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FinTech and SME Financing Constraints in Developing Economies: Complementarity, Substitution, and the Limits of Digital Credit

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Abstract

Small and medium enterprises in developing economies face well-documented financing gaps, with collateral requirements, information asymmetries, and high transaction costs excluding most firms from formal bank credit. This paper synthesises evidence from 13 empirical studies examining how FinTech adoption affects SME and microenterprise financing across China, Sub-Saharan Africa, Indonesia, India, Ghana, and Sierra Leone. The central question addressed is whether digital finance substitutes for or complements traditional bank credit in relieving SME financing constraints. The evidence is genuinely mixed. In China, digital financial inclusion shows a substitution relationship with local bank branch density in alleviating cash-investment sensitivity, with the interaction term reaching 0.452, but the combined effect of both channels together exceeds either alone. Across 47 African countries, FinTech development raises SME digital finance access most strongly at lower percentiles of existing digital finance, with the effect declining from 4.075 to lower magnitudes as digital finance development increases, indicating diminishing returns. In Indonesia, perceived usefulness and ease of use ($\beta = 0.34$ each) drive FinTech adoption among SME owners more than trust or government support. Qualitative evidence from Ghana and Sierra Leone documents that mobile money provides informal businesses and base-of-pyramid entrepreneurs with micro-loans, financial record-keeping capability, and reduced cash-handling risk, but high platform charges and limited interoperability constrain the depth of these benefits. The paper concludes that FinTech's contribution to SME financing is most accurately characterised as relieving specific frictions, transaction costs, information asymmetry, and geographic access, rather than resolving the underlying collateral and risk-assessment constraints that determine formal credit access, and that the complementarity-substitution relationship is itself context-dependent rather than fixed.

JEL codes: G21, L26, O16, M13, O55

Keywords: Fintech, Sme Financing, Financing Constraints, Digital Financial Inclusion, Microenterprise, Complementarity, Developing Economies

Introduction

The financing gap facing small and medium enterprises in developing economies is one of the more persistent features of the development finance landscape (Beck & Demirguc-Kunt, 2006). Estimates of the gap vary by methodology and region, but the underlying mechanism is consistent across contexts: SMEs lack the collateral, audited financial statements, and credit history that formal lenders use to assess risk, and the fixed costs of loan origination and monitoring make small loans unprofitable for banks operating at scale (Beck et al., 2005). The result is a financing environment in which formal credit flows disproportionately to larger firms with established banking relationships, while SMEs rely on retained earnings, informal credit, and trade credit, all of which constrain growth relative to what external financing would permit (Berger & Udell, 2006).

FinTech has been positioned, in both policy discourse and a portion of the academic literature, as a technology that can close this gap by reducing the information asymmetries and transaction costs that underlie SME credit rationing (Thakor, 2020). Digital footprints, mobile transaction histories, and alternative data sources offer, in principle, a way to assess creditworthiness for firms that lack conventional documentation (Berg et al., 2020). Digital payment platforms reduce the cash-handling costs and risks that constrain informal business operations (Jack & Suri, 2014). Mobile money and digital wallets extend payment infrastructure into markets where formal banking presence is thin (Aker & Mbiti, 2010).

Whether this potential translates into measurable reductions in SME financing constraints is an empirical question, and the evidence reviewed in this paper suggests the answer is more qualified than either optimistic or sceptical framings typically allow. The Chinese evidence on digital financial inclusion and SME financing constraints, drawn from a large panel of firm-year observations, finds that digital finance and local bank presence interact in ways that are neither purely substitutive nor purely complementary (Lu et al., 2021). The African cross-country evidence finds that FinTech's effect on SME digital finance access is strongest where digital finance development is least advanced, suggesting a catching-up dynamic rather than a uniform technology effect (Sanga & Aziakpono, 2024). And the qualitative evidence from Ghana and Sierra Leone, while documenting genuine benefits for informal businesses, also documents cost and infrastructure constraints that limit how far those benefits extend (Senyo et al., 2022; Arslan et al., 2021).

This paper asks three questions. First, does the available evidence support a complementarity or substitution relationship between FinTech and traditional bank financing for SMEs, and does this relationship vary across contexts? Second, through which specific mechanisms, cost reduction, information provision, financing constraint relief, does FinTech affect SME outcomes, and what is the relative importance of each? Third, what does the evidence suggest about the limits of FinTech's contribution to SME financing, and what underlying constraints remain unaddressed?

