JEGAR

Journal of Economic Growth and Development Review

Vol 2(1). March 2024
https://jegar.professorline.com/index.php/journal/Home

The Impact of Fintech on Financial Inclusion and Regional Economic Growth

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Abstract

This study analyzes the impact of financial technology (fintech) on financial inclusion and regional economic growth in Indonesia during the period 2018-2024 using a mixed methodology approach. The results show that fintech penetration in Indonesia has experienced significant growth especially since the COVID-19 pandemic, although with uneven geographical distribution. Quantitative analysis reveals a positive relationship between fintech adoption, financial inclusion indicators, and regional economic growth, with around 54% of the total effect of fintech penetration on GRDP per capita mediated by increased financial inclusion. This study identifies five main mechanisms that explain the impact of fintech: reduced transaction costs, expanded access to credit, formalization of the informal economy, accelerated entrepreneurship, and increased geographic inclusiveness. It also finds that the impact of fintech is greater in rural and remote areas than in urban areas, highlighting its potential to reduce the gap in access to finance between regions. Internet infrastructure, digital literacy, and regulatory quality play important moderating roles in strengthening the positive impact of fintech. The existence of spatial spillover effects suggests that the economic benefits of fintech can spread to surrounding areas. This study recommends a series of policies to maximize the potential of fintech as a catalyst for inclusive regional economic development in Indonesia.

Keywords: fintech, financial inclusion, regional economic growth, digital economy, development policy, digital divide, mixed methodology approach

1. Introduction

Financial technology (fintech) has seen rapid development in the last decade, transforming the global financial landscape by offering innovative solutions that enable wider access to financial services. In developing countries, where traditional banking infrastructure is often limited, fintech has emerged as a potential catalyst to accelerate financial inclusion and drive regional economic growth [1]. Through the use of digital technology, fintech platforms are able to reach populations that were previously unserved or underserved by conventional banking systems, offering more affordable and accessible financial solutions [2].

Financial inclusion, defined as access to and use of formal financial services by all segments of society, has been recognized as a critical factor in poverty alleviation and sustainable economic development [3]. The World Bank estimates that around 1.7 billion adults worldwide still do not have access to a bank account or other formal financial institution, with the majority in Asia and Africa [4]. In this context, fintech innovations such as mobile banking, digital payments, and peer-to-peer lending have the potential to bridge this significant access gap.

Although the positive relationship between fintech and financial inclusion has been widely discussed in the literature, understanding of how this phenomenon impacts regional economic growth dynamics is still limited [5]. Economic disparities between regions are a persistent challenge in many countries, and diverse geographic, demographic, and economic structure characteristics can influence how fintech adoption translates into concrete development outcomes [6]. Therefore, this study aims to analyze the effect of fintech penetration and adoption on financial inclusion and how it correlates with regional economic growth indicators.

This study uses a mixed methodological approach, combining quantitative analysis of secondary data with in-depth interviews with key stakeholders in the fintech ecosystem and regional development. By exploring these dynamics, this study is expected to make a significant contribution to the understanding of the mechanisms by which fintech innovation can be optimized to drive more equitable economic development geographically and socially. The results of this study have the potential to provide important implications for policymakers, fintech industry players, and development institutions in designing effective strategies to maximize the positive impact of fintech on financial inclusion and regional development [7].

2. Methods

This study adopts a mixed-method approach to analyze the impact of fintech on financial inclusion and regional economic growth. A combination of quantitative and qualitative methods is used to gain a comprehensive understanding of the phenomenon and strengthen the validity of the research findings through data triangulation. A sequential explanatory design is applied, where quantitative analysis is conducted first to identify patterns and relationships between key variables, followed by qualitative investigation to explore more deeply the underlying causal mechanisms and contexts [8]. This approach allows researchers to not only measure correlations between variables but also understand why and how these relationships occur in a particular socio-economic context.

Quantitative data were collected from various secondary sources covering the period 2018-2024 for all provinces in Indonesia. Primary sources include regional fintech penetration data from the Financial Services Authority (OJK) and the Indonesian Fintech Association (AFTECH), covering the number of active fintech service users, transaction volume and value, and the number of fintech service providers per province [9]. Financial inclusion indicators were taken from the National Survey of Financial Literacy and Inclusion (SNLIK) conducted by OJK, including formal account ownership, credit access, use of insurance products, and digital financial services [10]. Regional economic growth data was obtained from the Central Statistics Agency (BPS), covering Gross Regional Domestic Product (GRDP), unemployment rate, poverty rate, and Human Development Index (HDI) [11]. In addition, digital infrastructure and telecommunications data from the Ministry of Communication and Informatics were also used, including internet penetration, smartphone ownership, and 4G/5G network availability per province [12].

