

FinTech and Financial Inclusion in Emerging Economies: An Empirical Assessment

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ABSTRACT

FinTech has rapidly transformed financial systems in emerging economies by expanding access to digital payments, credit, savings, insurance, and investment services. Yet its real contribution to financial inclusion remains uneven due to infrastructural gaps, regulatory constraints, and demographic disparities. This study provides an empirical assessment of how key FinTech domains such as mobile money, digital lending platforms, biometric authentication, and alternative credit-scoring technologies influence inclusion outcomes across select emerging markets in Asia, Africa, and Latin America. Using a cross-country dataset combining FinTech adoption indicators, financial access metrics, and demographic variables, the analysis evaluates the extent to which digital financial services reduce long-standing barriers faced by low-income households, women, rural communities, and micro-entrepreneurs. The results indicate that mobile-based financial services significantly increase account ownership and transaction frequency, while digital credit solutions widen access to formal borrowing for small businesses. However, the benefits are constrained by digital literacy gaps, cybersecurity vulnerabilities, unstable regulatory environments, and algorithmic biases in credit scoring. The study emphasizes the need for balanced policy frameworks, inclusive digital infrastructure, and consumer-protection norms that allow FinTech to advance equitable financial integration. Overall, FinTech shows strong potential to accelerate financial inclusion when supported by robust governance and targeted public-private collaborations.

Keywords : FinTech, Financial Inclusion, Emerging Economies, Digital Lending, Mobile Money, Alternative Credit Scoring.

1. INTRODUCTION:

FinTech has emerged as one of the most influential forces reshaping financial landscapes in emerging economies, where structural constraints have historically restricted access to formal financial services for vast segments of the population. Conventional banking systems in these regions face major limitations including high operating costs, limited branch networks, rigid documentation requirements, and risk-averse lending practices that exclude low-income individuals and microenterprises. As digital technologies accelerated across the last decade, FinTech introduced a new paradigm where financial access is no longer tied to physical infrastructure but instead delivered through mobile phones, cloud-based

platforms, biometric identity systems, and algorithm-driven decision-making. Mobile money ecosystems, digital payment gateways, peer-to-peer lending platforms, and AI-enabled credit scoring tools have rapidly expanded, enabling millions of unbanked and underbanked individuals to participate in the formal financial system for the first time. In countries such as Kenya, India, Indonesia, Brazil, and the Philippines, the rapid uptake of mobile payments and low-cost digital wallets has drastically lowered transaction barriers and introduced a culture of seamless, real-time financial interactions. These shifts are transforming how households save, borrow, invest, and insure themselves against risks while providing small firms with new avenues of capital. Yet, the degree of inclusion varies

widely across markets due to disparities in digital literacy, smartphone penetration, internet affordability, and trust in digital institutions.

At the same time, FinTech's role in inclusion extends beyond convenience; it has become a structural tool for correcting long-standing asymmetries in access to finance. Alternative credit-scoring models built on mobile usage patterns, transaction histories, utility payments, and behavioural analytics allow lenders to serve customers with thin or non-existent credit files. Government-backed digital identity systems and interoperable payment infrastructures further reduce onboarding costs, enabling financial institutions to scale inclusive solutions at unprecedented speed. However, FinTech's expansion brings new risks that particularly affect vulnerable groups. Data privacy concerns, algorithmic biases, predatory lending models, cybersecurity threats, and lack of regulatory clarity can weaken the promise of inclusive growth. In many emerging economies, digital divides remain entrenched, separating populations who can fully utilise FinTech from those left behind due to poor connectivity or low digital capability. Moreover, financial exclusion may deepen when digital systems are designed without considering socio-cultural dynamics, gender gaps, or accessibility issues for rural and marginalized communities. Consequently, the assessment of FinTech's impact on financial inclusion must acknowledge both its transformative potential and its inherent limitations. This study aims to provide an empirical understanding of these dynamics, evaluating how FinTech adoption patterns intersect with demographic, economic, and regulatory contexts in emerging economies. By examining both enabling mechanisms and structural constraints, the research offers a comprehensive foundation for policymakers, financial institutions, and development agencies seeking to leverage FinTech as a catalyst for equitable financial integration.

