



THE RISE OF UPI AND DIGITAL BANKING IN INDIA: IMPACTS, CHALLENGES, AND GLOBAL LESSONS

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ABSTRACT

The Unified Payments Interface (UPI), launched in 2016 by the National Payments Corporation of India (NPCI), has become the backbone of India's digital financial transformation. In less than a decade, it has outpaced traditional card-based systems and mobile wallets, recording exponential growth in both transaction value and volume. UPI is more than a technological platform; it represents a state-led approach to building public digital infrastructure that is both interoperable and low-cost. This paper examines UPI's growth trajectory, its implications for banks, fintech players, and consumers, and its role in advancing financial inclusion. Drawing on Reserve Bank of India (RBI) reports, NPCI transaction data, and World Bank Global Findex surveys, the analysis highlights both achievements and unresolved tensions. On the one hand, UPI has expanded access, deepened digital adoption, and positioned India as a global leader in payments innovation. On the other hand, issues of cybersecurity, banks' revenue sustainability, and market concentration continue to raise concerns. A comparative lens with China, Europe, the United States, and Africa underscores India's distinct model, one that combines public infrastructure with private adoption. The paper concludes that UPI's future success will depend on balancing inclusivity with resilience, and on offering lessons adaptable to different global contexts.

KEYWORDS: Unified Payments Interface, Digital Banking, Fintech, Financial Inclusion, India, Global Payments

1. INTRODUCTION

India's financial system has witnessed profound change since the early 2010s, with digitalisation reshaping the way citizens transact and banks operate. Among the many initiatives, the Unified Payments Interface (UPI) stands out as the single most transformative development. Introduced in 2016 by the NPCI under the guidance of the RBI, UPI allows instant money transfer between bank accounts via smartphones, operating round the clock, every day of the year.

The timing of UPI's rise coincided with two critical events in India's economic history: the government's demonetisation exercise in late 2016 and the nationwide adoption of low-cost mobile internet following Reliance Jio's entry. These developments drastically increased demand for cashless payments, and UPI provided the infrastructure to meet that demand. Within a span of nine years, monthly UPI transactions rose from just 0.1 million in 2016 to more than 12 billion in mid-2025, overtaking both debit and credit card usage combined (RBI, 2023; NPCI, 2024).

2. THE UPI MODEL: DESIGN AND INSTITUTIONAL FRAMEWORK

The architecture of UPI reflects a unique blend of public initiative and private participation. The NPCI, a not-for-profit organisation jointly owned by the RBI and a consortium of Indian banks, developed the platform. Unlike credit card networks, which are dominated by private global players such as Visa and Mastercard, UPI was designed as public infrastructure, accessible to all banks and payment service providers.

Its key features explain much of its success. First, UPI transactions are real-time and interoperable, meaning that a customer of one bank can seamlessly transfer money to another, regardless of platform. Second, UPI operates 24x7, an advantage over earlier payment systems such as NEFT or RTGS, which had banking-hour restrictions. Third, UPI requires only a smartphone and an internet connection, eliminating the need for a physical card or point-of-sale machine. Fourth, and perhaps most crucially, UPI transactions are either free or involve negligible costs due to government policy support.

3. GROWTH OF UPI (2016–2025)

The trajectory of UPI adoption has few parallels in the history of financial technology. From just 21 member banks at its launch in 2016, UPI now includes nearly all scheduled commercial banks in India. Monthly transaction volumes, which barely touched one lakh in its first year, crossed one billion by October 2019. By July 2025, the system was processing more than twelve billion transactions every month with a transaction value exceeding ₹19 lakh crore (NPCI, 2024).