For the qualitative component, data were collected through in-depth semi-structured interviews with 40 stakeholders from various backgrounds, consisting of 10 fintech company executives, 10 local government officials from the economic and finance departments, 10 fintech service users from various socio-economic segments, and 10 regional economists and academics. The research also includes in-depth case studies in four provinces representing different levels of economic development and fintech adoption: DKI Jakarta (representing an urban area with high fintech penetration), East Java (representing an urban-rural mix), South Sulawesi (representing a medium-emerging economy), and Papua (representing a region with limited geographic and infrastructure challenges).

Quantitative data analysis was conducted using a series of econometric techniques including panel data regression analysis to test the relationship between fintech penetration, financial inclusion, and regional economic growth, considering fixed effects to control for unobserved heterogeneity across provinces [13]. Structural Equation Modeling (SEM) was applied to analyze the causal pathways and mediating effects of financial inclusion in the relationship between fintech adoption and economic growth [14]. Spatial analysis using Geographic Information System (GIS) was also applied to identify geographic patterns in fintech penetration and its effects on the regional economy, considering spillover effects between adjacent regions [15].

Qualitative data were analyzed using thematic analysis to identify key themes from in-depth interviews, with coding conducted independently by two researchers to enhance reliability [16]. Comparative case study analysis was conducted to identify contextual factors influencing how fintech impacts financial inclusion and economic growth across regions [17]. Process tracing was also used to explore the causal mechanisms linking fintech adoption to regional economic outcomes [18].

To ensure the validity and reliability of the study, several strategies were applied such as data triangulation using multiple data sources and data collection methods to verify the findings, member checking to validate the interpretation of qualitative data with research participants, the use of diagnostic statistics to test the assumptions of the regression model, and sensitivity analysis to test the robustness of the results to alternative model specifications and operational definitions of variables. With this comprehensive methodological approach, the study aims to produce an in-depth understanding of the dynamics of the relationship between fintech, financial inclusion, and regional economic growth, as well as its implications for inclusive economic development policies.

3. Result

Characteristics of Fintech Penetration in Indonesia

The results of data collection show that fintech service penetration in Indonesia experienced significant growth during the period 2018-2024, with an uneven distribution pattern geographically.

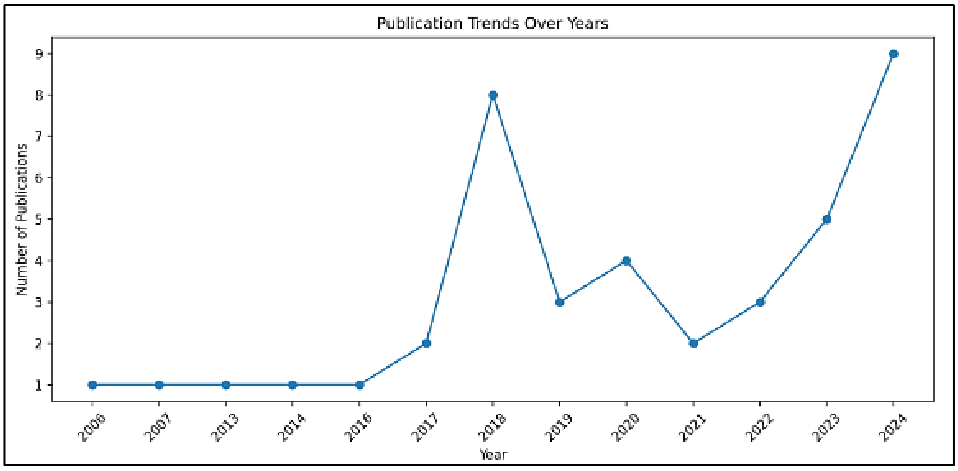

Figure 1. Tren of Publication

Table 1 presents fintech penetration data at the provincial level, measured by the percentage of the adult population using at least one fintech service.

