

The Intersection of FinTech Adoption and Financial Inclusion Worldwide

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Abstract

Financial technology (FinTech) has changed the terms on which households and small firms reach formal financial services. Yet the evidence on whether it narrows or reproduces exclusion remains fragmented across technical, economic and development literatures. This review synthesises 24 peer-reviewed studies published between 2017 and 2026. It combines a bibliometric description of publication trends, journals and thematic clusters with a qualitative synthesis of empirical findings from Africa, Asia and Latin America. Three results emerge. First, mobile financial services remain the strongest documented driver of account ownership where banking infrastructure is thin, although access frequently does not convert into sustained use. Second, blockchain and artificial intelligence extend the frontier of inclusion through lower verification costs and alternative credit scoring, while concentrating new risk in unregulated lending and opaque algorithms. Third, adoption is mediated less by perceived usefulness than by trust, digital literacy, social awareness and the regulatory environment, which technology acceptance models treat as background rather than structure. The review argues that individual-level theories cannot explain institutional variation, proposes an integrative framework linking drivers, mediating capabilities and outcomes, and sets out a research agenda on causality, gender and consumer protection.

Keywords: Fintech Adoption; Financial Inclusion; Digital Financial Services; Mobile Money; Bibliometric Review

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INTRODUCTION

Financial technology (FinTech) refers to digitally delivered financial services—payments, credit, savings, insurance and investment—built on mobile networks, data analytics and distributed ledgers rather than on physical branches. Its expansion has altered the terms on which households and small firms reach the formal financial system. The scale of that change is visible in the Global Findex data: by 2021, 76% of adults worldwide held an account at a financial institution or with a mobile money provider, and a large share of the increase since 2017 came from digitally enabled accounts in developing economies (Demirgüç-Kunt et al., 2022). Account ownership, however, is not the same as inclusion. A substantial minority of adults still transact entirely in cash, and among those who hold accounts, dormancy and shallow usage remain common (Klapper, 2024; Sahay et al., 2020).

Traditional banking models reach marginalised communities poorly because branch networks, documentary requirements and collateral-based credit assessment impose fixed costs that small, informal and rural customers cannot cover. FinTech attacks each of these costs in turn. Mobile money and agent networks substitute for branches; digital identity and transaction records substitute for documentary proof; machine-learning scorecards substitute for collateral (Akanfe et al., 2025; Kim et al., 2018). In several economies the result has been a form of technological leapfrogging, in which populations that never had a bank branch acquired a payment account within a decade.

Optimism about this trajectory is not universal. Gabor and Brooks (2017) argue that the digital turn in inclusion agendas has been captured by a financialised development model in which the unbanked appear primarily as a new market rather than as citizens with claims on public infrastructure. Where that reading holds, inclusion can deepen exposure instead of reducing vulnerability. Unregulated digital credit, algorithmic exclusion and the extraction of personal data are documented risks rather than hypothetical ones (Alnasser Mohammed, 2025; Nanda & Yunus, 2024). The same technology that lowers the cost of reaching a rural customer also lowers the cost of over-lending to that customer.

Scholarship on this intersection has grown quickly, but it remains fragmented in three respects. Bibliometric studies map the field's structure without adjudicating between its findings; empirical studies test single mechanisms in single countries; and theoretical work continues to rely on adoption models designed for voluntary individual use of technology. Reviews that connect these three layers are rare, and the result is a literature that can describe its own growth more confidently than it can explain its outcomes. This review addresses that gap through three questions. First, what does the bibliometric record show about the intellectual structure and maturity of the field? Second, which technological drivers and mediating conditions does the empirical evidence identify as decisive for inclusion outcomes? Third, what theoretical and empirical gaps remain, and what framework would close them?

The review makes four contributions. It synthesises a dispersed body of evidence into three testable propositions about how access converts into inclusion. It identifies a theoretical gap in the field's reliance on individual-level adoption models and proposes a multi-level framework that situates adoption within capability and institutional layers. It positions regional evidence comparatively, showing that the same technology produces different outcomes under different institutional conditions. Finally, it sets out a research agenda that prioritises causal design, gender-disaggregated analysis and consumer protection. The remainder of the paper proceeds as follows. Section 2 sets out the methodology. Section 3 reviews the bibliometric landscape and the theoretical foundations. Section 4 examines technological drivers. Section 5 compares

regional evidence and socio-economic consequences. Section 6 synthesises the findings and states the contribution. Section 7 concludes and identifies directions for future research.

METHODOLOGY

Research Design

This review adopts a mixed-methods design that combines a quantitative bibliometric component with a qualitative thematic synthesis. The distinction matters for how the study should be read. Bibliometric analysis is primarily quantitative: it applies statistical and network techniques to publication metadata, including publication counts, citation distributions, co-authorship and keyword co-occurrence, in order to describe the structure of a field. That is the method used here to answer the first research question. The qualitative component answers the second and third: the findings reported by the retained studies are coded, compared and interpreted thematically, so that the review explains what the observed patterns mean and where studies conflict rather than merely counting them. The design is therefore sequential. The bibliometric layer establishes the shape of the field, and the qualitative layer interrogates its content (Del Sarto & Ozili, 2025; Kesavan & Polisetty, 2025).