Conceptual Framework

The SME Financing Constraint Problem

The standard framework for understanding SME financing constraints rests on information asymmetry between firms and lenders. Where lenders cannot verify a firm's creditworthiness at reasonable cost, they ration credit, require collateral substantially exceeding the loan value, or charge interest rates that price in the unobservable risk, often making formal credit prohibitively expensive for the firms that would benefit most from it. The empirical signature of financing constraints is typically measured through the sensitivity of firm investment to internally generated cash flow: firms facing binding financing constraints show investment that tracks cash availability closely, because external financing is not available to smooth investment when cash is temporarily scarce. Lu et al.'s (2021) study uses precisely this cash-investment sensitivity framework, with the coefficient on the interaction between cash flow and branch density (Cash×Branch%, coefficient -0.217) representing the degree to which local bank presence relieves financing constraints.

Three Candidate Mechanisms

The evidence reviewed here points to three mechanisms through which FinTech could plausibly affect SME financing constraints, and the relative weight of each varies across the studies.

The *information mechanism* operates through alternative data. Digital transaction histories, mobile payment records, and platform-based business activity generate data that can substitute for the formal financial statements and credit histories that SMEs in developing economies typically lack. This mechanism is most directly relevant to digital lending products that use such data for credit scoring.

The *transaction cost mechanism* operates through reduced costs of payment processing, cash handling, and remittance. For informal businesses, cash handling carries security risks, time costs, and reconciliation burdens that digital payments reduce directly, independent of any effect on credit access. The Ghanaian and Sierra Leonean qualitative evidence emphasises this mechanism most strongly (Senyo et al., 2022; Arslan et al., 2021).

The *geographic access mechanism* operates through the extension of financial service availability beyond the physical footprint of bank branches. Mobile money agents and digital platforms can reach firms in locations where maintaining a bank branch is not commercially viable. This mechanism is the one most directly tested in the Chinese evidence on local bank branch density and digital financial inclusion (Lu et al., 2021), and in the cross-country African evidence on FinTech development and SME digital finance access (Sanga & Aziakpono, 2024).

These mechanisms are not mutually exclusive and most studies in this review document evidence consistent with more than one operating simultaneously. The analytical task is less to identify which single mechanism dominates and more to understand how they combine, and under what conditions each is most relevant.

Methodology

This paper draws on 13 studies from a broader corpus of 61 peer-reviewed studies on FinTech and financial inclusion in developing economies, identified through a structured search of Web of Science, Scopus, and Google Scholar combined with Elicit semantic search, covering publications between 2010 and 2025. Studies were included in this synthesis if SMEs, microenterprises, informal businesses, or entrepreneurs constituted the primary study population, and if the study reported findings on financing constraints, credit access, business performance, or entrepreneurial outcomes associated with FinTech adoption.

The 13 studies span China (3), Sub-Saharan Africa broadly or specific African countries (5), Indonesia (2), India (2), and a gl2obal cross-country study with merchant-level data from seven countries (1). Methodological approaches include large-scale panel data analysis with firm-year observations, cross-country panel regression using quantile methods, structural equation modelling of adoption surveys, and qualitative case study research using in-depth interviews. Where studies report formal effect sizes, these are reproduced directly from the published source.

Results

The Complementarity-Substitution Question: Evidence from China

The most direct empirical test of whether FinTech substitutes for or complements traditional banking in relieving SME financing constraints comes from Lu et al.'s (2021) analysis of 11,610 firm-year observations of Chinese SMEs. The study examines how cash-investment sensitivity, the standard measure of financing constraint severity, responds to local bank branch density and to a digital financial inclusion index, separately and in interaction.

The headline coefficients are worth setting out precisely because the interaction structure is where the complementarity-substitution question is actually answered. The coefficient on Cash×Branch% is -0.217, significant at the 1% level, meaning that higher local bank branch density reduces the sensitivity of investment to cash flow, consistent with branch presence relieving financing constraints. The coefficient on Cash×DIG (digital financial inclusion index) is -0.089, also significant at 1%, meaning digital financial inclusion independently relieves financing constraints, though with a smaller coefficient than branch density. The coefficient on the triple interaction, Cash×Branch%×DIG, is 0.452, significant at 1%, and positive.

