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Technological Innovation, Public Trust, and Policy Strategies for a Sustainable Financial Sector: A Systematic Review

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ABSTRACT

This study aims to address a gap in the literature exploring the state of innovation in the financial industry by presenting key findings and insights from such research. Specifically, it addresses research questions related to the experiences and determinants of successful implementation of financial innovation in different countries, the underlying challenges that often arise, and solutions to overcome them. A systematic literature review (SLR) method was used to explore and investigate the research problem by applying three main protocols: scoping the literature, selecting and retrieving the most relevant articles, and critically reviewing the selected articles. The results of the current study indicate that studies related to financial innovation have grown significantly and are published in medium to high-quality literature sources, but much effort is still needed to bring this topic to a more mature stage. A critical review of previous research results in three main propositions contributing to this study. These include factors that facilitate successful financial innovation, overcoming challenges related to public trust, and policy strategies for sustainable financial innovation.

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I. INTRODUCTION

Over the past decade, the financial sector has undergone significant technological evolution. This transformation is characterized by the emergence of innovative financial products, such as digital assets, online payment and lending services, and more inclusive investment products that target not only high-income earners but also low- and middle-income earners (Feyen et al., 2022; Feyen et al., 2021; Gomber, Kauffman, Parker, & Weber, 2018). FinTech development has reached an impressive scale. For instance, Ozili (2021) investigated the effects of mobile financial service innovations on financial inclusion in 49 countries and discovered that these innovations have enhanced financial inclusion. Despite this progress, however, the stability of financial institutions has become a global concern. An empirical study by Stankevičienė and Kabulova (2022) across 37 countries showed that FinTech significantly impacts bank performance stability, including profitability. The study demonstrates that FinTech has disrupted the traditional financial industry by creating direct competition that challenges traditional banks' ability to generate profits. Additionally, FinTech requires substantial investments for digital transformation and establishing optimal operational standards. According to Liu, Luan, Wu, Zhang, & Hsu (2021), the goal of financial innovation is to expand financial services to a broader population and overcome structural barriers to reach economically disadvantaged individuals. However, some people still prefer traditional financial products because of their simplicity and convenience. Others may hesitate to adopt more complex applications, such as FinTech (Sapovadia, 2018). Consequently, literature on financial innovation continues to grow, offering new evidence and insights by examining the performance of innovative financial products and evaluating the effectiveness of service providers both established financial institutions and emerging digital startups (Anifa, Ramakrishnan, Joghee, Kabiraj, & Bishnoi, 2022; Guo & Liang, 2016; Li, Spigt, & Swinkels, 2017).

Due to the complex impact and dynamics of rapid growth, a significant amount of research in financial innovation literature has examined the determinants of innovation performance and its effect on socioeconomic conditions. For instance, Błach (2020) posits that developed countries may have a leg up on developing countries regarding technological innovation, as technology flows within the domestic financial sector are balanced with those in other industrial sectors. This view is supported by cases in Russia, where blockchain technology is rapidly developing, and in European Union (EU) countries, where fintech startups are thriving (Kimani et al., 2020; Mavlutova et al., 2022). However, the literature also highlights that financial innovation remains challenging for individuals and small businesses in developing countries, and research on this topic is limited (Nguena, 2019; Qamruzzaman & Wei, 2018; Shaikh, Glavee-Geo, Karjaluoto, 2017). Studies by Arun and Kamath (2015), Hassouba (2023), and an OECD report (2020) point to the slow adoption and diffusion of financial innovations from financial institutions to end users and from policymakers to financial institutions. These studies argue that the fintech diffusion and adoption gap across multiple dimensions is mainly due to trust issues, including a lack of trust in innovative products and a lack of trust between financial institutions and policymakers. Many existing studies have offered insights on creating financial innovations that build trust among users, service providers, and policymakers (Anagnostopoulos, 2018; Gozman, Liebenau, & Mangan, 2018; Kshetri, 2013). Nevertheless, these studies are fragmented and unable to synthesize the determinants of innovation in the financial sector, trust-related challenges, and practical policy solutions. Therefore, a comprehensive and systematic understanding is needed to explore this area further.

To address the fragmentation in the existing literature and the need for a comprehensive understanding, this study employs a systematic literature review approach used to sift through the most relevant literature, synthesize existing empirical evidence, and present key findings by defining and answering the following research questions (RQ):

- RQ1: What are the key determinants of the success of financial innovations, especially with respect to user-related, product/service provider-related, and agent-related factors?
- RQ2: What are the key challenges to implementation, especially regarding public trust? What role do policymakers play in establishing the necessary regulations, legal framework, and digital literacy?
- RQ3: Which alternative policy strategies and ecosystem factors are important for achieving sustainable financial innovation?

The main contribution of this study lies in its three core propositions, which provide a cohesive

framework and address gaps in previous, fragmented studies. These propositions link success determinants, trust-related challenges, and specific policy responses. Additionally, the findings offer practical suggestions for integrating technological innovation effectively into the financial industry. These suggestions are directed at policymakers regarding regulatory design, service providers and agents regarding trust-building strategies, and end users regarding adoption and utilization.

The rest of the paper is organized as follows: Section 2 describes the methodology used for the systematic literature review, detailing the three-step protocol applied to select the most relevant literature. Section 3 presents the review's results, including the systematic distribution of the selected articles and the articles' main findings. Section 3 is the core section, presenting and discussing the implementation of innovations in the financial sector, the challenges faced, and potential solutions. Finally, Section 4 concludes the study by summarizing the implications of the review results, noting limitations, and suggesting future research.

II. METHODOLOGY

The current study is conducted according to the systematic literature review methodology of Wibisono (2023). The research protocol was rigorously and systematically applied in three main processes: initial literature scoping (protocol 1), selection and retrieval of relevant articles (protocol 2) and conducting a review of the selected articles (protocol 3).

