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From Access to Usage: Digital Payments and Financial Inclusion in India – A Review of Evidence and Emerging Gaps

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Abstract

India has built one of the world's largest public digital payment infrastructures, anchored in the Unified Payments Interface (UPI), universal bank account programmes and biometric identity. This paper reviews the empirical and policy literature on whether this infrastructure has translated into meaningful financial inclusion, and supplements the review with secondary data from the Reserve Bank of India (RBI), the National Payments Corporation of India (NPCI) and the World Bank's Global Findex 2025. Using a structured narrative review of peer-reviewed studies, working papers and official statistics published between 2016 and 2026, the paper organises the evidence around four themes: the expansion of access, the drivers of adoption, the economic effects of digital payments, and the risks and exclusions that persist. The review finds that access has expanded dramatically: UPI processed 24.51 billion transactions in August 2026, the RBI Financial Inclusion Index rose to 70.0 in March 2026, and the share of account owners with inactive accounts fell from 35 per cent in 2021 to 16 per cent in 2024. Causal studies associate digital payment adoption with higher household income, new business formation and improved access to FinTech credit. However, usage remains uneven, with persistent gender gaps, an inactivity rate four times that of comparable economies, and limited conversion of payment activity into credit, insurance and savings. The paper argues that India's next policy challenge is to move from access to productive usage, and it proposes an agenda for research on usage depth, gender, consumer protection and the payments-to-credit pathway.

Keywords: - Digital Payments, Financial Inclusion, Unified Payments Interface, FinTech, India

I. INTRODUCTION

Financial inclusion, understood as the availability and use of affordable formal financial services by individuals and firms, is widely regarded as an enabler of poverty reduction, household resilience and enterprise growth. For most of its post-independence history, India approached this goal through supply-side measures such as bank nationalisation, priority sector lending and rural branch expansion. Since 2014, however, the strategy has shifted towards digital public infrastructure: the Pradhan Mantri Jan Dhan Yojana (PMJDY) opened basic accounts at scale, Aadhaar provided a biometric identity layer, and the Unified Payments Interface (UPI), launched in 2016, created an interoperable real-time payment rail that any bank or app can join.

The scale of this transformation is striking. Annual UPI transaction volume rose from 1.78 crore in 2016-17 to more than 24,162 crore in 2025-26, and the number of banks live on the platform grew from 44 to 703 over the same period. In August 2026, UPI processed 24.51 billion transactions worth ₹29.82 lakh crore, its highest monthly volume to date. The RBI's Digital Payments Index, which was set at 100 in March 2018, reached 516.76 by September 2025.

Yet rapid growth in transactions does not automatically mean that the excluded have been included. A transaction count can rise because existing users transact more often, while large segments of the population remain outside the system or hold accounts they rarely use. The World Bank's Global Findex 2025 reports that about 16 per cent of Indian account owners have

inactive accounts, compared with an average of 4 per cent in other low- and middle-income economies (Klapper et al., 2025). This tension between spectacular aggregate growth and uneven individual usage motivates the present review.

The paper addresses the following research question: to what extent has India's digital payments expansion translated into meaningful financial inclusion, and what gaps remain? It contributes in three ways. First, it brings together evidence from economics, finance and information systems that is usually discussed in separate literatures. Second, it updates the discussion with the most recent official data available as of 2026, including the Global Findex 2025 and the RBI Financial Inclusion Index for March 2026. Third, it identifies specific gaps that can guide future empirical work in commerce and management research.

The remainder of the paper is organised as follows. Section 2 reviews the theoretical and empirical literature. Section 3 describes the review method and data sources. Section 4 presents the findings, Section 5 discusses their implications, and Section 6 concludes with directions for further research.

II. LITERATURE REVIEW

2.1. Conceptual foundations

Two strands of theory frame the study of digital payments. The first concerns individual adoption. The Technology Acceptance Model holds that perceived usefulness and perceived ease of use shape a person's intention to use a technology (Davis, 1989), while the Unified Theory of Acceptance and Use of Technology (UTAUT) adds social influence and facilitating conditions as determinants of intention and use (Venkatesh et al., 2003). Diffusion of innovations theory complements these models by explaining how adoption spreads through a population over time, from early adopters to the late majority (Rogers, 2003).

The second strand concerns market structure. Payment systems are two-sided platforms: their value to consumers depends on how many merchants accept them, and vice versa (Rochet & Tirole, 2003). Such network externalities create coordination problems, because no single merchant gains from accepting a payment method that few customers use. This insight is important for India, because it suggests that the timing and scale of adoption can depend on aggregate shocks and public coordination, not only on individual preferences.