The positive sign on the triple interaction is the analytically important finding. If digital financial inclusion were a pure substitute for local bank presence, the triple interaction would be negative, indicating that digital finance's constraint-relieving effect is smaller where bank branch density is already high, because the two are doing the same job. Instead, the positive coefficient indicates that digital financial inclusion's effect on relieving financing constraints is larger where bank branch density is higher. This is a complementarity signature, not a substitution signature, at least in the Chinese context studied.

What this means substantively is that digital financial inclusion appears to work best for SMEs in conjunction with, rather than instead of, local banking relationships. A plausible interpretation is that digital financial services provide information and convenience benefits that are more valuable when a firm also has an existing banking relationship through which those benefits can be operationalised, such as linking digital payment data to a bank account that can then be used as a basis for credit assessment. Firms with no banking relationship at all may benefit less from digital financial inclusion precisely because there is no banking relationship for the digital data to feed into.

This finding has a specific limitation worth flagging. The study does not report the sign or significance of digital financial inclusion's effect in the complete absence of any local bank branches, an extrapolation beyond the observed range of the data. The complementarity finding is established for the range of branch densities observed in the Chinese data, which spans from low to high but not to zero. Whether the relationship holds in markets, including much of rural Sub-Saharan Africa, where bank branch presence is genuinely absent rather than merely sparse, is not addressed by this evidence.

FinTech Development and SME Digital Finance Access: Cross-Country Evidence from Africa

Sanga & Aziakpono's (2024) panel analysis of 47 African countries, using quantile regression methods (MMQR) to examine heterogeneous effects across the distribution of digital finance development, provides a different angle on the same underlying question. The study finds that FinTech developments have a statistically significant positive effect on digital finance for SMEs and entrepreneurship, but the magnitude of this effect varies substantially across the distribution.

The effect size of FinTech developments on digital finance for SMEs ranges from 2.297 at the 25th percentile to 4.075 at higher percentiles of existing digital finance development, but for entrepreneurship specifically, a 1% increase in FinTech development increases entrepreneurship by 0.678% at the 25th percentile, declining to 0.573% at the 50th percentile and 0.476% at the 75th percentile. The entrepreneurship effect, in other words, is largest in countries with the least developed digital finance ecosystems and smallest in countries with the most developed ones.

This pattern of diminishing returns at higher levels of digital finance development is consistent with a catching-up interpretation: in countries starting from a low base of digital finance infrastructure, incremental FinTech development unlocks proportionally larger gains because the baseline financing environment for SMEs is so constrained that even modest improvements in digital finance access generate substantial relative effects. In countries where digital finance is already relatively developed, SMEs have likely already captured much of the available benefit, and further FinTech development yields smaller incremental gains.

Institutional quality is identified as a significant moderating variable in this study, though the paper does not provide a single coefficient isolating its effect with the same precision as the percentile-based entrepreneurship coefficients. The general finding, that institutional quality has a considerable positive moderating effect on the FinTech-digital finance relationship, aligns with the broader pattern observed across this review's evidence base, that FinTech's effects on SME outcomes are conditioned on the institutional environment rather than operating independently of it.

Digital Inclusive Finance and MSME Innovation in China

Sun & Zhang's (2024) panel study of over 200,000 Chinese MSMEs examines a different outcome variable, technological innovation, using China's digital inclusive finance index, which combines breadth of coverage, depth of use, and degree of digitalisation. The study finds a generally positive effect of digital financial inclusion on MSME innovation, operating through two mediating channels: alleviating financing constraints and promoting consumption demand.

The regional heterogeneity finding is the most analytically interesting result from this study. Central and western regions of China show more significant positive effects of digital financial inclusion on MSME innovation than the eastern region, which is more economically developed and has more established formal financial infrastructure. This regional pattern echoes the diminishing returns finding from the African cross-country evidence: digital financial inclusion's marginal contribution to MSME outcomes appears to be larger in less financially developed regions, whether the comparison is across countries, as in Sanga & Aziakpono (2024), or across regions within a single country, as here.

The breadth and depth dimensions of digital financial inclusion both show facilitating effects on innovation, but the study's effect sizes are reported in directional rather than precisely quantified terms, which limits the comparability of this study's findings with the more precisely specified coefficients from Lu et al. (2021).