The first step of the literature search was conducted through a scoping process. This process refers to the PICOC concept (Mengist, Soromessa, & Legese, 2020; Roehrs, Da Costa, da Rosa Righi, & De Oliveira, 2017). The study population (population/P) includes financial institutions as a broad entity without regional or country category restrictions. The intervention (intervention/I) is implemented by exploring critical findings from selected literature related to the research question or problem. A comparative study (comparison/C) was conducted on all the evidence of the study and aimed to synthesize the critical findings of the selected articles, which would then become the main contribution and outcome (O) of this research. The context (C) of the study is limited to technological innovation or change in the financial sector and its institutions.

The second protocol consists of searching or retrieving literature from the database. In this case, the database used was Scopus, which is considered to be a collection of high-quality journal articles that have undergone the necessary peer-review process (Baas, Schotten, Plume, Côté, & Karimi, 2020; Björk & Solomon, 2012; Kähler, 2010). During the search process, the authors used a combination of keywords: "innovation" AND "financial sector" OR "financial sectors" AND "financial institution" OR "financial institutions" in the search menu. The primary search was limited to article titles, abstracts, and keywords containing all three combinations of keywords. Then, the search was limited to articles published in the last five years (2019-2023) and written in English. In addition, only research articles (including review articles) were selected, while conference proceedings/materials and book chapters were excluded. This is to ensure a peer-review process in the publication of articles. The selection of scientific topics was also limited to economics, business, management, and social sciences. It is noted that some exclusion criteria were applied in this second protocol.

The literature search in Protocol 2 retrieved twenty-four (24) articles considered potentially relevant to the research objectives/questions. To confirm this, the titles and abstracts of the articles were further screened. At this stage, thirteen (13) articles were found to be most relevant to the research objectives or questions, and eleven (11) irrelevant articles were excluded. These eleven excluded articles contained a combination of the three search terms. However, from the content and essence contained in the abstract (which represents the article's content), the articles did not directly relate to the research objectives. For example, some articles discussed issues of low-carbon sustainable development, green economic development, and the use of renewable energy without addressing the context of innovation in the financial sector or institutions. Some articles focused on the study of innovation in terms of financial support for the patenting process and knowledge spillovers from the digital finance innovation process. The rest were related to the study of blockchain and cybersecurity in digital finance. After eliminating eleven irrelevant articles, there were thirteen most relevant articles that met the criteria selected for further processing.

A summary of the article search/selection process is shown in the PRISMA diagram (Figure 1) below (de Barcelos Silva et al., 2020; Moher, Liberati,

Tetzlaff, Altman, & The PRISMA Group, 2009; Page et al., 2021).

The third protocol involves a systematic and critical review of the selected articles. The process began with a descriptive analysis of the distribution and development of financial innovation research topics over the past five years. The analysis included categorization by publishing journal, journal quality based on the 2023 Scimago Journal Rank (SJR), scientific or subject area category, and citation analysis. Although this systematic literature review protocol was designed for maximum rigor and transparency, the authors acknowledge its methodological limitations. In particular, relying on a single database (Scopus) risks publication bias because relevant literature not indexed in Scopus may be overlooked. To mitigate these limitations, this study strictly limited its scope to high-quality journal articles verified using the SJR 2023 metric. This ensured that only articles that had undergone rigorous peer review were selected. This made it possible to produce synthesized findings based on high-quality, relevant evidence. The results of this descriptive analysis are presented in Section III.A.

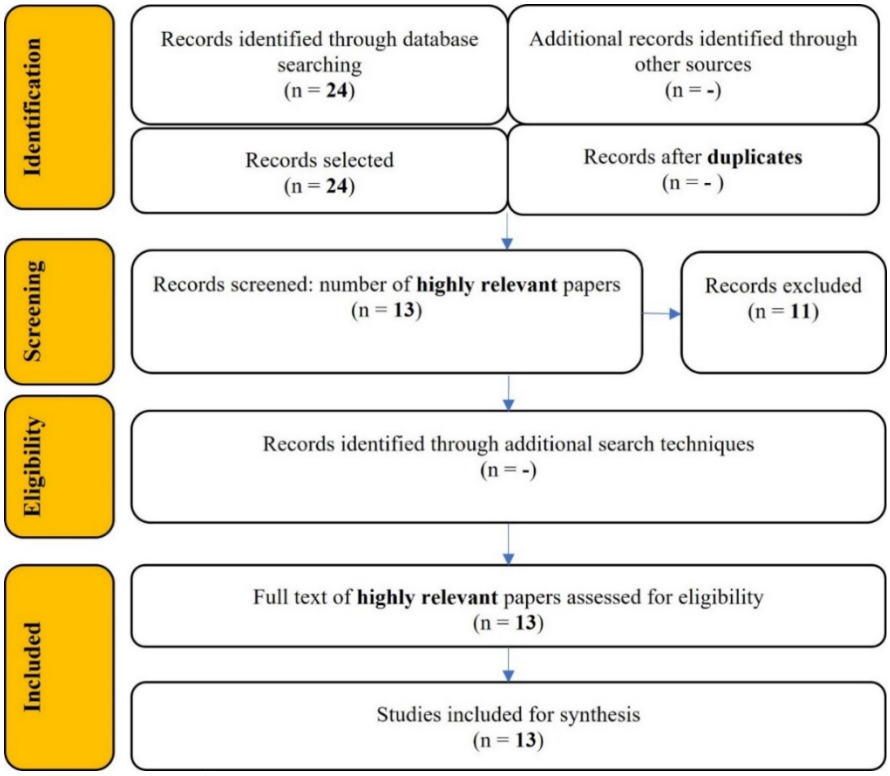
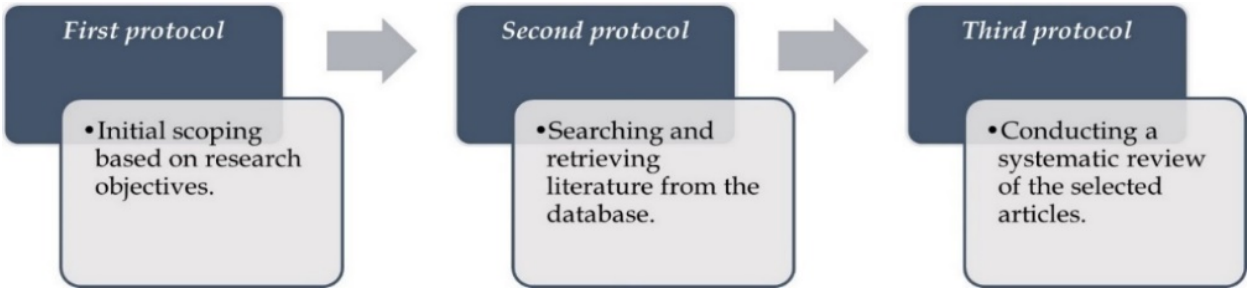