Search Strategy And Corpus

Studies were identified through Scopus, Web of Science, Google Scholar and Crossref using the Boolean string ("fintech" OR "financial technology" OR "digital financial services" OR "mobile money") AND ("financial inclusion" OR "unbanked" OR "underserved"). The search was restricted to peer-reviewed journal articles and scholarly book chapters published in English between 2017 and 2026, the period in which both the bibliometric and the empirical literatures consolidated. Records were screened first on title and abstract and then on full text. Studies were included where they addressed an explicit relationship between a FinTech instrument and an inclusion outcome, and where they reported either primary empirical evidence or a systematic or bibliometric review. Practitioner reports, conference abstracts without full text, and studies of banking performance or financial literacy that carried no inclusion outcome were excluded, as were duplicates across databases. Twenty-four studies were retained for synthesis. The protocol is summarised in Table 1.

Table 1: Review Protocol and Inclusion Criteria

Element	Specification
Databases	Scopus, Web of Science, Google Scholar, Crossref
Search string	("fintech" OR "financial technology" OR "digital financial services" OR "mobile money") AND ("financial inclusion" OR "unbanked" OR "underserved")
Period	2017–2026
Language	English
Document types	Peer-reviewed journal articles; scholarly book chapters
Inclusion criteria	Explicit FinTech–inclusion relationship; primary empirical evidence or systematic/bibliometric review
Exclusion criteria	Practitioner reports; abstracts without full text; studies without an inclusion outcome; duplicates

Element	Specification
Studies retained	24
Analytical strategy	Bibliometric description followed by qualitative thematic synthesis (constant comparison)

Note: Author-generated (2026).

Analytical Procedure

Analysis proceeded in three stages. The first was a descriptive performance analysis of the corpus, recording publication trajectories, the journals and disciplines in which the work appears, and the geographic distribution of empirical sites. The second was a science-mapping stage, in which the thematic clusters reported by the bibliometric studies in the corpus were compared with one another in order to establish which clusters are stable across independent mappings and which are artefacts of a single database or search string. The third was a qualitative thematic synthesis. Findings were extracted from each empirical study, coded inductively, and grouped into three analytic categories that structure the remainder of this paper: technological drivers, mediating capabilities, and socio-economic outcomes. Coding proceeded by constant comparison, with each new study tested against the emerging categories and categories revised where a study did not fit.

Three procedures protect the trustworthiness of the synthesis. The coding matrix in Table 2 records, for each theme, the studies that support it and the gap that remains, and it therefore doubles as an audit trail. Convergence was checked across the bibliometric and empirical layers, so that a theme is reported only where structural evidence and substantive evidence agree. Divergence was retained rather than smoothed: where the mapping literature identifies a cluster that the empirical literature barely addresses, that discrepancy is treated as a finding about the field's development rather than as noise.

Table 2: Thematic Coding Matrix: Supporting Evidence and Remaining Gaps

Analytic category	Specific theme	Studies supporting	Evidence type	Gap remaining
Technological drivers	Mobile financial services and access	Kim et al. (2018); Adel (2024); Klapper (2024)	Systematic review; cross-regional empirical; policy analysis	Dormancy and usage depth rarely measured
Technological drivers	Blockchain and distributed ledgers	Kanwal et al. (2023); Carè et al. (2025)	Conceptual; bibliometric	No outcome comparison against conventional instruments
Technological drivers	AI and alternative credit scoring	Akanfe et al. (2025); Nanda & Yunus (2024)	Review; qualitative	Fairness auditing of scoring models absent
Mediating capabilities	Digital and financial literacy	Adel (2024); Ahmeti (2025); Singh et al.	Cross-regional empirical; review	Capability formation over time unstudied

Analytic category	Specific theme	Studies supporting	Evidence type	Gap remaining
		(2026)		
Mediating capabilities	Trust and social awareness	Aziz & Naima (2021); Bharathi et al. (2023)	Mixed methods; review	Mediation rarely tested quantitatively
Institutional conditions	Regulation and political economy	Gabor & Brooks (2017); Danladi et al. (2023); Ediagbonya & Tioluwani (2023)	Critical political economy; policy analysis	Sequencing of protection before scale unaddressed
Distributive outcomes	Gender and intersectionality	Boughrara & Gherbi (2024); Aziz & Naima (2021)	Survey; empirical	Intra-household control over accounts unstudied
Outcome measurement	Poverty, resilience and welfare	Alnasser Mohammed (2025); Sahay et al. (2020)	Empirical; policy analysis	No longitudinal welfare link established

Note: Author-generated (2026). The matrix records the mapping between analytic categories and the studies coded to them, and functions as the audit trail for the synthesis described in Section 2.3.

Justification for the Approach

Bibliometric data and empirical research are appropriate to this question for four reasons. First, the field is large and dispersed across information systems, finance, development studies and policy journals. A narrative review of that literature would depend on the reviewer's reading, whereas a bibliometric frame supplies a systematic and reproducible sampling logic and makes the selection criteria inspectable. Second, bibliometric mapping reveals structure that individual studies cannot show, including which clusters are growing, which are isolated, and where technical and development scholarship fail to cite one another. Third, bibliometrics alone is insufficient because citation counts measure attention rather than truth. A frequently cited study may be frequently contested. Empirical studies supply the outcome evidence that mapping cannot: they show whether access converts into use, and whether use improves welfare. Fourth, the two layers triangulate. Where a cluster identified bibliometrically is also supported by consistent empirical findings, confidence in the resulting claim is higher than either method would support alone.

The approach carries limitations that are acknowledged at the outset. Index coverage favours English-language journals from large publishers, so scholarship from Latin America, Francophone Africa and non-indexed national journals is under-represented. Citation-based measures lag recent work, which disadvantages studies published after 2023. And the corpus, although screened systematically, is bounded by the search string: work that studies inclusion without using the term may have been missed. These limitations qualify the review's claims about the field's structure more than its claims about mechanisms, since the empirical findings synthesised in Sections 4 and 5 are drawn from studies read in full.

