

Fintech Innovations for Financial Inclusivity: A Trend Analysis and Critical Narrative Review

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Abstract

The rapid advancement of technology in financial services has given rise to financial technology, or “fintech,” transforming how financial products and services are delivered. This paper examines how fintech innovations contribute to financial inclusivity through three analytical pillars: cost-effectiveness, accessibility, and personalization. The study employs a mixed-method design that combines a qualitative critical narrative review with quantitative bibliometric mapping. A PRISMA 2020-informed screening of Scopus-indexed literature published between 2014 and 2026 yielded 18 studies for thematic synthesis, while VOSviewer-based co-word analysis of the wider corpus identified research trends, thematic clusters, and emerging topics. The findings show that fintech lowers transaction costs, extends access through mobile payments and peer-to-peer lending, and tailors financial products to underserved users via data-driven algorithms. These gains, however, are unevenly distributed. Hidden fees, data privacy risks, weak infrastructure, and low financial literacy constrain effectiveness in low- and middle-income economies, where financial inclusion may even widen rather than narrow income disparities. The bibliometric analysis indicates that scholarly attention has grown sharply since 2021, with regtech, Islamic fintech, and green finance emerging as underexplored frontiers. The study concludes that fintech’s inclusive potential depends less on technological capability than on transparent fee structures, ethical data governance, and complementary investment in infrastructure and financial literacy. It recommends targeted regulatory frameworks and community-based literacy programs to ensure that fintech innovations advance, rather than reproduce, financial exclusion in developing economies.

Keywords: financial inclusion; fintech innovation; bibliometric analysis; narrative review; developing economies

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A. INTRODUCTION

The fast advances in technology are disrupting almost every industry on Earth. Widespread usage of the Internet, social media, and digital gadgets is one of the consequences. The resulting outcome is a more diverse form of fresh approaches to financial services delivery. Hence, new businesses known as financial technology or “fintech” are emerging to take advantage of this digitalization and enter the market to offer financial services and products (Barroso & Laborda, 2022). Fintech also attempts to challenge some barriers in the financial sector, such as excessive expenses for sending money overseas, ineffectiveness in the delivery of do-

mestic payments, and a lack of financing options for micro, small, and medium enterprises (MSMEs) (Berg et al., 2020).

Fintech refers to the use of technology in the development and provision of financial services and products (Mamonov, 2020). In light of this, Gomber et al. (2018) came to the conclusion that fintech has made it possible for consumers to access innovative financial services, like peer-to-peer lending, crowdfunding, online payment, mobile financial services, savings and investments, and budgeting and financial planning. Fintech has been recognized as a promising means to promote financial inclusion, the process of granting ex-

cluded households and small businesses access to financial products and services, by giving the previously unbanked people access to savings, investment, consumption smoothing, and insurance options (Morgan, 2022).

India has witnessed a substantial improvement in financial inclusion over the past several years. Nearly 80% of Indians now have bank accounts, an increase from previous years. Together with this advancement, the fintech industry is becoming more and more well-known as the Indian government works to provide financial services to underbanked populations (Asif et al., 2023). In Balkan countries, Europe, while significant adoption of fintech has been reported, there are gaps between fintech and financial inclusion between those countries, which are assumed to be a result of governmental regulations, the advancement of information technology, and public acceptance of new financial services and goods (Apostu et al., 2023).

Achieving financial inclusion entails providing people and organizations with responsible, long-lasting access to practical, reasonably priced financial goods and services that address their needs in terms of payments, transactions, savings, credit, and insurance (World Bank, 2018). While the COVID-19 pandemic has increased the use of fintech, which is necessary for sustainable economic growth and alignment with the 2030 Sustainable Development Goals (SDGs), developing nations still have significant gaps in access and usage of fintech between wealth levels, gender, and urban versus rural areas (Tay et al., 2022). Therefore, the discussion has moved to the positive and negative influences of the adoption of fintech to promote financial inclusivity.

Despite the growing optimism surrounding fintech as a driver of financial inclusion, its benefits are not evenly distributed across countries. While fintech adoption has improved access to financial services and reduced inequality in many high-income economies, evidence suggests that its impact may be less effective or even counterproductive in lower-income nations due to limited infrastructure, low financial literacy, regulatory weaknesses, and unequal digital access. This condition highlights a “fintech–inclusion gap,” referring to the disparity between fintech’s promise to democratize financial services and its uneven outcomes in practice. Therefore, a critical examination is needed to understand not only how fintech enhances financial inclusivity but also the challenges that may limit its effectiveness, particularly in developing economies.

This paper aims to explore the issue of how fintech innovations can enhance financial inclusivity and the possible counterarguments regarding the beneficial role of fintech innovations on financial inclusivity. This paper explores the various dimensions of how fintech innovations enhance financial inclusivity while also examining the potential drawbacks and challenges associated with these advancements. Moreover, critical analysis will also be performed to bring a reasoned conclusion

based on the evidence and arguments presented. In this paper, the main arguments will revolve around the cost-effectiveness, accessibility, and personalization of fintech.