Figure 1. PRISMA diagram
Source: author's elaboration

The selected articles underwent qualitative coding using two approaches to extract and categorize findings that directly addressed the three research questions (Bowen, Edwards, & Catell, 2012; Riazi, Ghanbar, & Rezvani, 2023). The first approach was open coding, which involved a comprehensive review of the results and discussion sections of the thirteen selected articles to identify determinants of financial innovation, associated challenges, and potential solutions. The results of this coding are presented in Section III.B. The second approach was axial/thematic coding. Common findings from the initial critical review were grouped into specific thematic categories. These categories included technological innovation as a determining factor, trust as a challenging factor in implementing financial innovation, and practical and policy suggestions as potential solutions. These groupings form the basis of the three study propositions presented at the end of the critical review. The results of this coding are presented in Section III.C. In addition, cross-country comparisons were conducted, and the findings were validated through narrative synthesis by systematically comparing results from developed and developing countries (Snilstveit, Oliver, & Vojtkova, 2012). This coding process ensured the transparent extraction of relevant findings and allowed us to prioritize determinants and solutions based on the frequency and strength of the reported evidence. The results of the critical

review formed the foundation for the three final propositions of this study, representing significant research contributions.

The three research protocols are shown in Figure 2 below:



Source: Wibisono (2023)
Figure 2. Research protocol

III. SYSTEMATIC LITERATURE REVIEW RESULT

A. Distribution of the selected articles

This section provides an overview of the thirteen selected articles. Publication trends from 2019 to 2023 demonstrate a notable surge in articles addressing financial sector and institution innovations published in prominent journals indexed in the Scopus database (see Table 1). Specifically, three articles were published in 2019; one was published in 2020; three were published in 2021; and two and four were published from 2022 to mid-2023. These developments demonstrate the continued growth of financial innovation studies, with the number of articles published by mid-2023 nearly doubling compared to previous years. The sharp surge in publications in 2022 and 2023 is an immediate response by academics to the evolving FinTech landscape. Specifically, this surge coincides with the emergence of FinTech stability risks and governance challenges at the macro level. The newly published articles during this period empirically address the impact of FinTech on the stability of financial institutions, thus validating this issue. Thus, the increasing publication trend signals a shift in discourse from mere descriptions of the technology's impact to in-depth analyses of the systemic and policy challenges, which will be discussed in detail in the section of the critical review of the selected articles.

Table 1. Selected articles list

No.	Year of Publication	Number of Articles	Author(s)
1	2019	3	Iskakova, Kupalova, Srailova, Amerkhanova, & Ischanova (2019); Krylov and Seleznev (2019); Uribe-Echeberria, Igartua, & Lizarralde (2019)
2	2020	1	Lehmann and Smets (2020)
3	2021	3	Bentzen, Freij, & Varnes (2021); Ozili (2021); Radnejad, Osiyevskyy, & Scheibel (2021)
4	2022	2	Stankevičienė and Kabulova (2022); Washington, Rehman, & Lee (2022)
5	2023	4	Dananjayan, Gopakumar, & Narayanasamy (2023); Hakimi, Jaafar, & Aziz (2023); Jumaa (2023); Ofori-Acquah, Avortri, & Preko (2023)

elaboration

The following description is the grouping of articles based on the journal/publisher and the quality or quartile of the journal (Table 2) and the grouping of articles based on the scientific subject category of the journal (Figure 3). Of the thirteen articles selected, two articles were published in the first quartile journal (Q1), five articles were published in the second quartile journal (Q2), five articles were published in the third quartile journal (Q3), and one article was published in the fourth quartile journal (Q4). This quartile distribution shows that the majority of articles on this topic were published in journals in the upper-middle quartile (Q2 and Q3), with an equal share of 38.5% each, while the rest were distributed among journals in the upper (Q1) and lower (Q4) quartile of the Scopus database. It can be said that research on innovation in the financial sector still needs to be encouraged. Although there are several studies published in top journals that can be used as practical and theoretical references, considering that the distribution of this research topic is generally still in middle-class journals, this indicates that this research topic still has the opportunity to further develop into a more mature research topic and focus

Table 2. Publication sources

No.	Publication Source and Publisher	Number of Articles	Journal Quartile (SJR 2023)
1	Environment and Planning A - *SAGE Publications Ltd*	1	Q1 - Geography, Planning and Development
2	International Journal of Entrepreneurship and Innovation - *SAGE Publications Inc.*	1	Q1 - Business and International Management
3	Economies - *Multidisciplinary Digital Publishing Institute (MDPI)*	1	Q2 - Economics, Econometrics and Finance (miscellaneous)
4	Journal of Information Technology Teaching Cases - *Springer International Publishing AG*	1	Q2 - Library and Information Sciences
5	Technological and Economic Development of Economy - *Vilnius Gediminas Technical University*	1	Q2 - Finance
6	Global Social Welfare - *Springer Nature Switzerland AG*	1	Q2 - Sociology and Political Science
7	Journal of Financial Services Marketing - *Palgrave Macmillan Ltd.*	1	Q2 - Finance
8	Finance: Theory and Practice - *Financial University under The Government of Russian Federation*	2	Q3 - Economics, Econometrics and Finance (miscellaneous)
9	Forum for Social Economics, The - *Taylor and Francis Inc.*	1	Q3 - Economics and Econometrics
10	Journal of Risk and Financial Management - *MDPI AG*	1	Q3 - Finance
11	Rutgers Business Review - *Rutgers Business School*	1	Q3 - Business and International Management
12	Journal of Environmental Management and Tourism - *ASERS Publishing*	1	Q4 - Economics and Econometrics

