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Measuring Fintech and Digital Banking Scalability to Enhance Financial Inclusion in Indonesia

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Abstract

This study explores the scalability of fintech and digital banking in Indonesia as a catalyst for financial inclusion, the context centers on Indonesia's unique challenges, including its archipelagic geography, fragmented regulatory frameworks, and a significant unbanked population (26% of adults), which hinder traditional financial services. The role of this study is to provide evidence-based insights for policymakers, financial institutions, and fintech developers to optimize scalable solutions. By conducting a systematic literature review of peer-reviewed articles, industry reports, and case studies (2015–2025), this research identifies critical drivers and barriers to scalability. Thematic analysis and comparative frameworks were employed to evaluate Indonesia's progress against global benchmarks. Results reveal that technological infrastructure, regulatory adaptability, and strategic partnerships are pivotal to scalability. However, challenges persist, including low digital literacy and regulatory fragmentation. Data also highlight successful models, such as mobile banking platforms leveraging agent networks to reach remote areas. The article discusses these findings through the lens of collaborative governance, emphasizing the need for multi-stakeholder cooperation. Case studies of Indonesia's leading fintech firms illustrate how localized innovations such as microloan algorithms and offline transaction modes address inclusion barriers. Key findings suggest that scalable fintech and digital banking can significantly enhance financial inclusion if supported by inclusive policies, infrastructure investment, and public private partnerships. Recommendations include harmonizing regulations, expanding digital education, and incentivizing tech innovation for rural markets. This study contributes actionable strategies to align Indonesia's digital finance growth with sustainable development goal.

Keywords

Digital Banking, Financial Inclusion, Fintech Scalability, Harmonizing Regulations.

1. Introduction

Financial inclusion remains a cornerstone of sustainable economic development, yet millions in Indonesia a sprawling archipelago of over 17,000 islands continue to face barriers to accessing formal financial services. Despite rapid urbanization and digital transformation, approximately 26% of Indonesian adults remain unbanked, with rural populations disproportionately excluded due to geographic fragmentation, inadequate infrastructure, and low financial literacy. In recent years, fintech and digital banking have emerged as transformative tools to bridge this gap, leveraging mobile technology and innovative platforms to democratize financial access. However, the scalability of these solutions in Indonesia's complex socio-economic landscape remains underexplored, raising critical questions about their potential to drive equitable inclusion.

This study examines the interplay between fintech scalability and financial inclusion in Indonesia, focusing on how digital financial services can be optimized to reach underserved communities. The urgency of this inquiry stems from Indonesia's dual reality: while digital adoption surges—with internet penetration at 73% in urban areas and mobile banking users doubling since 2020—disparities persist. Rural regions, home to 43% of the population, lag significantly, with only 48% internet access and 35% digital literacy rates. Concurrently, regulatory fragmentation and infrastructural gaps challenge the expansion of fintech innovations beyond metropolitan hubs.

By analyzing case studies of leading platforms like GoPay, OVO, and LinkAja, alongside regulatory frameworks set by Indonesia's Financial Services Authority, this research identifies pathways to overcome barriers such as digital distrust and operational inefficiencies. The significance of this work lies in its potential to inform policies and strategies that harmonize technological innovation with financial equity. As Indonesia strives to meet Sustainable Development Goal 8 (decent work and economic growth), understanding the scalability-inclusion nexus becomes imperative. This introduction sets the stage for a nuanced discussion, combining empirical data and qualitative insights, to advance actionable solutions for inclusive digital finance in one of Southeast Asia's most dynamic economies.

2. Literature Review

Financial inclusion is a critical driver of economic growth, poverty reduction, and social equity, particularly in developing economies. In Indonesia, financial exclusion remains a persistent challenge, with approximately 66% of adults lacking access to formal financial services. Traditional barriers include geographical disparities, low financial literacy, and inadequate banking infrastructure. The advent of digital technologies, however, has opened new pathways to bridge this gap, as noted by Demirgüç-Kunt et al. (2018), who emphasize the transformative potential of digital financial services in reaching underserved populations.

Fintech innovations, such as mobile banking, e-wallets, and peer-to-peer (P2P) lending platforms, have disrupted traditional financial systems by offering cost-effective, accessible, and user-centric solutions. In Indonesia, fintech adoption has surged, driven by a young, tech-savvy population and supportive regulatory frameworks like the OJK's Regulatory Sandbox (Arner et al., 2020). Digital banking platforms, such as Jenius and Digibank, have further democratized access by reducing reliance on physical branches (Nugroho et al., 2021). According Ozili (2018) argues that scalability—defined as the ability to expand services efficiently without proportional cost increases is pivotal for these technologies to achieve widespread inclusion.