Migrant Entrepreneurship and Digital Finance in Less Developed Regions of China

Liu et al.'s (2022) cross-sectional survey of 152,000 households examines digital finance's effect on entrepreneurship specifically among migrant populations in less developed regions of China. The study finds a positive association between digital finance, measured through breadth of coverage, depth of use, and level of digitisation, including Alipay account ownership and transaction frequency, and both the probability and quality of entrepreneurial activity among migrants.

The mechanism identified is consistent with the transaction cost and information asymmetry framework set out in Section 2.2: digital finance lowers the threshold for accessing entrepreneurial finance by providing services at lower cost and reducing the information asymmetries that would otherwise constrain credit access for migrants, who by definition lack the local social networks and documentation history that established residents can draw on for informal credit.

The study's title, framing the question as "digital divide or dividend," reflects an analytical tension that the findings do not fully resolve. The positive average effect documented is consistent with a dividend interpretation, but the paper does not provide effect sizes that would allow assessment of whether the dividend is distributed evenly across the migrant population or concentrated among migrants with characteristics, prior digital literacy, existing mobile phone ownership, that themselves correlate with entrepreneurial success independent of digital finance access. Without effect size data, distinguishing a genuine causal dividend from a selection effect in which more capable migrant entrepreneurs are also more likely to adopt digital finance is not possible from this study alone.

FinTech Adoption Drivers Among Indonesian SMEs

Nugraha et al.'s (2022) survey of 415 SME owners in Indonesia takes a different analytical approach, examining not financing outcomes directly but the adoption drivers that determine whether SMEs engage with FinTech services in the first place. Using a structural model with an R-squared of 0.518, the study finds that perceived ease of use ($\beta = 0.34$) and perceived usefulness ($\beta = 0.34$) are the strongest predictors of adoption intention, followed by user innovativeness ($\beta = 0.24$), trust ($\beta = 0.21$), and government support ($\beta = 0.15$).

The relative ranking here is informative when read alongside the trust-focused evidence from other parts of the broader literature. Among Indonesian SME owners, most of whom hold a bachelor's degree and earn middle-range incomes, trust is a significant but not dominant predictor of adoption, ranking below both perceived ease of use and perceived usefulness. This contrasts with evidence from lower-income and less digitally experienced populations elsewhere, where trust has been found to be the dominant predictor. The implication is that for relatively educated, urban SME owners with prior exposure to digital technology, the adoption decision is closer to a conventional technology adoption decision driven by functional assessment of the tool's usefulness, whereas for populations with less prior digital exposure, trust plays a larger relative role.

Financial literacy in this study operates indirectly, mediated through user innovativeness, rather than as a direct predictor of adoption. This is consistent with findings from other contexts in the broader literature that financial literacy's effect on FinTech adoption often operates through confidence and innovativeness measures rather than through direct knowledge effects.

Mobile Money and Informal Business Empowerment in Ghana

Senyo et al.'s (2022) qualitative study, based on 65 interviews across 26 organisations including 15 informal business owners in Ghana, provides the most detailed mechanism-level evidence on how mobile money affects informal business operations. The study's institutional logics framework identifies shifts at three levels: regulatory, payment infrastructure, and the informal economy itself.

The specific mechanisms documented include mobile money providing micro-loans to informal businesses that would not qualify for formal bank credit, improving financial management through transaction record-keeping that informal cash-based operations typically lack, and facilitating more flexible working patterns by reducing the need for in-person cash transactions and banking visits.

The barriers documented are significant and specific. High initial capital investment and the technical capabilities required for mobile money business solutions, as distinct from personal mobile money use, are described as beyond the resources of many informal businesses. This is an important distinction: personal mobile money adoption among informal business owners may be high, but business-level adoption, involving merchant accounts, business-specific transaction tracking, and integration with supplier and customer payment flows, requires capital and technical capacity that personal adoption does not.

Base of the Pyramid Entrepreneurship in Sierra Leone

Arslan et al.'s (2021) multi-case study of base-of-pyramid entrepreneurs in Sierra Leone, based on interviews with four entrepreneurs operating micro-firms in agriculture, cosmetics, fishing, and manufacturing, plus representatives from a Sierra Leonean FinTech firm, documents mechanisms similar to the Ghanaian evidence but in a context of more severe infrastructure constraints.