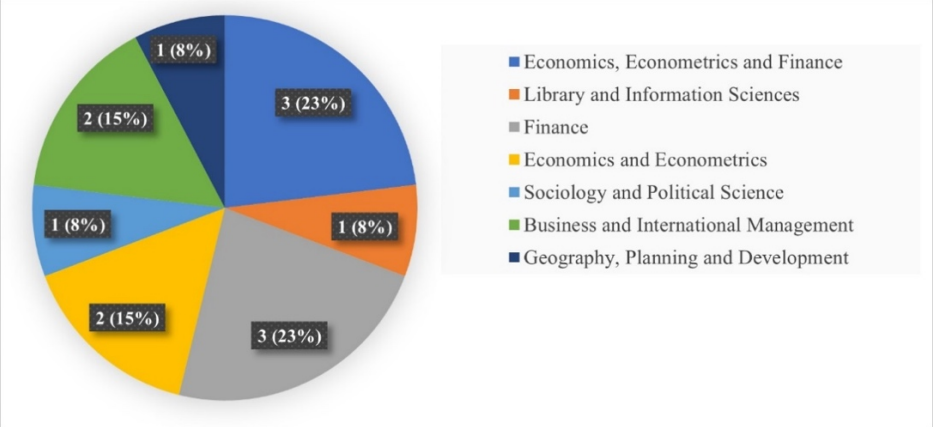


Figure 3. Journal subject categor

Table 3. List of number of article citations

Names of authors	No. of citations (Google Scholar)
Iskakova et al. (2019)	1
Krylov and Seleznev (2019)	5
Uribe-Echeberria et al. (2019)	32
Lehmann and Smets (2020)	17
Bentzen et al. (2021)	10
Ozili (2021)	822
Radnejad et al. (2021)	15
Stankevičienė and Kabulova (2022)	30
Washington et al. (2022)	29
Dananjayan et al. (2023)	7
Hakimi et al. (2023)	23
Jumaa (2023)	1
Ofori-Acquah et al. (2023)	7

Figure 3 illustrates that in terms of subject categories, these research topics are most frequently published in journals in the subject categories of Economics, Econometrics, and Finance and Finance (23% each), followed by journals in the subject categories of Economics and Econometrics, and International Business and Management (15% each). Similar topics are also covered by journals in the Library and Information Science, Sociology and Political Science, and Geography, Planning and Development subject categories.

A citation analysis of the thirteen selected articles, summarized in Table 3, reveals significant differences in the core literature. The analysis provides insight into the discourse surrounding the three main research focuses, which are based on three research questions. The theme "Implementation and Impact of Technological Innovation" (topic focus 1), which is dominated by Ozili (2021), has the highest influence weight. With 822 citations, the article is the most influential in the group. Ozili's work demonstrates that the success of innovations is not only

measured by bank profitability (or other financial performance) but also by social impact and user accessibility. This justifies the focus of this study on demand-side determinants in Research Question 1 (RQ1). Articles with moderate influence, such as those by Uribe-Echeberría et al. (2019) and Stankevičienė & Kabulova (2022), support the importance of the practical implementation and validation of the sector stability risks posed by FinTech. This reinforces the dominance of the "Implementation and Impact of Technological Innovation" theme. In contrast, discussions on trust challenges related to RQ2 and policy solutions related to RQ3 have lower influence weights, indicating that these areas are still evolving. Despite their importance, discussions of trust challenges, as illustrated by Hakimi et al. (2023) with 23 citations, have a moderate number of citations. Similarly, articles focusing on policy solutions demonstrate that evidence-based approaches are in the developmental stage and often rely on specific case studies. In summary, the current scientific discourse on technology impact issues is relatively mature. However, there is still a significant need for a unified synthesis of fragmented trust challenges and policy solutions, which validates this study's main objective. This observation forms the basis for the next section, where we divide the critical review into three focus groups.

B. Critical findings of the selected articles

This subsection systematically reviews and outlines the critical findings of the selected articles, which are divided into three categorical groups based on their research focus (Table 4). The first group of five articles focuses on the use and effects of technological innovations in the financial sector and institutions. The second group of three articles focuses on public trust issues that often arise in implementing technological innovations in the financial sector and institutions. The third group of five articles discusses regulation and governance, which can be a solution to overcome challenges and improve the success of innovation implementation in the financial sector or institution.

The study by Dananjayan et al. (2023) examined the progress and growth of digital financial technology in the banking industry in India. The study used a case study research approach and a literature review that included various related academic literature, news reports, and factual field sources. Financial technology (fintech) adoption has efficiently increased the effectiveness of digital financial services over conventional financial services in India. The adoption of digital technology in the Indian financial sector has been transformational due to simple processes, low costs, and easy and fast access to data. As this article serves as a teaching case/resource, Dananjayan et al. (2023) suggest that educators emphasize the importance of ethical considerations when adopting digital technologies in financial services. Issues such as cybersecurity and personal data privacy should be taken seriously.