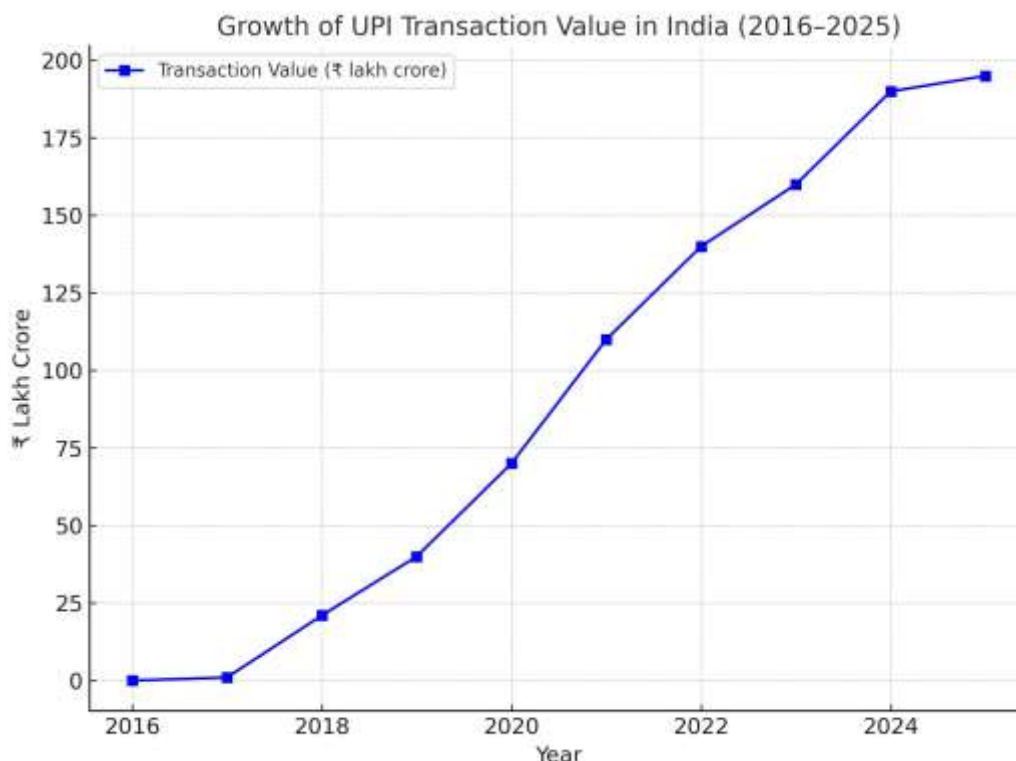
Several structural factors explain this growth. The first is the mobile internet revolution. The entry of Reliance Jio in 2016 lowered data costs drastically, making smartphones affordable for millions of new users. By 2025, India had over 800 million smartphone users, providing a large digital-ready base. The second factor was the policy push. The government and RBI encouraged banks and merchants to adopt digital payments, while the BHIM app acted as a demonstration platform to build initial trust. Third, demonetisation in late 2016 created an abrupt



shortage of cash, nudging both consumers and merchants towards digital alternatives.

A fourth factor was the COVID-19 pandemic, which turned digital payments from a convenience into a necessity. Lockdowns, social distancing norms, and concerns over handling cash boosted UPI volumes in 2020–21.

Figure 1: Growth of UPI Transaction Value in India (2016–2025)