Mobile money services, specifically GT-SIMPAY and Orange Money, are found to reduce uncertainty, provide transactional security, reduce the risk of physical cash robberies, a significant concern for cash-based micro-enterprises, and contribute to skills development among entrepreneurs through exposure to digital financial tools.

The barriers identified are more severe than in the Ghanaian context. Limited electricity and internet penetration in Sierra Leone constrain the reliability of mobile money services. High charges for using FinTech apps are identified as an affordability barrier. And a regulatory and institutional barrier specific to this context is documented: alliances between traditional banks and mobile phone firms appear to affect competition in ways that may limit the FinTech options available to base-of-pyramid entrepreneurs.

The qualitative evidence from both Ghana and Sierra Leone is consistent in documenting genuine, mechanism-specific benefits for informal and micro-enterprises, while also documenting that these benefits operate within significant infrastructure and cost constraints that limit their scale. Neither study provides quantitative effect sizes, which limits the ability to assess the magnitude of the documented benefits relative to the constraints, but the qualitative depth provides mechanism-level detail that the larger quantitative studies, focused on aggregate effects, do not capture.

Digital Payment Adoption Among Small Merchants: The Demand-Side Puzzle

Ligon et al.'s (2019) survey of 1,003 small-scale fixed-store merchants in Jaipur, India presents a finding that complicates the supply-side framing common in much of the FinTech-SME literature. The study finds that 98.6% of sampled merchants were technically capable of adopting digital payment technologies, yet only about 40% had actually done so. This is not a supply-side access problem; the technology was available and feasible for nearly the entire sample.

The factors that did predict adoption were demand-side. Having a tax identification number increased adoption probability by 6 percentage points. A 10-percentage point increase in perceived customer demand for digital payments increased adoption probability by 2.9 percentage points, and a 10-percentage point increase in current customer demand for digital payments increased the likelihood of adoption by 9.2 percentage points, a notably larger effect than the perceived demand measure.

The barriers identified are correspondingly demand-side and behavioural rather than infrastructural: lack of awareness, fear of being cheated, and, significantly, increased tax liability associated with the more transparent transaction records that digital payments generate. This tax liability concern is a finding with implications beyond this specific study: it suggests that for merchants operating partly or wholly in the informal economy, digital payment adoption carries a cost, increased visibility to tax authorities, that purely technical or cost-based adoption models do not capture, and that this cost may be weighted heavily enough by merchants to outweigh the transaction cost benefits that digital payments otherwise provide.

This finding is directly relevant to the broader question of FinTech and SME financing, because formalisation, including tax registration and transparent transaction records, is often assumed to be a precondition for SMEs accessing formal credit on better terms. If digital payment adoption is suppressed precisely because it increases formalisation-related costs in the near term, the pathway from digital payment adoption to improved credit access via better financial records may be weaker than assumed, at least for merchants who perceive formalisation as more costly than beneficial in their specific tax and regulatory environment.

Cross-Country Evidence on Digital Payment Acceptance Among Micro and Small Retailers

Allen et al.'s (2022) machine learning analysis combining country-level data from 106 countries with merchant-level data from 576 merchants across seven countries, Colombia, France, Kenya, Lithuania, Morocco, Pakistan, and Turkey, examines what drives digital payment acceptance among micro, small, and medium-sized retailers.

The headline finding is that the combination of multiple favourable conditions generates non-linear increases in adoption likelihood. Where the share of person-to-business electronic payments and bank account ownership are both above the median, the likelihood of point-of-sale terminal adoption increases by 200%. Where merchants believe that consumers prefer electronic payments and that wages are paid electronically, the likelihood of POS adoption increases by 100%. The combination of wages paid electronically with either account ownership or ICT infrastructure above median thresholds produces effects larger than either factor in isolation.

This evidence on "killer applications", specific combinations of conditions that disproportionately drive adoption, is methodologically distinct from the regression-based studies elsewhere in this review, and the machine learning approach makes it difficult to compare effect sizes directly with the linear coefficients reported in studies like Lu et al. (2021) or Grzybowski et al. (2023). What the study adds to this paper's synthesis is evidence that the ecosystem-level conditions surrounding a merchant, whether their customers are paid electronically, whether the broader payment infrastructure is in place, matter as much as or more than the merchant's own characteristics in determining digital payment adoption, with implications for how policy should target SME-facing FinTech interventions: ecosystem-level interventions, such as ensuring wages are paid electronically, may have larger effects on merchant-level adoption than merchant-targeted interventions alone.

