



Digital Payments and Financial Inclusion in Indonesia: Evidence from 2020–2025

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Abstract

Indonesia's QRIS payment network expanded substantially during 2020–2025, while financial inclusion continued to differ across population groups. This study examined the scale of QRIS acceptance and the distribution of formally reported financial inclusion without assuming that the two indicators measure the same outcome. A descriptive secondary-data analysis compiled annual merchant counts and selected payment-system indicators from Bank Indonesia and compared their measurement scope with subgroup estimates from the 2024 National Survey of Financial Literacy and Inclusion. Merchant counts rose from 5.80 million in 2020 to 42.75 million in 2025, corresponding to a five-year compound annual growth rate of approximately 49.1%; Bank Indonesia reported 59.53 million QRIS users in 2025. The 2024 survey recorded financial inclusion of 75.02% and financial literacy of 65.43%, with inclusion of 78.41% in urban areas and 70.13% in rural areas. The comparison documents rapid growth in payment acceptance alongside a cross-sectional 8.28-percentage-point geographic inclusion difference. It does not identify changes in inclusion gaps over time or any causal effect of QRIS adoption. The findings support separate monitoring of network availability, active payment use, consumer capability, and the distribution of formal financial-service participation.

Keywords: digital payments, financial inclusion, Indonesia, QRIS, secondary data.



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INTRODUCTION

Interoperable retail payments have become a major component of Indonesia's financial infrastructure, connecting merchants, consumers, banks, and nonbank payment service providers through the Quick Response Code Indonesian Standard (QRIS). Bank Indonesia's payment-system agenda positions interoperability as a means of reducing payment fragmentation and lowering transaction frictions (Bank Indonesia, 2021; Bank Indonesia, 2022). These functions are distinct from financial inclusion, which concerns the population's access to and use of appropriate formal financial services. International evidence documents substantial growth in digital payment use alongside persistent differences in participation by income, geography, gender, connectivity, and digital capability (World Bank, 2022; GSMA, 2024). A larger merchant network consequently establishes wider opportunities to make digital payments, but it does not establish whether previously underserved individuals obtain or use savings, credit, insurance, or other regulated products.

The analytical distinction is between payment availability, observed use, and substantive financial participation. Lower service-delivery costs may facilitate access, whereas uneven identification, network quality, knowledge, and trust may prevent access from becoming regular or beneficial use (Ozili, 2018; Gabor & Brooks, 2017). Evidence on mobile money in Kenya identifies welfare effects in a system where repeated transactions were integrated into household economic relationships, but its institutional setting and measured outcomes differ from Indonesia's interoperable merchant-payment network (Suri & Jack, 2016). Adoption studies instead identify perceived usefulness, risks, trust, and user experience as conditions affecting individuals' willingness to transact (Ryu, 2018; Gomber et al., 2018). These strands explain different mechanisms and cannot substitute for evidence that QRIS adoption changes formal financial inclusion. They motivate a framework that distinguishes the scale of

payment acceptance from activity within the payment system and from population-level financial-service use.

Indonesia presents a substantial contrast between reported QRIS network growth and the distribution of formal financial participation. The number of QRIS merchants increased from approximately 5.80 million in 2020 to 14.78 million in 2021, 22.70 million in 2022, 30.41 million in 2023, 35.90 million in 2024, and 42.75 million in 2025 (Bank Indonesia, 2021; Bank Indonesia, 2022; Bank Indonesia, 2023a; Bank Indonesia, 2024; Bank Indonesia, 2025a; Bank Indonesia, 2026). These figures describe the administrative reach of an acceptance standard rather than the proportion of adults who transact actively. Indonesian adoption studies focus on perceived performance, facilitating conditions, product fit, and digital financial literacy among particular users or firms (Setiawan et al., 2021; Nugraha et al., 2022; Kasri et al., 2022). Their behavioral explanations inform the interpretation of network diffusion, but they do not identify the distribution of formal financial-service usage across the national population.

The 2024 National Survey of Financial Literacy and Inclusion offers a different measurement perspective. It reported national financial inclusion of 75.02% and financial literacy of 65.43%, together with inclusion rates of 78.41% in urban areas and 70.13% in rural areas (OJK & BPS, 2024). These are survey estimates for financial-service usage and financial literacy, not QRIS-specific adoption rates. Research on financial self-efficacy and digital inclusion identifies capability, socioeconomic resources, and financial-system conditions as relevant to participation (Mindra et al., 2017; Zhou, 2021; Khera et al., 2021). Evidence from emerging economies similarly treats financial awareness and digital competencies as important, although the constructs and research designs are not identical across studies (Aleemi et al., 2023; Al-Shami et al., 2024). The coexistence of high national payment-network coverage and differentiated inclusion rates is therefore a measurement problem requiring separate indicators, not proof that payment expansion has failed or succeeded in closing a particular gap.

