



## Fintech — A financial sector revolution in India

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### Abstract

Fintech (financial technology) has reshaped India's financial landscape over the past decade, accelerating digital payments, widening access to credit, transforming insurance and investment services, and spawning a vibrant startup ecosystem. This paper examines the rise of fintech in India, catalogs major achievements, assesses limitations and risks, and provides conclusions and policy and industry recommendations. Drawing on government releases, industry reports and academic analyses, the paper argues that fintech's revolution is real and measurable — driven by infrastructure (Aadhaar, mobile penetration, UPI), regulatory experimentation (regulatory sandbox, tailored guidelines), and private capital but that sustainable inclusion requires stronger consumer protection, data governance, and capacity-building to manage fraud, uneven access, and business-model risks.

**Keywords:** Fintech, India, UPI, digital payments, financial inclusion, regulatory sandbox, digital lending, insurtech, fintech startups

### Introduction

Financial technology (fintech) refers to the application of modern information and communication technologies to deliver, enhance, or automate financial services. In India, fintech's emergence has been particularly rapid and visible: real-time retail payments via Unified Payments Interface (UPI), platformized lending, digital insurance distribution, wealthtech robo-advisors, and banking-as-a-service models have all seen explosive growth. These developments dovetail with India's broader digital infrastructure initiatives like Aadhaar (biometric digital ID), JAM (Jan Dhan–Aadhaar–Mobile) stack, and expanding smartphone penetration, creating a unique environment in which fintech innovations can scale quickly.

The year 2015 was a formative year for the Indian fintech sector, which saw the emergence of numerous fintech startups, incubators and investments from public and private investors. It was clearly reflected that a right mix of technical skills, capital investments, government policies, regulatory framework and entrepreneurial and innovative mind-set could be the driving force to establish fintech as a key enabler for financial services in India. Building a robust fintech ecosystem where start-up firms engage in external partnerships with financial institutions, universities and research institutions, technology experts and government agencies is expected to be a key enabler for growth and innovation in the fintech sector. The key segments within the FinTech space include Digital Payments, Digital Lending, BankTech, InsurTech and RegTech, Crypto currency. It is amongst the most thriving sectors at present in terms of both business growth and employment generation. Apart from this, FinTech can also help in the furtherance of the goal of financial inclusion. This paper explores this revolution, evidencing achievements, revealing limitations, and proposing recommendations for sustaining inclusive, secure growth.

### Methodology and Sources

This study is a qualitative, policy-oriented review that synthesizes peer-reviewed articles, working papers, industry

reports, official statistics, and reputable market analyses. Literature was identified across academic databases, government publications, and well-known industry reports. Empirical claims are supported by government releases and industry reports where possible (e.g., NPCI/PIB, PwC, Grant Thornton, Tracxn, India Briefing). The approach emphasizes triangulation: where multiple independent sources report on a fact (e.g., UPI transaction volumes or fintech funding), those sources are used to corroborate the claim.

### Literature Review

The academic and policy literature on fintech in India clusters around several themes: payments infrastructure and its macro effects; digital lending and associated consumer-protection issues; fintech's role in financial inclusion; regulatory frameworks and supervision; and cybersecurity/privacy concerns. Below we review representative streams and findings.

#### 1. Payments infrastructure and UPI: scale and economic effects

A dominant strand of literature documents how India's Unified Payments Interface (UPI) — developed by the National Payments Corporation of India — reshaped retail payments by enabling inexpensive, interoperable, instant transfers between bank accounts through mobile apps and QR codes. Empirical studies and policy reports emphasize UPI's outsized contribution to the growth of digital transactions and its role in formalizing previously cash transactions (Government of India, Ministry of Finance, 2024) [16]. Researchers have argued that real-time interbank rails reduce transaction frictions, lower costs for small merchants, and create data externalities that can be used for credit scoring and merchant services (Ozili, 2024) [17].