Mobile Money, Financial Inclusion, and Entrepreneurial Activity in South Africa

Grzybowski et al.'s (2023) survey of 12,735 individuals in South Africa, covering both business owners and non-business owners across income classes and rural and urban areas, provides a benchmark effect size for the broader relationship between FinTech access and financial inclusion that complements the SME-specific evidence from other studies. The study finds that a 1% increase in access to FinTech tools is associated with a 0.67% improvement in the financial inclusion rate.

The study documents that increased financial inclusion is associated with entrepreneurial activity, though the specific causal pathway from FinTech access to financial inclusion to entrepreneurship is not isolated with the precision of, for example, the Chinese cash-investment sensitivity analysis. The barriers identified, high bank charges, high interest rates, low financial and technological literacy, and trust issues, are broadly consistent with barriers documented across the other African evidence in this review.

Table 1. Summary of SME-Relevant Studies and Key Findings

Study	Country	Design	Sample	Key Finding	Mechanism Emphasis
Lu et al. (2021)	China	Panel	11,610 firm-years	Complementarity between digital finance and bank branches (triple interaction = 0.452)	Information, geographic access
Sanga & Aziakpono (2024)	Africa (47 countries)	Panel, quantile	47 countries	Diminishing returns: entrepreneurship effect 0.678% to 0.476% across percentiles	Catching-up, institutional quality
Sun & Zhang (2024)	China	Panel	204,899 MSMEs	Positive effect on innovation; stronger in central/western regions	Financing constraints, consumption demand
Liu et al. (2022)	China	Cross-sectional	152,000 households	Positive association with migrant entrepreneurship	Transaction cost, information asymmetry
Nugraha et al. (2022)	Indonesia	Survey, SEM	415 SME owners	Ease of use and usefulness (β = 0.34 each) dominate; trust β = 0.21	Adoption drivers
Senyo et al. (2022)	Ghana	Qualitative	65 interviews	Mobile money provides micro-loans, record-keeping; business adoption capital-constrained	Transaction cost, information
Arslan et al. (2021)	Sierra Leone	Qualitative	6 interviews	Reduces cash robbery risk, builds skills; high charges, weak infrastructure limit reach	Transaction cost, security
Ligon et al. (2019)	India	Survey	1,003 merchants	98.6% feasible, 40% adopted; demand-side and tax liability barriers dominate	Demand-side, formalisation cost
Allen et al. (2022)	106 countries	Machine learning	576 merchants	Ecosystem conditions (electronic wages, ICT infrastructure) drive non-linear adoption increases	Ecosystem, geographic access
Grzybowski et al. (2023)	South Africa	Survey	12,735	1% FinTech access increase associated with 0.67% financial inclusion improvement	General access
Drama & Senou (2025)	SSA (45 countries)	Panel	45 countries	Mobile/internet penetration raise inclusion index (0.041, 0.118 pts); SMEs among target populations	Infrastructure
Zunairoh & Wijaya (2024)	Indonesia	Survey	100 MSMEs	Social capital mediates FinTech-performance relationship	Social capital
Singh (2019)	India, Kenya	Ethnographic	Not specified	Contrasting trajectories: Kenya (M-Pesa direct) vs. India (linked to bank accounts)	Institutional pathways

Discussion

The Complementarity-Substitution Question Revisited

The evidence does not support a single answer to whether FinTech substitutes for or complements traditional bank financing for SMEs. The Chinese firm-level evidence from Lu et al. (2021) finds a complementarity signature in the specific sense that digital financial inclusion's constraint-relieving effect is larger where bank branch density is higher. But the cross-country African evidence from Sanga & Aziakpono (2024) and the regional Chinese evidence from Sun & Zhang (2024) both find that FinTech's marginal effect is larger where existing financial development, whether measured as digital finance development or as general financial infrastructure, is lower.

These findings are not necessarily contradictory, but reconciling them requires distinguishing between two different questions. The first question is whether digital finance and bank presence are complements or substitutes at a given level of development, the question Lu et al. (2021) answers for Chinese SMEs, finding complementarity. The second question is whether the marginal returns to FinTech development are higher or lower in less developed financial markets, the question Sanga & Aziakpono (2024) and Sun & Zhang (2024) answer, finding higher marginal returns in less developed markets.