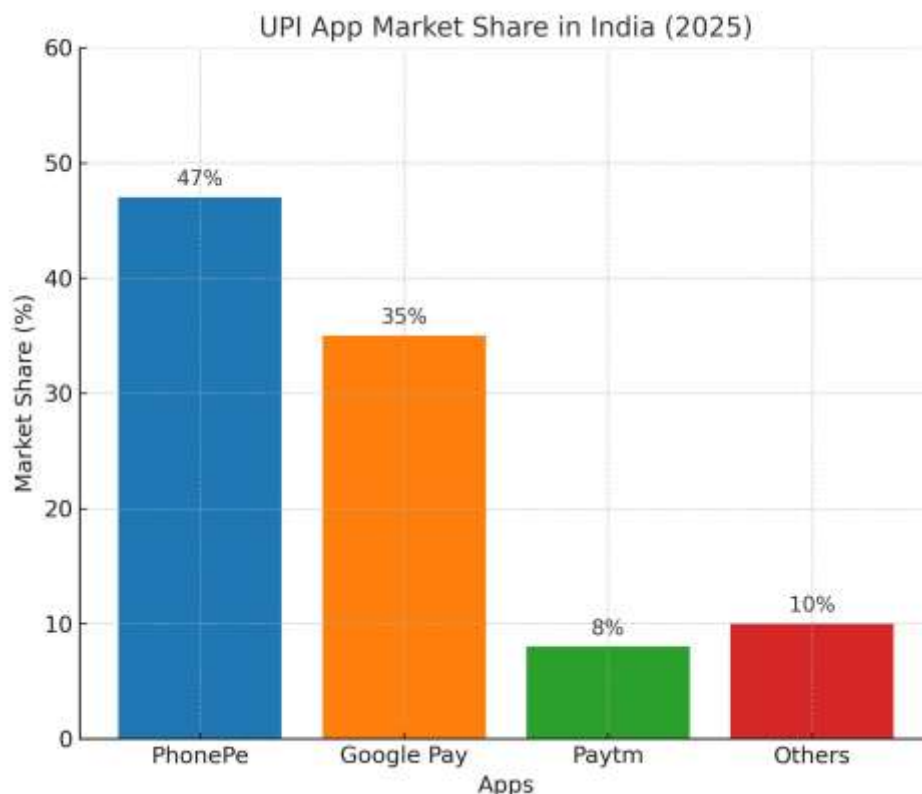
4. IMPACT ON BANKS AND THE FINANCIAL SYSTEM

The rise of UPI has had mixed consequences for Indian banks. On the one hand, UPI transactions enhance customer engagement by keeping users within the banking ecosystem. A customer who frequently uses UPI is more likely to remain active on their savings account, making them easier to cross-sell other services such as loans, insurance, or investment products. For banks, therefore, UPI serves as a digital touchpoint that maintains customer relationships in a competitive environment.

On the other hand, the economics of UPI are problematic for banks. The government's decision to enforce a zero-MDR (merchant discount rate) policy means that banks earn virtually no revenue from processing UPI transactions. Unlike debit or credit card payments, where a small percentage fee accrues to banks and networks, UPI is effectively costless to the consumer and merchant. The burden of maintaining servers, ensuring settlement, and handling dispute resolution falls on banks without direct compensation.



Figure 2: UPI App Market Share in India (2025)



5. UPI AND FINANCIAL INCLUSION

One of the most celebrated aspects of UPI is its contribution to financial inclusion. By linking with the Jan Dhan accounts and Aadhaar-based KYC, UPI created an accessible payment channel even for low-income households. Direct Benefit Transfers (DBTs) during the COVID-19 lockdowns were often routed through Jan Dhan accounts, and UPI provided the simplest means for beneficiaries to access funds.

Survey evidence suggests that digital payment adoption has penetrated segments of the population that were previously excluded. According to the World Bank's Global Findex Database (2022), around 80 per cent of Indian adults reported making or receiving a digital payment in 2021, compared with less than 30 per cent in 2014. Much of this increase can be attributed to UPI's simplicity and interoperability.

Table 1: UPI vs Debit and Credit Card Transaction Values in India (2016–2025, ₹ lakh crore)

Year	UPI (₹ lakh crore)	Debit Cards (₹ lakh crore)	Credit Cards (₹ lakh crore)
2016	0	8	3
2017	1	9	3
2018	21	10	4
2019	40	12	5
2020	70	14	6
2021	110	16	7
2022	140	18	8
2023	160	19	9
2024	190	20	10
2025	195	21	11

6. CHALLENGES AND RISKS

While UPI is widely regarded as a success story, its rapid expansion has exposed several vulnerabilities. The most immediate concern is cybersecurity. Reports of phishing, fraudulent apps, and social engineering scams have increased alongside transaction volumes. Many first-time users, especially in rural areas, lack the digital literacy to distinguish genuine

platforms from fraudulent ones. The RBI has repeatedly issued public advisories, but policing such risks at scale is difficult.

7. GLOBAL COMPARISONS

In China, digital payments are dominated by private players such as Alipay and WeChat Pay. These platforms offer not just payments but entire ecosystems. By contrast, India's UPI is open



and interoperable, designed as public infrastructure. In Europe, the Single Euro Payments Area (SEPA) Instant system has seen modest adoption due to fees. In the US, Zelle and FedNow illustrate fragmentation. In Africa, M-Pesa highlights an alternative model using telecom networks.

8. LESSONS FOR GLOBAL PAYMENTS

UPI demonstrates the potential of public digital infrastructure in scaling payments. Its low-cost model ensured mass adoption, though it also created financial stress for banks. The Indian case underscores that success relies on supportive context—cheap mobile internet, Aadhaar-linked KYC, and policy push. Other countries may find lessons here but must adapt them to their own conditions.

9. CONCLUSION AND POLICY IMPLICATIONS

UPI represents a striking example of how digital technology can reshape finance in an emerging economy. Its growth has been dramatic, its reach unparalleled, and its contribution to financial inclusion undeniable. Yet challenges remain: ensuring bank sustainability, strengthening cybersecurity, and avoiding concentration. For the world, UPI is both an inspiration and a cautionary tale: proof that inclusive payments are possible, but also a reminder that scale brings its own vulnerabilities.

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