#### 2. Digital lending: access, speed, and risks

Literature on digital lending highlights gains in speed and access for micro and small borrowers, but raises concerns about predatory practices, opaque pricing, and debt traps. Several empirical works find that algorithmic underwriting

and alternate data can extend credit to thin-file customers; however, the same studies caution about weak disclosure standards and collection practices in some non-bank digital lenders (mapping and review studies, 2023–2024). The interplay between speed of credit delivery and consumer protection has been a recurring research theme.

### 3. Financial inclusion and the JAM ecosystem

Multiple studies find that the JAM (Jan Dhan–Aadhaar–Mobile) architecture — including the Pradhan Mantri Jan Dhan Yojana (PMJDY) — enabled direct benefit transfers and facilitated access to formal financial services. While account ownership increased dramatically, researchers emphasize that account ownership does not always translate to active usage, credit access, or financial capability (MPRA/financial inclusion reviews, 2024). The literature calls for complementing access with digital literacy and demand-side interventions.

### 4. Regulation, system resilience, and public digital infrastructure

A growing literature examines regulatory approaches: how the Reserve Bank of India (RBI), Ministry of Finance, and sectoral regulators balance innovation and systemic safety. Scholars note that India's approach has been pragmatic: open enough to spur experimentation (e.g., sandbox initiatives) while gradually introducing formal supervisory measures when risks emerge (e.g., payment aggregator rules) (legal and policy reviews through 2024). The literature stresses the need for harmonized data governance and cross-border considerations.

### 5. Cybersecurity and privacy concerns

As transactions migrated online, empirical reports and case studies documented rising frauds, phishing, and social engineering attacks. Academic and policy analyses underscore that technological defenses must be paired with consumer education and robust incident response mechanisms (consumer protection literature, 2022–2024).

### Historical Context: Why India Was Primed For Fintech

Several structural and policy factors created fertile ground for fintech in India:

- Digital identity and the JAM stack:** Aadhaar (unique biometric identity), coupled with mobile penetration and bank-account initiatives (Pradhan Mantri Jan Dhan Yojana), reduced identity and onboarding frictions. These building blocks enabled remote KYC and simplified customer acquisition.
- Mobile and internet reach:** Rapid smartphone adoption and falling data costs enabled mass access to digital financial services.
- Regulatory enabling environment:** The Reserve Bank of India (RBI), Department of Financial Services, and other agencies pursued pragmatic regulatory tools including the regulatory sandbox to allow supervised live-testing of innovations.

These combined factors accelerated a shift from cash and branch-centric finance to digital, platform-based models.

### Achievements of Fintech in India

This section details major achievements with supporting data.

## 1. Transformation of Payments — The UPI Phenomenon

UPI (Unified Payments Interface), launched in 2016, has been the single most visible fintech success in India. UPI's design, instant bank-to-bank transfers using virtual payment addresses (no need to share account numbers), APIs for merchant and third-party integration, and interoperability across banks and apps catalyzed rapid adoption.

Key metrics:

- In October 2024 UPI processed ~16.58 billion transactions valued at ₹23.49 lakh crore (₹23.49 trillion), showing massive scale and continued year-on-year growth. UPI accounted for a dominant share of retail digital transactions in India.
- Historical volumes indicate a multi-year compound annual growth: UPI transactions grew from tens of crores in FY 2017–18 to tens of thousands of crores within a few years, becoming a central retail payments rail.

UPI's low-cost, interoperable model has been credited domestically and internationally as a blueprint for fast retail payments. Its ubiquity has reduced transaction costs, brought micro merchants into the digital fold, and enabled instant disbursements of government transfers.

## 2. Financial Inclusion and Access

Fintech has meaningfully expanded access to financial services for previously underserved populations:

- Digital onboarding and low-cost payments enabled small merchants, gig workers, and rural households to transact electronically, improving convenience and reducing dependence on cash. Government and industry reports show large increases in the number of digital transactions and reductions in frictions for small-value payments.