Financial inclusion itself is increasingly defined in multidimensional terms. Ozili (2018) argues that digital finance can widen access for individuals, providers and governments, but warns that it also introduces risks related to cost, fraud, data and financial stability. The RBI's Financial Inclusion Index reflects this view by combining Access, Usage and Quality dimensions, weighted at 35, 45 and 20 per cent respectively, rather than relying on account ownership alone.

2.2. Building access: accounts and infrastructure

The most direct evidence on account expansion comes from studies of PMJDY. Using administrative account-level data, Agarwal et al. (2017) document 255 million new accounts opened under the programme, of which about 77 per cent maintained a positive balance. They find that usage was initially infrequent but gradually converged towards that of comparable banked households, and that regions more exposed to the programme saw increases in lending. D'Silva et al. (2019) describe how India layered identity, accounts and interoperable payments into a "stack" of public digital infrastructure, arguing that this design lowered the cost of serving low-income customers.

International evidence suggests that such access can matter for welfare. In Kenya, Suri and Jack (2016) estimate that access to the M-PESA mobile money system raised per capita consumption and lifted about 2 per cent of households out of poverty, with stronger effects for female-headed households. These findings have been influential but also contested; Bateman et al. (2019) question both the causal identification and the generalisability of the results, cautioning against treating digital finance as a standalone solution to poverty.

2.3. Drivers of adoption

Studies of Indian consumers largely confirm the adoption models. In a survey of 491 Indian consumers, Patil et al. (2020) find that performance expectancy, intention to use and grievance redressal significantly predict actual mobile payment use, and they highlight trust and effective complaint handling as factors specific to the Indian context. These findings imply that the quality of consumer protection, not only convenience, shapes sustained usage.

At the aggregate level, the 2016 demonetisation provided a natural experiment. Chodorow-Reich et al. (2020) show that districts facing more severe cash shortages experienced sharper short-run contractions in economic activity but faster adoption of alternative payment technologies. Crouzet et al. (2023) find that the temporary cash contraction led to a persistent increase in retailers' adoption of an electronic wallet, and estimate that adoption would have been about 45 per cent lower without complementarities between adopters. Together, these studies show that network effects are central to payment adoption and that large shocks can shift an economy to a new equilibrium.

2.4. Economic effects of digital payments

A growing body of work examines whether digital payments change real economic outcomes. Using district-level UPI transaction data, Dubey and Purnanandam (2023) find that districts with higher post-UPI cashless payment intensity saw greater household income growth and new business formation, with larger effects for the self-employed and in areas with lower financial development. Purnanandam (2025) situates these findings in a broader account of UPI as public infrastructure that lowers transaction costs for small merchants.

A second channel operates through credit. Ghosh et al. (2026) show, using loan-level data from an Indian FinTech lender, that borrowers' use of cashless payments improves their access to credit and predicts lower default, because digital transaction records provide verifiable information about cash flows. This "payments-to-credit" pathway is particularly relevant for small firms and individuals without formal credit histories.

2.5. Research gap

The literature thus offers strong evidence on access expansion, adoption dynamics and selected economic effects. However, three gaps stand out. First, most studies predate the Global Findex 2025 and the latest RBI indices, so the relationship between recent payment growth and broader inclusion outcomes has not been reassessed. Second, studies tend to examine either aggregate transactions or individual adoption, with less attention to the depth and distribution of usage. Third, the risks of digital inclusion, such as fraud, exclusion of women and digitally inexperienced users, and over-reliance on a single payment channel, are discussed in policy reports more often than in academic research. This review seeks to address these gaps.

III. METHODS

The study adopts a structured narrative review design supplemented by descriptive analysis of secondary data. A narrative review is appropriate because the relevant evidence spans different disciplines, methods and publication types, which limits the feasibility of a formal meta-analysis.

3.1. Search and selection

Literature was identified through searches of Google Scholar, RePEc/IDEAS, SSRN and the publication pages of the RBI and the World Bank, using combinations of the terms "digital payments", "UPI", "financial inclusion", "mobile payment adoption", "demonetisation", "Jan Dhan" and "India". Studies were included if they (a) examined digital payments or financial inclusion in India, or provided widely cited international evidence relevant to the Indian case; (b) were published between 2016 and 2026, with earlier works retained only where they supply the core theoretical framework; and (c) appeared in peer-reviewed journals, recognised working paper series or official publications. Opinion pieces and studies without a clear empirical or conceptual contribution were excluded. Selection was purposive, prioritising studies with credible identification strategies or large samples.

3.2. Secondary data

To situate the literature in current conditions, the review draws on the following official sources: the RBI Digital Payments Index (RBI-DPI) series from March 2018 to September 2025; the RBI Financial Inclusion Index (FI-Index) for March 2021 to March 2026; NPCI's UPI transaction statistics, including figures for 2025-26 and August 2026; the World Bank's Global Findex 2021 and 2025; and fraud statistics from the RBI Annual Report 2025-26.