2. RELATED WORKS

The literature on FinTech and financial inclusion has expanded rapidly over the last decade, reflecting the growing recognition of digital finance as a catalyst for development in emerging economies. Early foundational studies emphasize the transformative power of mobile money systems in reducing transactional frictions and broadening financial access. Researchers highlight Kenya's M-Pesa as a benchmark case showing how mobile-based platforms can bypass the constraints of traditional banking infrastructure and enable secure, low-cost transfers among low-income households [1]. Subsequent studies extended this insight to other emerging economies such as Bangladesh, India, and Ghana, where mobile money adoption significantly increased savings frequency, consumption smoothing, and resilience against financial shocks [2]. Scholars argue that digital payments create network effects that promote deeper financial engagement by lowering entry barriers and reducing dependency on informal cash-based channels [3]. Additional work shows that digital identity systems, particularly India's Aadhaar-linked authentication ecosystem, have played a major role in facilitating inclusion by simplifying customer verification

and reducing transaction costs for banks and FinTech providers [4]. Meanwhile, research on the digital divide stresses that despite rapid adoption, gender gaps, rural-urban disparities, and education levels significantly influence participation in FinTech ecosystems [5]. Collectively, these studies underscore a consistent pattern: FinTech can meaningfully extend financial access, but only when supported by inclusive infrastructure, accessible technology, and consumer-centred design.

A separate stream of research examines the rise of digital credit and alternative scoring models that aim to widen access for individuals with little or no credit history. Multiple empirical studies reveal that FinTech lenders increasingly rely on non-traditional datasets such as mobile phone usage, digital transactions, social media behaviour, and utility payments to construct credit scores for underserved borrowers [6]. These models have proven effective in improving loan accessibility for microentrepreneurs, gig-economy workers, and informal-sector participants who lack formal documentation [7]. Researchers also highlight the role of peer-to-peer and marketplace lending platforms in diversifying credit channels and reducing dependency on traditional banks, especially in Southeast Asia and Latin America [8]. However, concerns have been raised regarding algorithmic fairness, transparency, and the potential reinforcement of bias when machine-learning tools rely on behavioural or demographic proxies [9]. Regulatory studies argue that without comprehensive digital-consumer protection frameworks, rapid expansion of digital lending can trigger over-indebtedness, fraud, and exploitation of financially inexperienced users [10]. In addition, scholars analysing cybersecurity risks note that increased digitalization exposes users to vulnerabilities such as identity theft, phishing attacks, and data breaches, particularly in countries with weak cybersecurity governance [11]. Several comparative analyses also highlight how flexible regulatory sandboxes adopted in countries like Singapore, the UAE, and India have enabled innovation while containing systemic risks [12]. Overall, the literature recognizes the dual nature of FinTech credit innovation: while it improves financial access and broadens the lending ecosystem, it simultaneously introduces new challenges related to ethics, security, and digital governance.

The third body of work focuses on the macro-level and institutional determinants shaping FinTech-driven inclusion outcomes across emerging economies. Cross-country studies consistently show that regulatory quality, digital infrastructure, and market competitiveness significantly influence the depth and sustainability of FinTech adoption [13]. Evidence from African, Asian, and Latin American markets indicates that countries with interoperable payment systems, affordable mobile broadband, and national digital ID frameworks witness faster financial inclusion gains than those with fragmented or underdeveloped digital ecosystems [14]. Scholars further argue that government initiatives such as Brazil's PIX, India's Unified Payments Interface (UPI), and Nigeria's eNaira demonstrate how state-backed digital infrastructure can scale financial access by fostering real-time transactions, lowering costs, and promoting