Digital lending platforms and alternative data scoring have allowed thin-file individuals and micro/small enterprises to access short-term credit without lengthy branch processes, although credit quality and responsible lending remain concerns.

## 3. Startup Ecosystem and Capital Formation

India's fintech startup ecosystem grew rapidly:

- Despite a funding dip in 2024 (industry reports show around \$1.9B in fintech funding in 2024, down from earlier highs), there are expectations of early-stage funding and deal activity showing resilience into 2025.

## 4. Regulatory Experimentation and Support

Regulators recognized fintech's potential and created tailored frameworks:

- RBI and other regulators set up regulatory sandboxes and frameworks to test new financial products in a controlled environment, facilitating innovation while protecting consumers. The RBI's Enabling Framework for Regulatory Sandbox formalized cohort testing and regulatory engagement.

## 5. Product Innovation across Financial Verticals

Fintech innovations transformed multiple verticals:

- Lending:** Digital platforms use alternate data, automated underwriting and faster disbursements to cater to MSMEs and retail consumers.

- **Insurtech:** Distribution via digital channels reduced acquisition costs and brought micro-insurance products to new customers.
- **Wealthtech:** Robo-advisory and fractional investing lowered barriers to investment.
- **Fintech-as-a-Service / Banking-as-a-Service (BaaS):** APIs and platform services enabled non-bank players to integrate financial services into their offerings.

These product-level innovations increased choice, competition, and often, price efficiency for end-users.

### Limitations, Risks, and Challenges

Alongside rapid achievements, fintech in India faces several material limitations and risks.

#### 1. Fraud, Cybersecurity, and Consumer Harm

Rapid scale has been accompanied by fraud incidents and cyber risks. Recent government reporting and media coverage highlight rising numbers of digital payment scams and financial fraud, including social-engineering attacks that exploit users' trust. For example, authorities reported large-value frauds and hundreds of thousands of complaints in fiscal windows, underscoring the need for stronger consumer awareness and technical safeguards.

UPI's massive volumes make it a focus for both legitimate scaling and also potential abuse; regulators and payment operators continue to iterate on device-binding, limits, two-factor authentication, and AI-based monitoring to reduce misuse.

#### 2. Data Privacy, Governance, and Concentration

Fintech's dependence on data — both personal financial data and alternative signals — raises governance questions:

- India's data protection environment has been evolving; while proposals for stronger personal data laws are in discussion, limited or uncertain rules can create gaps in user protections. Concentration of data in major platforms or large third-party apps can also increase systemic risks and market power.

#### 3. Regulatory and Supervisory Gaps

While regulatory sandboxes and targeted policies exist, fintech sometimes sits at the intersection of multiple regulators (RBI, SEBI, IRDAI, NPCI, Ministry of Finance), creating coordination challenges for cross-sector products (e.g., payment-plus-credit offerings, embedded insurance). Harmonized approaches and clear jurisdictional rules are still evolving.

#### 4. Responsible Lending and Over-Indebtedness

Digital lending brought speed but also risks of predatory practices and over-indebtedness:

- Rapid loan offers, aggressive collection practices and opaque pricing have resulted in consumer complaints in certain segments, driving the need for stronger disclosure norms, suitability checks, and industry self-regulation. Policymakers and industry bodies have taken steps (e.g., SRO recognition for fintech lenders), but enforcement and compliance remain work in progress.

### 5. Funding Volatility and Business Model Sustainability

After several years of growth, fintech funding cycles showed volatility: 2024 saw a funding slowdown in some reports, reflecting investor caution and higher expectations around unit economics and profitability. This created pressure on startups to prioritize sustainable business models over unchecked growth-at-all-costs.

### 6. Digital Divide and Uneven Benefits

Despite strides, digital inclusion remains incomplete: - Urban, English-literate, smartphone-enabled users benefit disproportionately. Many rural or low-literacy users face usability, language, connectivity and trust barriers that limit fintech's reach. Complementary interventions (financial literacy, local language UX, offline-capable solutions) are necessary to make fintech's benefits truly universal.

