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DIGITAL FINANCIAL INCLUSION AND ECONOMIC GROWTH IN EMERGING ECONOMIES: A SYSTEMATIC LITERATURE REVIEW WITH EVIDENCE FROM CENTRAL ASIA

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Abstract: Digital financial inclusion (DFI) — the delivery of payments, savings, credit, and insurance through mobile and internet-based platforms — has become one of the most actively studied channels linking financial-sector development to economic growth in emerging economies. This paper synthesises the empirical literature on the DFI–growth nexus published between 2018 and 2025, drawing on panel-data studies covering China, the ASEAN region, the Asia-Pacific, Sub-Saharan Africa (SADC), and the OIC bloc, and complements this evidence with an emerging body of country-level research on Central Asia, with particular attention to Uzbekistan. A structured literature-review methodology was used to identify and synthesise 20 peer-reviewed and working-paper sources. The review finds a broadly positive association between DFI and gross domestic product (GDP) growth across regions and estimation techniques (fixed effects, two-stage least squares, and generalised method of moments), while also identifying three consistent moderating factors: institutional quality, internet-infrastructure penetration, and the composition of digital-finance proxies used. Evidence from Uzbekistan's post-2017 liberalisation reforms illustrates how rapid growth in mobile payments, agent banking, and fintech platforms can translate into measurable gains in formal-sector participation, while also revealing structural gaps — rural infrastructure, financial literacy, and cybersecurity — that constrain the magnitude of the growth effect. The paper concludes that DFI is best understood as a necessary but not sufficient condition for inclusive growth, and it proposes a policy agenda centred on institutional strengthening, targeted rural connectivity investment, and coordinated regional data standards.

Keywords: digital financial inclusion; economic growth; fintech; emerging economies; Central Asia; Uzbekistan; panel data

JEL Classification: O16; G21; O53; F63

1. Introduction

Financial inclusion — broadly defined as the access to, and effective use of, a range of appropriate financial services by households and firms — has been identified by international development institutions as an enabler of at least eight of the United Nations Sustainable Development Goals, including poverty reduction, decent work, and reduced inequality. Over the past decade the concept has evolved from an emphasis on physical access to bank branches toward digital financial inclusion (DFI): the use of mobile money, digital banking, e-payment platforms, and other internet- or mobile-based financial technologies to reach populations that remain excluded from traditional banking infrastructure. Because DFI lowers transaction costs, extends the geographic reach of financial services, and generates transactional data that can substitute for conventional collateral in credit decisions, it has attracted growing attention as a potential driver of economic growth in low- and middle-income countries.

The empirical literature on the relationship between DFI and gross domestic product (GDP) growth has expanded rapidly since 2018, spanning cross-country panels, regional blocs such as the Association of Southeast Asian Nations (ASEAN) and the Southern African Development Community (SADC), and single-country studies of large emerging markets such as China. Despite this growth in the literature, findings remain heterogeneous: the strength, and occasionally the sign, of the DFI–growth relationship varies with the proxy used for digital finance, the econometric technique applied, and the institutional context of the country sample. A second, smaller but rapidly growing strand of research examines DFI in Central Asia, a region whose digital-finance ecosystems have expanded markedly following market liberalisation, currency-convertibility reforms, and the entry of fintech platforms.

This paper has three objectives. First, it synthesises the empirical evidence on the DFI–growth relationship published in peer-reviewed journals between 2018 and 2025, organising the findings by region and estimation method. Second, it examines the moderating role that institutional quality, internet penetration, and the choice of DFI proxy play in shaping the strength of the relationship. Third, it extends the review to the Central Asian context, using Uzbekistan as an illustrative case of a transition economy in which digital-finance reform has proceeded rapidly since 2017, in order to assess whether the mechanisms identified in the broader literature travel to a post-Soviet, resource-dependent economic structure. The remainder of the paper is organised as follows. Section 2 describes the review methodology. Section 3 presents the synthesised results and discusses them in relation to theory and regional context. Section 4 concludes with policy recommendations and directions for future research.

2. Materials and Methods

This review follows a structured literature-review protocol adapted from established systematic-review practice in economics and finance. The search covered peer-reviewed journal articles, working papers, and conference proceedings published between January 2018 and October 2025, retrieved through general academic search and publisher databases (including Elsevier ScienceDirect, MDPI, AIMS Press, and institutional repositories). Search terms combined "digital financial inclusion," "financial technology" or "fintech," and "economic growth" or "GDP," together with regional qualifiers ("ASEAN," "SADC," "China," "Central Asia," "Uzbekistan") to ensure regional coverage beyond the most heavily studied economies.