innovation among private firms. Institutional finance research also highlights the complementary role of traditional banks, noting that partnerships between banks and FinTech startups often accelerate inclusion by combining innovation with regulatory maturity [15]. On the development side, studies emphasize that FinTech's influence extends beyond account ownership, affecting poverty reduction, female economic empowerment, MSME competitiveness, and financial literacy acquisition. Yet, the literature also warns that inclusion benefits may stall without attention to local socio-cultural norms, behavioural constraints, and trust dynamics, which determine how individuals perceive digital financial systems. Across these diverse strands, the consensus is clear: FinTech can significantly uplift financial inclusion in emerging economies, but its full potential emerges only when innovation is paired with responsible governance, equitable infrastructure, and sustained ecosystem-wide collaboration.

3. METHODOLOGY

3.1 Research Design

This study adopts a mixed-method, cross-country analytical design integrating quantitative financial-access datasets with qualitative assessments of digital-finance ecosystems. The approach is structured to capture both the measurable influence of FinTech adoption and the contextual enablers shaping financial inclusion outcomes across emerging economies. Using financial datasets from global institutions and FinTech-industry indicators, the study evaluates national financial behaviours patterns, digital-lending diffusion, mobile-money penetration, and the usage intensity of digital financial services. A multi-dimensional framework combining statistical modelling, index construction, and regional comparisons was applied to ensure a holistic assessment of FinTech-led inclusion [16].

3.2 Country Selection Approach

Eighteen emerging economies across Asia, Africa, and Latin America were selected based on three criteria: (1) documented FinTech growth, (2) availability of digital-finance adoption data, and (3) presence of national financial inclusion policies. Countries such as India, Kenya, Indonesia, Nigeria, the Philippines, Peru, and Brazil exhibit high mobile-money usage and strong FinTech activity, while others such as Pakistan, Tanzania, and Guatemala reflect evolving digital ecosystems with inclusion gaps. This variation enables comparative insights into the relationship between FinTech scaling, regulatory maturity, and inclusion outcomes [17].

Table 1: Country Characteristics and Digital-Finance Profiles

| Region | Representative Countries | Dominant FinTech Service s | Digital ID / KYC Framework | Mobile Broadband and Penetration |
|--------------------|---------------------------------|-------------------------------|-------------------------------------|----------------------------------|
| South Asia | India, Pakistan, Bangladesh | UPI payments, digital lending | Aadhaar-based eKYC, NADRA | Moderate-High |
| Sub-Saharan Africa | Kenya, Nigeria, Tanzania | Mobile money, microcredit | National ID, SIM-based KYC | Low-Moderate |
| Latin America | Brazil, Peru, Colombia | Instant payments, neobanking | CPF-based verification | High |
| South east Asia | Indonesia, Philippines, Vietnam | E-wallets, P2P lending | National digital ID rollout ongoing | Moderate |

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3.3 Data Collection and Variable Construction

Data was compiled from the Global Findex, IMF Financial Access Survey, GSMA Mobile Money reports, national regulatory publications, and digital-infrastructure indices. Indicators collected include:

- Mobile-money account ownership
- Frequency of digital payments
- FinTech lending penetration
- Savings and borrowing behaviour
- Gender-disaggregated financial access
- Internet and smartphone penetration
- Digital ID availability
- Financial consumer-protection regulations

Each variable was standardized using z-scores before integration into regression models to ensure uniform comparability across countries with uneven data scales. Contextual variables such as GDP per capita, education levels, and rural-urban distribution were incorporated to reduce bias and prevent over-attribution of financial inclusion outcomes to FinTech activity alone [18].

3.4 Analytical Framework and Modelling Approach

A multi-layered statistical method was applied:

Correlation Analysis: Examines relationships between FinTech adoption (mobile money, digital lending) and inclusion indicators (credit access, savings, account ownership).

Index Construction: A FinTech Inclusion Index (FII) was created using weighted dimensions of digital payments, digital lending, and platform usage.