Based on the above background and discussion, this paper addresses the following research question: “*How do fintech innovations enhance financial inclusivity, and what challenges limit their effectiveness in achieving inclusive financial systems, particularly in developing economies?*” This research question guides the paper’s critical analysis of how fintech contributes to cost-effectiveness, accessibility, and personalization in financial services, while also examining potential barriers such as data security, digital inequality, and infrastructural limitations.

This paper focuses on cost-effectiveness, accessibility, and personalization as the three primary analytical pillars because these dimensions consistently emerge in the fintech and financial inclusion literature as key mechanisms through which fintech influences financial service adoption and inclusivity. Cost-effectiveness reflects fintech’s ability to reduce transaction and operational costs, accessibility emphasizes the expansion of financial reach to underserved populations, and personalization highlights the growing role of data-driven technologies in tailoring financial services to individual needs. Rather than being derived from a single economic theory, these dimensions are selected based on recurring themes identified in prior literature and the observed research gap regarding how these mechanisms collectively shape inclusive financial systems, particularly in developing economies.

B. LITERATURE REVIEW

B.1 Fintech Innovation

Fintech, short for financial technology, refers to the integration of technology into the delivery and management of financial services, fundamentally transforming the way financial activities are conducted (Suryono et al., 2020). The term encompasses a wide range of innovations that utilize software, algorithms, and digital platforms to enhance the efficiency, accessibility, and security of financial transactions and services (Gomber et al., 2017). Fintech includes various applications such as mobile payments, digital wallets, peer-to-peer lending, blockchain technology, robo-advisors, and online banking, which aim to streamline financial processes, reduce costs, and improve customer experiences. As a rapidly evolving sector, fintech not only disrupts traditional financial institutions by introducing more agile and customer-centric services but also plays a critical role in expanding financial inclusion, particularly in underserved and unbanked populations around the world (Łasak & Gancarczyk, 2021).

Fintech innovation has rapidly transformed the financial services landscape, offering new ways for consumers and businesses to interact with financial products and services. The advent of technologies such

as blockchain, artificial intelligence (AI), and machine learning has significantly disrupted traditional banking and financial models, leading to the emergence of new financial products and services that are more efficient, accessible, and cost-effective (An et al., 2021; Sujee et al., 2022). Fintech innovation is not just a technological advancement but a paradigm shift that challenges the very foundations of financial services by introducing novel business models and altering the competitive dynamics within the industry. This innovation is driven by the increasing demand for digital and automated services, which has been accelerated by the global adoption of smartphones and the internet, enabling fintech companies to offer personalized, real-time solutions that meet the evolving needs of consumers (Gomber et al., 2018).

Furthermore, fintech innovation has also facilitated the democratization of financial services, making them accessible to previously underserved populations. Innovations such as mobile payment platforms, peer-to-peer lending, and robo-advisory services have lowered the barriers to entry for financial services, particularly in emerging markets where traditional banking infrastructure is limited (Jarvis & Han, 2021). For instance, mobile money services like M-Pesa in Kenya have revolutionized the way people manage money, allowing individuals without access to traditional banking to perform transactions, save, and access credit (Abdulhamid, 2020). These innovations have not only expanded financial access but also stimulated economic activity and fostered financial resilience among low-income populations (Dai, 2020). This example illustrates fintech's potential to support financial “leapfrogging,” where digital solutions bypass traditional banking limitations. However, such progress has not occurred uniformly across developing regions. In countries with inadequate internet connectivity, unreliable electricity, weak digital infrastructure, and low financial literacy, fintech adoption remains constrained, limiting its capacity to enhance financial inclusion. Consequently, while Kenya represents a successful case of fintech-enabled inclusion, other regions continue to face structural barriers that slow the realization of similar outcomes.

Despite the transformative potential of smart fintech and AI-driven financial services, institutional barriers continue to limit their effectiveness, particularly in developing economies (Ediagbonya & Tioluwani, 2023). Weak regulatory frameworks, inconsistent digital governance, fragmented financial policies, and limited consumer protection mechanisms often hinder the large-scale adoption of fintech innovations. In many developing countries, regulatory uncertainty surrounding digital lending, data privacy, cybersecurity, and cross-border financial transactions discourages both institutional investment and consumer trust (Sharma et al., 2021). Furthermore, inadequate coordination between financial regulators, technology providers, and bank-

ing institutions may slow the integration of advanced fintech solutions into formal financial systems. Consequently, while smart fintech offers significant opportunities for improving efficiency and financial inclusivity, its success depends not only on technological readiness but also on supportive institutional and regulatory environments.

B.2 Financial Inclusivity

Financial inclusivity refers to the availability and accessibility of financial services to all segments of society, particularly the underserved and marginalized populations (Nandru et al., 2021). The concept has gained significant attention in recent years, driven by the recognition that financial inclusion is a key enabler of economic development and poverty alleviation. Benami and Carter (2021) argue that access to financial services, such as savings accounts, credit, and insurance, is essential for individuals and businesses to manage their financial lives, invest in education and health, and respond to economic shocks. Financial inclusivity is closely linked to improved economic outcomes, as it enables greater participation in the formal economy, reduces income inequality, and promotes inclusive growth (Corrado & Corrado, 2017; Kim, 2016).