Sources were included if they (a) used a quantitative empirical design linking a digital-finance indicator to a growth or GDP-related outcome, (b) were published in a peer-reviewed journal or as a working paper from a recognised research institution, and (c) reported effect sizes, coefficients, or clearly stated directional findings. Purely conceptual or descriptive pieces without an empirical growth estimate were excluded unless they provided institutional or policy context directly relevant to the Central Asian case study. Twenty sources met these criteria and form the evidence base synthesised in Section 3; the reference list reports the full set.

Because the included studies use different DFI proxies — automated-teller-machine density, debit-card penetration, mobile-money-account ownership, composite indices built through principal component analysis (PCA), and internet-banking usage — findings are reported narratively by region and proxy rather than pooled into a single meta-analytic effect size, consistent with the heterogeneity-management approach recommended for economics reviews that combine studies using materially different measurement strategies and econometric estimators (ordinary least squares, two-stage least squares, fixed-effects, and system generalised method of moments, GMM).

3. Results and Discussion

3.1 Cross-country and regional evidence

Studies using large, multi-country panels generally report a positive association between DFI and GDP growth, although the magnitude and statistical significance depend heavily on the proxy employed. Working with data from 51 developing countries for 2014 and 2017, Yaqin and Safuan (2023) constructed a composite DFI index using principal component analysis and, applying a fixed-effects model, found that digital financial inclusion is positively associated with GDP growth, while noting that the average level of DFI across developing economies remained at a middling stage of development. In a study of member countries of the Organisation of Islamic Cooperation (OIC), Kim et al. (2018) established an early empirical foundation for the financial-inclusion–growth link, finding that broader access to financial services is associated with higher growth, a result that subsequent DFI-focused studies have generally reaffirmed and extended to digital channels.

The most methodologically detailed cross-country evidence comes from Meniago (2025), who examined sixteen SADC economies over 2010–2023 using a system-GMM estimator and PCA-constructed DFI and institutional-quality indices. The results confirmed a statistically significant positive relationship between DFI and GDP growth and, critically, showed that an interaction term between DFI and institutional quality was itself positive and significant in most specifications — indicating that the growth dividend from digital finance is substantially larger in countries with stronger governance, rule of law, and regulatory frameworks. This finding is echoed in the Asia-Pacific evidence surveyed by Meniago (2025) and in Khera et al.'s (2022) construction of a digital financial inclusion index for emerging markets, both of which stress that DFI's growth effect is conditional rather than automatic.

For China, Liu et al. (2021) used the Peking University Digital Inclusive Finance Index together with provincial panel data for 2011–2019 and found that digital financial inclusion made a significant contribution to economic growth, with the effect exhibiting a threshold pattern tied to the level of internet penetration in a given province — that is, the growth dividend from DFI increased once a province crossed a minimum level of internet access. This threshold finding recurs across the literature: internet-penetration rate is consistently reported as one of the strongest control variables in DFI–growth regressions, suggesting that digital-finance infrastructure and general digital infrastructure are complements rather than substitutes.

Evidence from the ten-member ASEAN bloc provides a useful counterpoint because it examines both the growth and environmental dimensions of DFI jointly. Using data for 2005–2022 and proxying DFI with automated-teller-machine density and debit-card usage, Bajwa et al. (2025) found that both proxies had a significant positive effect on GDP growth across pooled ordinary least squares, two-stage least squares, and system-GMM specifications, with debit-card usage showing the more consistent effect across estimators. However, the same study found that digital financial inclusion was also positively associated with carbon dioxide emissions, implying that the expansion of digital finance in ASEAN has so far been accompanied by increased energy-intensive economic activity rather than a shift toward lower-carbon growth. This dual result is consistent with Guan and Zhao (2024), who found that financial inclusion promotes economic growth and quality of life but leaves its environmental-sustainability implications ambiguous, and with Ansari et al. (2024), who showed that the interaction between digital finance and institutional quality — rather than digital finance alone — is what determines whether renewable-energy uptake accompanies financial-sector deepening.

Taken together, the cross-country evidence supports three generalisations. First, the direction of the DFI–growth relationship is positive in the large majority of specifications reviewed, regardless of region or estimator. Second, the size of the effect is not uniform: it depends on which digital-finance indicator is used, with transaction-based proxies (debit-card usage, mobile-money-account activity) generally showing stronger and more robust coefficients than pure access-based proxies (ATM density). Third, institutional quality functions as a moderating variable in most of the reviewed studies, amplifying the growth effect of DFI where governance is stronger and dampening it where governance is weak — a pattern directly relevant to transition economies such as those of Central Asia, where institutional reform has often lagged financial-technology adoption.