3.3. Analysis

The selected studies were coded by research setting, data, method and principal findings, and then grouped into four themes: access, adoption, economic effects, and risks and exclusions. Secondary data were analysed descriptively to compare earlier and latest values for each indicator. Because the study relies on published sources, no primary data were collected and ethical approval was not required.

IV. RESULTS

4.1. Expansion of access and activity

Table 1 summarises the main indicators. Every measure of access and activity improved substantially over the review period. The RBI-DPI rose more than fivefold from its March 2018 base, the FI-Index increased from 53.9 in March 2021 to 70.0 in March 2026, and annual UPI volume rose roughly 13,000-fold between 2016-17 and 2025-26.

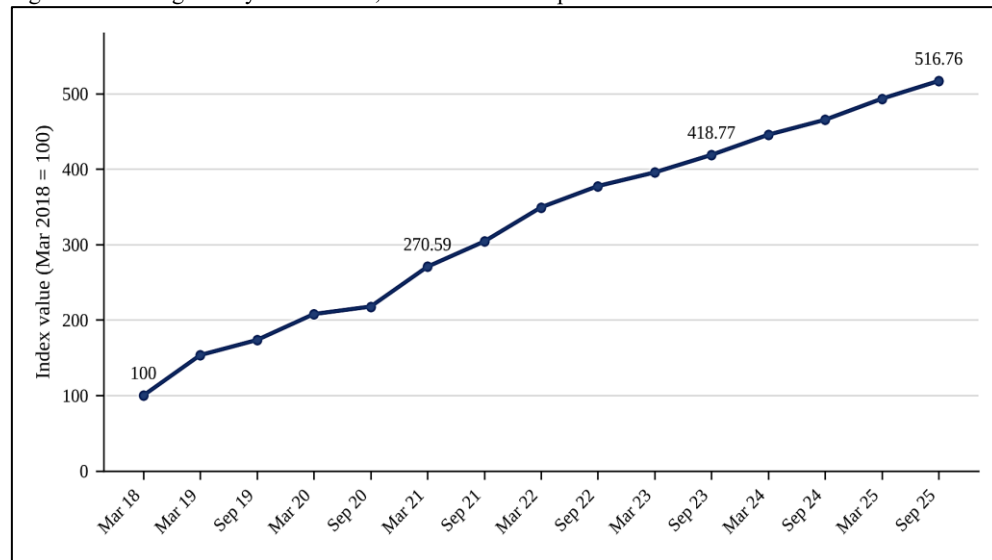
Table 1. Key Indicators of Digital Payments and Financial Inclusion in India

Indicator	Earlier value	Latest value	Source
RBI Digital Payments Index	100 (Mar 2018)	516.76 (Sep 2025)	RBI
RBI Financial Inclusion Index (0–100)	53.9 (Mar 2021)	70.0 (Mar 2026)	RBI
Annual UPI transactions	1.78 crore (2016-17)	24,162 crore (2025-26)	NPCI; MoF
Banks live on UPI	44 (2016-17)	703 (2025-26)	NPCI; MoF
Monthly UPI volume (peak)	21.7 billion (Jan 2026)	24.51 billion (Aug 2026)	NPCI
Account owners with inactive accounts	35% (2021)	16% (2024)	World Bank Findex
Card/internet/digital fraud cases reported	28,836 (2023-24)	293 (2025-26)	RBI Annual Report

Source: Compiled by the author(s) from RBI (2025, 2026a, 2026b, 2026c), NPCI (2026), Ministry of Finance (2026), Demirgüç-Kunt et al. (2022) and Klapper et al. (2025). Fraud figures reflect cases reported by banks under the RBI's classification and should be interpreted with caution, as changes in reporting thresholds and categories affect year-on-year comparisons.

Figure 1 plots the RBI-DPI series. Growth has been steady rather than episodic, with the index rising in every published period since its inception, including during the pandemic years.

Figure 1: RBI Digital Payments Index, March 2018 to September 2025



Source: RBI (2025, 2026b). Base: March 2018 = 100.

4.2. Synthesis of key empirical studies

Table 2 synthesises the principal empirical studies reviewed. Three patterns emerge. First, access programmes succeeded in opening accounts at scale, but early usage was low. Second, adoption of digital payments is strongly shaped by network effects and was accelerated by the demonetisation shock. Third, where rigorous causal evidence exists, digital payments are associated with positive economic outcomes, especially for small enterprises and the self-employed.

