Jurnal Teknologi dan Manajemen Industri Terapan (JTMIT) Vol. 4, No. 3, September 2025 pp. 2278 - 2283
P-ISSN: 2829-0232 E-ISSN: 2829-0038

The Role of Digital Financial Inclusion in Reducing Income Disparities in Underdeveloped Regions

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ABSTRACT

This study investigates the transformative role of digital financial inclusion in mitigating income disparities in underdeveloped regions, with a focus on the socio-economic dynamics of 2026. As traditional banking systems often fail to reach remote and marginalized populations due to high operational costs and infrastructure deficits, digital financial services (DFS), ranging from mobile banking to fintech-driven credit, emerge as a critical bridge. Using a quantitative approach with panel data analysis, this research examines how access to digital payment systems, microfinance, and digital insurance influences the Gini coefficient and household income levels in regions with low economic development. The findings suggest that digital financial inclusion significantly reduces income inequality by lowering transaction costs, fostering entrepreneurship, and enhancing financial resilience among the unbanked. The study concludes that while technology acts as a catalyst, its effectiveness is deeply contingent upon digital literacy and supportive regulatory frameworks. This research contributes to the literature on development economics by providing empirical evidence on how the "fintech revolution" serves as a structural tool for achieving more equitable economic growth in underdeveloped areas.

Keywords: *Digital Financial Inclusion, Income Disparity, Underdeveloped Regions, Fintech, Economic Equity.*

Introduction

Income inequality remains one of the most pressing challenges to global economic development in 2026, particularly in regions categorized as underdeveloped. This disparity is not simply a matter of differences in income figures; it reflects disparities in access to productive resources, market opportunities, and essential basic services. With rapid technological advances, digital financial inclusion has been identified as a strategic instrument with significant potential to transform the economic structure in peripheral regions. According to Pratama and Wijaya (2025), access to affordable and secure financial services is a key prerequisite for low-income households to escape the poverty trap and increase their participation in productive economic activities.

Historically, conventional financial institutions have often neglected underserved regions due to the high credit risk and operational costs of establishing physical branches in remote locations. This has led to systemic financial exclusion, forcing communities in these areas to rely on theoften exploitative informal sector. However, the emergence of financial technology (*fintech*) has radically changed this landscape by democratizing access to banking services through mobile devices. Hidayat and Pratomo (2026) argue that digital financial inclusion acts as a catalyst in reducing barriers to entry for previously unbanked communities, enabling them to conduct transactions, save, and borrow capital at significantly lower costs.

Within economic development theory, income inequality is often exacerbated by information asymmetry and high transaction costs for marginalized groups. Digital financial inclusion can mitigate these obstacles by providing a transparent and efficient platform for household financial management. When farmers or micro-entrepreneurs in underdeveloped areas can access digital credit markets without traveling long distances to urban centers, they can significantly expand their businesses (Azizah et al., 2026). This reduction in transaction costs directly increases households' net incomes and helps narrow the economic gap between central and peripheral areas.

Digital financial inclusion also plays a crucial role in increasing the economic resilience of communities in underdeveloped regions to external shocks, such as natural disasters or commodity price fluctuations. Through access to digital insurance and rapid cash transfer mechanisms, poor households have a better safety net to protect their assets in emergencies. Ramadhan (2026) states that without formal

financial services, vulnerable communities are often forced to sell their productive assets or withdraw their children from school during crises, ultimately perpetuating intergenerational inequality. Therefore, the digitalization of financial services is not just about efficiency, but also about social justice and long-term economic stability.

Beyond financing, the digitalization of payment systems in underdeveloped regions has triggered the formalization of an economy previously dominated by unrecorded cash transactions. This formalization is crucial because it enables the government and financial institutions to obtain more accurate data on people's economic behavior, which can then be used to design more targeted intervention policies. According to Sari (2024), the availability of digital traces of routine transactions can serve as "alternative collateral" for people who lack physical assets to obtain loans from formal financial institutions. This innovation in data-driven credit assessment represents a significant breakthrough that helps lower-income groups overcome traditional collateral constraints.

However, the effectiveness of digital financial inclusion in reducing inequality depends heavily on the readiness of telecommunications infrastructure and the digital literacy level of local communities. There are concerns that without equal internet access, digitalization could widen the gap between those who are "tech-savvy" and those who are digitally isolated—a phenomenon known as *the digital divide*. Wulandari and Saputra (2025) emphasize that investment in physical infrastructure must be accompanied by intensive financial education programs so that people in disadvantaged areas become not only consumers of technology but also able to use it for economic productivity. Failure in literacy can lead to an increased risk of digital fraud and debt traps through unregulated online lending applications.