### Discussion: Balancing Innovation and Protection

Fintech's future depends on balancing three imperatives:

1. **Innovation and scale:** preserve the ability of startups and incumbents to experiment and scale what works. Regulatory sandboxes, API openness and public infrastructure (like UPI/NPCI rails) are key enablers.
2. **Consumer protection and resilience:** as volumes grow, so must safeguards, stronger KYC/screening, fraud monitoring, transparent pricing, and accessible grievance redressal systems. The government and industry have introduced technical and procedural measures, but continuous enhancement is necessary.
3. **Sustainable business models and investor discipline:** the funding environment has shifted to reward clearer paths to profitability and governance. Fintech players must demonstrate robust risk controls, compliance, and realistic unit economics to sustain investor confidence.

An integrated approach across regulators, industry bodies, and civil-society stakeholders can create an ecosystem that fosters innovation while reducing systemic and consumer risks.

### Recommendations

Based on the evidence and challenges discussed, the following recommendations are offered for policymakers, regulators, industry participants and other stakeholders.

#### 1. Strengthen Consumer Protection and Financial Literacy

- Implement clearer disclosure standards for digital credit (transparent APRs, fees, and repayment schedules).
- Expand public campaigns and targeted financial literacy programs addressing social engineering scams, authentication hygiene, and safe transaction practices — using local languages and vernacular media.

#### 2. Enhance Data Governance and Privacy Protections

- Adopt robust data protection rules that balance innovation with user rights (consent, portability, purpose limitation). Consider sector-specific rules for financial data sensitivity and cross-border transfers.
- Promote privacy-preserving techniques (tokenization, differential privacy) for analytics and scoring.

### 3. Improve Regulatory Coordination and Clarity

- Create formal coordination mechanisms across RBI, SEBI, IRDAI, NPCI and Ministry of Finance for products spanning multiple domains (embedded finance, combined products).
- Provide clearer licensing/registration pathways for new fintech models to reduce regulatory uncertainty.

### 4. Institutionalize Fraud Monitoring and Incident Reporting

- Strengthen real-time fraud-detection collaboration between banks, fintech platforms and law enforcement. Standardize incident reporting, timelines and remediation procedures; maintain public dashboards for transparency where appropriate.

### 5. Promote Responsible Lending and Market Conduct

- Enforce robust suitability assessments for digital credit and standardize grievance redressal. Encourage industry self-regulatory bodies to set code-of-conduct standards for collections and data usage.

### 6. Support Financial Inclusion with Localized Solutions

- Encourage product designs for low-connectivity and low-literacy contexts (USSD/IVR-based flows, vernacular UIs, assisted onboarding through local agents). Link these to last-mile payment acceptance infrastructure for merchants.

### 7. Foster Sustainable Funding & Operational Resilience

- Support mechanisms that encourage long-term capital and prudent governance (e.g., investor education, improved disclosure standards). Promote risk management best practices to ensure resilience to shocks.

### Conclusion

Fintech has catalyzed a structural transformation in India's financial sector. UPI's meteoric rise illustrates how interoperable infrastructure, supportive regulation and market dynamics can drive rapid financial digitization. Fintech startups and incumbent financial institutions together expanded access, improved convenience, and introduced new products across payments, lending, insurance, and investments. However, the revolution is incomplete: fraud and cyber risks, data governance gaps, regulatory coordination challenges, funding volatility, and the persistent digital divide require urgent attention.

Sustainable, inclusive fintech requires policy frameworks and industry practices that preserve innovation while protecting consumers and the financial system. With targeted interventions, stronger data protection, consumer literacy, harmonized regulation, and responsible capital deployment, India's fintech ecosystem can continue to deepen financial inclusion and contribute to economic growth. The evidence suggests tremendous progress, but also a clear roadmap of policy and operational priorities to make the fintech revolution durable and equitable.