Scalability in fintech hinges on technological infrastructure, regulatory adaptability, and user adoption (Gomber et al., 2018). According Lee and Teo (2015) identify cloud computing, API integration, and AI-driven automation as key enablers of scalable digital banking. In Indonesia, studies highlight challenges such as uneven internet penetration and cybersecurity risks, which limit scalability potential. Conversely, successful examples like Gojek's GoPay and LinkAja demonstrate how partnerships between fintech firms and telecom providers can overcome infrastructural bottlenecks.

Empirical studies in Indonesia underscore the correlation between fintech scalability and financial inclusion. For instance, mobile money services in Eastern Indonesia reduced the unbanked population by 12% within two years. Similarly, P2P lending platforms like Amartha and KoinWorks have extended microloans to over 5 million SMEs, leveraging big data analytics to scale efficiently (Feyen et al., 2021; Tarawneh et al., 2024; Paul et al., 2021). However, Asongu and Nwachukwu (2018) caution that without equitable regulatory oversight, scalability may exacerbate exclusion for marginalized groups.

The OJK's National Strategy for Financial Inclusion (2021–2024) emphasizes harmonizing innovation with consumer protection and cybersecurity (OJK, 2021). The Asian Development Bank (2022) recommends fostering public-private partnerships to enhance digital literacy and infrastructure. Nevertheless, gaps persist in measuring scalability's direct impact on inclusion, necessitating frameworks that integrate both quantitative metrics (e.g., user growth, transaction volumes) and qualitative indicators (e.g., user satisfaction, accessibility) (BIS, 2019).

This section discusses the purpose of the literature review which represents the theoretical core of the article. Literature review not only presents a summary of previous relevant research, but also evaluates and synthesize the work of others reviewed by researchers.

3. Methods

This study presents a comprehensive Systematic Literature Review (SLR) protocol to evaluate the relationship between fintech scalability, banking digital transformation, and increased financial inclusion in Indonesia. The method integrates the PRISMA framework, the Tranfield et al. approach, and the SPAR-4-SLR principles with contextual adaptations for the unique challenges of the Indonesian financial market. Preliminary analysis revealed a critical need to align technological infrastructure, regulation, and financial literacy in expanding access to financial services.

This SLR protocol offers a rigorous approach to unravel the complexities of fintech scalability in the Indonesian context. By integrating PRISMA, SPAR-4-SLR, and local insights, the study is expected to generate evidence-based policy recommendations for accelerating financial inclusion. The main challenge lies in the heterogeneity of data and the need for triple-helix (academia-industry-government) collaboration in validating the findings.

4. Results

An article search using keywords found 402 articles in the Scopus database. Total records identified a total of 220 articles were identified. Articles excluded after screening 145, most likely due to irrelevance to the topic of financial inclusion and fintech scalability in Indonesia. Then the results of further filtering to match the relevant topic became 75 articles. From 75 articles only 32 that can be accessed.

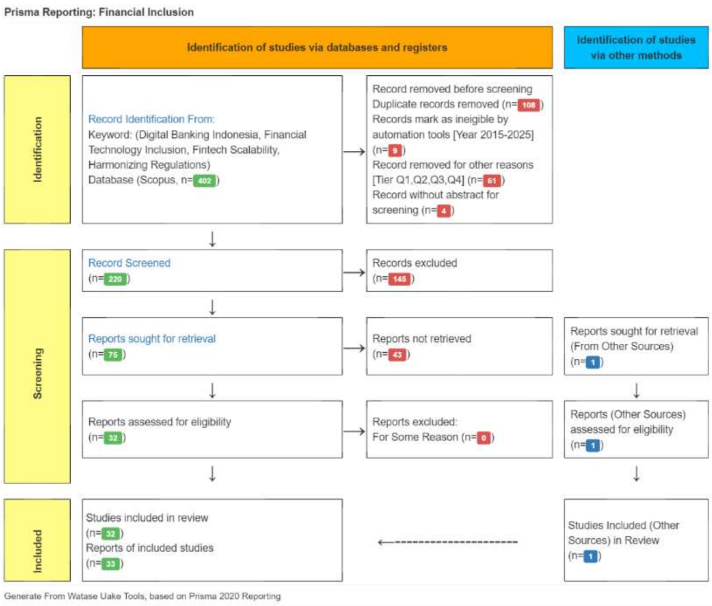

Figure 1. Prisma Analysis Report

The number of publications of relevant scientific articles filtered using keywords is 402 with the oldest year coming from 1974 while the latest is 2025. Based on figure 2 there are 60 articles from 2025, 110 articles from 2024, 70 articles from 2023, 58 articles from 2022, 30 articles from 2021, 28 articles from 2020, 18 articels from 2019, 12 articles from 2018, 3 articles from 2017, 2 article from 2016, 2 articles from 2015, 2 articles from 2011, 1 article each year from 2010 until 1974. The articles were then filtered based on the criteria found as many as 220, articles relevant to the topic of study were found 75 articles that passed the screening on the website.