Theoretical Foundations and the Bibliometric Landscape

What the Bibliometric Record Shows

Academic interest in the FinTech–inclusion intersection has grown sharply since 2017, and the bibliometric studies in the corpus agree on the broad shape of that growth. Del Sarto and Ozili (2025) trace an evolution from early work on the definition and mechanics of electronic banking towards the adoption and diffusion of disruptive technologies in emerging economies. Their analysis finds a field increasingly organised around the tailoring of specific instruments, notably mobile wallets and digital credit, to the needs of underserved groups, and it sets out an agenda concerned with long-run effects on economic stability and with the institutional conditions that enable or constrain integration.

Carè et al. (2025) reach a complementary conclusion from a different corpus. They identify two weakly connected streams: one concerned with the technical architecture of FinTech and one with the socio-economic outcomes of inclusion. Their argument that a financial-technology lens allows the two to be read together implies that the field's fragmentation is not simply a matter of scale but of conceptual organisation. Gallego-Losada et al. (2023) show that “digital financial inclusion” has consolidated as a recognisable sub-field with its own vocabulary, while noting that the literature increasingly turns on the sustainability of digital interventions and on the absence of a robust theoretical link between adoption and measured inclusion. Afjal (2023) reaches a similar conclusion from a bibliometric reading of digital financial services, arguing that closing the financial gap requires a multidimensional strategy in which infrastructure and economic development carry as much weight as user acceptance.

More recent mappings confirm that the field has continued to expand without converging. Elgharib and Elmarzouky (2026) and Kesavan and Polisetty (2025) both report rising output, thematic concentration around a small number of instruments, and persistent separation between technical and development-oriented clusters. Read together, these studies support four claims and unsettle a fifth. They agree that output is growing, that mobile money and digital credit dominate the empirical core, that the field has moved from definitional work to questions of impact, and that African and South Asian evidence is over-represented relative to population. They do not agree on whether consolidation is occurring: growth in volume has not been matched by convergence in theory, method or outcome measurement.

This is the first gap the review identifies. Bibliometric studies describe the architecture of the field but cannot adjudicate its findings, and their clusters are organised by technology and geography rather than by mechanism. A reader can learn from them that mobile money is the largest cluster, but not why mobile money succeeds in one institutional setting and stalls in another. Answering that question requires the empirical evidence reviewed in Sections 4 and 5, read against a theoretical frame.

Technology Adoption Models in Financial Services

The dominant theoretical apparatus in the corpus is the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT). Both explain adoption as a function of beliefs about the technology: perceived usefulness and ease of use in TAM, and performance expectancy, effort expectancy, social influence and facilitating conditions in UTAUT. Bharathi et al. (2023) review the synergy between financial technologies and inclusion and find that perceived usefulness and ease of use remain the primary determinants of adoption, but that in inclusion contexts trust and social influence carry

more weight than they do in general technology adoption. Their conclusion is that an instrument must be socially and culturally legible, not merely functional, if it is to be taken up by populations outside the formal system.

Anagreh et al. (2024) test UTAUT in the Jordanian banking sector and find performance expectancy and effort expectancy to be significant predictors of mobile payment adoption, which they treat as the entry point to wider digital financial inclusion. Their result is consistent with the broader literature and useful for institutional design, since both constructs are partly manageable by providers. Yet the study also illustrates the limits of the framework: it explains intention to adopt a payment instrument among existing bank customers, which is a narrower question than whether a previously unbanked household gains durable access to credit, insurance or savings.

The Theoretical Gap

Four limitations follow from the field's reliance on individual-level adoption models, and together they constitute the theoretical gap this review addresses. The first is the unit of analysis. TAM and UTAUT model a voluntary individual decision, whereas inclusion is produced by institutions: by interoperability rules, agent network economics, identity systems and licensing regimes. A model that treats these as “facilitating conditions” cannot explain why identical technologies produce different inclusion outcomes across countries. The second is the dependent variable. The models predict intention and use, not inclusion, and inclusion is a multi-dimensional construct comprising access, usage depth, quality and welfare effect. The third is the treatment of capability. Trust, digital literacy and social awareness enter these models as additional constructs bolted onto the original specification, without a theory of how capability is formed or how it mediates the conversion of access into benefit. The fourth is temporal and distributive. The models are cross-sectional, silent on sequencing, and unable to represent algorithmic exclusion, in which a scoring system denies service to a group without any individual decision to reject it.

Figure 1 sets out the framework that this review proposes in response. Technological drivers occupy the left of the model and are grouped into access, operational and intelligence technologies. Mediating factors occupy the lower band and comprise digital literacy, trust, social awareness and the regulatory environment. Socio-economic outcomes occupy the right: poverty alleviation, economic resilience and gender parity. The framework's contribution is not the list of variables, most of which appear individually in the literature, but the arrangement. Adoption sits in the centre as a conversion process rather than an endpoint, drivers act on it from without, and mediators determine the rate at which access becomes use and use becomes welfare. Institutions are not background; they set the terms on which the mediators operate.