Previous fintech research characterizes changes in financial intermediation and inclusive service delivery, but ecosystem analyses and innovation studies do not necessarily measure population-level usage (Gomber et al., 2017; Lashitew et al., 2019). Reviews and adoption-oriented investigations also examine the enabling role of product design, capability, and trust, while their units of observation vary across organizations, technologies, and individuals (Gallego-Losada et al., 2023; Shaikh et al., 2023). Indonesian studies contribute detailed explanations of user behavior and small-firm adoption, but these cannot show whether aggregate acceptance indicators and nationally reported inclusion measures represent equivalent dimensions of participation (Widyastuti et al., 2024; Yaqin & Safuan, 2023). The unresolved issue is consequently not simply a lack of side-by-side statistics; it is the tendency to interpret payment-network size as a proxy for meaningful financial inclusion without examining what each indicator actually measures. A structured comparison can identify where the evidence permits a conclusion about infrastructure reach, where it identifies differences in formal-service participation, and where a relationship between those domains remains unobserved.

The study describes QRIS merchant expansion during 2020–2025 and places the resulting administrative series beside the geographic and demographic distribution of financial inclusion reported in 2024. Three questions guide the analysis: what was the magnitude and annual pattern of merchant-network expansion; which population subgroups showed different reported inclusion levels in 2024; and which distinctions between network reach, reported transaction activity, financial capability, and distributional coverage are relevant to monitoring policy? Four interpretive dimensions organize the comparison: acceptance availability, payment-system activity, financial capability, and distributional reach. Their separation is consistent with accounts of digital-finance development that emphasize complementary infrastructure, institutional access, and user capabilities (Pazarbasioglu et al., 2020; Sahay et al., 2020). The contribution is a source-traceable, measurement-conscious comparison of official indicators. Because the inclusion evidence is cross-sectional and is not linked to individual QRIS records, the design neither estimates a causal effect nor compares the annual rates of change of QRIS adoption and financial inclusion.

RESEARCH METHODS

A descriptive secondary-data design combined a national administrative QRIS series for calendar years 2020–2025 with published estimates from the 2024 National Survey of Financial Literacy and Inclusion (SNLIK). The time-series observation unit was the reporting year, whereas the inclusion

observation units were the national population and the subgroups tabulated in the official survey. Annual merchant counts were extracted from the corresponding Bank Indonesia economic reports and checked, where possible, against institutional, payment-system, or fourth-quarter releases. The official documents and the specific quantities carried forward to the analysis are inventoried in Table 1; the 2024 transaction figures were checked against Bank Indonesia's 2024 annual financial report, and the 2025 QRIS counts against Chapter 3 of its 2025 economic report (Bank Indonesia, 2025b; Bank Indonesia, 2026). Source selection required an identifiable institutional publisher, a stated reference year or reporting period, and an explicit QRIS or inclusion measure. The analysis retained the rounded values published by the institutions and did not impute missing observations or create unreported annual inclusion estimates.

For this analysis, QRIS merchant count refers to the number of merchant acceptance registrations or merchants reported by Bank Indonesia under the QRIS standard; it measures network scale, not verified active outlets. The QRIS user figure is the central bank's published aggregate user count, which cannot be treated as a count of unique, continuously active adults without additional documentation. Transaction volume denotes the reported number of QRIS payment transactions, and transaction value denotes their aggregate nominal rupiah amount; the 2024 figures of 6.24 billion transactions and Rp659.94 trillion were used as an annual activity snapshot rather than a fully comparable transaction time series (Bank Indonesia, 2025b). The six merchant counts were compared as successive year-end or fourth-quarter administrative observations. Rounding, potential revisions, and reporting-classification differences were acknowledged; a constant underlying administrative definition was not independently verified for every year. Regional QRIS user totals were retained as absolute geographical counts because consistent adult-population denominators, active-user measures, and directly matched regional inclusion observations were not available in the compiled material.

SNLIK 2024 was conducted by the Financial Services Authority (OJK) and Statistics Indonesia (BPS) through face-to-face fieldwork on 9 January–5 February 2024. The official documentation reports 10,800 respondents aged 15–79 years across 34 provinces, 120 regencies or municipalities, and 1,080 census blocks, using stratified multistage cluster sampling (OJK & BPS, 2024). Its financial inclusion index is the published proportion of the target population using financial products and/or services; its financial literacy index summarizes the survey's distinct literacy construct. The national, urban, rural, male, female, age-26–35, and entrepreneur figures were taken directly from reported subgroup results rather than recalculated from unavailable respondent records. These survey percentages are not measures of QRIS-specific proficiency, financial safety, product quality, or payment intensity. Survey design weights, replicate weights, respondent records, and variance estimates were not available for this secondary analysis, so the study did not calculate confidence intervals or significance tests for subgroup differences.