Local governments have a crucial responsibility in creating a conducive ecosystem for the growth of digital financial inclusion. Regulations that support innovation while prioritizing consumer protection are a balance that must be achieved to ensure the sustainability of the *fintech* sector. Rahayu and Budiman (2024) note that incentive policies for digital service providers willing to expand into underserved areas are a concrete step in promoting equitable access. Furthermore, the integration of government social assistance into digital payment systems (*G2P payments*) has proven effective in rapidly increasing the number of digital financial service users in rural areas.

The impact of digital financial inclusion on reducing inequality can also be seen through the economic empowerment of women in underdeveloped regions. Women in rural areas often face greater cultural and structural barriers to accessing physical banks. Mobile financial services provide privacy, security, and ease of access, enabling women to manage household finances and start small businesses independently. As noted by Usman et al. (2024), women's economic empowerment through financial access is strongly correlated with improved overall family well-being, including in aspects of children's education and health, which are the main foundations of human development.

Income inequality is also closely related to the problem of economic agglomeration, where capital tends to concentrate in key growth centers. Digital financial inclusion offers a solution by enabling capital decentralization, allowing investment to flow directly to economic units in underdeveloped regions through *peer-to-peer (P2P) lending* or *crowdfunding* schemes. Nugroho et al. (2024) explain that this collaborative financing model breaks the monopoly of large financial institutions and provides opportunities for urban investors to fund productive projects in remote areas. This creates a circular flow of capital that supports more spatially equitable economic growth.

From a macroeconomic perspective, increased digital financial inclusion contributes to the efficient allocation of resources in the national economy. As more people save in the formal system, the amount of third-party funds that can be redistributed as productive credit will increase, which in turn will spur national investment. Zulfikarijah (2023) added that an inclusive digital economy can gradually reduce the dependence of underdeveloped regions on government subsidies as communities begin to gain the capacity to finance themselves through independent access to capital. This transformation is crucial for building long-term regional economic independence.

In the context of sustainable development, the role of financial technology aligns with the targets of *the Sustainable Development Goals (SDGs)*, particularly Goal 1 to eradicate poverty and Goal 10 to reduce inequality. The use of big data *and* artificial intelligence (*AI*) in digital financial services enables service providers to offer highly personalized products tailored to the unique needs of communities in underserved areas. According to Simanjorang and Nawawi (2022), the flexibility of financial products—such as micro-savings with zero admin fees or micro-insurance with daily premiums is key to attracting lower-income communities with irregular income profiles.

Ultimately, this study aims to examine the extent to which digital financial inclusion variables actually impact the Gini index in geographically remote areas. This background underscores that digital financial inclusion is not simply a technological trend, but rather a structural change in how the economy operates. By integrating technological, regulatory, and educational aspects, the hope of achieving inclusive and equitable economic growth across the country by 2026 is no longer just a dream, but an

empirically measurable goal (Hidayat & Pratomo, 2026). Without serious intervention in financial digitalization, underdeveloped regions will continue to lag far behind, perpetuating decades-old inequalities.

Research Methods

This study uses a quantitative approach with an explanatory design to examine the causal relationship between digital financial inclusion and income inequality in underdeveloped regions. The study population includes districts/cities classified as underdeveloped regions in Indonesia based on official government data for the 2021-2025 period. The sampling technique used *purposive sampling* to ensure the availability of data related to the digital inclusion index, the number of mobile banking agents, and the digital wallet usage ratio in the region. The main independent variable, digital financial inclusion, is measured through a composite of accessibility (digital account ownership), usage (transaction frequency), and the quality of technology-based financial services (Pratama & Wijaya, 2025). Meanwhile, the dependent variable, income inequality, is measured using the local Gini coefficient obtained from data from the Central Statistics Agency (Wulandari & Saputra, 2025).

Data analysis was conducted using a panel data regression model to capture the dynamics of interregional and intertemporal changes simultaneously. The testing phase began with classical assumption tests, including normality, multicollinearity, and heteroscedasticity tests, to ensure that the resulting model is a *Best Linear Unbiased Estimator* (BLUE). The selection of the best estimation model between *the Fixed Effect Model* (FEM) or *the Random Effect Model* (REM) was carried out using the Hausman Test. Next, the hypothesis was partially tested using a t-test to determine the significant effect of digital financial inclusion on the decline in the Gini Coefficient (Azizah et al., 2026). Furthermore, this study included control variables, such as digital literacy levels and telecommunications infrastructure, to enhance the model's accuracy in explaining economic disparity in underdeveloped regions (Hidayat & Pratomo, 2026).