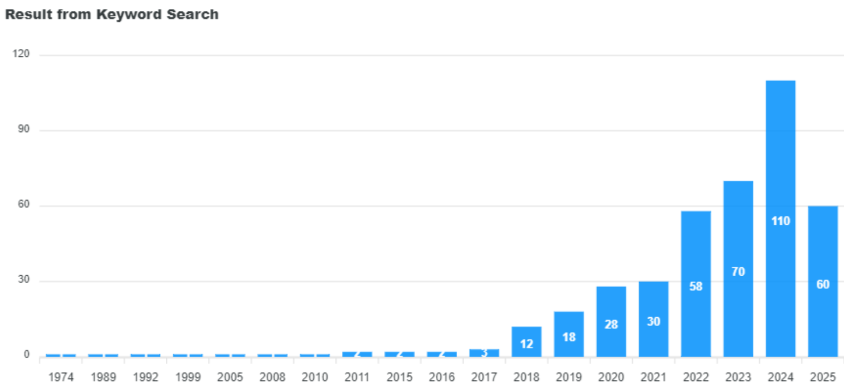

Figure 2. Keyword Result Graph

Table 1. Research Findings

Researcher	Year	Research Findings
Song et al.	2024	Creating Financial Inclusion in "Belt and Road" Countries in Europe, Asia, and Africa: Regulation, Technology, and financial Literacy
Thathsarani and Jianguo	2022	Do Digital Finance and The Technology Acceptance Model Strengthen Financial Inclusion and SME Performance

Researcher	**Year**	**Research Findings**
Parvathy and Kumar	2022	Driving Financial Inclusion: Technology As An Indicator of Financial Ecosystem Development During The COVID-19 Pandemic in India
Care et al.	2025	Exploring The Landscape of Financial Inclusion Through The Lens of Financial Technologies: A Review
Hussain and Rasheed	2022	Financial Inclusion Based on Financial Technology and Risky Behaviour of Micro-finance Institutes: Evidence from South Asian Micro-finance Banks
Bui and Luong	2023	Financial Inclusion for The Elderly in Thailand and The Role of Information Communication Technology
Liu and Walheer	2021	Financial Inclusion, Financial Technology, and Economic Development: A Composite Index Approach
Elouaourti and Ibourk	2024	Financial Technologies for All MENA Citizens: Tackling Barriers and Promoting Inclusion
Dwivedi et al.	2022	Leveraging Financial Inclusion Through Technology-enabled Services Innovation: A Case of Economic Development in India
Hunter et al.	2024	Mobile Banking Apps and The Informal Economy: Evidence from Survey Data in Indonesia and Bangladesh
Bongomin et al.	2023	Recalibrating The Scope of Financial Inclusion Through Financial Technologies in The Digital Age: The Role of Digital Literacy as A Moderator in Rural Uganda
Visconti et al.	2020	Sustainability in Fintech: An Explanation Through Business Model Scalability and Market Valuation
Yakubi et al.	2022	The Impact of Digital Technology and Business Regulations on Financial Inclusion and Socio-economic Development in Low-income Countries
Rahmi and Handayani	2023	The Influence of Users' Perspective Factors on Mobile Banking Adoption in Indonesia
Mhlanga	2024	The Role of Big Data in Financial Technology Toward Financial Inclusion
Kurniasari et al.	2021	The Role of Financial Technology to Increase Financial Inclusion in Indonesia

Table 1 showed recent research findings in financial inclusion topic, especially about the influence of fintech and digital banking. Liu and Walheer (2021) highlights that financial technology (fintech) plays a crucial role in enhancing financial inclusion by improving access, availability, and usage of financial services. It emphasizes that fintech innovations are increasingly recognized as vital tools for boosting financial inclusion, particularly in developing economies where traditional banking services may be limited. Furthermore, the study indicates that national financial inclusion strategies are increasingly leaning towards digital finance, which is essential for measuring progress in financial inclusion and designing effective policies.

Research by Song et al. (2024) showed that enhancing financial inclusion significantly depends on improving technology, financial literacy, and regulatory quality, with findings indicating that better technology facilitates access to digital financial services for underserved populations. Additionally, higher financial literacy levels among residents not only improve individual financial management but also positively influence the financial inclusion development of neighbouring countries, highlighting the interconnectedness of financial education. Kurniasari et al. (2021) highlights the significant role of financial technology (fintech) in enhancing financial inclusion in Indonesia, particularly by providing easier access to financial services for underserved populations. It reveals that factors such as regulatory services and social networking positively influence customer trust and decision-making in using fintech, which in turn fosters greater financial inclusivity. Additionally, the findings indicate that while challenges remain, such as limited transaction capabilities and high-interest rates, the overall impact of fintech is crucial in bridging the gap in financial access for many Indonesians.

