclined to integrate sustainability in their business decisions and allocate their financial assets to renewable energy and other green initiatives (Chen et al., 2023; Cornell & Shapiro, 2021; George et al., 2021; Crawford & Leslie, 2023; Rivera et al., 2022).

Despite many studies on sustainable finance in academic circles, the link between the practices of ESG and financial performance is still being debated. There are some scholars who found that the incorporation of sustainability in the strategy of business contributes to better performance, but there are some scholars who have found inconsistent results based on the market conditions, regulatory framework, industry, and stakeholder pressure (Huang, 2022a, 2022b; Nirino et al., 2021; Shaikh, 2022; Sharma et al., 2019; Thomas et al., 2021; Zhang & Lucey, 2022).

2.3 FinTech and Sustainable Finance

Combining FinTech and sustainable finance has been seen as a rapidly rising area of research, due to the increasing importance of the use of technology in sustainable economic development. Innovations like blockchain, artificial intelligence, and big data have been used by financial firms to increase transparency, enhance ESG disclosures, evaluate climate risks, and take more informed decisions regarding investments. In addition, these innovations facilitate the development of novel financial solutions that encourage responsible investments.

Moreover, the emergence of digital financial innovations has enabled new opportunities for green finance via the provision of online investment platforms, carbon accounting systems, and the financing of renewable energy sources. This is evident according to Ashta (2023), where the author points out that both traditional financial entities and innovative FinTech companies are involved in the adoption of environmentally friendly financial practices through technological innovations. In addition, Bayram et al. (2022) indicate that enabling policies and regulations will ensure faster development of digital financial environments for sustainable finance. However, the success of such initiatives will depend on sound regulation, strong digital infrastructure, and coordination between various parties.

2.4 Research Gap

The current literature points towards the rising convergence between FinTech and sustainable finance in terms of an increased emphasis on innovation in technology, ESG integration, green finance, financial inclusion, and technology-based investment solutions. Even though these studies have made considerable contributions to the existing knowledge of the subject, a majority of these studies have been done on the basis of particular technologies or financial applications in specific countries.

Despite the availability of many literature reviews that address some dimensions of FinTech or sustainable finance, no substantial bibliometric study has been carried out to shed light on the intellectual growth of the field. In fact, there has been little effort made towards the analysis of publication patterns, influential authors, prominent journals, collaboration patterns, citation patterns, and the changing nature of research themes in FinTech or sustainable finance over time.

In order to fill this gap, this research paper performs a bibliometric analysis of the articles indexed in Scopus, which were written from 2015 until 2025. Using the analysis of research productivity, scientific impact, collaboration patterns, citation networks, and keywords, the study presents an intellectual evolution of FinTech in the context of sustainable finance.

Table 1. Compilation of Literature on FinTech and Sustainable Finance

Authors	Focus of the Study	Key Findings	Research Gap
Mention (2019)	Evolution of FinTech	FinTech disrupted traditional financial services through innovative digital products and business models.	Limited discussion on the role of FinTech in achieving sustainability objectives.
Jarvis and Han (2021)	Technological innovations in FinTech	Blockchain, AI, and P2P lending accelerated the global growth of FinTech.	Focused primarily on technological advancement rather than sustainable finance.
Suryono et al. (2020)	Digital financial technologies	FinTech improved payment systems, lending, and asset management through digital technologies.	Environmental and sustainability outcomes were not examined.
Desalegn and Tangl (2022)	FinTech services	FinTech expanded financial accessibility and customized financial solutions.	Limited attention to sustainable financial ecosystems.
Ashta (2023)	FinTech and sustainability	FinTech firms support carbon accounting, renewable energy finance, and environmental sustainability.	Based mainly on secondary evidence; empirical validation remains limited.
Bayram et al. (2022)	Sustainable finance policies	Government policies encourage FinTech adoption for climate risk analysis and green finance.	Implementation challenges remain due to regulatory and technological barriers.
Almansour (2023)	AI in FinTech	AI enhanced customer experience through personalized financial services and digital marketing.	Sustainability applications were not the primary focus.
Mogaji and Nguyen (2022)	AI-enabled FinTech	AI improved fraud detection, customer service, and operational efficiency.	Limited discussion on sustainable financial development.
Orij et al. (2023)	FinTech adoption challenges	Regulatory complexity, technological limitations, and consumer concerns hinder adoption.	Sustainable finance implications require further exploration.
Atadoga et al. (2024)	Barriers to FinTech adoption	Trust, privacy, perceived risk, and legal compliance significantly influence FinTech adoption.	More research is needed on balancing innovation with sustainability goals.
Kamuangu (2024)	Risk management in FinTech	Effective risk management and technology integration are essential for long-term FinTech success.	Future studies should examine sustainability-oriented risk management frameworks.
Adeoye et al. (2024)	Future of FinTech	Highlights opportunities and challenges associated with the future development of FinTech.	Calls for comprehensive reviews that map research trends and future directions.