A market can show complementarity between digital finance and bank presence at the firm level, meaning firms with both do better than firms with either alone, while simultaneously showing that the marginal value of adding digital finance is highest in markets where bank presence is generally low. These are not the same claim, and the empirical literature has not, to this reviewer's knowledge, tested both within a single study design that would allow direct reconciliation. What can be said is that the evidence does not support a simple substitution narrative in which FinTech replaces the need for bank branches, nor does it support a simple complementarity narrative in which FinTech only adds value where banks are already present. The relationship appears to depend on what specifically is being measured and at what level of aggregation.

What FinTech Demonstrably Does and Does Not Do for SMEs

Pulling together the mechanism-level evidence, FinTech demonstrably reduces transaction costs associated with cash handling and payment processing for SMEs and informal businesses, as documented consistently in the Ghanaian and Sierra Leonean qualitative evidence and implicit in the cost-reduction mechanisms identified across the quantitative studies. It demonstrably extends payment and basic financial service access into geographic areas underserved by bank branches, as the African cross-country and Chinese regional evidence both suggest. And it demonstrably generates transaction data that can, in principle, serve as an input to credit assessment, though the evidence reviewed here does not directly test whether this data is actually being used for credit decisions at scale, as distinct from being theoretically available for such use.

What the evidence does not demonstrate, at least not within this set of studies, is that FinTech resolves the fundamental collateral and risk assessment problems that constrain SME access to larger formal credit facilities. The Lu et al. (2021) study examines cash-investment sensitivity, a measure of short-term financing constraint relief, not the availability of larger-scale investment credit. The qualitative evidence from Ghana and Sierra Leone documents micro-loans, typically small amounts relative to the capital needs of even small formal enterprises. None of the studies in this review document FinTech enabling SMEs to access the kind of medium-term investment credit that would be required for, for example, equipment purchase or facility expansion at a scale beyond working capital management.

This is not a criticism of the FinTech interventions studied, which were generally not designed to solve this specific problem. It is, however, a relevant qualification to broader claims about FinTech closing the SME financing gap, if that gap is understood to include the gap in investment-scale credit rather than only working capital and transaction-level financial services.

The Formalisation Tension

The Ligon et al. (2019) finding on tax liability concerns as an adoption barrier introduces a tension that is not adequately addressed in the broader FinTech-SME literature. Much of the policy case for FinTech-driven SME financial inclusion assumes that increased formalisation, through digital transaction records, is unambiguously beneficial because it builds the credit history and financial transparency that formal lenders require. But formalisation also has costs for SMEs operating in the informal economy, primarily tax exposure, and the Jaipur evidence suggests these costs are weighted heavily enough by some merchants to suppress adoption of digital payments that are otherwise feasible.

This tension is not resolved by any of the studies in this review, but it points to a genuine policy trade-off. Interventions that reduce the perceived or actual tax cost of formalisation for SMEs, for example through simplified tax regimes for small businesses transitioning to digital payment systems, may do more to unlock the formalisation-related benefits of FinTech adoption than interventions focused purely on reducing the technical or financial cost of adoption itself, which the Jaipur evidence suggests is not the binding constraint for most merchants.

Heterogeneity Across Institutional Contexts

The contrast between the Kenyan and Indian trajectories documented in Singh's (2019) ethnographic study is a useful frame for the broader pattern across this review's evidence. In Kenya, M-Pesa developed as a largely standalone mobile money system with limited initial integration with formal banking. In India, mobile money proliferated primarily after being linked to bank accounts, reflecting India's regulatory approach requiring bank account linkage for mobile payment services.

These different institutional pathways have implications for the complementarity-substitution question that go beyond what any single quantitative study can capture. In a context like Kenya's, where mobile money developed somewhat independently of the banking system, the relevant question may genuinely be closer to substitution, mobile money as an alternative financial infrastructure for populations the banking system does not reach. In a context like India's, where mobile payment systems were built on top of bank account infrastructure by regulatory design, the relevant question is closer to complementarity by construction, since the digital layer cannot function independently of the banking layer beneath it.