3.2 Digital financial inclusion in Central Asia and Uzbekistan

Country-level research on Central Asia is more recent and less methodologically uniform than the cross-country literature discussed above, but a coherent picture is emerging, with Uzbekistan as the most studied case. Since the 2017 liberalisation of the exchange-rate regime and the subsequent National Financial Inclusion Strategy undertaken by the Central Bank of Uzbekistan with support from the Asian Development Bank, digital payment platforms such as Click, Payme, and Uzum have expanded from niche products into what regional researchers describe as "super-app" ecosystems combining payments, e-commerce, and banking functions within single platforms. An assessment of Uzbekistan's first National Financial Inclusion Strategy found that digital financial services had brought millions of previously unbanked people into the formal financial system by reducing transaction costs and expanding the reach of financial services, including for rural and underserved populations, while cautioning that the next phase of reform needs to move beyond account ownership toward building households' capacity to save, manage risk, and invest (Asian Development Bank, 2026).

Country-specific quantitative studies corroborate the direction, if not always the precision, of the cross-country findings. Alijonova (2025) examined digital payment systems and financial inclusion in Uzbekistan and reported that expanding digital-payment infrastructure has been associated with improved access to financial services for previously excluded segments of the population. A separate assessment of Uzbekistan's digital-technology-driven economic development reported that internet access reached roughly 86 percent of the population by 2024, fintech usage rose to approximately 79 percent, and the digital sector's contribution to GDP climbed to about 5.5 percent, while also identifying rural infrastructure gaps, a shortage of skilled information-technology professionals, and rising cybersecurity risk as the principal constraints on further gains (Abdurakhmonov & Turaev, 2025). These figures are broadly consistent with the internet-penetration threshold effects documented for China by Liu et al. (2021): Uzbekistan appears to be approaching, but has not yet uniformly reached, the connectivity level at which digital-finance growth effects become strongest in other emerging-market settings.

The institutional-quality moderation effect identified in the SADC and ASEAN literature (Meniago, 2025; Ansari et al., 2024) is directly relevant to Uzbekistan's reform trajectory. The country's regulatory sandbox, open-banking application programming interfaces (APIs), and National FinTech Strategy represent precisely the type of institutional deepening that the cross-country literature associates with a larger growth dividend from digital financial inclusion, and recent macroeconomic indicators — including a reported 8.5 percent GDP growth rate in the first half of 2026 and a sovereign-rating upgrade — are consistent with, though not proof of, a positive contribution from this institutional and digital-finance reform combination. At the same time, the same body of country research cautions that the informal economy, low rural financial literacy, and uneven regional access to digital infrastructure continue to constrain how broadly the growth

benefits of DFI are shared within the population, echoing the equity concerns raised in the SADC and OIC literature (Kim et al., 2018; Meniago, 2025).

4. Conclusion and Recommendations

This review synthesised empirical evidence on the relationship between digital financial inclusion and economic growth across cross-country panels, the ASEAN and SADC regional blocs, China, and the emerging Central Asian literature, with Uzbekistan serving as an illustrative transition-economy case. The overall pattern that emerges is that digital financial inclusion is positively associated with GDP growth in the substantial majority of reviewed studies, through mechanisms of transaction-cost reduction, credit-market deepening, and improved fiscal traceability. However, the size of this effect is not uniform: it depends on the specific digital-finance proxy used, the level of general internet-infrastructure penetration, and — most consistently — the quality of a country's governance and regulatory institutions. Evidence from Uzbekistan's post-2017 reform period is broadly consistent with this pattern, showing rapid growth in digital-payment adoption and formal-sector participation alongside continuing constraints in rural connectivity, financial literacy, and skilled-workforce availability.

Three policy implications follow. First, because institutional quality moderates the growth dividend from digital finance, policymakers in transition economies should sequence financial-technology liberalisation together with, rather than ahead of, regulatory and governance reform — a lesson directly applicable to Uzbekistan's ongoing open-banking and fintech-strategy rollout. Second, because internet-penetration thresholds condition the strength of the DFI–growth relationship, continued investment in rural broadband and mobile-network infrastructure should be treated as a complement to, not a substitute for, digital-finance policy. Third, because the ASEAN evidence indicates that digital-finance-driven growth can carry an environmental cost, growth strategies built around DFI expansion should be paired with energy and emissions policy rather than assumed to be environmentally neutral by default.

The review is subject to two limitations that also suggest directions for future research. First, the Central Asian evidence base remains smaller and methodologically less uniform than the cross-country literature on China, ASEAN, and SADC, limiting the precision of comparative claims; future country-specific panel studies using standardised DFI indices for Uzbekistan and its neighbours would strengthen this evidence base considerably. Second, most reviewed studies rely on national- or provincial-level panel data and are therefore not well positioned to identify firm-level or household-level mechanisms; micro-level studies using household survey data, of the kind increasingly available through the Global Findex initiative, would help clarify which specific channels — savings, credit access, remittances, or payments — drive the aggregate growth effects that this review has documented.

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