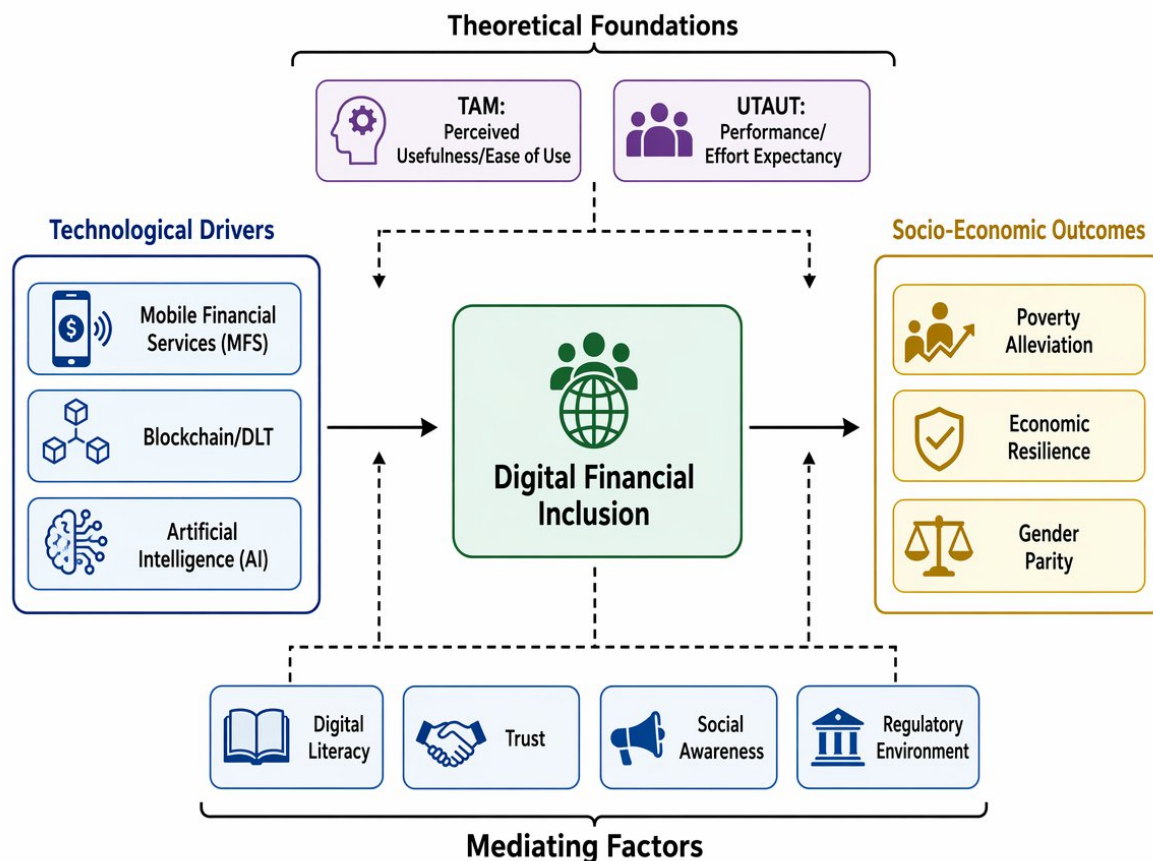


Figure 1: An Integrative Framework of FinTech Adoption and Financial Inclusion

Note: Author-generated (2026), synthesised from Bharathi et al. (2023), Akanfe et al. (2025) and Danladi et al. (2023). TAM = Technology Acceptance Model; UTAUT = Unified Theory of Acceptance and Use of Technology; MFS = mobile financial services; DLT = distributed ledger technology.

Technological Drivers of Inclusion

Mobile Financial Services

Mobile financial services (MFS) are the most extensively documented driver of inclusion in the corpus, particularly where banking infrastructure is thin. Kim et al. (2018), reviewing the literature systematically, observe that developing economies have led innovation in mobile money despite weaker institutional capacity, and that user behaviour and interface design are decisive for take-up among low-income users. The “bank in the pocket” property of MFS allows financial services to scale without a branch network, which is why the instrument has been associated with leapfrogging in a large number of national development trajectories.

Three constraints recur across the studies that examine MFS in practice, and they explain why adoption and inclusion diverge. The first is the economics of the agent network: cash-in and cash-out depend on agents whose liquidity and geographic reach are themselves a business problem, so access is uneven within countries that appear well served in aggregate. The second is dormancy: an account opened to receive a single transfer may never be used for savings, credit or insurance, which means that headline account-ownership figures overstate inclusion

(Klapper, 2024). The third is interoperability. Where wallets are closed systems, users hold multiple accounts and the efficiency gains of digital payments are partly lost. These constraints are institutional rather than technological, and they foreshadow the argument developed in Section 5.

Blockchain and Distributed Ledger Technology

Blockchain and distributed ledger technologies are presented in the literature as a means of raising the transparency and efficiency of financial systems rather than as a route to mass retail access. Kanwal et al. (2023) examine the nexus of financial technologies, inclusion and blockchain in Islamic finance, arguing that decentralisation and immutability align with the ethical requirements of Islamic finance and can reduce the cost of transaction verification for unbanked users. In their account, distributed ledgers make remittances and micro-loans cheaper and more auditable, and smart contracts allow conditional transfer mechanisms to operate without an intermediary.

The claim is plausible but thinly evidenced. Most of the work reviewed here concerns architecture, pilot projects and institutional fit rather than measured inclusion outcomes at scale, and the corpus contains no study that compares a distributed-ledger intervention with a conventional one on a common outcome measure. This is a second gap. Blockchain's most defensible contribution at present is to specific niche problems, such as remittance corridors with high intermediation costs and credit products that require verifiable ethical compliance, rather than to the broad inclusion problem that mobile money addresses.