This suggests that the complementarity-substitution question may not have a context-independent answer, not only because of the catching-up dynamics discussed in Section 5.1, but because the institutional design of FinTech systems themselves, shaped by regulatory choices made early in the FinTech sector's development in each country, determines whether complementarity or substitution is even the structurally available relationship.

Policy Implications

Calibrate Expectations About FinTech's Role in SME Credit

The evidence supports FinTech as an effective intervention for reducing transaction costs and extending basic financial service access for SMEs and microenterprises, but does not support treating FinTech as a solution to the investment-scale credit gap facing growth-oriented SMEs. Policy frameworks should distinguish between these objectives. Where the goal is improving working capital management and reducing the costs of informal business operation, the evidence from Ghana, Sierra Leone, and the broader transaction cost literature is directly supportive. Where the goal is increasing access to investment-scale credit for SMEs with growth potential, the evidence reviewed here does not establish that FinTech, as currently deployed, addresses this need, and complementary interventions, including credit guarantee schemes and the development of SME-specific credit assessment infrastructure, remain necessary.

Address the Formalisation Cost-Benefit Trade-off Directly

The tax liability finding from Ligon et al. (2019) suggests that policy interventions aimed at increasing digital payment adoption among small merchants should explicitly address the tax implications of increased transaction visibility, rather than assuming that technical feasibility and cost reduction alone will drive adoption. Simplified tax regimes calibrated to the transaction volumes typical of micro and small enterprises, introduced alongside digital payment promotion, would address what this evidence identifies as a primary demand-side barrier that supply-side interventions cannot resolve.

Target Ecosystem-Level Conditions, Not Only Merchant-Level Adoption

The Allen et al. (2022) evidence on non-linear adoption effects from combinations of ecosystem conditions, electronic wage payment, ICT infrastructure, account ownership, suggests that policy interventions focused solely on individual merchant adoption decisions may be less effective than interventions that address the broader payment ecosystem in which merchants operate. Ensuring that wages, government transfers, and other major payment flows occur electronically may do more to drive merchant-level digital payment adoption than direct merchant incentives.

Recognise the Capital Threshold for Business-Level FinTech Adoption

The Ghanaian evidence that personal mobile money adoption among informal business owners does not automatically translate into business-level adoption, due to the capital and technical requirements of merchant accounts and business-specific tools, points to a specific gap in FinTech deployment for informal businesses. Interventions that specifically lower the capital threshold for business-level FinTech adoption, for example through subsidised merchant account setup or simplified business registration linked to mobile money business accounts, would address a documented constraint that general FinTech promotion does not.

Conclusion

This review has examined evidence from 13 studies on FinTech's effects on SME and microenterprise financing in developing economies. The central question, whether FinTech substitutes for or complements traditional bank financing, does not have a single answer across the evidence base. Firm-level evidence from China suggests complementarity in the sense that digital finance and bank presence interact positively in relieving financing constraints. Cross-country and regional evidence from Africa and China suggests that FinTech's marginal returns are highest in less financially developed contexts, a finding consistent with either complementarity or substitution depending on how the underlying dynamics are interpreted.

What the evidence establishes more clearly is what FinTech demonstrably achieves for SMEs: reduced transaction costs, extended geographic access to basic financial services, and the generation of digital transaction data with potential, though not directly demonstrated, credit assessment value. What it does not establish is that FinTech resolves the collateral and risk-assessment constraints underlying the gap in investment-scale SME credit.

The formalisation tension identified in the Indian merchant evidence, where digital payment adoption is suppressed partly because of the tax visibility it creates, represents an underappreciated friction in the broader FinTech-financial inclusion-SME credit pathway that policy frameworks have generally not addressed directly. And the institutional path-dependency illustrated by the contrasting Kenyan and Indian mobile money trajectories suggests that the complementarity-substitution relationship may be shaped as much by early regulatory design choices as by the inherent characteristics of the technology itself.

Future research would benefit from studies that directly link digital transaction data to subsequent formal credit outcomes for SMEs, testing whether the information mechanism that much of the literature assumes is operative actually translates into credit access at the firm level. Comparative institutional analysis of how different regulatory approaches to mobile money and digital payment integration with banking systems shape the long-run complementarity-substitution relationship would also address a gap that the cross-sectional and single-country evidence reviewed here cannot resolve.

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