Merchant expansion was described using changes in millions, year-on-year percentage differences, a base-year index equal to 100 in 2020, and a five-year compound annual growth rate (CAGR): $[(42.75/5.80)^{(1/5)} - 1] \times 100 = 49.1\%$ after rounding. The geographic inclusion difference was computed as $78.41 - 70.13 = 8.28$ percentage points; the literacy–inclusion difference was $75.02 - 65.43 = 9.59$ percentage points, although those indices measure different constructs. Interpretation proceeded through four dimensions: acceptance availability (reported merchant and user network counts), observed payment-system activity (available transaction volume and value), financial capability (the national literacy index as a contextual—not QRIS-specific—proxy), and distributional reach (published inclusion proportions by population group and absolute regional QRIS user distributions). Within each dimension, the relevant figure and measurement boundary were considered before cross-domain interpretation, consistent with distinctions made in descriptive digital-finance research (Gallego-Losada et al., 2023; Widyastuti et al., 2024; Kasri et al., 2022; Ryu, 2018; Aleemi et al., 2023). The resulting comparison is an indicator audit rather than a linked panel, correlation analysis, or evaluation of an intervention; no estimate of the direction, magnitude, or statistical significance of an effect of QRIS on inclusion is identified.

Triangulation involved checking the numerical series against adjacent official releases and comparing the survey figures with OJK–BPS's primary dissemination rather than secondary summaries. This source-centered strategy follows ecosystem-oriented treatments of digital finance while maintaining a distinction between system infrastructure, behavioral adoption, and inclusive service use (Gomber et al., 2017; Gomber et al., 2018; Lashitew et al., 2019; Al-Shami et al., 2024; Khera et al., 2021; Sahay et al., 2020). It mitigates transcription and contextual errors but cannot remove

administrative measurement changes or the limitations of grouped survey statistics. Comparisons between a multi-year payments series and a single survey year show coexistence of system scale and cross-sectional subgroup differences; they do not establish temporal convergence, changes in inclusion gaps, individual-level associations, or causal mechanisms.

Table 1. Source Inventory, Reporting Periods, and Analytical Indicators

Period	Official document / location	Indicator and reference period
2020	Bank Indonesia (2021), Economic Report 2020, Ch. II, p. 47	5.80 million QRIS merchants; year-end 2020
2021	Bank Indonesia (2022), Economic Report 2021, §6.2.3.1	14.78 million QRIS merchants; December 2021
2022	Bank Indonesia (2023a), Economic Report 2022; 2022 institutional report, p. 61	22.70 million QRIS merchants; 2022
2023	Bank Indonesia (2024), Economic Report 2023; Monetary Policy Report Q4 2023	30.41 million QRIS merchants; December 2023
2024	Bank Indonesia (2025a), Economic Report 2024; Bank Indonesia (2025b), 2024 Annual Financial Report	35.90 million merchants, 55.40 million users; 6.24 billion transactions; Rp659.94 trillion, annual 2024
2025	Bank Indonesia (2026), Economic Report 2025, Ch. 3, Fig. 3.13	42.75 million merchants and 59.53 million users; Q4 2025
SNLIK 2024	OJK & BPS (2024), SNLIK 2024, survey methodology and inclusion results	National, geographic, gender, age, and occupational inclusion estimates; survey Jan–Feb 2024

Source: Official Bank Indonesia and OJK–BPS publications cited in the References. All quantities are reported aggregates; QRIS users and merchants are not necessarily active, unique individuals or establishments.

RESULTS AND DISCUSSION

QRIS network expansion and transaction scale

The merchant series shows a structural rather than incremental expansion of national payment acceptance. QRIS merchants increased from approximately 5.8 million in 2020 to 14.78 million in 2021, more than doubling within one year as interoperable quick-response payments moved beyond early adoption. Growth continued to roughly 22.7 million merchants in 2022 and 30.41 million in 2023, indicating that the common standard was diffusing through a large base of small retail outlets rather than remaining concentrated in modern urban chains (Bank Indonesia, 2021; Bank Indonesia, 2022; Bank Indonesia, 2023). The expansion coincided with a policy environment that emphasized payment interoperability and broader digital economic participation. Table 1 summarizes the annual merchant trajectory and makes clear that later growth occurred from an increasingly large base, which strengthens the interpretation that QRIS had become embedded in ordinary retail infrastructure rather than functioning as a niche payment instrument.

Table 1. QRIS Merchant Expansion in Indonesia, 2020–2025

Year	Merchants (million)	Index (2020=100)
2020	5.80	100.0
2021	14.78	254.8
2022	22.70	391.4
2023	30.41	524.3
2024	35.90	619.0

Year	Merchants (million)	Index (2020=100)
2025	42.75	737.1

Source: Compiled from Bank Indonesia annual economic and payment-system publications.

By 2024, Bank Indonesia reported 35.9 million QRIS merchants and 55.4 million users, while QRIS transaction volume reached approximately 6.24 billion and transaction value Rp659.94 trillion (Bank Indonesia, 2025a). These values indicate that the network was not merely accumulating static registrations; it was supporting transaction frequency at a scale large enough to influence routine merchant-consumer interactions. The reported composition is equally important: about 92.6% of merchants were micro, small, and medium enterprises, linking the payment standard to a business segment that historically faces higher costs in acquiring electronic payment acceptance. Research on Indonesian QR adoption has shown that facilitating conditions, usefulness, and compatibility are closely related to adoption decisions, which helps explain why a standardized and provider-neutral acceptance mechanism can diffuse rapidly across heterogeneous merchants (Setiawan et al., 2021; Nugraha et al., 2022).