The intersection of fintech innovation and financial inclusivity has further accelerated progress in this area. Additionally, fintech solutions have also addressed issues of affordability, transparency, and convenience, making financial services more accessible to low-income individuals (Kulshrestha, 2023). The rise of fintech has been instrumental in closing the financial inclusion gap, particularly in regions with high levels of financial exclusion. However, challenges remain, including the need for regulatory frameworks that ensure the safe and sustainable expansion of fintech-driven financial inclusion initiatives.

Financial inclusivity is intricately linked to the achievement of the SDGs, as it plays a pivotal role in promoting economic growth, reducing poverty, and fostering social equity (Kara et al., 2021). By providing access to essential financial services such as savings, credit, insurance, and payment systems, financial inclusivity empowers individuals and businesses to make informed financial decisions, invest in education, healthcare, and entrepreneurship, and build resilience against economic shocks. This, in turn, supports several SDGs, including Goal 1 (No Poverty), Goal 8 (Decent Work and Economic Growth), and Goal 10 (Reduced Inequalities). For instance, by enabling marginalized populations to participate in the formal economy, financial inclusivity helps to bridge the gap between the rich and the poor, contributing to more equitable economic development (Danladi et al., 2023). Additionally, it supports gender equality (SDG 5) by providing women with greater control over their finances and opportunities to contribute economically. In essence, financial inclusivity is a critical driver of sustainable

development, ensuring that economic progress is inclusive, equitable, and resilient, benefiting all segments of society.

C. RESEARCH METHODS

The issue regarding fintech and its impact on financial inclusivity was investigated using literature obtained from Scopus database. The keywords utilized were: (“financial technology” OR “fintech”) AND (“inclusive finance” OR “financial inclusion” OR “financial inclusivity”). To ensure the relevance and timeliness of the information, the search was limited to peer-reviewed journal articles, book chapters, and credible conference papers published between 2014 and 2026. The period 2014–2026 was selected because it captures a decade of accelerated fintech development following the post-2008 financial crisis recovery, alongside the rapid expansion of smartphone adoption and digital financial ecosystems, which significantly transformed access to financial services worldwide. The gathered materials were examined and organized according to how well they addressed the main points and counterarguments of the study.

This study adopts a qualitative trend analysis and critical narrative review approach, integrating both bibliometric mapping and narrative synthesis to explore the contribution of fintech innovations to financial inclusivity. The research design combines quantitative and qualitative elements, enabling both an assessment of publication trends and a deeper understanding of conceptual themes. The data collection process followed a structured procedure based on the identified keywords, focusing only on publications that discussed the relationship between fintech and financial inclusion or investigated the role of technological innovations in improving access to financial services. Articles were selected if they provided either empirical evidence or theoretical insights relevant to the topic. Studies that were not peer-reviewed, not written in English, or did not directly address the interplay between fintech and financial inclusivity were excluded.

The analysis proceeded in two stages. First, the selected literature was categorized thematically based on three analytical dimensions that form the core framework of this paper: cost-effectiveness, accessibility, and personalization. Second, bibliometric trend analysis was conducted using Scopus-indexed publications to capture the quantitative evolution of the field. Bibliographic information was extracted and processed using VOSviewer software to generate network and overlay visualizations with a minimum of three keyword occurrences, allowing the identification of research hotspots, thematic relationships, and temporal developments in fintech and financial inclusion studies. The combination of these two analytical techniques ensured that the findings of this paper reflect both statistical trends and interpretive insights.

The results from the bibliometric mapping were in-

terpreted in conjunction with the qualitative review to provide a holistic understanding of how fintech innovations influence financial inclusivity across different contexts. This mixed analytical approach allowed the study to identify opportunities, limitations, and emerging research directions that shape the evolving relationship between fintech and inclusive finance. Overall, this methodology ensures the study’s rigor, transparency, and replicability while providing an evidence-based foundation for the discussion and conclusions that follow.

The literature selection process followed a PRISMA 2020-informed screening procedure to improve transparency and rigor in identifying relevant studies. An initial search was conducted using the Scopus database, resulting in 830 records related to fintech and financial inclusion. To ensure relevance and consistency with the study objectives, screening criteria were applied based on publication period, document relevance, and thematic alignment. Prior to screening, 12 duplicate records were removed, while 397 records were excluded automatically due to publication year restrictions, resulting in 421 records subjected to title and abstract screening. During this stage, 351 records were excluded because they did not sufficiently align with the study focus on fintech innovations and financial inclusivity. The full screening sequence is summarized in Figure 1.