Table 4. Grouping of articles by topic focus

No.	Topic focus group	Author(s)
1	Implementation and impact of technological innovations in the financial sector and institutions	*Five articles:* Dananjayan *et al.* (2023); Jumaa (2023); Ozili (2021); Stankevičienė & Kabulova (2022); Uribe-Echeberria *et al.* (2019)
2	The challenges frequently associated with trust	*Three articles:* Hakimi *et al.* (2023); Krylov & Seleznev (2019); Ofori-Acquah *et al.* (2023)
3	Management, regulation, and governance as solutions to address these challenges and increase success	*Five articles:* Bentzen *et al.* (2021); Iskakova *et al.* (2019); Lehmann & Smets (2020); Radnejad *et al.* (2021); Washington *et al.* (2022)

Source: author's elaboration

The study conducted by Jumaa (2023) examined the state of innovation in financial services in the United Arab Emirates (UAE). Specifically, the study identified the types of financial innovations used, how they are used, who the users are, and the impact of financial innovations on the performance and competitiveness of institutions in the financial sector. The study collected primary data by distributing questionnaires to 500 bank customers in the UAE and analyzed the data using descriptive statistical methods. The results show that although the UAE is ranked as the 6th country in the world with the highest ICT adoption rate, most UAE citizens need to become more familiar with financial innovation products such as financial technology (fintech). On the other hand, UAE residents are very open to using technology in financial services, especially those in their productive years. Therefore, the government is constantly encouraging technology investments in these companies to increase the use of digital financial technology in the UAE society.

Ozili (2021) conducted a literature review study to examine financial progress and inclusiveness in developing countries. This study examines the widely debated issues related to financial inclusiveness, including the policies and inclusive impact of the services of bank and non-bank financial institutions. The main contribution of this study relates to the role of financial innovation

in promoting financial inclusion, among other factors such as financial sector stability, financial literacy, and country regulation. The article also highlights the need for further research on financial inclusion, particularly by identifying critical gaps in the emerging research. According to the study, policymakers have expressed a desire to encourage more practical, solution-oriented research that addresses common socioeconomic problems such as poverty reduction and innovative non-bank financial services, the results of which can be more easily used by developing countries. Nevertheless, from an academic perspective, it remains crucial to conduct a critical study of financial inclusion by examining the proxies and assumptions underlying economic models of financial inclusion. This study also encourages future research investigating the policies and regulations needed to improve financial inclusion through financial technology innovation.

Stankevičienė and Kabulova (2022) examine the impact of financial technology (fintech) and firms' responses to its adoption, particularly concerning stability, performance, and potential risks. Using panel data collected from the Thomson Reuters Datastream (TRD) database of banks listed in 2015-2019 in 37 countries and employing fixed effects panel data regression analysis techniques, the results suggest that the impact of financial technology on financial stability varies across markets. According to this study, the effect of financial technology (fintech) on the stability of financial institutions would be more significant if the market-level indicators were included.

Uribe-Echeberria et al. (2019) investigated the impact of digital transformation in the financial industry on consumers, focusing on satisfaction, opinions, transparency, and trust in financial institutions. An explanatory approach was used with 385 bank customers, followed by ordinal logistic regression and chi-square analysis techniques. The results show the significant impact of technological innovation, which is an essential milestone in the financial sector's digital transformation. Integrating these technologies improves convenience, satisfaction, and communication channels between customers and companies. Communication, transparency, and trust are essential for a successful innovation transition. Effective communication and interaction strategies will foster harmonious relationships between parties. Transparency in introducing service innovations and handling technical issues can build consumer trust and loyalty, which ultimately increases the success of the transformation process.

Several studies have examined the issue of transparency and consumer trust in financial sector transformation. Krylov and Seleznev (2019) study explored the attributes of blockchain technology and its adoption in conventional financial markets. The data was statistically analyzed, and relevant scientific works were reviewed to determine the blockchain adoption process. The study outlines the innovation diffusion process in implementing blockchain technology in the financial sector. Various economic and sociological factors contribute to the slow adoption of blockchain in financial markets, including user concerns about security, privacy, openness, transparency, and trust in this technological innovation. Blockchain technology's social and economic impact remains to be determined despite its promises and exaggerated expectations. As a result, traditional financial markets have yet to see a significant increase in the use of blockchain, as digital solutions provided by conventional financial institutions are more trusted by the public.

Hakimi et al. (2023) examined the behavior of individuals of productive age (20-40 years) in Melaka, Malaysia, using mobile banking services. This study used the Theory of Planned Behavior (TPB), Diffusion of Innovation Theory (DOI), and Technology Acceptance Model (TAM) to develop a research construct that can effectively capture people's perceptions of digital services, namely mobile banking. Three hundred eighty-four data samples were collected and analyzed using Structural Equation Modeling and Confirmatory Factor Analysis. The main findings of this study show that the intention to use mobile banking depends on user trust, along with the perceived ease of use of the menu, the attractive appearance of the application, and the transparency and security of customer data. These three factors are critical determinants for individuals in determining the importance of technology use and whether they will use a particular product.

In Ghana, Ofori-Acquah et al. (2023) highlighted the issue of public trust in service innovation in the financial sector. This study examines the efforts of the Ghanaian financial industry and institutions to gain public trust in technological advances in the financial market. It investigates the tactics used to increase public trust and the barriers faced in fostering such trust. Through a literature review of financial sector developments in Ghana, the research reveals the emergence of two digital

service platforms in the Ghanaian financial sector: digital payment services and digital investment services. The government is committed to building public trust in financial technology innovations by implementing relevant policies and frameworks for digital financial services that prioritize user privacy to mitigate security risks and cybercrime. Technology is used in products and to promote public trust in financial sector innovation. In other words, the government seeks to build public trust and create a technological environment supporting financial technology adoption. However, the implementation of financial technology in Ghana still faces challenges related to access to technology for low-income individuals, digital literacy, and legal support for service users. All of these factors affect the adoption and implementation of digital financial services and public trust in Ghana's financial sector.