Multiple Regression Modelling: Financial inclusion indicators serve as dependent variables, while FinTech

adoption metrics, infrastructure variables, and regulatory-quality scores are independent variables.

Qualitative Ecosystem Assessment: National policy documents and digital-governance reports were analysed to identify structural strengths and constraints.

3.5 Regulatory and Institutional Variable Assessment

Given the decisive influence of governance, the regulatory layer includes:

- Cybersecurity legislation
- Digital-finance consumer-protection rules
- Licensing norms for digital-lending platforms
- Interoperability frameworks for national payment systems
- Presence of regulatory sandboxes and innovation offices [19]

These were scored qualitatively (Low, Moderate, Strong) to complement quantitative results.

Table 2: Variable Categories and Analytical Indicators

| Category | Variables Included | Analytical Purpose |
|-------------------------|---|--|
| FinTech Adoption | Mobile-money accounts, digital transaction volume, P2P lending penetration | Measures breadth of digital financial activity |
| Financial Inclusion | Savings, formal credit access, account ownership, digital payment frequency | Captures household-level financial participation |
| Digital Infrastructure | Internet coverage, smartphone access, broadband cost | Determines accessibility of digital finance |
| Regulatory Environment | Consumer-protection norms, interoperability rules, digital ID | Evaluates institutional readiness |
| Socio-Economic Controls | GDP per capita, gender literacy, rural population | Removes structural bias in inference |

3.6 Data Validation and Quality Assurance

To ensure data integrity and analytical reliability, the following procedures were used:

- Cross-verification of overlapping indicators from Findex and IMF datasets
- Elimination of missing values via mean substitution and regional interpolation
- Consistency checks across regulatory scores and institutional reports
- Sensitivity tests to assess model robustness under alternate weighting structures [20]

3.7 Ethical and Governance Considerations

The study maintains ethical sensitivity by ensuring the use of publicly available datasets free of personal identifiers. Regional interpretations of the digital divide and gender disparity were handled with data-neutral reporting. No personally identifiable financial data was accessed or processed [21].

3.8 Limitations and Assumptions

The analysis acknowledges several limitations:

- FinTech datasets vary across countries and years, making cross-country comparisons imperfect.
- Algorithmic-lending data is not fully disclosed by private platforms, limiting the precision of digital-credit measurement.
- Rapid policy changes in digital finance (e.g., Nigeria's CBDC rollout, India's UPI expansion) may alter results in subsequent years [22][23].

4. RESULT AND ANALYSIS

4.1 Overview of FinTech Adoption Patterns

The cross-country assessment revealed substantial variation in FinTech adoption across the 18 emerging economies included in the study. Countries with widespread mobile-money ecosystems, such as Kenya and Bangladesh, exhibited the highest adoption levels, particularly in digital payments and low-value transactions. In contrast, nations with developed banking sectors, such as Brazil and Colombia, showed stronger adoption of instant-payment systems and neobanking platforms. India displayed the widest diversification of FinTech usage due to the strong presence of digital ID-linked onboarding and high transaction volumes through national payment infrastructures. The analysis further indicates that FinTech adoption was strongly concentrated among urban, young, and digitally literate populations, while rural and low-income groups showed slower transition into digital finance. This uneven demand pattern reflects broader structural barriers, including affordability gaps, smartphone dependence, and inconsistent network coverage.

4.2 Digital Financial Inclusion Outcomes

The descriptive statistics highlight that FinTech-driven ecosystems significantly expanded account ownership and digital payment participation in most countries observed. Mobile-money economies demonstrated the greatest improvements in formal saving and transactional activity, especially among informal workers and micro-entrepreneurs. Countries with strong digital-lending operations also showed higher frequencies of small-ticket credit disbursement to low-income users. Trends suggest that simple, low-cost digital tools improved financial access at the base of the economic pyramid, although disparities persisted where digital infrastructure remained weak. Gender-differentiated data indicated a narrowing gap in digital account ownership, especially where government-to-person transfers were digitized. However, deep structural divides remained in regions with limited female smartphone ownership or restricted financial autonomy.