Subsequently, 70 reports were sought for full-text retrieval, of which 14 could not be accessed or retrieved. The remaining 56 full-text articles were assessed for eligibility based on predefined inclusion criteria, including direct relevance to fintech and financial inclusion, empirical or theoretically grounded contributions, and conceptual alignment with the analytical dimensions of this study. During eligibility assessment, 38 articles were excluded due to limited relevance to fintech and financial inclusion ($n = 19$), excessive focus on banking performance without inclusivity dimensions ($n = 11$), or non-empirical and conceptually irrelevant content ($n = 8$). Ultimately, 18 studies were retained for the qualitative critical narrative review and thematic synthesis, serving as the primary evidence base for analyzing fintech’s contribution to cost-effectiveness, accessibility, and personalization in promoting financial inclusivity.

D. RESULTS AND DISCUSSION

D.1 Distribution of Studies

Table 1 presents the thematic distribution of the 18 studies included in the critical narrative review. Accessibility and personalization of fintech emerged as the dominant themes, each represented by six studies (33.3%), followed by cost-effectiveness with five studies (27.8%). One study (5.6%) was classified as cross-cutting, as it indirectly contributed to the understanding of financial inclusion barriers and informal financial mechanisms. This distribution suggests that contemporary fintech scholarship increasingly emphasizes ac-

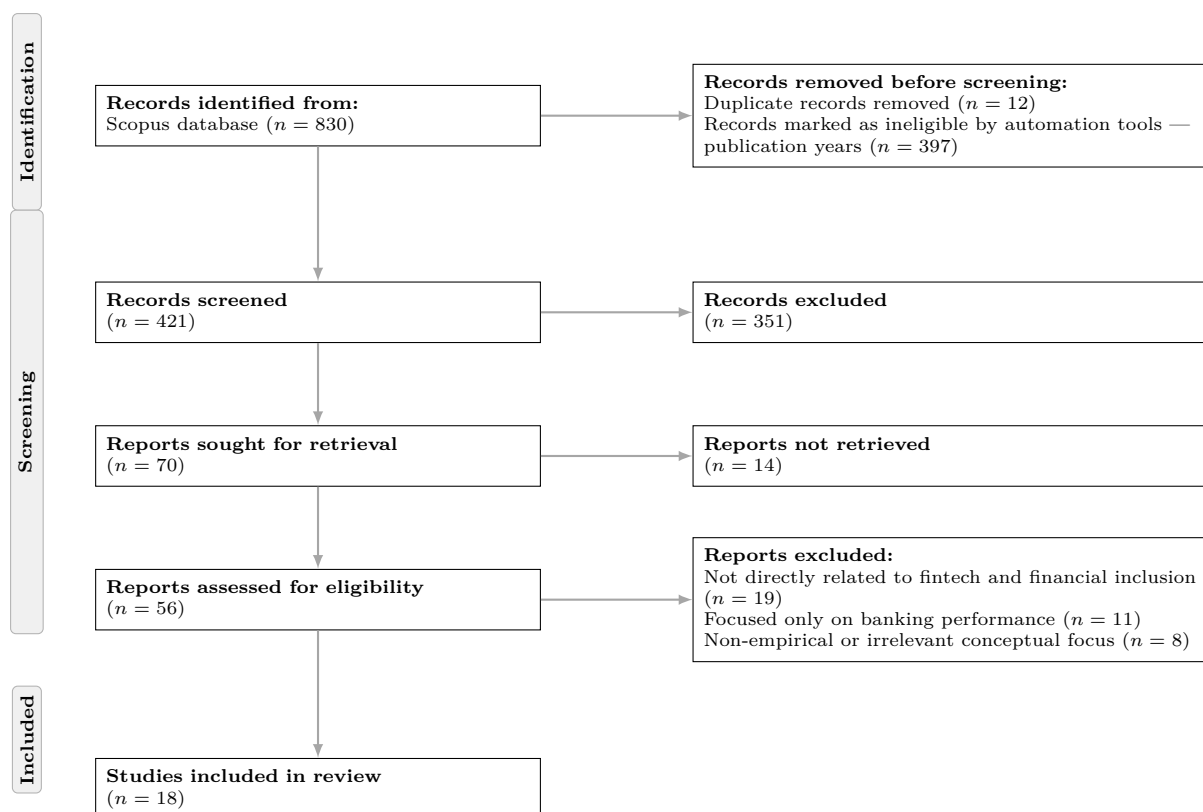


Figure 1. PRISMA 2020 flow diagram for the identification of studies via the Scopus database.

Source: Scopus search results, processed by the author following the PRISMA 2020 statement.

cess expansion and personalized financial solutions as central mechanisms for promoting financial inclusivity.

Figure 2 summarizes the temporal distribution of the studies included in this review. The findings indicate that fintech and financial inclusion research has grown considerably in recent years, with the highest concentration of studies published in 2021 (27.8%). Publications between 2021 and 2024 accounted for the majority of included studies, reflecting the increasing scholarly interest in digital finance, financial inclusion, and emerging fintech innovations following the acceleration of digital transformation during and after the COVID-19 period. The inclusion of recent studies published in 2025 and 2026 further highlights the evolving nature of fintech research and its continued relevance to financial inclusivity debates.