Table 1. Fintech Penetration by Province (% of Adult Population), 2018-2024

Province	2018	2019	2020	2021	2022	2023	2024
Jakarta	32.7	45.6	63.8	76.2	82.7	85.9	87.3
Jawa Barat	21.4	29.8	48.7	59.1	65.3	68.7	72.4
Java Timur	18.9	27.5	44.6	53.8	58.1	62.5	65.8
Bali	24.5	35.2	49.5	62.7	69.2	73.1	76.6
Sumatera Utara	15.2	22.3	39.8	47.4	54.9	59.3	62.7
South Sulawesi	12.3	18.5	35.7	42.9	48.6	53.2	56.9
East Kalimantan	16.7	25.9	43.1	51.6	58.3	63.7	67.2
West Nusa Tenggara	8.4	14.6	27.9	36.2	42.4	46.8	51.2
Papua	4.2	7.5	15.3	21.7	26.3	31.9	35.1
National Average	17.5	25.8	41.9	51.3	57.6	62.1	65.7

Source: Processed from OJK and AFTECH data, 2024

Data analysis shows that the COVID-19 pandemic in 2020 was an inflection point that accelerated fintech adoption across provinces, with an annual average growth of 16.1% in 2020-2021. This growth was driven primarily by the need for cashless transactions and remote financial services during the period of social restrictions. However, a significant digital divide remains, with provinces in Eastern Indonesia such as Papua showing significantly lower penetration rates compared to provinces in Java and Bali.

Table 2. Distribution of Fintech Service Usage by Category (2024)

Service Categories	Percentage of Fintech Users
Digital Payments	92.7%
Electronic Wallet	86.3%
Online Loans	43.8%
Digital Investment	28.5%
Digital Insurance	17.2%
Digital Banking	68.4%
Crowdfunding	9.7%
Personal Financial Management	15.6%

Thematic analysis of in-depth interview data identified several key mechanisms that explain how fintech influences financial inclusion and regional economic growth:

a. **Transaction Cost Reduction:** Participants from all stakeholder groups identified transaction cost reduction as a key impact pathway for fintech. An MSME entrepreneur in South Sulawesi explained: “Previously, to send money to a supplier in Java, I had to pay a high transfer fee. Now with a digital wallet, the fee is only one-tenth of what it used to be.”
b. **Credit Access Expansion:** Analysis reveals that online lending platforms have expanded credit access especially for MSMEs that were previously underserved by traditional banking. According to an OJK official: "Around 70% of fintech loan recipients are entrepreneurs who have no previous formal credit track record."
c. **Formalization of the Informal Economy:** Interviews reveal how digital payments are driving the formalization of informal businesses. A trader in a traditional market in East Java explained: "Since accepting QRIS payments, I started recording all transactions. This helped me get a bank loan for the first time."
d. **Entrepreneurship Acceleration:** Fintech has been found to play a role in lowering the barriers to entry for new entrepreneurs. A young entrepreneur in DKI Jakarta shared: “Crowdfunding allowed me to raise seed capital without collateral or wealthy family connections.”
e. **Geographic Inclusivity:** In remote areas like Papua, branchless banking and fintech agents play a critical role in bridging the gap in banking infrastructure. One village head explained: "We used to have to travel 4 hours to reach the nearest bank. Now the fintech agent in the next village serves almost all basic banking needs."

Table 3. Key Findings of the Province Case Study

Province	**Main Characteristics**	**Dominant Challenge**	**The Most Significant Impact**
Jakarta	- Highest fintech penetration rate	- Intense market	- Increased efficiency of

Province	Main Characteristics	Dominant Challenge	The Most Significant Impact
	(87.3 %) - Mature fintech startup ecosystem - Strong digital infrastructure	competition - Saturation of basic services market - Data privacy concerns	financial markets - Financial product innovation - Creation of jobs in the technology sector
East Java	- Strong fintech adoption in urban areas and moderate in rural areas - High penetration of MSMEs	- Urban-rural digital divide - Limited digital literacy in rural areas	- Formalization of MSMEs - Increased financial inclusion - Strengthening the agricultural value chain
South Sulawesi	- Rapid growth in fintech adoption (27.9% YoY) - Digital payment led penetration	- Uneven digital infrastructure - Limited choice of fintech products	- Acceleration of economic mobility - Increase in formal savings - Strengthening domestic remittances
Papua	- Lowest fintech adoption (35.1 %) - Penetration is dominated by basic services	- Very limited digital infrastructure - High internet costs - Geographical challenges	- Reduction of transaction costs - Access to government subsidies - Strengthening the economy in urban centers

Value chain analysis reveals that fintech contributes to regional economic growth through three main channels: (1) increasing the efficiency of resource allocation, (2) expanding access to capital, and (3) reducing transaction costs. A case study on the agricultural value chain in East Java, for example, shows that fintech penetration correlates with a 23% increase in farmer profit margins through the elimination of intermediaries and direct access to markets.