Artificial Intelligence and Alternative Credit Scoring

Artificial intelligence represents the current frontier. Akanfe et al. (2025) examine how technological interventions have shaped inclusion and argue that alternative credit scoring built on non-traditional data, including mobile usage patterns and digital footprints, allows lenders to assess applicants without formal credit histories. This addresses the binding constraint in credit markets, where the absence of a record is treated as evidence of risk. The same authors note that conversational agents and personalised financial advice can deliver financial education at a scale that neither branches nor human advisers could match.

The qualitative evidence complicates this optimism. Nanda and Yunus (2024) examine how technology shapes financial environments and conclude that access gains are real but conditional on a granular understanding of the demographic groups being served. Their central finding is that a one-size-fits-all instrument fails precisely where inclusion matters most, because local financial practice, household bargaining and prior experience with formal institutions shape what a tool can do. Read alongside Akanfe et al. (2025), the implication is that the intelligence layer of FinTech is where inclusion gains and exclusion risks are most tightly coupled: the same model that scores an invisible borrower into the formal system can score a whole category of borrowers out of it.

A Taxonomy of Inclusion Technologies

Figure 2 organises the technologies discussed above into three families. Access technologies, principally mobile money and integrated super-apps, extend the payment and storage frontier. Operational technologies, principally blockchain for remittances and smart contracts for micro-loans, reduce the cost of verification and execution. Intelligence technologies, principally AI credit scoring and conversational agents, extend the frontier of assessment and advice. The

taxonomy also records where each family has been most studied: access technologies in Africa, super-apps and smart contracts in Asia, and AI scoring and chatbots across the global South and Latin America in particular.

The distribution in Figure 2 carries an argument. Innovation and research attention are concentrated in the access and operational layers, where the inclusion effect is direct and measurable. The intelligence layer, where exclusion risk is concentrated because decisions are made by models rather than by officers, is the least governed and the least studied. A field that measures what is easy to count will systematically under-report the harms that are hardest to observe, and the taxonomy makes that bias visible.

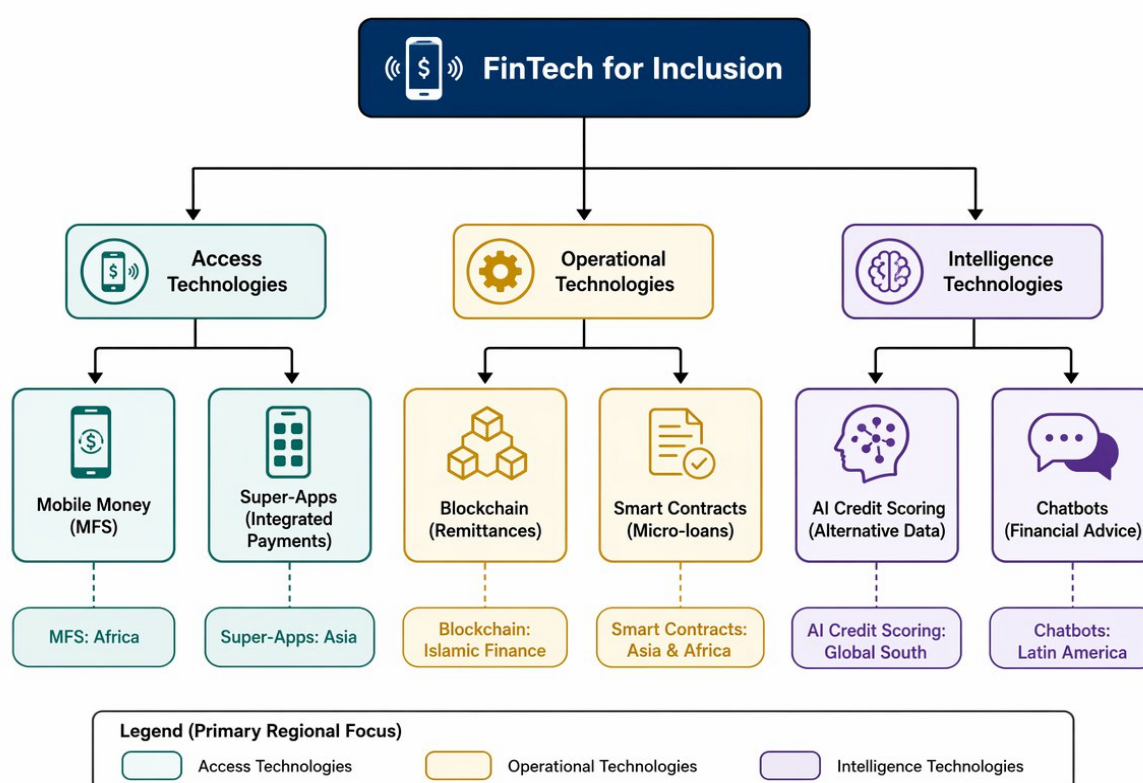


Figure 2: A Taxonomy of FinTech Innovations and Their Application to Unbanked and Underbanked Populations

Note. Author-generated (2026), developed from Akanfe et al. (2025) and Kanwal et al. (2023). Regional annotations indicate where each technology has been most extensively documented in the reviewed corpus, not where it is exclusively used.

Regional Evidence and Socio-Economic Consequences

Africa, Asia and Latin America

The effects of FinTech on inclusion are most visible in regions where the distance between the banked and the unbanked has historically been greatest, but the mechanisms differ. Adel (2024) compares digital literacy and technology adoption across Africa, Asia and Latin America and finds that the same instruments produce different outcomes depending on the digital literacy of the population. Mobile money dominates in Africa because high mobile penetration

coincides with demand for low-cost remittances; Asian markets have instead produced integrated super-apps that combine payments, social interaction and commerce into a single ecosystem. The comparison is important because it shows that the unit of competition is not the payment instrument but the platform on which financial services sit.