D.2 Cost-Effectiveness of Fintech

One of the ways fintech can contribute positively to financial inclusion is through cost-effectiveness. Fintech firms often provide services with lower operational expenses compared to traditional banking. Therefore, they are able to provide financial products at discounted prices or even without charge, increasing accessibility for those with limited means. Nangin et al. (2020) have proven that promotion significantly increases the potential of fintech adoption through improved customer trust. Furthermore, Feghali et al. (2021) stated that while consumers should be urged to switch to cashless payment methods (adopting fintech), which offer a safer payment option, financial in-

stitutions should invest in fintech services to increase their returns. This statement suggests that fintech may also bring benefits to institutional business operations, which may further increase financial inclusivity in their ecosystem. Singh et al. (2021) also supported this statement, as they found that banks that adopt fintech will gain improved profitability. In the literature, this cost-effectiveness is reflected through lower transaction fees, reduced service costs, faster payment processing, and broader access to low-cost digital financial products. Increased profitability can then be allocated to more discounts and promotions, offering more competitive prices to customers.

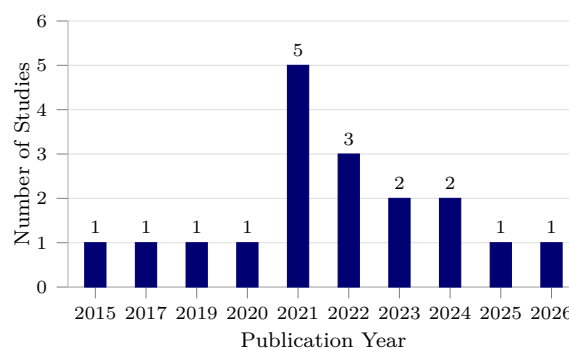


Figure 2. Distribution of Included Studies by Publication Year (n = 18).

Source: Scopus data, processed by the author. Years with no included study (2016, 2018) are omitted from the axis.

As opposed to the previous pro argument, customers (both individuals and institutions) will consider not

Table 1. Distribution of Included Studies by Thematic Focus

Thematic Focus	<i>n</i>	%	Studies
Cost-Effectiveness of Fintech	5	27.8	Nangin et al. (2020); Feghali et al. (2021); Singh et al. (2021); W. Zhang et al. (2023); Casselman et al. (2026)
Accessibility of Fintech	6	33.3	Tay et al. (2022); Ebirim and Odonkor (2024); Thomas and Hedrick-Wong (2019); Demir et al. (2022); Bayero (2015); Ediagbonya and Tioluwani (2023)
Personalization of Fintech	6	33.3	Cao et al. (2021); Awotunde et al. (2021); Mhlanga (2024); Al-buainain and Ashby (2025); Wang et al. (2017); C. Zhang and Zheng (2021)
Cross-cutting / Supporting Studies	1	5.6	Mpofu and Sibindi (2022)
Total	18	100.0	

Source: Scopus data, screened and classified by the author following the PRISMA 2020 procedure described in Section C.

only cost but also privacy and data safety in adopting and utilizing fintech. Fintech users may potentially have concerns that their important data will be misused, which can cause financial losses. In Pakistan, the adoption of fintech services from commercial banks significantly relied on data security and customer trust (W. Zhang et al., 2023). Furthermore, in comparison to cost-effectiveness, financially vulnerable people who do not fully comprehend the terms and circumstances could be disproportionately affected by hidden fees or charges associated with certain fintech services, even while on the surface, fintech may provide lower pricing (Casselman et al., 2026). This experience will be detrimental to the long-term adoption of fintech, as trust will be difficult to rebuild.

D.3 Accessibility of Fintech

Another way fintech can contribute to achieving financial inclusion is through improved accessibility. A review by Tay et al. (2022) concluded that fintech improves financial inclusivity in any country while also playing a role in achieving SDGs, especially due to heightened accessibility to all. Another mechanism of how fintech increases accessibility is by making peer-to-peer transactions and microlending practices possible through mobile payment platforms, which have empowered underbanked people (Ebirim & Odonkor, 2024). This broadening of participation is consistent with the premise that wider engagement with the formal financial system supports aggregate economic growth. Fintech also holds considerable potential to improve financial inclusion for populations at the base of the economic pyramid. Fintech can reduce costs, increase accessibility, and reach underrepresented people with financial services by leveraging digital technologies and innovations (Thomas & Hedrick-Wong, 2019). As discussed in the introduction section (regarding the definition of financial inclusivity), financial services that are tailored to individual requirements and desires at a fair price should be accessible to everyone.