After addressing the trust issues that often concern users of digital financial services, the next challenge is for financial innovation providers to find solutions that increase public trust in using their innovative products. Achieving sufficient adoption rates requires the development of convenient and secure technologies and privacy guarantees that can foster public trust. Iskakova et al. (2019) identified challenges facing the financial system development in Kazakhstan in the context of the global economy and sustainable development. They examined how strategic management and supervision can support sustainable development in the financial system. In addition to financial statistics, the analytical methods used included official state documents, laws, and regulations governing the management and supervision of the financial system. An essential finding of this research relates to creating sustainable development programs based on globally recognized standards. The aim is to improve the quality of domestic financial system planning and to set appropriate target indicators. Management and governance issues of financial institutions remain a significant concern, and countries need to adapt to the changing landscape of global financial markets. In addition, building partnerships and enhancing collaboration with advanced countries on strategies and policies to build successful financial systems and institutions is also a top priority.

Bentzen et al. (2021), in an analysis of the relationship between regulation and innovation performance in the financial sector, examined the mediating role of regulatory complexity and flexibility on financial innovation. Their research used a case study approach, examining 100 service innovation products in Denmark introduced by large financial institutions. Additionally, the study conducted interviews and workshops with ten managers responsible for innovation products, followed by qualitative document analysis. The research used Chi-square statistical analysis, which found that high flexibility and low complexity positively mediate the relationship between regulation and financial innovation performance. The recommendations above are critical for regulators to balance the complexity of regulation with the adaptability of its implementation to facilitate financial innovation.

Financial innovation products and frameworks regulated by governments or financial institutions are not necessarily necessary or impactful for users or capable of changing the existing financial system. This is the case for the banking industry in Germany. Radnejad et al. (2021) studied the implementation of the rules of the Payment Services Directive (PSD2), which were considered as "forced innovation". Interviews were conducted with 23 finance and banking experts over almost two years. From the interview transcripts, a content analysis was conducted to find essential themes related to the failure of PSD2 implementation. At the start of PSD2, financial industry players were not very receptive to this innovative measure, seeing it as a threat to their competitive advantage and imposing new costs. The incumbent banking industry sought ways to reduce these costs and share risks with other financial institutions. This is done so that the firm's innovation still has long-term benefits. A vital suggestion from this research is that innovations originating from influential authorities and applied to incumbent industries need to pay attention to the context of innovation that meets market needs and create a collaborative environment where these innovations are applied, for instance, through specific platforms that can facilitate innovation actors in the market. On the part of the innovation actors (incumbent industries), it is necessary to consider how they will respond to forced innovation. If it must be done, then cooperation between incumbent financial institutions and startups, such as financial technology (fintech), may be possible to create long-term success.

Washington et al. (2022) observed a similar phenomenon in the UK digital banking industry due to the implementation of rigid and strict regulation and governance of financial innovation (through regulatory sandbox). The study estimated the impact of these regulations on financial stability and the performance of financial

technology (fintech) and digital banking innovation. Using a sample of financial statements from 24 UK banks that participated in the regulatory sandbox between 2016 and 2021 and an empirical model estimated using a dynamic panel estimator (GMM), the study shows that the regulatory sandbox has a negative impact on financial stability and performance. However, the specific impact varies across experience and firm type. The results of this study encourage policymakers to design regulations for digital banks or propose alternative solutions to stimulate the growth of these innovative financial institutions in the long run.

Lehmann and Smets (2020) note that technological advances do not always drive sustainable innovation in financial services but can also be created by the social environment, such as the emergence of financial self-help groups. A clear example of groups implementing alternatives to the traditional financial system in the Netherlands can be found among the Ghanaian and Ethiopian immigrants who are members of the Rotating Savings and Credit Associations (ROSCA). In practice, ROSCA members contribute money regularly, and each member receives a lump sum in return. The research revealed several key findings by conducting semi-structured interviews with 21 ROSCA members, ranging from low-income residents to bank employees. This informal financial arrangement proved very helpful to members who had difficulty accessing formal financial institutions. Such community-based financial systems can potentially build a sustainable and robust financial infrastructure. While small-scale resilience testing can work within a self-help framework like ROSCA, more immense challenges require a balanced approach to governance. Therefore, policymakers seeking to create a sustainable financial system should recognize the potential for financial self-help to emerge from community-driven initiatives.

C. Implementation, challenges, and alternative solutions for innovation in the financial sector

This subsection seeks to provide an answer to the main research question of identifying the factors that influence the success of technological innovation in the financial sector, the challenges faced in the process of technology integration and innovation, and alternative solutions to overcome these challenges and improve the success of innovation in the financial sector. The impact of financial innovation has been demonstrated in several countries, such as India, where financial technology (fintech) has successfully disrupted traditional financial services (Dananjayan et al., 2023). Innovations, built with a certain level of complexity, aim to simplify and provide solutions to more complicated financial problems (Fishenden & Thompson, 2013). Therefore, the efficient and cost-effective use of technology offers immediate benefits that can quickly attract consumers from non-digital options (Reinartz, Wiegand, & Imschloss, 2019; Saarikko, Westergren, & Blomquist, 2020).

On the consumer side, factors such as communication, transparency, and trust play an important role in a firm's digital transformation process (Uribe-Echeberria et al., 2019). On the other hand, financial stability risks for firms that commercialize innovations are strongly influenced by market conditions. The positive and negative effects of financial innovations, such as financial technology (fintech), on firms will follow market-level indicators and firm profitability (Safiullah & Paramati, 2022; Stankevičienė & Kabulova, 2022). These profitability benefits may not be realized in the short run, as the innovation process takes time for adoption and diffusion (Eze, Chinedu-Eze, Awa, & Alharthi, 2021). Therefore, when designing financial innovations, firms should conduct a thorough market analysis and consider the risks associated with firm performance.