The 2025 figures extended that trajectory to 42.75 million merchants and 59.53 million users (Bank Indonesia, 2026). Relative to the 2020 merchant base, this represents an increase of about 36.95 million outlets and a network more than seven times as large. The estimated compound annual growth rate of 49.2% is unusually high for a retail financial infrastructure indicator sustained over five years. The result supports the view that standardization can create network effects: each additional provider and merchant makes the instrument more useful to users, while rising user familiarity increases the value of acceptance for merchants. Gomber et al. (2018) describe such interaction between technological innovation and financial-service transformation as a core feature of fintech ecosystems, while Lashitew et al. (2019) emphasize the role of inclusive business models in converting digital infrastructure into broader participation.

The year-to-year pattern also shows a change in the character of growth. Early expansion was dominated by the multiplication of acceptance points, whereas later years increasingly involved deeper use within an already extensive network. This distinction matters because the economic contribution of payment infrastructure depends on transaction density, repeat use, and integration with merchant cash-flow management, not simply the number of displayed QR codes. Digital financial-service research has repeatedly found that perceived convenience and relative advantage raise adoption, but sustained use requires reliability and trust (Ryu, 2018; Shaikh et al., 2023). The large transaction volumes reported in 2024 provide evidence of deepening use, although aggregated public data do not permit separation of occasional users from high-frequency users. That limitation should temper claims that registration counts are direct measures of household financial engagement.

The scale of MSME participation offers an additional applied insight. Small firms can adopt QR acceptance without dedicated point-of-sale hardware, reducing entry costs and allowing electronic records to emerge from transactions that were previously cash based. Such records may improve bookkeeping, enable more precise working-capital assessment, and potentially strengthen future access to formal financing, although these benefits depend on whether merchants integrate digital receipts into broader financial practices. Indonesian research has associated digital payment use with business efficiency and financial-management improvements, while broader studies show that digital finance can support inclusion when transaction data become part of credible financial identities (Yaqin & Safuan, 2023; Ozili, 2018). The QRIS trajectory therefore represents a large opportunity set, but the pathway from accepting payments to obtaining credit or building savings remains institutionally mediated.

Regional user distribution in 2025 demonstrates both scale and concentration. Bank Indonesia reported approximately 40.83 million QRIS users in Java, 10.40 million in Sumatra, 3.38 million across Sulawesi–Maluku–Papua, 2.95 million in Kalimantan, and 1.98 million in Bali–Nusa Tenggara (Bank Indonesia, 2026). The concentration partly reflects population and economic activity, but it also highlights why national totals should be interpreted alongside geographic access conditions. Digital financial inclusion research warns that network coverage, smartphone affordability, connectivity quality, and local merchant density can generate spatially uneven benefits even when the underlying payment standard is national (Khera et al., 2021; GSMA, 2024). Policy monitoring therefore needs

normalized measures such as users per adult population and active merchants per local economic unit, not only absolute counts.

The trajectory in Figure 1 visually reinforces the step change in acceptance capacity. Growth is steepest between 2020 and 2021 in proportional terms, but the system continued to add millions of merchants each year thereafter. This persistence is notable because many platform innovations experience early acceleration followed by rapid saturation; QRIS instead maintained substantial absolute additions after reaching tens of millions of merchants. Network economics offers one explanation: interoperability reduces fragmentation and creates a common acceptance language across banks and nonbank providers, increasing the usefulness of each additional connection. Gomber et al. (2017) similarly argue that digital finance evolves through infrastructure and business-model complementarities, while Pazarbasioglu et al. (2020) stress that digital financial services scale most effectively when public policy supports open, competitive, and reliable rails.