On the other hand, arguments also arise whether fintech innovation makes the gap between developing and developed countries wider. The study by Demir et al. (2022) found that fintech greatly lowers income

inequality through financial inclusion, although these benefits are mostly found in wealthier nations. The three aspects of financial inclusion (having an account, saving money, and borrowing from a formal financial institution) only lessen income disparity in high-income nations. However, in lower-middle-class and low-income nations, financial inclusion seems to have the reverse effect. This phenomenon may occur because access to fintech is often unevenly distributed, benefiting digitally literate and economically advantaged groups more than marginalized populations. In contexts with weak infrastructure, limited financial literacy, and inadequate regulation, fintech adoption may result in forms of “digital capture,” where financial opportunities are concentrated among populations already capable of accessing smartphones, stable internet, and formal identification systems. This is concerning, as these low- to middle-income nations (or developing countries) are dealing with problems such as a lack of knowledge about the cashless policy (Bayero, 2015) and reliance on unofficial funding sources (Mpofu & Sibindi, 2022). Ediagbonya and Tioluwani (2023) also argue that the reasons behind this widening gap in developing countries (especially Nigeria) are caused by illiteracy, inadequate infrastructure, sporadic power outages, poor cell reception, particularly in rural areas, unreliable bank networks, needless fees, information asymmetry, and breaches of data privacy. This fact suggests that the success of fintech utilization heavily depends on various factors, which may not be optimal in developing countries.

D.4 Personalization by Fintech

The vision of finance for all, or financial inclusivity, is also made possible due to the usage of cutting-edge algorithms and data analytics by fintech platforms to offer customized financial solutions based on each client’s demands. This is especially advantageous for underprivileged groups with specialized financial situations. “Smart fintech” is the term for the newest wave of fintech, which is primarily driven and enabled by data science and AI methodologies. In order to power intelligent, automated, whole-of-business, and personalized economic and financial businesses, services, and sys-

tems, smart fintech transforms economies and finance (Cao et al., 2021). On the other hand, the application of big data in fintech is considered a solid approach to gathering, demonstrating, and appraising information. Big data analytics is the modeling of large amounts of data to find relevant patterns and information, and then sharing that information to help make decisions and offer recommendations (Awotunde et al., 2021). Mhlanga (2024) also supports the notion that big data stimulates the creation of innovative financial services and products, provides insightful customer behavior analytics, improves risk management, and increases operational effectiveness, all of which lead to the promotion of financial inclusion. Fintech companies, for example, can use big data analytics to help them identify patterns in customer spending and transaction histories. These patterns can then be used to deliver personalized financial advice and investment recommendations. Moreover, fintech organizations can also benefit from big data's ability to improve risk management. Another empirical application of big data is the creation of personalized investments and insurance. Furthermore, the customization strategy is effective in boosting sales and revenues (C. Zhang & Zheng, 2021).

Accurate data is essential to personalized financial services, but once again, it may raise privacy issues, particularly in communities where financial institutions are already viewed with suspicion because of past discrimination or exploitation, resulting in financial or sociocultural gaps. In general, the fintech company will require accurate data of customers, which may be a part of 'sensitive data'. Disclosing too much important data will raise suspicion and doubt on the customer's end, which may influence customer trust and fintech utilization. This tendency is also discussed by Albuaian and Ashby (2025), who stated that data privacy is one of the barriers to fintech usage. Furthermore, some customers may intentionally provide incorrect data due to personal interest, such as to gain rewards, discounts, or other non-financial benefits, although this is only wrong on an ethical level. Another potential negative effect of fintech's personalized solution is lower effort expectations and higher performance expectations (Wang et al., 2017). Customers will understand that using fintech will result in no mistakes or problems and that the service they receive will always be optimal. Therefore, once they encounter a problem in using fintech, the impact on their customer experience will be detrimental.

D.5 Current and Future Trends in Fintech and Financial Inclusivity

Figure 3 demonstrates several thematic clusters that reveal the intellectual structure of fintech and financial inclusion research. The central green cluster, dominated by terms such as "fintech," "financial inclusion," "financial technology," and "banking," reflects the foundational literature emphasizing fintech as a

mechanism for expanding access to financial services. The red cluster highlights innovation-oriented themes, including "mobile payment," "peer-to-peer lending," "crowdfunding," and "financial innovation," suggesting a focus on practical fintech applications that enable inclusive finance. Meanwhile, the yellow cluster, which includes terms such as "poverty," "economic growth," and "developing countries," indicates strong scholarly interest in fintech's developmental and socioeconomic implications. The close relationship between "poverty" and "trust" suggests that financial inclusion is not solely determined by access to technology but also by institutional confidence, financial literacy, and user perceptions of security. In addition, smaller clusters such as "Islamic fintech," "Islamic finance," and "green finance" suggest emerging but still underexplored research areas within inclusive financial ecosystems.

Several geographic regions and economic dimensions also stand out in the analysis. Terms like "Africa", "India", "Indonesia", "Bangladesh", and "Pakistan" appear in the network, emphasizing the focus on emerging markets. In these regions, fintech has the potential to revolutionize financial systems by providing solutions that are not only more inclusive but also more adaptable to local contexts. The connections between terms like "developing countries", "poverty", and "trust" highlight how fintech is perceived as a key driver for inclusive growth and poverty alleviation. Furthermore, the presence of keywords like "digital finance", "technology", and "banking" in this geographic context suggests that research is centered on understanding how technological adoption can bridge gaps in traditional banking systems. This is especially important in regions where financial literacy and trust in technology-based financial services may still be developing.