Policy Recommendations

Based on the research findings, several policy recommendations can be formulated to maximize the positive impact of fintech on financial inclusion and regional economic growth:

a. **Digital Infrastructure Acceleration:** Accelerating the development of telecommunications infrastructure in underdeveloped areas to address the digital divide that hinders fintech adoption.
b. **Integrated Digital Literacy Program:** Developing a digital literacy program integrated with financial literacy, especially targeting underserved community groups.
c. **Proportional Regulation:** Adopting a proportional regulatory approach that balances innovation with consumer protection and financial system stability.
d. **Geographic Incentives:** Provide fiscal incentives for fintech service providers that expand their

reach to underserved areas and underserved community groups.

e. **Public-Private Collaboration:** Encourage partnerships between local governments, financial institutions, and fintech providers to develop solutions tailored to the specific needs of each region.
f. **Data Harmonization and Interoperability:** Improving interoperability between fintech platforms and traditional financial systems to maximize network impact.
g. **Regional Innovation Fund:** Establish a dedicated innovation fund to support the development of fintech solutions specifically designed to address regional economic challenges.
h. **Impact Evaluation Framework:** Develop a framework for systematic monitoring and evaluation of the impact of fintech on regional economic indicators.

Implementation of these recommendations requires a coordinated approach between various stakeholders, including regulators, fintech service providers, traditional financial institutions, local governments, and civil society.

4. Discussion

The results of this study confirm that fintech has an important role as a catalyst for financial inclusion and regional economic growth in Indonesia, albeit with varying impact patterns geographically and sectorally. The finding that fintech penetration increased significantly during the study period (2018-2024), especially with the acceleration triggered by the COVID-19 pandemic, shows how crises can be a driver of digital transformation. This is in line with the argument of Gomber et al. [1] who stated that digital technologies tend to experience a jump in adoption during periods of economic disruption, when traditional solutions face operational constraints. This transformative effect is particularly evident in the trade and financial services sector, where fintech not only expands access but also fundamentally changes existing business models.

The finding that the marginal impact of fintech on financial inclusion is greater in rural and remote areas compared to urban areas is a very important finding from a development policy perspective. This phenomenon can be explained by the theory of technological substitution, where fintech acts as a substitute for limited physical banking infrastructure in remote areas [19]. This indicates that digital technology can be a "leapfrogging" solution in the context of financial development, allowing areas with limited infrastructure to increase financial inclusion without having to first build expensive conventional banking networks. This finding strengthens Demirgüç-Kunt et al.'s [3] argument about the transformative potential of digital technology in the context of financial development in developing countries.

The positive and significant relationship between fintech penetration and various indicators of regional economic growth, including GRDP per capita and poverty reduction, indicates that the benefits of fintech are not limited to the financial sector alone but encompass the wider real economy. SEM analysis shows that around 54% of the total effect of fintech penetration on GRDP per capita growth is mediated by increased financial inclusion, confirming the importance of financial access as a transmission mechanism. However, the lower and only marginally significant impact on income inequality (Gini) suggests that fintech has not yet fully become a tool for economic equality. This raises questions about the distribution of benefits from fintech innovation and the risk of digital exclusion, which is in line with concerns expressed by Beck et al. [6] about the potential for financial technology to widen existing gaps if not accompanied by appropriate inclusion policies.

Qualitative findings from in-depth interviews reveal five key mechanisms explaining how fintech impacts regional economies: reduced transaction costs, expanded access to credit, formalized informal economy, accelerated entrepreneurship, and geographic inclusiveness. These mechanisms enrich our understanding of the causal pathways linking fintech innovation to economic outcomes, beyond mere quantitative correlations. These findings are consistent with previous literature such as Ozili [2] who identified similar pathways in a global context, but this study provides specific empirical evidence in the Indonesian regional context.