To facilitate the adoption process of financial innovations, societal openness to new technologies (digital openness) is crucial (Alaassar, Mention, & Aas, 2023). Studies in the United Arab Emirates (UAE) provide evidence that technology can benefit society, as it is very receptive to technological innovations. Still, it must be supported by the significant involvement of governement authorities (Jumaa, 2023). The UAE is widely recognized for its high rate of ICT adoption, most likely due to investment in the sector. However, there is a downside in the financial industry, where people's understanding of financial innovation as users of banking products in the UAE is lacking. The balance between ICT investment at the enterprise level and user benefits needs to be further examined. As highlighted by Ozili (2021), financial innovation is essential in promoting financial inclusion in developing countries. Nevertheless, existing research seems more geared toward satisfying policymakers than contributing to the literature.

Undoubtedly, policymakers are looking for practical research that provides tangible social economic benefits. Therefore, the financial innovation and inclusion literature needs further conceptual development (Khraisha & Arthur, 2018). Further research is necessary to understand how firms and governments can efficiently introduce innovative products to the public or users.

Based on this explanation, we can formulate the first proposition visualized in Figure 4.

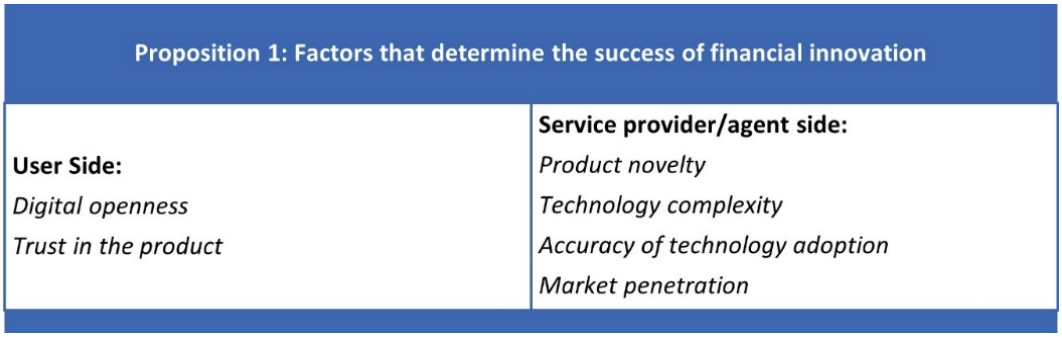


Figure 4. Proposition 1

Among several factors expected to affect the integration and implementation of product innovations in the financial sector, trust is a crucial issue frequently identified in various studies. For example, blockchain market penetration faces many barriers despite its promise and potential benefits (Krylov & Seleznev, 2019). The economic impact of blockchain has not been thoroughly documented (Du *et al.*, 2023). On the other hand, from a sociological perspective, people still consider traditional financial institutions a reliable solution. According to Hakimi et al. (2023), trust in a product or application is a vital factor influencing individual behavior when adopting financial services, such as mobile banking. Blockchain applications provide convenience, security, and ease of use in the digital financial ecosystem (Cole, Stevenson, & Aitken, 2019). However, a significant challenge for successfully integrating this technology into the financial market revolves around public trust.

As noted by Ofori-Acquah et al. (2023), the government of Ghana is strategically implementing plans to build public trust in innovative financial products. Policy instruments must have a reliable and clearly defined structure to monitor the effective integration of financial innovation products, maintain user privacy and security, and maintain innovation efficiency (Lumpkin, 2010). Factors affecting public trust may be directly or indirectly related to the successful implementation of financial innovation and confidence in the reliability of innovation products. However, an important aspect is the availability of systematic and measurable tools and policy frameworks that support the protection of users' privacy. Such devices should include the measurement of complaints about data protection violations and practical troubleshooting procedures. The government should improve its handling of digital literacy challenges, especially those related to accessibility and digital literacy, and provide a regulatory framework that protects all stakeholders in financial innovation.

From this explanation, we can formulate the second proposition as follows (Figure 5):

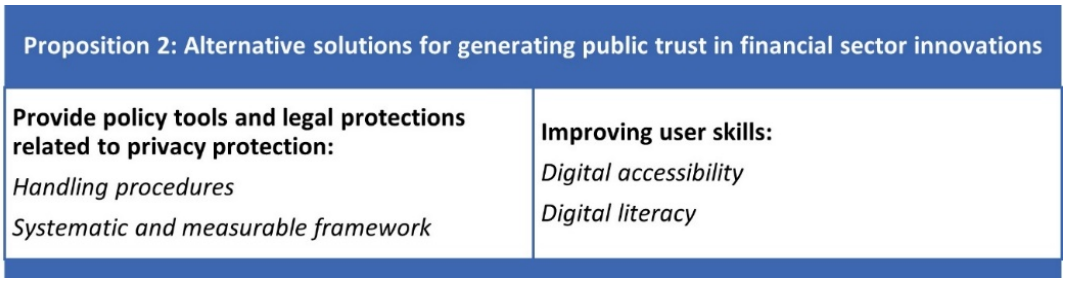


Figure 5. Proposition 2

From the perspective of financial product or service providers, the market is expected to readily accept innovations, although the adoption and penetration process may take time. If trust is one of the critical elements for public acceptance of innovative financial products, it should be carefully considered in the design of innovations. A crucial responsibility of policymakers is to build

initiatives that can develop a stable and resilient innovation ecosystem (Mazzucato, 2018). The findings of Iskakova et al. (2019) have significant implications in this regard, as sustainable development cannot be separated from the country's global position. Management and administration should also consider global financial issues and conditions. Therefore, it is recommended to collaborate or develop international partnerships in strategizing competitive, resilient, and sustainable financial institution policies (Ozili & Iorember, 2023; Razzaq & Yang, 2023). In addition, policymakers should consider Bentzen et al. (2021) regarding the complexity and flexibility of financial regulations for innovation purposes. Complex and flexible regulations can be challenging for firms and financial institutions to adopt. In addition to considering risks during the implementation process, such as reduced competitiveness and additional costs, firms need time to adapt (Yang & Li, 2018). Therefore, regulations promoting innovation in financial institutions should consider market conditions, issues, and needs.