While several core themes are well-represented in the research, some emerging keywords appear to be underexplored. "Islamic fintech" and "Islamic finance" appear as smaller nodes, indicating that while they are gaining attention, they have not yet received significant scholarly focus compared to other areas of fintech. Given the large populations in regions like Southeast Asia and the Middle East that rely on Islamic finance principles, this represents a promising area for future research. Similarly, "regtech", which focuses on regulatory technology, is another relatively underexplored term. As fintech innovations continue to disrupt traditional financial systems, the role of regulatory technology in maintaining compliance and managing risk will become increasingly important, suggesting that this area may require more research in the coming years. Keywords like "financial exclusion" and "financial literacy" are also notably smaller in size, despite their direct relevance to the overarching goal of financial inclusivity.

The role of data in fintech innovations is evident,

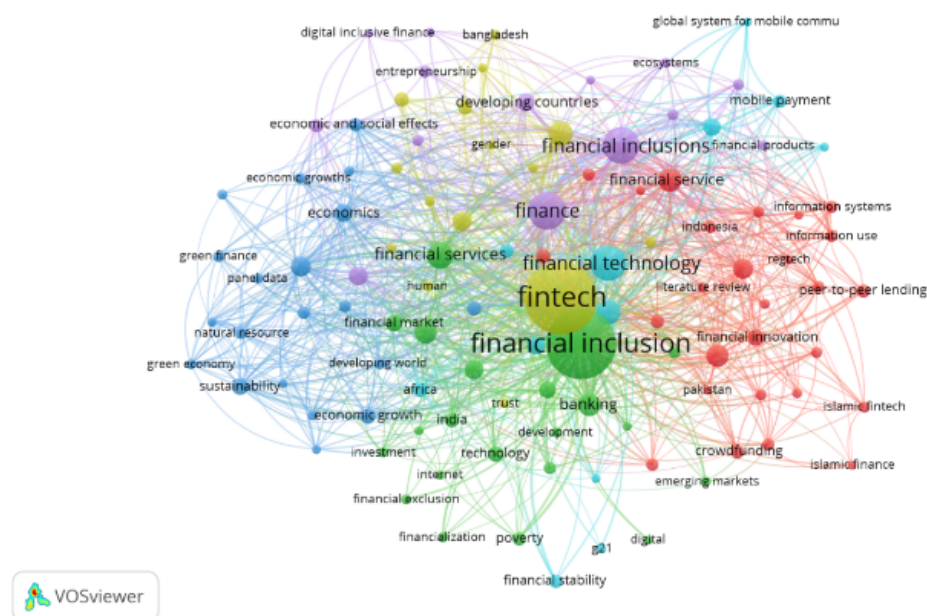


Figure 3. Network Map Analysis on Keywords in Fintech and Financial Inclusivity Research.

Source: Scopus data, processed by the author using VOSviewer.

with keywords like “data”, “personalization”, and “digital wallets” connected across different clusters in the network. These highlight the growing trend of utilizing data-driven algorithms to personalize financial services to individual users, especially in the context of financial inclusion. However, concerns around data security and privacy seem less prominent on the map, indicating that while fintech research is focused on personalization and access, there is less emphasis on addressing the risks associated with data privacy breaches, which could hinder broader adoption.

Figure 4 illustrates the co-occurrence of keywords related to “fintech” and “financial inclusion” over time, generated using VOSviewer software. At the core of the analysis are the most prominent and frequently cited themes—“fintech” and “financial inclusion.” These themes are interconnected with related terms such as “financial services,” “financial technology,” “banking,” and “financial markets.” The size of each node reflects the frequency of keyword occurrence, while the distance between terms indicates the strength of their co-occurrence in the literature. The color gradient, ranging from blue to yellow, represents the timeline of keyword prominence, where blue signifies earlier discussions (2021), and yellow marks more recent trends (2022–2023). It can be noted that the research trends of “fintech” and “financial inclusion” started blooming from 2021 onward.

During the period from 2021 to 2022, keywords located in the blue and green sections indicate a focus on fundamental topics, such as “financial inclusion,” “banking,” “financial markets,” and “financial services.” These core terms suggest that research during this period concentrated on examining the foundational relationships between fintech and financial in-

clusion. Additional terms such as “trust,” “economic growth,” and “financial stability” are notable, implying that early investigations explored the broader economic and societal implications of fintech, with a focus on how financial technology influences macroeconomic outcomes and trust in financial systems.

By mid-2022, a shift in research focus is evident, as represented by the green areas of the map. Terms like “developing countries,” “financial innovation,” “technology,” and “digital” suggest increasing scholarly attention toward the role of fintech in developing regions. This period reflects an interest in how fintech can address financial inclusion in countries where access to traditional banking services is limited. Emerging keywords such as “crowdfunding,” “peer-to-peer lending,” and “mobile payment” also suggest that research is increasingly addressing the proliferation of alternative financial services enabled by technological innovation, indicating the growing relevance of these fintech solutions for financial inclusion.