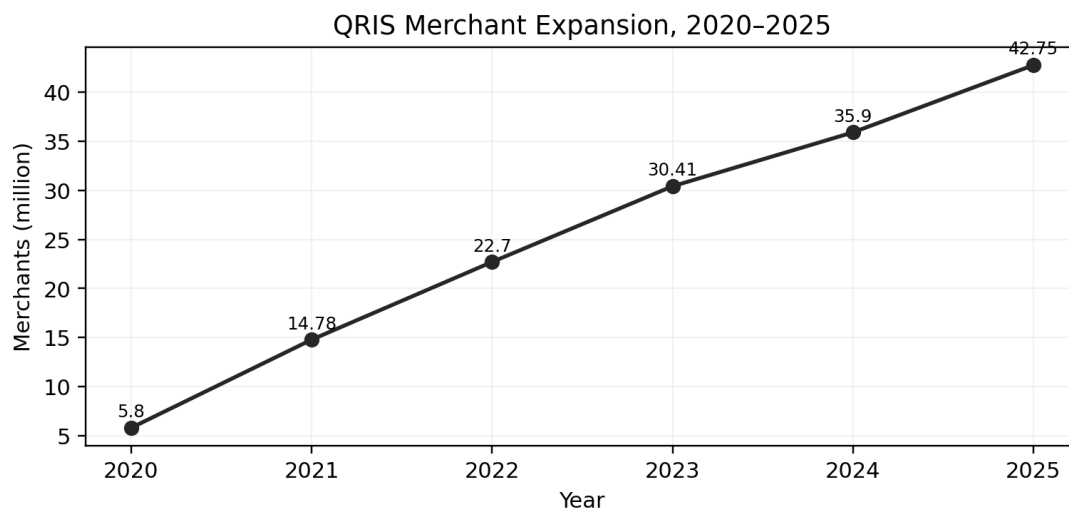


Figure 1. QRIS Merchant Expansion, 2020–2025

International evidence provides a useful benchmark without implying direct equivalence. Mobile money transformed household risk sharing and consumption smoothing in Kenya because it combined widespread agent access with repeated person-to-person and merchant use (Suri & Jack, 2016). Indonesia's QRIS is institutionally different, but the comparison illustrates why transaction infrastructure can have broader economic significance when adoption becomes sufficiently dense. Gabor and Brooks (2017) caution, however, that digital inclusion programs can narrow financial development to data extraction or transactional access if consumer welfare and institutional safeguards receive insufficient attention. The Indonesian figures support a balanced interpretation: QRIS has clearly solved a substantial acceptance-interoperability problem, but its contribution to inclusive finance depends on how users and merchants connect payment activity to savings, credit, insurance, and resilient financial behavior.

The main finding from the first analytical strand is therefore one of verified scale with an important measurement boundary. QRIS expanded from 5.8 million to 42.75 million merchants between 2020 and 2025, while registered users approached 60 million and transaction activity reached billions of annual payments. These indicators establish that digital acceptance is no longer a marginal channel in Indonesia. They do not, by themselves, reveal whether low-income or rural users transact frequently, whether merchants accumulate formal savings, or whether digital traces translate into improved access to affordable credit. The distinction echoes Zhou (2021), who finds that digital finance can influence household financial behavior through multiple channels, and Mindra et al. (2017), who show that financial self-efficacy mediates the relationship between knowledge and inclusion. The second analytical strand therefore turns from system scale to distributional reach.

Inclusion gaps and the transition from access to meaningful use

The 2024 national survey places Indonesia's financial inclusion index at 75.02% and its financial literacy index at 65.43%, leaving a 9.59 percentage-point difference between use or access and measured knowledge/capability (OJK & BPS, 2024). This gap is not evidence that included users are necessarily uninformed, because the two indices measure different constructs, yet it signals that infrastructure growth should be accompanied by capability-building. Digital interfaces can reduce transaction costs while simultaneously increasing exposure to phishing, fraud, impulsive credit, and unsuitable products if users lack sufficient understanding. Aleemi et al. (2023) find that financial awareness and technological familiarity shape digital financial behavior, and Al-Shami et al. (2024) similarly connect digital financial capability with inclusive outcomes. The survey results therefore support a policy emphasis on quality of use rather than a singular focus on access counts.

Geographic inequality is more directly visible. Urban financial inclusion reached 78.41%, compared with 70.13% in rural areas, an 8.28 percentage-point difference (OJK & BPS, 2024). The direction of this gap is consistent with differences in connectivity, branch and agent availability, income composition, merchant density, and exposure to digital financial products. It also implies that nationwide payment acceptance growth can coexist with lower rural participation in the wider financial system. Khera et al. (2021) show that digital financial inclusion is strongly shaped by infrastructure and socioeconomic conditions across countries, while GSMA (2024) documents persistent mobile and usage gaps even where network availability has expanded. For Indonesia, the applied implication is to measure whether QRIS merchant growth is reaching lower-density areas at a rate that supports meaningful consumer use, rather than assuming geographic diffusion from national totals.

Table 2. Selected Financial Inclusion Indicators, 2024

Group	Inclusion (%)	Difference from national (pp)
National	75.02	0.00
Urban	78.41	+3.39
Rural	70.13	-4.89
Men	73.97	-1.05
Women	76.08	+1.06
Age 26–35	84.28	+9.26
Entrepreneurs	85.40	+10.38

Source: OJK & BPS (2024).

Gender differences in the 2024 survey were comparatively small, with inclusion reported at 73.97% for men and 76.08% for women (OJK & BPS, 2024). The two-percentage-point difference should not be overinterpreted because aggregated survey rates do not reveal product mix, account control, transaction frequency, credit conditions, or household bargaining dynamics. The finding is still useful because it shows that headline account or service access does not necessarily follow the gender pattern observed in every emerging economy. World Bank (2022) data indicate that gender gaps vary substantially across countries and tend to narrow where mobile access and institutional reforms broaden entry points. A more informative next step for Indonesian monitoring would combine gender with rurality, employment status, and income because intersectional disadvantages may be masked when national male and female rates are considered separately.

Age and occupational indicators reveal stronger differentiation. The survey reported financial inclusion of 84.28% among respondents aged 26–35 and 85.40% among entrepreneurs, two groups likely to encounter digital payment systems frequently through consumption, employment, or business

activity (OJK & BPS, 2024). These rates are consistent with behavioral evidence that perceived usefulness rises when digital finance is closely tied to daily economic tasks. Kasri et al. (2022) show that intention to use digital financial services reflects expected performance and enabling conditions, while Setiawan et al. (2021) identify technology acceptance mechanisms in the Indonesian payment setting. The implication is not that age or entrepreneurship automatically causes inclusion, but that product relevance and transaction opportunities shape the intensity with which digital infrastructure becomes embedded in financial life.