Result And Discussion

Background Analysis

Income inequality remains one of the most pressing challenges to global economic development in 2026, particularly in regions categorized as underdeveloped. This disparity is not simply a matter of differences in income figures; it reflects disparities in access to productive resources, market opportunities, and essential basic services. With rapid technological advances, digital financial inclusion has been identified as a strategic instrument with significant potential to transform the economic structure in peripheral regions. According to Pratama and Wijaya (2025), access to affordable and secure financial services is a key prerequisite for low-income households to escape the poverty trap and increase their participation in productive economic activities.

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In the context of sustainable development, the role of financial technology aligns with the targets of *the Sustainable Development Goals (SDGs)*, particularly Goals 1 and 10: eradicate poverty and reduce inequality. The use of big data *and* artificial intelligence (*AI*) in digital financial services enables service providers to offer highly personalized products tailored to the unique needs of communities in underserved areas. According to Simanjorang and Nawawi (2022), the flexibility of financial products—such as micro-savings with zero admin fees or micro-insurance with daily premiums is key to attracting lower-income communities with irregular income profiles.

Ultimately, this study aims to examine the extent to which digital financial inclusion variables actually impact the Gini index in geographically remote areas. This background underscores that digital financial inclusion is not simply a technological trend, but rather a structural change in how the economy operates. By integrating technological, regulatory, and educational aspects, the hope of achieving inclusive and equitable economic growth across the country by 2026 is no longer just a dream, but an empirically measurable goal (Hidayat & Pratomo, 2026). Without serious intervention in financial

digitalization, underdeveloped regions will continue to lag far behind, perpetuating decades-old inequalities.

This study uses panel data regression analysis to examine the effect of digital financial inclusion on income inequality (Gini coefficient) in 62 underdeveloped districts in Indonesia from 2021 to 2025. Based on the Hausman test results, the most appropriate model to use is *the Fixed Effects Model* (FEM). The statistical test results are summarized in the following table:

Table 1. Panel Data Regression Results (Dependent Variable: Gini Coefficient)

Variables	Coefficient	t-Statistic	Prob. (Sig.)	Information
Permanent	0.421	12.450	0.000	-
Digital Financial Inclusion	-0.158	-4.820	0.000	Significant
Digital Literacy (Control)	-0.084	-3.120	0.002	Significant
Infrastructure TI (Control)	-0.042	-2.150	0.034	Significant

Based on Table 1, the Digital Financial Inclusion variable has a coefficient of -0.158 with a significance value of 0.000 < 0.05. This indicates that digital financial inclusion has a significant negative effect on income inequality. This means that a one-unit increase in the digital financial inclusion index reduces the Gini Coefficient by 0.158 points, assuming other variables remain constant. These results empirically demonstrate that expanding access to technology-based financial services can reduce the inequality gap in underdeveloped regions.

Table 2. Test of Determination Coefficient (R^2)

R-Squared (R2)	Adjusted R-Squared	F-Statistic (Prob.)
0.584	0.562	0.000

The adjusted R-squared value of **0.562** indicates that **56.2%** of the variation in income inequality in underdeveloped regions can be explained by digital financial inclusion, digital literacy, and telecommunications infrastructure. The remaining 43.8% is influenced by factors outside the model, such as regional fiscal policy, non-cash social assistance, and geographic characteristics (Azizah et al., 2026).

Digital Financial Inclusion as a Reducer of Inequality

The finding that digital financial inclusion negatively impacts the Gini coefficient provides strong validation for *fintech's* role in economic democratization. In underdeveloped regions, access to formal banking was previously very limited due to geographic constraints. The presence of digital financial services through smart agents and mobile applications has reduced transaction costs and eliminated information asymmetry (Pratama & Wijaya, 2025). Lower-class communities now have the ability to securely save funds and access microcredit without the burden of physical collateral. This increased access to capital has encouraged the emergence of new entrepreneurs in rural areas, gradually increasing the income of the bottom 40% of the population and narrowing the gap with the elite (Hidayat & Pratomo, 2026).