Evidence from Asia also establishes the double-edged character of the relationship. Alnasser Mohammed (2025) examines FinTech, inclusion and poverty reduction in Asian developing countries and finds that FinTech acts as a catalyst for empowerment by giving poor households tools to manage irregular incomes. The same study warns that rapid expansion of digital credit without regulatory oversight can produce over-indebtedness among vulnerable borrowers. Inclusion and indebtedness are therefore not opposing outcomes produced by different technologies; they are two results of the same mechanism operating under different regulatory conditions.

Latin America is the least covered of the three regions in this corpus. Its literature is dominated by accounts of super-app ecosystems and conversational banking rather than by studies of access at the base of the distribution, and the region's experience of high pre-existing banking penetration in urban areas makes its inclusion problem structurally different from Africa's. Table 3 sets out the comparison and makes the uneven evidence base explicit.

Table 3: Comparative Regional Evidence on FinTech and Financial Inclusion

Region	Dominant Model	Documented Drivers	Documented Barriers	Illustrative Studies
Sub-Saharan Africa	Mobile money and agent networks	Mobile penetration; remittance demand; absence of branch infrastructure	Agent liquidity; dormancy; low digital literacy	Kim et al. (2018); Adel (2024)
South and East Asia	Super-apps; digital credit	Platform integration; e-commerce; large unbanked base	Over-indebtedness; weak consumer protection	Alnasser Mohammed (2025); Aziz & Naima (2021)
Latin America	Super-apps; conversational banking	Urban smartphone penetration; incumbent bank participation	Thin evidence base; unequal coverage between urban and rural areas	Klapper (2024); Akanfe et al. (2025)
Cross-regional	Comparative and bibliometric designs	Digital literacy as a moderating condition	Measurement inconsistency across studies	Adel (2024); Gallego-Losada et al. (2023)

Note: Author-generated (2026) from the studies listed. Regional patterns describe the reviewed corpus and should not be read as exhaustive national coverage.

Gender and the Capability Gap

The gender gap is the most persistent inequality in the corpus and the one least explained by technology variables. Boughrara and Gherbi (2024) study Algeria and find that educational attainment and geographic location, rather than attitudes towards technology, determine whether women adopt FinTech instruments. Their conclusion is that interventions must be designed around the specific constraints women face, including documentation requirements, mobility restrictions and the terms on which phones are shared within households. A product that assumes an individually owned smartphone and an independent identity document excludes a measurable share of the women it is meant to reach.

Aziz and Naima (2021) reach a converging conclusion from Bangladesh through a different route. Their finding that social awareness mediates the relationship between technology adoption and inclusion implies that access alone does not produce use: users must know how the instrument works, trust it, and be able to act on that knowledge within their household and community. Singh et al. (2026) name the same phenomenon from the opposite direction, describing a literacy lapse in which technological capacity outruns the capability to use it, and argue that investment in digital literacy must accompany investment in infrastructure if inclusion is to contribute to the Sustainable Development Goals.

Taken together, these studies reframe the gender gap. It is not a gap in willingness to adopt, and it is only partly a gap in access. It is a gap in the capabilities and entitlements that allow access to be converted into use, and it is therefore produced by the same institutional arrangements that the adoption literature treats as context. This is the empirical basis for the mediating band in Figure 1.

Regulation, Political Economy and the Sustainable Development Goals

The political economy of FinTech determines whether innovation becomes inclusion or extraction. Gabor and Brooks (2017) argue that the digital revolution in financial inclusion has been shaped by a financialised development agenda that privileges the interests of international capital over local development, and that national inclusion strategies should therefore be assessed by who bears the risk rather than by how many accounts are opened. Their critique is the strongest available corrective to the account-ownership metric that dominates policy discourse, because it asks what the account is for and on whose balance sheet the risk sits.

The institutional literature supplies the constructive counterpart. Danladi et al. (2023) examine how multilateral institutions and African governments have designed inclusion strategies and conclude that achieving the Sustainable Development Goals through FinTech requires a multi-stakeholder approach involving providers, regulators and civil society, supported by investment in digital networks. Ediagbonya and Tioluwani (2023) review the issues and challenges of driving inclusion in developing and emerging markets and emphasise the regulatory balancing act: rules that are too permissive allow the harms documented by Alnasser Mohammed (2025), while rules that are too restrictive suppress the innovation that produced the access gains in the first place.

The synthesis that emerges is a principle of sequencing rather than a list of policies. Consumer protection, dispute resolution and disclosure requirements should be in place before digital credit scales, not after harm becomes visible; interoperability should precede the consolidation of closed wallets; and identity systems should be designed for the users who lack

documentation rather than for those who already hold it. Sequencing is where the literature is thinnest, and it is where the policy contribution of this review lies.

Infrastructure, Education and the Path to Empowerment

Physical and human infrastructure set the ceiling on what any instrument can achieve. Ahmeti (2025) examines the interaction between financial knowledge and technology adoption in Kosovo and finds that high financial literacy can spur the use of digital tools even where infrastructure is developing, which implies that education can partially compensate for infrastructural deficit. The reverse also holds: without basic connectivity, even the most financially literate user cannot reach a digital service. The relationship is therefore complementary rather than substitutable, and it points to a development strategy that treats telecommunications infrastructure and human capital as a single investment rather than as alternatives.