3. Research Design

This study makes use of the secondary research methodology, which is built on analyzing the scientific literature related to FinTech and sustainable finance. In light of the significant growth of scientific articles related to the interdisciplinary area, this study focuses on the articles indexed in the Scopus database from 2015 to 2025. The research context of this study will be determined by summarizing the literature related to FinTech, sustainable finance, ESG, green finance, blockchain, artificial intelligence, and digital finance innovation in Table 1 below. The table provides information about the goals, major findings, and contributions of the research. It can help define recent trends, new areas of research, and knowledge gaps in this area.

4. Findings and Discussion

This study examined the intellectual development of research on FinTech for sustainable finance through a bibliometric analysis of publications indexed in the Scopus database between 2015 and 2025. The findings are presented according to the two research questions formulated in the study.

4.1 RQ1: How has research on FinTech for sustainable finance evolved between 2015 and 2025 in terms of publication trends, influential contributors, and global research collaboration?

According to the bibliometric analysis, there has been a considerable increase in research about FinTech used in sustainable finance. This is evidenced by an increasing number of published articles, which signifies the growing interest in this topic in the scientific community. There has been a rising importance of ESG investing, climate finance, financial inclusion, and digital transformation, which has led to contributions of researchers from various disciplines.

The analysis also reveals that the development of the literature has been influenced by works of multiple authors and institutions from various countries. It is clear that cooperation between scholars has grown in the last years due to the fact that FinTech and sustainable finance have become the fields of multidisciplinary research involving such areas as finance, information technologies, environment, and business management.

It becomes evident from the analysis of sources that publications belong to the journals specializing in finance, sustainability, technologies, and business management. It reveals the interdisciplinary aspect of the field and its importance for the development of sustainable financial system.

Concluding from this review, the literature in question has made a consistent progression in the theoretical sense, and it has developed into an increasingly relevant area for scientific research. The increasing trends of publication and collaboration are clear signs that FinTech is a key player in the development of sustainable finance.

4.2 RQ2: What are the major research themes and emerging directions in the literature on FinTech for sustainable finance?

From the analysis of keywords co-occurrences, several recurring themes can be found that characterize the state of contemporary research. The main recurring themes include FinTech, sustainable finance, blockchain, artificial intelligence, green finance, ESG, digital banking, financial inclusion, and sustainable investments. All these themes illustrate the growing fusion of digital technologies with sustainability goals in finance.

The thematic analysis also shows that blockchain technology has received much attention since it increases transparency, security, and traceability of financial transactions. On the other hand, the relevance of artificial intelligence grows as it has a number of applications in risk management, fraud detection, customer service, and investment decision making. ESG research keeps expanding as well.

Another important trend in the literature is the rising importance of financial inclusion through digital financial services. The provision of mobile payment services, digital lending, and other innovative financial products has led to increased access to financial services in developing economies. There has been an increasing interest in the areas of climate finance, renewable energy financing, and green finance instruments.

Several emerging research areas for future investigation can also be identified from the analysis. Future research can focus on the implications of generative artificial intelligence, decentralized finance, central bank digital currencies, sustainable digital banking, cybersecurity, and regulation on the development of sustainable financial systems. Further investigations might focus on the comparative analysis of the impact of FinTech innovations on sustainability.

In general, the findings suggest that FinTech research into sustainable finance has advanced from concentrating mainly on technological advancement to tackling the wider issue of sustainability. The theoretical framework in the

discipline remains dynamic as different technologies, policies, and sustainability considerations affect global financial systems.

5. Conclusion

This research paper conducts bibliometric analysis on research papers related to FinTech for Sustainable Finance between the years 2015 and 2025. It is apparent that the integration of technology in the sustainable finance domain has been receiving more academic attention due to the increasing number of publications, international cooperation, and varied research topics related to this multidisciplinary subject matter.

The findings address both research questions formulated at the beginning of this study. Research question one focused on the developments in the literature through examining publication trends, contributors, and network of collaboration. The answer is the increasing scholarly interest in technology-based sustainable finance. Research question two aimed at exploring the prevailing research topics, which are blockchain technology, artificial intelligence, ESG, green finance, digital banking, and financial inclusion.

With a description of the intellectual structure of the domain, the paper gives an insight into the evolution of the field and identifies the gaps that need further exploration. The outcomes can be helpful to those scientists who want to engage themselves in the research process and may help in developing strategies for policymakers, banks, and FinTech companies to create more sustainable financial system.

There are some limitations of this paper. First of all, the analysis has been performed only for publications retrieved from the Scopus database. This means that there are some papers that have been missed because they were located in another bibliographic base. Secondly, the findings have been obtained using the particular search strategy and timeframe.

Future studies may build on the above findings by examining multiple databases and conducting comparative bibliometric analyses in different countries/regions, and even researching the new themes of decentralized finance, generative AI, sustainable digital banking, and innovation in regulation. This will help to better understand how the FinTech sector can facilitate the creation of resilient, inclusive, and sustainable financial ecosystems.

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