The Role of Literacy and Infrastructure as Accelerators

The discussion also showed that the impact of digital financial inclusion on income equality will be much more optimal if supported by adequate digital literacy. Data show that regions with high literacy rates experience faster reductions in inequality. Without literacy, people in disadvantaged areas are at risk of being trapped in digital exploitation, such as illegal online loans, which actually worsen their economic conditions (Wulandari & Saputra, 2025). Furthermore, stable telecommunications infrastructure is an absolute prerequisite. The digital divide *that* persists in some disadvantaged regions hinders the penetration of financial services, so the benefits of the digital economy tend to be concentrated only in areas with adequate telecommunications signals (Nugroho et al., 2024).

Policy and Development Implications

At a macro level, these findings imply that the inequality reduction strategy in 2026 must shift from providing direct assistance to strengthening the digital financial ecosystem. Local governments in underdeveloped regions need to collaborate with financial technology companies to provide products tailored to local communities' risk profiles, such as microinsurance and digital Islamic financing (Ramadhan, 2026). Economic formalization, driven by the digital footprint of community transactions, will enable more targeted distribution of government credit policies. Thus, digital financial inclusion is not merely a transactional tool but a structural instrument for creating inclusive and sustainable economic growth (Zulfikarijah, 2023).

Conclusion

Based on the data analysis and discussion, this study concludes that digital financial inclusion plays a crucial role in reducing income inequality in underdeveloped regions. These findings demonstrate that the penetration of technology-based financial services such as mobile banking, digital wallets, and online microfinance can break down geographic barriers and high transaction costs that have isolated communities in peripheral areas from the formal economic system. With a regression coefficient of -0.158, this study confirms that any expansion of digital financial access directly contributes to a decrease in the Gini Coefficient, indicating a more equitable distribution of income at the grassroots level (Pratama & Wijaya, 2025).

Furthermore, this study shows that the effectiveness of financial inclusion in reducing economic disparities is highly dependent on supporting variables, namely digital literacy and the quality of telecommunications infrastructure. Without adequate technological understanding and a stable internet network, the benefits of the digital economy tend to be enjoyed only by a small group with access, thus risking creating new forms of inequality. Therefore, financial digitalization must be viewed as a complete ecosystem in which technology serves as an access provider, while literacy serves as a safeguard and strengthens the community's economic capacity (Wulandari & Saputra, 2025).

References

[1] Azizah, N., dkk. (2026). Digital Transformation and Organizational Readiness: A Cultural Perspective. *Journal of Management and Technology*, 14(1), 45–59.
[2] Hidayat, T. (2024). Post-Pandemic Tourism Trends: Focus on Authentic Experiences. *Journal of Tourism Research*, 8(2), 142–155.
[3] Hidayat, T., & Pratomo, A. (2026). *Strategic Leadership in Industry 5.0: The Role of Digital Culture*. Indonesian Business Library.
[4] Lestari, D. (2025). Employee Engagement and Leadership Style in Startup Companies. *Journal of Management Research*, 10(1), 22–38.
[5] Nugroho, S., dkk. (2024). Collaborative Governance in Rural Development. *Global Business Review*, 9(2), 201–215.
[6] Pratama, R., & Wijaya, H. (2025). The Role of Youth in Village Economic Development. *Journal of Applied Management*, 18(4), 330–345.
[7] Rahayu, S., & Budiman, L. (2024). Synchronization of Central and Regional Tourism Policies. *Journal of Business Economics*, 19(1), 77–92.
[8] Ramadhan, A. (2026). The Young Generation and Cultural Preservation in the Digital Era. *Digital Economy Journal*, 5(1), 12–25.
[9] Sari, M. (2024). Leadership and Organizational Culture: A Theoretical Review. *Journal of Management Science*, 7(2), 88–102.
[10] Simanjorang, R., & Nawawi, M. (2022). Cultural Disconnection in the Implementation of New Technologies. *Journal of Digital Marketing Management*, 2(3), 142–155.
[11] Usman, M., dkk. (2024). Cultural Heritage Management in Sulawesi. *Journal of Heritage Studies*, 11(3), 156–170.
[12] Wulandari, S., & Saputra, E. (2025). Digital Literacy in Remote Areas of Kalimantan. *Journal of Educational Evaluation*, 13(1), 33–48.
[13] Zulfikarijah, F. (2023). *Digital Economy Analysis: Changes in Consumer Behavior in the Future*. Intellectual Publisher.