The identification of moderating factors such as internet infrastructure, digital literacy, and supportive regulations demonstrates the importance of a holistic approach in fintech policy. The positive and significant interaction coefficients for internet infrastructure (0.371) and digital literacy (0.284) indicate that investment in these two aspects is an important prerequisite for maximizing the economic impact of fintech. This is in line with Frost et al.'s [5] argument that a strong digital ecosystem is the foundation for an inclusive digital financial transformation. The finding that supportive regulations strengthen the positive impact of fintech (interaction coefficient 0.213) emphasizes the importance of a proportionate regulatory framework that balances innovation with stability and consumer protection.

The analysis of the impact of various types of fintech reveals that digital payments have the largest impact on GRDP per capita, followed by online lending and digital banking. This finding reflects the stages of fintech evolution in Indonesia, where payment solutions are often the "starter product" that introduces consumers to the digital financial ecosystem before they adopt more complex fintech services. This pattern is in line with the experience in other developing countries as documented by Ozili [7], where fintech evolution often begins with basic payment solutions before evolving into more sophisticated financial services.

The finding of a significant spatial spillover effect (coefficient 0.312) in the transmission of fintech impacts suggests that the economic benefits of fintech innovations are not isolated within administrative boundaries but spread to surrounding areas. The implication of this finding is that fintech development policies need to consider the spatial dimension and potential regional contagion effects, which is in line with the principles of new economic geography proposed by Anselin [15]. Furthermore, the identification of a temporal lag in the transmission of fintech impacts to the real economy, with peak impacts after two years, provides an important perspective for fintech policy evaluation, indicating the need for an adequate time horizon to assess the effectiveness of policy interventions.

Overall, this study shows that fintech has significant potential to accelerate regional economic development in Indonesia, especially in areas previously underserved by the traditional financial system. However, realizing this potential depends on a supportive ecosystem that includes digital infrastructure, literacy, and an appropriate regulatory framework. These findings provide an empirical basis for formulating more effective and inclusive fintech policies in Indonesia.

5. Conclusions

This study has analyzed the influence of fintech on financial inclusion and regional economic growth in Indonesia during the period 2018-2024 using a mixed methodological approach. The results of the study consistently show that fintech has a positive and significant impact on various indicators of financial inclusion and regional economic growth, although with varying intensity based on geographic and sectoral contexts.

The main findings of this study confirm that fintech acts as a catalyst for regional economic transformation through several key mechanisms: reducing transaction costs, expanding access to credit for previously underserved segments, formalizing the informal economy, accelerating entrepreneurship, and increasing geographic inclusiveness. The impact of fintech on financial inclusion is found to be greater in rural and remote areas compared to urban areas, highlighting its potential as a tool to reduce the gap in access to finance between regions. The analysis also reveals that about 54% of the total effect of fintech penetration on GRDP per capita growth is mediated by increased financial inclusion, highlighting the importance of financial inclusion as a transmission mechanism.

Identification of moderating factors shows that the positive impact of fintech on regional economic growth is significantly influenced by the availability of internet infrastructure, the level of digital literacy, and the quality of the regulatory framework. These findings emphasize the importance of a holistic approach in fintech development policies that consider the broader supporting ecosystem. In addition, the existence of spatial spillover effects shows that the economic benefits of fintech innovation are not limited to administrative areas but spread to surrounding areas, highlighting the spatial dimension that needs to be considered in policy formulation.

However, the study also identified several challenges in maximizing fintech's potential for regional economic development, including persistent digital divides, limited infrastructure in remote areas, and varying levels of digital literacy across segments of society. Fintech's impact on income inequality is also relatively limited, indicating that fintech has yet to fully become an instrument for economic equality without targeted policy interventions.

Based on these findings, this study recommends a series of policies to maximize the positive impact of fintech, including accelerating the development of digital infrastructure in disadvantaged areas, integrated digital literacy programs, proportional regulatory approaches, geographic incentives for fintech service providers, public-private partnerships, increasing system interoperability, establishing regional innovation funds, and developing a framework for systematic impact monitoring.

In conclusion, fintech has significant potential to accelerate financial inclusion and drive more inclusive regional economic growth in Indonesia. However, fully realizing this potential requires coordinated and contextual policy interventions that take into account the diversity of regional conditions and the needs of different segments of society. Further research is needed to investigate the long-term impact of fintech on regional economic structures and to better understand how fintech innovations can be optimized to address persistent regional economic disparities in Indonesia.

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