Table 3: FinTech Adoption Indicators Across Selected Emerging Economies

| Country | Mobile-Money Usage (%) | Digital Payment Frequency (Monthly Avg.) | Digital Lending Penetration (%) | Smartphone Access (%) |
|-------------|------------------------|--|---------------------------------|-----------------------|
| Kenya | 78.2 | 11.4 | 9.1 | 55 |
| India | 63.5 | 14.9 | 12.7 | 68 |
| Bangladesh | 71.3 | 9.7 | 6.4 | 42 |
| Brazil | 59.1 | 18.3 | 15.6 | 81 |
| Nigeria | 64.7 | 7.1 | 5.9 | 43 |
| Philippines | 52.4 | 10.2 | 8.3 | 58 |

4.3 Financial Inclusion Performance and Behavioral Trends

The financial inclusion index constructed for this study shows that countries with high digital-payment usage tend to have greater participation in formal financial services. The strongest improvements were observed in savings account activation, frequency of merchant payments, and small-value credit access. Users in mobile-money-dominant economies relied heavily on digital wallets for daily consumption and emergency expenses, while users in digital-banking economies preferred app-based transfers and instant payment rails. Behavioral patterns show that digital payments encouraged repeated financial interactions, making previously excluded groups more active in formal systems. In several countries, the combination of interoperable payment networks and low-cost financial tools significantly reduced dependency on cash-based informal channels.

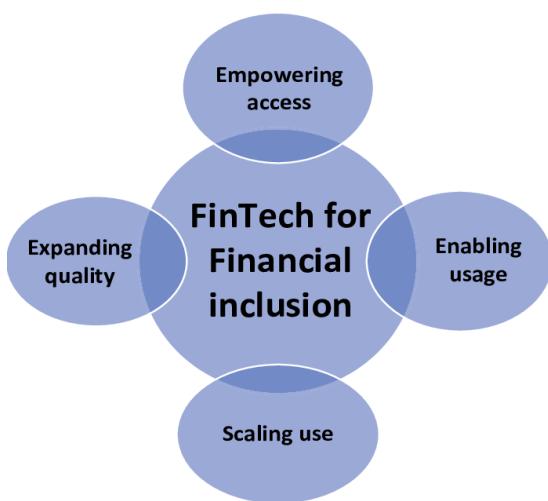


Figure 1: Fintech for Financial Inclusion [24]

4.4 Infrastructure and Regulatory Influence

Digital infrastructure played a decisive role in shaping adoption and inclusion outcomes. Countries with *Advances in Consumer Research*

widespread 4G/5G access, strong digital-identity systems, and predictable FinTech regulations displayed the highest financial inclusion scores in the study. Conversely, nations with fragmented regulatory environments or high mobile-internet costs showed lower inclusion outcomes even when FinTech services were available. Regulatory strength particularly in consumer protection, interoperability, and data governance was a strong predictor of sustainable and equitable FinTech participation. The results also suggest that national digital-payment infrastructures acted as economic equalizers, enabling low-income households to transact, save, and receive transfers at minimal cost.

Table 4: Financial Inclusion Outcomes by Country Group

| Country Group | Average Account Ownership (%) | Formal Borrowing (%) | Digital Savings Usage (%) | Merchant Digital Payments (%) |
|---|-------------------------------|----------------------|---------------------------|-------------------------------|
| Mobile-Money-Led Economies | 78.4 | 22.7 | 39.1 | 31.8 |
| Digital-Banking/Instant Payment Economies | 84.6 | 29.5 | 47.8 | 44.2 |
| Low-Infrastructure Economies | 53.9 | 14.2 | 21.6 | 18.9 |