Table 2 places selected subgroup rates beside the national figure and highlights the need to separate broad progress from remaining access frictions. The national inclusion rate is materially higher than the literacy rate, urban participation is higher than rural participation, and high-engagement groups such as entrepreneurs exceed the population average. These patterns suggest that the next phase of inclusion policy needs finer-grained segmentation. A merchant-acquisition campaign may remain appropriate in locations with sparse acceptance, whereas areas with dense QRIS coverage may benefit more from consumer protection, digital financial literacy, account-to-savings conversion, or credit products designed around verified cash-flow data. Widyastuti et al. (2024) emphasize the role of digital financial capability in shaping adoption outcomes, and Nugraha et al. (2022) show that user acceptance depends on the perceived fit between technology and everyday needs.

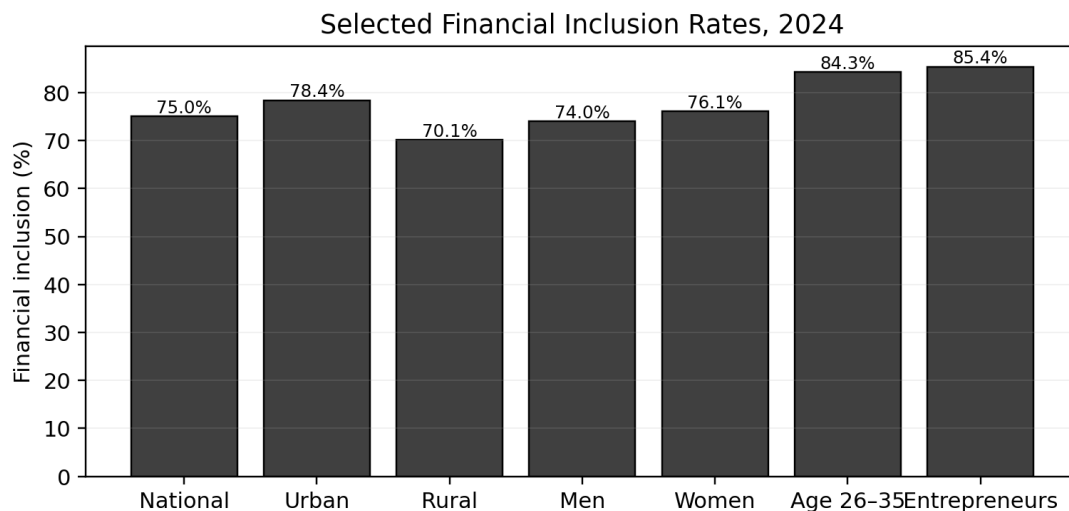


Figure 2. Selected Financial Inclusion Rates, 2024

The core empirical mismatch is the difference in speed between infrastructure scaling and the closure of inclusion gaps. A 49.2% estimated annualized increase in QRIS merchants over 2020–2025 is far faster than any plausible annual change in a mature inclusion index measured on a 0–100 scale. This is not a failure of the payment system; it indicates that the binding constraints shift after acceptance infrastructure becomes widespread. Once a merchant can receive an interoperable payment, the next constraints concern user capability, reliable connectivity, income regularity, product suitability, trust, and the economics of financial intermediation. Sahay et al. (2020) frame digital financial inclusion as a process that can advance quickly through technology but remains conditioned by institutional and developmental factors. Gallego-Losada et al. (2023) likewise show that digitalization can improve financial participation when it is connected to broader financial behavior and not treated as a stand-alone technological outcome.

A practical monitoring framework should therefore combine payment-system indicators with outcome indicators. Table 3 proposes a compact set of measures that can be compiled from routine administrative and survey data: active QRIS users rather than registrations alone, transactions per active user, active merchants per 1,000 adults, rural–urban usage gaps, repeat-use rates, fraud complaints per transaction volume, and transitions from payment accounts into savings or formal credit. Such a dashboard would help distinguish scale from depth and allow intervention design to follow the location of the constraint. The recommendation is consistent with the inclusive-fintech literature, which argues that success should be evaluated through actual financial welfare and durable use rather than platform growth alone (Lashitew et al., 2019; Ozili, 2018). It also responds to concerns that digitization can widen

exposure to financial systems without ensuring equivalent gains in capability or protection (Gabor & Brooks, 2017).

Table 3. Applied Monitoring Framework for Meaningful Digital Financial Inclusion

Dimension	Operational indicator	Interpretive purpose
Reach	Active merchants per 1,000 adults	Local acceptance density
Depth	Transactions per active user	Repeat-use intensity
Equity	Rural–urban active-use gap	Distributional reach
Capability	Literacy and digital-safety measures	Ability to use services safely
Protection	Complaints or fraud losses per transaction	Consumer risk
Progression	Payment-to-savings/credit transition	Broader financial engagement

Source: Authors' framework based on the empirical results and cited literature

The results have implications for MSME policy as well as household inclusion. Because micro and small firms dominate the QRIS merchant base, transaction histories can potentially become inputs to cash-flow-based credit assessment, inventory management, and tax or accounting formalization. That opportunity should be approached cautiously because data availability does not guarantee fair underwriting, and opaque scoring systems can introduce new exclusions. Shaikh et al. (2023) emphasize that digital finance adoption is shaped by trust and perceived risks, while Pazarbasioglu et al. (2020) argue that digital financial ecosystems require competition, responsible data use, and strong consumer safeguards. Applied policy should therefore encourage portable transaction records, transparent consent, dispute mechanisms, and financial products that reward stable merchant activity without forcing businesses into expensive or unsuitable debt.