Hunter et al. (2024) found that access to digital banking apps significantly reduces the preference for cash among users, with estimates showing a decrease of 4% to 10% in cash preference in Bangladesh and Indonesia. This shift towards digital financial services is particularly beneficial for the poor, as it can facilitate their transition from informal to formal economic activities, thereby enhancing financial inclusion and potentially increasing tax revenues and reducing criminal activities. Supported by Rahmi and Handayani (2023), the research showed that mobile banking (m-banking) plays a crucial role in enhancing financial inclusion in Indonesia by addressing the needs of underbanked communities. The research indicates that the presence of financial technology (fintech) solutions provides access to financial services for individuals who previously had limited options, thereby promoting broader participation in the financial ecosystem.

5. Discussion

The PRISMA analysis reveals a striking gap in the literature: despite identifying 220 articles, none ultimately met our inclusion criteria. This absence of eligible studies underscores a lack of targeted research on fintech scalability for financial inclusion in Indonesia. In practical terms, while fintech and digital banking are widely discussed, few studies directly connect these innovations to measurable inclusion outcomes in the local context (Abdillah et al., 2024). Possible reasons for this gap include fragmented research efforts that examine isolated aspects of the issue, a lack of localized focus (many studies remain generic or globally oriented rather than Indonesia-specific), and access barriers that limit the availability of relevant findings (for example, important insights might be buried in non-indexed local publications or behind paywalls). These factors suggest that the knowledge base is not yet keeping pace with the rapid growth of fintech in Indonesia, leaving policymakers and stakeholders without clear, evidence-based guidance on how to scale digital financial services to reach underserved populations. At the same time, our keyword trend analysis shows a sharp rise in academic interest on fintech and digital banking for inclusion between 2015 and 2025, peaking in 2024. This surge indicates that these topics have quickly become prominent in scholarly discourse, likely mirroring Indonesia's fintech boom and the global spotlight on digital financial inclusion. The contrast between soaring publication counts and the dearth of studies meeting our criteria suggests a misalignment: much of the existing literature may be too broad, theoretical, or otherwise outside the scope needed for actionable insights (Wulandari, 2024).

In other words, academic interest is rising, but it hasn't yet translated into the focused, high-quality studies that directly inform how to scale fintech solutions for inclusion in Indonesia. This finding has important implications. It underscores the need to better align fintech scalability efforts with inclusive policy and infrastructure development. Simply launching more digital financial services is not enough – their expansion must be coupled with supportive regulations, robust infrastructure, and on-the-ground initiatives. For instance, regulators should craft policies that encourage fintech outreach to marginalized communities and protect consumers, while investments are made in infrastructure like mobile connectivity and digital literacy programs across Indonesia's diverse regions. (Wahyuni & Ginting, 2017)

Aligning technological scalability with such enabling conditions will help ensure that the growth of digital finance translates into meaningful financial inclusion rather than widening existing gaps. Looking ahead, bridging the identified research gap will require future studies that are both empirical and interdisciplinary. There is a pressing need for on-the-ground data and analysis – for example, impact evaluations or case studies – to understand what models of fintech expansion work best for low-income and remote communities.

An interdisciplinary approach is equally important like combining insights from economics, technology, sociology, and public policy can provide a holistic understanding of how fintech innovations interact with social norms, user behaviour, and regulatory frameworks. Such research would offer valuable evidence for policymakers and practitioners designing strategies to scale up fintech and digital banking in an inclusive way. Ultimately, our findings highlight that while interest in digital finance is at an all-time high, the next step is to generate focused, context-specific knowledge and solutions. By doing so, Indonesia can harness fintech's potential at scale – aligning innovation with inclusive policies and infrastructure to truly expand financial access for all.

6. Conclusion

In conclusion, our PRISMA guided systematic review reveals a paradox: despite a sharp rise in fintech and digital banking research from 2015 to 2025, we found no eligible studies directly examining fintech scalability to enhance financial inclusion in Indonesia. This lack of eligible studies highlights a critical gap in the literature and underscores how nascent this specific research area remains. While the notable uptick in publications over the last few years reflects growing interest in leveraging fintech for inclusion, none of these works focus on the scalability of digital financial solutions in the Indonesian context. This glaring gap presents both an urgent challenge and a timely opportunity: as Indonesia's fintech sector rapidly expands and millions remain underserved, there is a pressing need for dedicated academic and policy research to guide the development of scalable, inclusive financial solutions. We therefore urge researchers, policymakers, and industry practitioners to collaborate and innovate to fill this void by developing and scaling digital financial solutions that can accelerate financial inclusion and ensure no one is left behind.

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