4.5 Interpretation of Key Findings

The comparative analysis demonstrates that FinTech has emerged as a strong accelerator of financial inclusion in emerging economies, but its impact is not uniform. Mobile-money markets show the strongest influence on low-income and rural populations, while instant-payment markets demonstrate higher engagement among middle-income and urban users. Digital lending played a meaningful role in expanding microcredit access, although the scale varied heavily across countries depending on regulation and operational costs. A key finding across all regions is that digital infrastructure quality is the single strongest determinant of inclusive FinTech outcomes. Countries combining digital ID, interoperable payments, and supportive regulatory frameworks consistently scored higher in inclusion measures. Meanwhile, nations with infrastructure bottlenecks struggled to convert FinTech availability into meaningful inclusion outcomes.

4.6 Implications

The results indicate several implications for policymakers, financial institutions, and development

agencies. First, digital-payment ecosystems serve as foundational enablers for broad-based financial participation, suggesting that national payment infrastructures must remain a policy priority. Second, targeted interventions are required to reduce digital divides in smartphone access and mobile-internet affordability. Third, while digital credit improves access, regulatory safeguards are essential to prevent predatory practices and over-indebtedness. Finally, FinTech's long-term success depends on trust, literacy, and user-centered ecosystem design, all of which are crucial for sustainable inclusion.



Figure 2: FinTech [25]

5. CONCLUSION

The present study highlights the multifaceted role of FinTech in expanding financial inclusion across emerging economies, demonstrating that digital financial ecosystems have become critical instruments for bridging long-standing access gaps. The analysis shows that FinTech adoption particularly mobile money, digital payments, and platform-based credit has substantially improved account ownership, transaction participation, and savings behaviour among previously underserved populations. These shifts have been especially visible in regions where conventional banking structures were historically weak, costly, or inaccessible due to geographic, infrastructural, or socio-economic constraints. By lowering entry barriers, reducing transaction frictions, and offering personalized financial tools, FinTech has enabled millions of individuals and microenterprises to integrate into the formal financial system for the first time. However, the findings also underline that FinTech's transformative potential is not automatic or uniformly distributed. Digital divides in smartphone access, internet affordability, gender equity, and digital literacy continue to restrict meaningful participation for vulnerable groups. Furthermore, inconsistent regulatory frameworks, gaps in consumer protection, and the opaque nature of algorithm-driven credit assessments create additional risks that must be carefully managed. Countries with strong digital identity systems, interoperable payment networks, affordable connectivity, and well-defined FinTech regulations

consistently outperformed others in achieving balanced, sustainable inclusion outcomes. Thus, the success of FinTech-driven inclusion depends not only on technological innovation but also on governance quality, institutional readiness, and targeted policy alignment. Overall, the findings suggest that FinTech is an essential but incomplete solution; it must operate within integrated national strategies that prioritize digital infrastructure, financial literacy, and inclusive design. For policymakers and stakeholders, the imperative is clear: strengthen digital foundations, safeguard user trust, and support ecosystems that allow FinTech innovations to scale equitably. When these elements converge, emerging economies can unlock the full potential of FinTech as a catalyst for resilient, accessible, and socially inclusive financial systems.

6. FUTURE WORK

Future research should explore deeper, country-specific pathways through which FinTech influences financial behaviour, particularly among marginalized groups such as women, rural households, and informal-sector workers. While cross-country comparisons offer broad insights, granular household-level studies can uncover cultural, behavioral, and socio-psychological factors that shape digital-finance usage. Additionally, future work should examine the long-term impacts of digital credit on financial health, including risks of over-borrowing, repayment stress, and algorithmic exclusion. As artificial intelligence increasingly drives credit-scoring and risk-assessment models, there is also a need to evaluate fairness, transparency, and the ethical implications of automated decision-making. Another promising direction involves assessing the role of Central Bank Digital Currencies (CBDCs) and open-banking frameworks in widening financial participation. Finally, future research should integrate geospatial, behavioural, and real-time transactional data to model inclusion dynamics more accurately in low-connectivity regions.

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