Table 2. Synthesis of Selected Empirical Studies

Study	Setting and data	Principal finding
Agarwal et al. (2017)	India; PMJDY account-level data	255 million new accounts; usage initially low but converging; more lending in exposed regions
Suri & Jack (2016)	Kenya; household panel surveys	M-PESA access raised consumption and reduced poverty, especially for female-headed households
Chodorow-Reich et al. (2020)	India; district data on demonetisation	Cash shortage reduced activity but accelerated adoption of alternative payments
Patil et al. (2020)	India; survey of 491 consumers	Performance expectancy, intention and grievance redressal predict use
Crouzet et al. (2023)	India; e-wallet data after demonetisation	Persistent adoption rise; complementarities explain about 45% of adoption
Dubey & Purnanandam (2023)	India; district-level UPI data	Higher cashless intensity linked to income growth and new businesses
Ghosh et al. (2026)	India; FinTech loan-level data	Cashless payment use improves credit access and predicts lower default

Source: Compiled by the author(s).

4.3. Persistent gaps in usage and quality

Despite these gains, the evidence points to four persistent gaps. The first is inactivity. Although the share of inactive accounts fell sharply between 2021 and 2024, India's rate remains about four times the average of other low- and middle-income economies (Klapper et al., 2025). Lack of money, distance from the bank and low trust are commonly reported reasons for not using accounts.

The second is gender. Account ownership among Indian women has broadly reached parity with men, but women remain less likely to make or receive digital payments and are more likely to hold inactive accounts (Klapper et al., 2025). Many women's accounts are opened to receive government transfers rather than for everyday transactions.

The third is the limited conversion of payment activity into other financial services. The FI-Index places the largest weight on usage, and the March 2026 improvement was driven mainly by higher usage, which is encouraging. However, the research by Ghosh et al. (2026) indicates that the credit benefits of digital payments depend on lenders' ability to use transaction data, and such data-sharing arrangements remain at an early stage for most small borrowers.

The fourth concerns risk. Card, internet and digital payment frauds accounted for the largest number of reported bank frauds in 2023-24 and 2024-25, before advances-related frauds took the largest share in 2025-26 (RBI, 2026a). While the reported number of digital payment fraud cases declined sharply, consumer-facing scams that do not appear in bank-reported statistics remain a concern for new and less experienced users.

V. DISCUSSION

The findings support a cautiously positive answer to the research question. India's digital payments expansion has clearly widened access and deepened activity, and rigorous studies link it to measurable economic gains. The fact that the FI-Index's latest improvement came mainly from the usage dimension suggests that the system is beginning to move beyond account opening. In this respect, the Indian experience is consistent with the two-sided platform view: once public infrastructure solved the coordination problem among banks, apps, merchants and consumers, adoption became self-reinforcing (Crouzet et al., 2023; Rochet & Tirole, 2003).

At the same time, the review shows that aggregate transaction growth can overstate inclusion. A large share of UPI activity reflects frequent low-value payments by people who were already connected, while inactivity and gender gaps show that a meaningful minority remains on the margins. This distinction between the extensive margin (who is included) and the intensive margin (how deeply they participate) is often blurred in public discussion, and it deserves explicit treatment in both research and policy.

The findings carry several implications. For policymakers, the priority should shift from expanding access to improving the quality and usefulness of inclusion, through targeted digital and financial literacy for women and first-time users, faster grievance redressal, and stronger safeguards against fraud. The evidence from Patil et al. (2020) that grievance redressal predicts actual use suggests that consumer protection is not only a welfare concern but also a driver of adoption. For banks and FinTech firms, the payments-to-credit pathway offers a commercial opportunity to serve thin-file borrowers, provided that data are shared with informed consent and adequate privacy protection. For merchants, particularly micro and small enterprises, digital payment records can become an asset for accessing formal finance.

The review also has limitations. As a narrative review, it does not produce pooled effect sizes, and the selection of studies, although guided by explicit criteria, involves judgement. Several important studies are working papers that may change before final publication. The secondary indicators are aggregate measures that cannot reveal individual-level dynamics, and fraud statistics in particular are sensitive to changes in reporting definitions. Finally, the international evidence from Kenya may not transfer directly to India's bank-led model.

VI. CONCLUSION

This paper reviewed the evidence on digital payments and financial inclusion in India and combined it with the latest official data. It finds that India has achieved near-universal account access and world-leading payment volumes, and that digital payments are associated with higher household income, new business formation and better access to credit. However, inactive accounts, gender disparities, limited progression from payments to credit and insurance, and evolving fraud risks show that inclusion remains incomplete.

The central conclusion is that India's next challenge is to move from access to productive usage. Several areas merit further research. First, micro-level studies using linked payment and credit data could quantify how far digital transaction histories improve credit access for women, farmers and micro-enterprises. Second, longitudinal surveys could track how first-time users progress from receiving transfers to making payments, saving and borrowing. Third, research on consumer protection could assess the incidence and cost of digital fraud among new users, including scams outside bank-reported statistics. Fourth, regional and state-level studies, including in states such as Kerala with high literacy and remittance flows, could explain why usage differs across places with similar access. Addressing these questions would help ensure that India's digital payment success translates into durable financial well-being.

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