Danladi et al. (2023) make the same point at the level of policy, arguing that the financial divide is frequently a symptom of a wider digital divide, with rural and marginalised communities excluded by the absence of connectivity rather than by the absence of financial products. Figure 3 assembles these findings into a five-stage path from infrastructure readiness through technology adoption and user engagement to financial inclusion and economic impact, with the digital divide and algorithmic bias represented as barriers at the stages where they bite. Regulatory oversight and consumer protection run beneath all five stages rather than appearing as a final step, which is the framework's main departure from the stage models implicit in much of the literature.

The stages in Figure 3 are sequential in logic rather than in time, and the framework is useful precisely because it allows failure to be located. A country with good connectivity and low engagement has a capability problem at stage three. A country with high adoption and rising default has a protection problem that the stage model would otherwise hide. Locating failure is a precondition for designing intervention, and it is the practical reason for preferring a staged framework to a single adoption index.

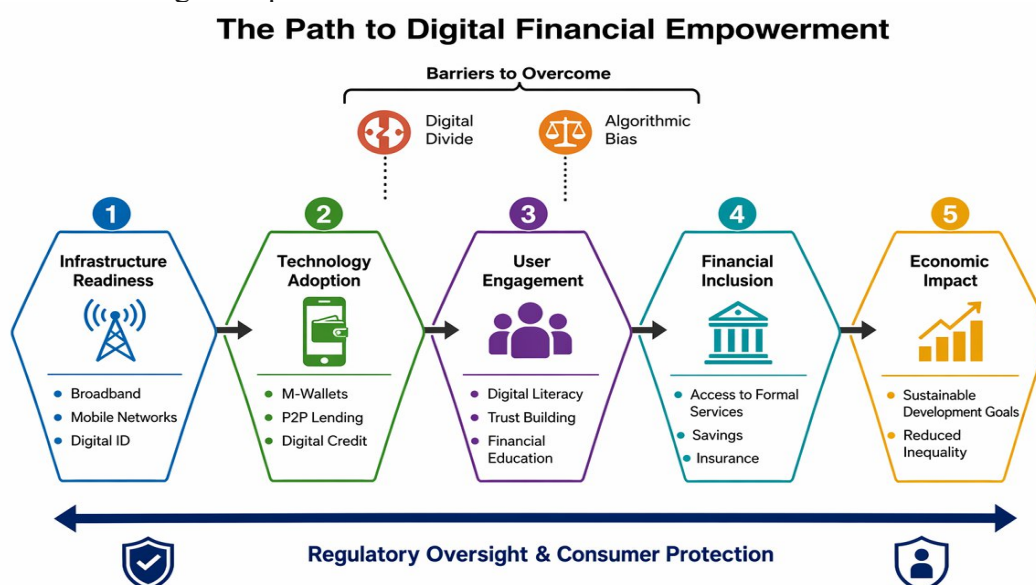


Figure 3: The Path from Digital Infrastructure to Digital Financial Empowerment

Note: Author-generated (2026), informed by Danladi et al. (2023), Adel (2024) and Ahmeti (2025). Stages describe a logical sequence; in practice they overlap and may regress.

SYNTHESIS OF FINDINGS AND CONTRIBUTION TO KNOWLEDGE

Three Propositions

The synthesis supports three propositions, each of which is stated in a form that future work can test. The first is that adoption is necessary but not sufficient: inclusion depends on usage depth and quality rather than on account ownership. The evidence for this is convergent. Aziz and Naima (2021) show that social awareness mediates the conversion of access into use; Klapper (2024) documents dormancy as a systematic feature of digital account data; and Sahay et al. (2020) reach the same conclusion from the perspective of post-pandemic financial resilience. Where the present review departs from the adoption literature is in treating this not as a measurement problem but as the central theoretical problem, since a model that stops at use cannot represent the outcomes that inclusion policy is meant to produce.

The second proposition is that capability, not perception, is the binding constraint at the margin. Perceived usefulness and ease of use retain explanatory power where instruments are unfamiliar, but in mature markets they saturate: mobile payment interfaces are now sufficiently standard that variation in ease of use explains little of the remaining gap. What continues to explain the gap is digital and financial literacy, the presence of trusted intermediaries, and social permission to use formal instruments. This aligns with Adel (2024) on digital literacy as a cross-regional moderator, with Ahmeti (2025) on financial knowledge, and with Singh et al. (2026) on the literacy lapse. It also explains why the gender gap survives instruments that are nominally available to everyone (Boughrara & Gherbi, 2024).

The third proposition is that institutional design determines whether innovation becomes inclusion or extraction. The same digital credit instrument that gives a household working capital can indebt it; the same scoring model that includes a borrower without a credit history can exclude a category of borrowers without appeal. Gabor and Brooks (2017) identify the mechanism, Alnasser Mohammed (2025) documents the outcome, and Danladi et al. (2023) and Ediagbonya and Tioluwani (2023) describe the governance response. This proposition is the least represented in the adoption literature and the most consequential for policy.

Gaps in the Existing Literature

Four gaps remain after the synthesis, and they are summarised with the review's response in Table 4. The theoretical gap has been described in Section 3.3: the field's dominant models are individual-level, static and oriented towards intention rather than outcome. The empirical gap is causal identification. Almost all studies in the corpus are cross-sectional, most rely on self-reported adoption, and few exploit policy discontinuities, mobile network rollouts or phased licensing as sources of exogenous variation. The contextual gap is geographic and demographic: Latin America is thinly covered, fragile and conflict-affected states are almost absent, and gender-disaggregated analysis appears in a minority of studies. The methodological gap is the separation of the bibliometric and empirical literatures, which means that the field's structural knowledge and its substantive knowledge are produced by different communities that rarely cite one another.