### References

1. Anusha p. Fintech issues and challenges in India. International journal on recent technology and engineering, 2019, 904-908.

2. Dwivedi. FinTech an inclusive technological framework for the Indian Financial Ecosystem. Journal on fintech in indian ecosystem, 2020, 18-25.
3. Shrivastava D. Fintech Industry in India: History, Growth, And Future Of Fintech In India, 2020. Retrieved from <https://startuptalky.com/fintech-industries-in-india/>
4. Wilson R. 20 Most Promising Indian Fintech Startups As Per CB Insights, 2020. Retrieved from <https://www.marketingmind.in/20-most-promising-indian-fintech-startups-as-per-cb-insights-2020-list/>
5. Kapadia s. India: "How Digitization Is Impacting Banking Transactions and Financial Markets in India? Journal On Digitalisation On The Indian Banking Sector, 2021.
6. Bank for International Settlements. Faster digital payments: Global and regional perspectives — Lessons from the Unified Payments Interface (UPI) BIS Papers, 2024. [https://www.bis.org/publ/bppdf/bispap152\\_e\\_rh.pdf](https://www.bis.org/publ/bppdf/bispap152_e_rh.pdf) (Bank for International Settlements)
7. Department of Financial Services, Government of India. Growth of Various Modes of Digital Payment. Ministry of Finance, 2024. <https://financialservices.gov.in/beta/en/page/growth-various-modes-digital-payment> (Department of Financial Services)
8. Press Information Bureau (PIB), Government of India. UPI processed ₹23.49 Lakh Crores across 16.58 billion financial transactions in October, 2024. <https://www.pib.gov.in/PressReleasePage.aspx?PRID=2079544> (Press Information Bureau)
9. Tracxn. Fintech — India Annual Funding Report, 2024. [https://cdn.tracxn.com/marketing-campaigns/Fintech\\_-\\_India\\_Annual\\_Funding\\_Report\\_-\\_2024\\_Key4q2B9dEym96KF55ugv.pdf](https://cdn.tracxn.com/marketing-campaigns/Fintech_-_India_Annual_Funding_Report_-_2024_Key4q2B9dEym96KF55ugv.pdf) (cdn.tracxn.com)
10. PwC India. The Indian payments handbook, 2029. [https://www.pwc.in/assets/pdfs/indian\\_payment\\_handbook-2024.pdf](https://www.pwc.in/assets/pdfs/indian_payment_handbook-2024.pdf) (PwC)
11. Reserve Bank of India. Enabling Framework for Regulatory Sandbox. RBI documentation on sandbox frameworks and objectives, 2024. <https://www.rbi.org.in/commonman/English/scripts/FAQs.aspx?Id=3822> (Reserve Bank of India)
12. Government/News reporting on UPI frauds and consumer protection measures. UPI fraud reporting and measures to combat digital payment scams. Navbharat Times / Government briefings summary reports, 2024.
13. PwC. FinTech Insights — January 2024. PwC India, 2024. <https://www.pwc.in/assets/pdfs/pwcs-fintech-insights-january-2024.pdf> (PwC)
14. Grant Thornton. India Payments Trends Report 2024. Grant Thornton India. Retrieved from Grant Thornton publications. Grant Thornton Bharat, 2024.
15. India Briefing. (2024, October 17). India's fintech sector attracts US\$778 million in funding in Q3 2024. Retrieved October 2024, from India-Briefing website. India Briefing, 2024.
16. Ministry of Finance, Government of India / Press Information Bureau. Exponential Growth in Digital Transactions (Press release). Press Information Bureau. Retrieved 2024. Press Information Bureau, 2024.
17. Ozili PK. Financial inclusion and fintech research in India: A review. MPRA Paper. (Review article synthesizing financial inclusion research in India). Munich Personal RePEc Archive, 2024.