In the most recent period, from late 2022 to 2023, emerging themes are represented by yellow-colored keywords. Terms such as “green finance,” “sustainability,” “regtech,” “Islamic fintech,” and “mobile payments” indicate a diversification of research areas within fintech. The increasing prominence of “green finance” and “sustainability” reflects the growing integration of environmental and sustainability considerations into financial technology discussions, in line with global efforts to promote sustainable development. The rise of “regtech” (regulatory technology) signals an enhanced focus on the intersection of fintech and regulatory frameworks, likely driven by the need to manage the growing complexity and risks associated with fintech innovations. Additionally, the emergence of “Islamic

cause they provide people with the information they need to make wise financial decisions and appreciate the importance of data privacy. To preserve integrity and trust, ethical standards for data collection and use must be scrupulously adhered to. Fintech may achieve both financial success and social good by putting these strategies into practice, which will eventually lead to the development of a more equal and inclusive financial ecosystem.

Several gaps in the literature also suggest potential future research directions. The relative underrepresentation of Islamic fintech offers a niche for scholars to explore how Islamic finance principles can be integrated with modern fintech solutions to provide inclusive services to large populations in Islamic regions. Additionally, the emerging focus on regtech suggests that as financial systems become increasingly digitalized, more research is needed on how to navigate regulatory challenges and risks. Similarly, more attention could be paid to the roles of financial literacy and gender in promoting fintech adoption. Given that women and low-income individuals are often among the most financially excluded, understanding how fintech can address these gaps in a targeted way is a critical area for further exploration. Finally, green finance and sustainability are linked to fintech, albeit with less prominence. As the world moves toward a more sustainable future, research into how fintech can support the green economy and sustainable development goals will likely become more relevant.

Looking ahead, the future of smart fintech will increasingly depend on the integration of artificial intelligence, big data, and personalized financial technologies to expand financial access and improve decision-making. However, the success of these innovations will depend on balancing technological advancement with efforts to address historical mistrust, privacy concerns, and unequal digital capabilities, particularly among vulnerable populations.

To maximize fintech's contribution to financial inclusivity, central banks and regulators should prioritize clear regulatory frameworks, stronger consumer protection, and transparent data governance to reduce privacy risks and strengthen trust in digital financial systems. At the same time, fintech startups and financial institutions should focus on ethical data practices, transparent fee structures, and user-centered financial products tailored to underserved populations. Community-based outreach and financial literacy programs should also be strengthened through partnerships between governments, fintech providers, and local organizations to improve digital capabilities and reduce historical mistrust toward formal financial services. Such collaborative efforts are essential to ensuring that fintech innovations contribute to more inclusive and sustainable financial systems.

Among the identified gaps, financial literacy and gender inclusion represent the most urgent priorities

for future fintech research, particularly in developing economies where unequal digital access and low financial capability may reinforce exclusion. Future studies should explore how fintech can better address barriers faced by women and low-income populations. In parallel, regtech deserves greater attention to strengthen consumer protection and data governance, while Islamic fintech remains a promising but more context-specific area of inquiry. While “fintech” and “financial inclusion” are long-standing topics, the research is expanding to cover a broader array of issues, such as sustainability, regulatory technology, and mobile payments. These trends indicate how fintech is not just revolutionizing traditional finance but also addressing emerging global concerns like environmental sustainability and inclusive economic development. The dynamic nature of these keywords, especially the shift towards topics like “green finance” and “regtech,” suggests that future research will likely continue exploring how fintech can solve both existing and emerging challenges in the financial sector.

F. CONCLUSION

This study demonstrates that fintech innovations contribute to financial inclusivity through cost-effectiveness, accessibility, and personalization, while also facing challenges related to hidden fees, data privacy, weak infrastructure, and low financial literacy, particularly in developing economies. The bibliometric analysis indicates growing scholarly attention to fintech and financial inclusion since 2021, with emerging interests in regtech, Islamic fintech, and sustainability. Taken together, the narrative and bibliometric findings provide a holistic understanding of fintech as both an opportunity and a challenge for inclusive finance.

It is evident how urgent it is to use digital technology to improve financial inclusion, especially for people at the bottom of the economic pyramid. Fintech has become a viable means of offering underprivileged communities individualized, accessible, and reasonably priced financial services. The ability of fintech to lower costs through economies of scale and operational efficiency, improve accessibility through mobile banking and remote onboarding, provide cutting-edge financial products like savings platforms and microloans, and provide users with individualized services and financial literacy are the main points in its favor. Fintech can also offer customized financial advice and more inclusive credit ratings through the use of data-driven insights. On the other hand, rebuttals draw attention to the serious privacy issues raised by the gathering and use of private client information. These worries are made worse by the historical mistrust that financial institutions have received, especially from vulnerable people. A significant obstacle is the possibility of data exploitation brought on by unethical behavior or security lapses. Moreover, clients may submit false information for their own benefit, which would undermine

the efficacy of customized services.

DECLARATIONS

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Data availability. All data analysed in this study were derived from publicly available records in the Scopus database. The search string, screening criteria, and the list of the 18 included studies are reported in full in Sections C and D. The VOSviewer map files are available from the author on reasonable request.

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