Table 4: Research Gaps and the Contribution of this Review

Gap	Nature of the gap	Response in this review	Section
Theoretical	Individual-level adoption models cannot	Multi-level framework nesting adoption within capability and	3.3; 6.3

Gap	Nature of the gap	Response in this review	Section
	represent institutional variation or outcome quality	institutional layers	
Empirical	Few causal designs; reliance on cross-sectional and self-reported data	Propositions stated as testable claims (P1–P3) rather than asserted conclusions	6.1
Contextual	Latin America, fragile states and gender-disaggregated evidence under-represented	Comparative regional synthesis and explicit mapping of evidence coverage	5.1–5.2
Methodological	Bibliometric and empirical literatures do not inform one another	Sequential design coding empirical findings against bibliometric clusters	2.3
Practical	Policy advice fragmented across instruments and regions	Sequencing principle: protection and interoperability before scale	5.3; 7.2

Note: Author-generated (2026).

Contribution to Knowledge

The review makes a theoretical contribution by relocating the unit of explanation. Existing frameworks ask why an individual adopts an instrument; the framework in Figure 1 asks how a population converts access into welfare, and it treats the mediating layer of literacy, trust, social awareness and regulation as the mechanism through which drivers reach outcomes. This is a modest move in form and a significant one in consequence, because it makes institutional variation an object of explanation rather than a residual. It also reconciles two literatures that currently talk past each other: the political-economy critique of Gabor and Brooks (2017) supplies the institutional layer that TAM and UTAUT lack, while the adoption literature supplies the micro-foundations that the critique lacks.

The review makes an empirical contribution by synthesising dispersed regional evidence into three propositions that hold across contexts and can be falsified. It makes a practical contribution by deriving a sequencing principle for policy, arguing that consumer protection and interoperability are preconditions for scale rather than corrections applied afterwards. And it makes a methodological contribution by demonstrating how bibliometric mapping and thematic synthesis can be combined so that the structure of a field informs the interpretation of its findings, rather than serving as decoration in an introduction.

These contributions are bounded. The corpus is English-language and index-dependent, the synthesis is interpretive rather than statistical, and the framework is proposed as an organising device rather than validated as a causal model. Each of these limits corresponds to a direction for future research set out in Section 7.2.

CONCLUSION AND DIRECTIONS FOR FUTURE RESEARCH

This review set out to determine what is known about the relationship between FinTech adoption and financial inclusion, how that knowledge is structured, and where it fails. Three conclusions follow. The first concerns the state of the field. Research output has grown rapidly and has moved from definitional questions towards questions of impact, but growth in volume has not produced convergence in theory, method or measurement. Technical and development literatures remain weakly connected, and the bibliometric record describes this separation without resolving it.

The second conclusion concerns substance. Mobile financial services remain the most robustly evidenced driver of access where branch infrastructure is thin. Blockchain and artificial intelligence extend the frontier of inclusion in narrower and less well-evidenced ways, principally by lowering verification costs and by allowing credit assessment without a formal history. In each case the constraint on inclusion has shifted from the technology to the conditions under which it is used. Digital literacy, trust, social awareness and regulatory capacity determine whether access becomes usage and whether usage becomes welfare. The gender gap illustrates the point most clearly, since it persists in markets where instruments are nominally available to all and is produced by documentation, device ownership and social permission rather than by preference.

The third conclusion concerns policy. FinTech is not intrinsically inclusive. The same instrument that lowers the cost of serving a poor household also lowers the cost of over-lending to it, and the same model that includes an invisible borrower can exclude a category of borrowers without appeal. Whether the net effect is inclusion or extraction depends on sequencing: on whether consumer protection, dispute resolution, interoperability and identity design are established before scale rather than after harm. The framework proposed here is intended to make that dependence visible, and the propositions it generates are intended to be tested rather than assumed. Financial technology has genuine potential to widen access to formal finance. Realising it requires treating inclusion as an outcome to be measured and governed, not as a consequence to be assumed from adoption.

Directions for Future Research

Six directions follow directly from the gaps identified in Section 6.2. First, the field needs causal designs. Panel studies that exploit the staggered rollout of mobile network infrastructure, changes in licensing regimes or the introduction of interoperable payment rails would allow inclusion effects to be separated from selection effects, which cross-sectional survey data cannot do. Second, outcome measurement requires development beyond account ownership. Indicators of usage depth, transaction frequency, product breadth and resilience to shocks are needed, and they should be collected at household level so that dormancy can be distinguished from exclusion.

Third, gender and intersectional analysis should become standard rather than occasional. Studies that disaggregate by gender, income, disability and rurality, and that examine intra-household control over accounts and devices, would address the gap identified in Section 5.2. Fourth, algorithmic governance requires empirical attention. Fairness auditing of credit-scoring models in inclusion contexts, together with research on explainability and appeal mechanisms, would test the claim that the intelligence layer concentrates exclusion risk. Fifth, Latin America, fragile states and forced-migration settings need dedicated study; the evidence base

is currently organised around a small number of well-documented national cases, and the transferability of those findings is an open question.

Sixth, the relationship between bibliometric structure and substantive knowledge should be treated as an object of study in its own right. Research that maps citation flows between technical and development literatures would show whether the fragmentation documented here is closing, and would give reviewers and funders a measurable indicator of interdisciplinary integration. A seventh and more ambitious direction concerns welfare. Almost nothing in the corpus links FinTech adoption to measured household welfare over time, and until that link is established the field's central claim, that inclusion improves lives, remains plausible rather than demonstrated.

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