Given the rapid development of technology and the emergence of new entities from different directions, the use of specialized platforms can facilitate the creation of a collaborative financial innovation ecosystem (Pushpananthan & Elmquist, 2022). Policy products need to accurately estimate the impact of implementing new regulations. Policy impact assessment is a well-developed aspect of innovation policy research (Zilgalvis, 2014). However, what matters most is the long-term impact of policy implementation in the financial innovation ecosystem. Concerning the sustainability of financial innovation, social and community-based forms of institutional innovation, such as those found by Lehmann and Smets (2020) in the Netherlands, are of particular interest. More research is needed to explore financial self-help strategies in developing countries with stronger social environments. However, immediate action can be taken to link these self-help and formal financial institutions to improve their resilience and sustainability.

As a result of this explanation, we can articulate the third proposition as follows (Figure 6):

Figure 6. Proposition 3

Overall, this synthesis of findings confirms that the sustainability of financial innovation depends on key drivers and the ecosystem's ability to address systemic challenges through adaptive policy strategies. The three propositions presented in this study collectively form an integrated conceptual framework (see Figure 7), linking all the findings into a coherent system. This model visually shows cause-and-effect relationships. For example, failure to secure key user-side drivers (Proposition 1/RQ1) directly triggers systemic challenges (Proposition 2/RQ2). These challenges are classified as either demand-side (e.g., digital literacy and exclusion) or supply-side (e.g., regulation and cost) barriers. Ultimately, these challenges demand context-appropriate policy interventions (Proposition 3/RQ3) to achieve sustainable outcomes. This integrated framework is important because it explicitly positions policy strategies as connecting variables aligned with evidence-based solutions while building a financial innovation ecosystem that considers the sustainability dimensions of the ecosystem.

Figure 7. Integrated Framework

D. Further Discussion and Suggestions for Future Research

Although financial innovation (fintech) has demonstrated advantages in terms of market inclusion and efficiency, future discussions should shift from broad generalizations to a more detailed analysis of the specific impact of each technology. Examples of these technologies include blockchain, artificial intelligence (AI), and open banking. Each technology has different goals and challenges. For instance, blockchain technology primarily grapples with issues of public trust and market penetration (Wang et al., 2023). Although it offers strong transparency and data immutability, it does not eliminate the need for human trust. Rather, it facilitates trust through reliable data. In contrast, AI and machine learning focus on enhancing operational efficiency and precise risk assessment (Rezki & Mansouri, 2024). AI can help financial institutions reduce bad debt rates by up to 15% through more thorough credit evaluation and improve risk management efficiency. However, AI also presents unique challenges, such as "black box" risk (a lack of transparency in algorithms), algorithm bias, and increased operational and systemic risks due to reliance on functional AI providers. Meanwhile, open banking aims to improve competition and consumer welfare by providing greater access to data (Borgogno & Manganelli, 2021). However, it also brings the risk of data monopolization by large technology companies, which could threaten traditional competitors. Analyzing the challenges and contributions of these technologies will allow future discussions to achieve a deeper understanding of the need for strategic policies tailored to each technology.

The critical review presented in the previous section is thematic and provides a basis for a more nuanced comparative analysis. Financial innovation is essential for driving inclusion and market efficiency. However, further exploration is needed to identify differences among key technologies, such as blockchain, AI, and open banking. Furthermore, explicitly presenting cross-literature comparisons uncovers important contextual nuances. Research in developing countries consistently highlights user-side factors, such as digital literacy and privacy protection, as critical success factors. For example, research conducted in Ghana supports this idea. In contrast, literature from developed countries, such as the UK, focuses on regulatory flexibility and systemic stability. These discrepancies confirm our key finding that effective policy strategies must fit the context and address factors hindering sustainable innovation in the market. Therefore, the analytical framework presented in Figure 7 and our three propositions provide an important foundation for researchers and policymakers to develop interventions tailored to technology-specific challenges and contextual market needs in different countries.

IV. CONCLUSION

This research is motivated by the limited literature on innovation in the financial sector or institutions. There has been a rapid growth in the analysis of the impact of digital financial innovation products on various socio-economic conditions. However, challenges related to public

trust often arise in implementing financial innovations. Several studies separately propose measures to address these challenges.

Using a systematic literature review approach, this article first comprehensively presents the development of financial innovation research in a global database of reputable journal publications. The review shows that financial innovation research has evolved significantly. The fact that this research has developed on medium to high-quality literature sources encourages future research to develop this research to a more mature stage. From several articles relevant to the research objectives, important findings and implications of this research are presented. At the systematic end of the study, and as part of the crucial contributions of this research, three propositions are put forward. The first proposition is that the factors determining financial innovation's success can be approached from two sides, namely the user side and the financial product/service provider/agent side. The role of government as a policy maker is proposed in the second proposition, which is related to the necessity of regulations and legal frameworks to overcome challenges related to public trust and the role of policymakers in increasing the digital literacy of the community/users. Alternative policy solutions for sustainable financial innovation constitute the third proposition, which emphasizes specifically developed policy strategies and the importance of ecosystems for sustainable financial innovation.

This research is expected to make an academic contribution to the innovation and financial studies literature. However, the main expected benefit is the practical implications for effective integration of technological innovation, especially in the financial industry. Users of innovative products, service providers/agents, and policymakers are expected to consider the three propositions presented. Given the limited literature focusing on innovation in the financial sector, particularly the database used, the authors acknowledge the limitation that it is premature to generalize the results of this study to broader issues such as innovation studies and financial studies. This topic is still evolving, and further research and investigation are needed to reach a more mature standard. Finally, these three propositions will be more valid if they can be empirically tested. Future research is recommended to use the results of this study and conduct further research to validate these propositions empirically.

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