A distribution-sensitive interpretation also requires attention to the denominator used in future monitoring. Absolute merchant and user counts favor populous and economically dense regions, whereas active-user rates, transactions per adult, and merchant density per local business population can reveal whether service intensity is expanding outside established centers. The World Bank (2022) and GSMA (2024) show that digital access gaps increasingly concern quality and frequency of use rather than simple network availability, while Khera et al. (2021) link digital financial inclusion to wider infrastructure and socioeconomic conditions. For Indonesia, this means that provincial or district dashboards should pair QRIS growth with connectivity, literacy, complaint, and formal-account indicators so that areas with similar acceptance counts but different user capabilities are not treated as equivalent. Such disaggregation would also make policy evaluation more precise by distinguishing locations where the remaining constraint is merchant acceptance from locations where affordability, trust, consumer protection, or income volatility limits meaningful use. The empirical contribution of the present comparison is to show why national scale should be treated as the starting point for this finer measurement rather than as evidence that inclusion gaps have already been resolved.

The study has three limitations that define the interpretation of its findings. First, the QRIS time series is an aggregate network measure and cannot identify individual adoption pathways; second, the 2024 inclusion survey and the annual payment statistics are generated through different measurement systems; third, the analysis is descriptive and cannot estimate the causal effect of QRIS on inclusion. Even with those constraints, the combined evidence answers the applied question more clearly than either dataset alone. Indonesia has achieved extraordinary growth in interoperable payment acceptance, yet national inclusion still varies meaningfully across geography and socioeconomic categories. The result supports continued infrastructure expansion where gaps remain, coupled with a stronger policy

shift toward meaningful use, financial capability, consumer protection, and outcome-based monitoring. This interpretation is consistent with the broader literature on fintech transformation and inclusive finance (Gomber et al., 2018; Zhou, 2021).

CONCLUSION

The reported QRIS merchant network increased from 5.80 million in 2020 to 42.75 million in 2025, an absolute addition of 36.95 million and a five-year CAGR of approximately 49.1%. The 2024 SNLIK separately reported financial inclusion of 75.02%, financial literacy of 65.43%, and an urban–rural inclusion difference of 8.28 percentage points. Reading the two official statistical systems together establishes a specific empirical boundary: national merchant expansion documents the reach of payment acceptance, whereas the survey documents subgroup differences in the use of formal financial services. Neither dataset identifies the financial behavior of individual QRIS users, and their juxtaposition cannot demonstrate that inclusion gaps widened, narrowed, or changed at the same rate as merchant registrations. The study’s contribution is therefore an operational distinction among infrastructure availability, transaction activity, financial capability, and the distribution of reported inclusion, rather than an estimate of the impact of QRIS on financial welfare.

Two policy priorities follow from the observed measurement gaps. First, payment-system monitoring should supplement registrations with verified active merchants and users, transaction frequency, and comparable population-adjusted regional indicators. Second, inclusion monitoring should assess rural participation and consumer capability alongside safe usage, complaints, and transitions into suitable formal financial products. These proposals respond to the evidence but were not evaluated as interventions. A subsequent design linking geocoded QRIS activity with repeated inclusion surveys or consent-based individual and firm records could test whether adoption is associated with savings behavior, household financial management, business resilience, or formal borrowing after accounting for local conditions. Until such linked evidence is available, claims about the inclusion effects of QRIS should remain distinct from verified growth in payment infrastructure.

REFERENCES

- Aleemi, A. R., Javaid, S., & Hafeez, M. (2023). Financial literacy and digital financial services adoption: Evidence from an emerging economy. *Heliyon*, 9, e22551. <https://doi.org/10.1016/j.heliyon.2023.e22551>
- Al-Shami, S. A., Al Mamun, A., Rashid, N., & Cheong, C. B. (2024). Fintech and financial inclusion: The mediating role of digital financial literacy. *Heliyon*, 10, e34902. <https://doi.org/10.1016/j.heliyon.2024.e34902>
- Bank Indonesia. (2021). Economic report on Indonesia 2020. Bank Indonesia.
- Bank Indonesia. (2022). Economic report on Indonesia 2021. Bank Indonesia.
- Bank Indonesia. (2023). Economic report on Indonesia 2022. Bank Indonesia.
- Bank Indonesia. (2024). Economic report on Indonesia 2023. Bank Indonesia.
- Bank Indonesia. (2025a). Economic report on Indonesia 2024. Bank Indonesia.
- Bank Indonesia. (2026). Economic report on Indonesia 2025. Bank Indonesia.
- Gabor, D., & Brooks, S. (2017). The digital revolution in financial inclusion: International development in the fintech era. *New Political Economy*, 22(4), 423–436. <https://doi.org/10.1080/13563467.2017.1259298>
- Gallego-Losada, R., Montero-Navarro, A., Rodríguez-Sánchez, J.-L., & González-Torres, T. (2023). Mapping financial inclusion and fintech research: A bibliometric review. *Research in International Business and Finance*, 64, 101862. <https://doi.org/10.1016/j.ribaf.2022.101862>
- Gomber, P., Kauffman, R. J., Parker, C., & Weber, B. W. (2018). On the fintech revolution: Interpreting the forces of innovation, disruption, and transformation in financial services. *Journal of Management Information Systems*, 35(1), 220–265. <https://doi.org/10.1080/07421222.2018.1440766>
- Gomber, P., Koch, J. A., & Siering, M. (2017). Digital finance and fintech: Current research and future research directions. *Journal of Business Economics*, 87, 537–580. <https://doi.org/10.1007/s11573-017-0852-x>
- GSMA. (2024). State of the industry report on mobile money 2024. GSMA.

- Kasri, R. A., Azzahra, C., Widiatmoko, D., & Abdul Hamid, B. (2022). Intention to use digital financial services during the COVID-19 pandemic. *Heliyon*, 8(11), e11198. <https://doi.org/10.1016/j.heliyon.2022.e11198>
- Khera, P., Ng, S., Ogawa, S., & Sahay, R. (2021). Is digital financial inclusion unlocking growth? *Asian Economic Policy Review*, 16(1), 52–71. <https://doi.org/10.1111/aepr.12336>
- Lashitew, A. A., van Tulder, R., & Liasse, Y. (2019). Mobile phones for financial inclusion: What explains the diffusion of mobile money innovations? *Research Policy*, 48(5), 1201–1215. <https://doi.org/10.1016/j.respol.2018.12.010>
- Mindra, R., Moya, M., Zuze, L. T., & Kodongo, O. (2017). Financial self-efficacy: A determinant of financial inclusion. *International Journal of Bank Marketing*, 35(3), 338–353. <https://doi.org/10.1108/IJBM-05-2016-0065>
- Nugraha, D. P., Setiawan, B., Nathan, R. J., & Fekete-Farkas, M. (2022). Fintech adoption drivers for innovation for SMEs in Indonesia. *Journal of Open Innovation: Technology, Market, and Complexity*, 8(4), 208. <https://doi.org/10.3390/joitmc8040208>
- Otoritas Jasa Keuangan, & Badan Pusat Statistik. (2024). National survey of financial literacy and inclusion 2024. OJK.
- Ozili, P. K. (2018). Impact of digital finance on financial inclusion and stability. *Borsa Istanbul Review*, 18(4), 329–340. <https://doi.org/10.1016/j.bir.2017.12.003>
- Pazarbasioglu, C., Mora, A. G., Uttamchandani, M., Natarajan, H., Feyen, E., & Saal, M. (2020). Digital financial services. World Bank.
- Ryu, H.-S. (2018). What makes users willing or hesitant to use fintech? *Industrial Management & Data Systems*, 118(3), 541–569. <https://doi.org/10.1108/IMDS-07-2017-0322>
- Sahay, R., von Allmen, U. E., Lahreche, A., Khera, P., Ogawa, S., Bazarbash, M., & Beaton, K. (2020). The promise of fintech: Financial inclusion in the post COVID-19 era. International Monetary Fund.
- Setiawan, B., Nugraha, D. P., Irawan, A., Nathan, R. J., & Zoltan, Z. (2021). User innovativeness and fintech adoption in Indonesia. *Journal of Open Innovation: Technology, Market, and Complexity*, 7(3), 188. <https://doi.org/10.3390/joitmc7030188>
- Shaikh, A. A., Glavee-Geo, R., Karjaluo, H., & Hinson, R. E. (2023). Mobile financial services adoption and the digital transformation of financial inclusion. *Technological Forecasting and Social Change*, 186, 122158. <https://doi.org/10.1016/j.techfore.2022.122158>
- Suri, T., & Jack, W. (2016). The long-run poverty and gender impacts of mobile money. *Science*, 354(6317), 1288–1292. <https://doi.org/10.1126/science.aah5309>
- Widyastuti, U., Respati, D. K., & Irmawati. (2024). Digital financial literacy and financial inclusion in emerging digital markets. *Cogent Business & Management*, 11, 2322778. <https://doi.org/10.1080/23311975.2024.2322778>
- World Bank. (2022). The Global Findex Database 2021: Financial inclusion, digital payments, and resilience in the age of COVID-19. World Bank. <https://doi.org/10.1596/978-1-4648-1897-4>
- Yaqin, A., & Safuan, S. (2023). Digital payment adoption and microenterprise financial performance in Indonesia. *International Journal of Applied Economics, Finance and Accounting*, 17(2), 302–313.
- Zhou, G. (2021). Mobile internet and household financial participation. *Economic Modelling*, 96, 198–210. <https://doi.org/10.1016/j.econmod.2021.03.009>