

The Role of UPI in Digital Economic Transformation in India (2019–2025)

Nishat Fatma

Ph.D. Research Scholar, Department of Commerce, Ranchi University, Ranchi, Jharkhand, India

Abstract—India's digital economy has seen considerable transformation over the past decade, with the Unified Payments Interface (UPI) emerging as one of the most significant innovations in the financial space. The Unified Payments Interface (UPI), launched by the National Payments Corporation of India (NPCI) in April 2016, has revolutionized digital payments by providing a secure, real-time, and interoperable payment system. Between 2019 and 2025, UPI is projected to witness rapid growth in transaction volume and value, driven by rising smartphone adoption, government initiatives, fintech innovation, and changing consumer behaviors. This study presents a secondary data analysis of the UPI's growth trajectory between 2019 and 2025, drawing on statistics published by the NPCI, the Reserve Bank of India (RBI), the Press Information Bureau (PIB), and secondary industry sources. The analysis explores growth in transaction volume and value, bank and merchant participation, application-level market concentration, and the mix of person-to-person (P2P) versus person-to-merchant (P2M) transactions. The findings show annual transaction volume grows from approximately 10.79 billion in 2019 to 228.3 billion in 2025, a more than twenty-one-fold increase, while the transaction value increases from ₹18.17 lakh crore to ₹299.7 lakh crore over the same period. The majority of digital retail payments in India now take place through UPI, which the International Monetary Fund recognizes as the world's largest real-time payment system. This article discusses the policy, infrastructural, and behavioral factors driving this growth, as well as persistent challenges such as platform concentration, rural-urban usage gaps, and monetisation. Implications for financial inclusion and digital public infrastructure (DPI) policy are considered.

Index Terms—UPI, digital payments, India, financial inclusion, NPCI, fintech, digital public infrastructure.

I. INTRODUCTION

Digital payment systems have become the cornerstone of modern economic development. In India, the

introduction of the Unified Payments Interface (UPI) has revolutionized the way individuals and businesses conduct financial transactions. UPI enables instant money transfers through mobile applications without requiring bank account details, making digital payments faster, cheaper, and more accessible. A significant milestone in this transformation is the launch of the Unified Payments Interface (UPI), developed by the National Payments Corporation of India (NPCI) under the guidance of the Reserve Bank of India (RBI). UPI enables real-time money transfers between bank accounts using smartphones without requiring bank account details. Users can transfer funds using Virtual Payment Addresses (VPAs), QR codes, or mobile numbers, making digital transactions secure, simple, and accessible. Since its launch on 11 April 2016, UPI has experienced unprecedented growth and has become the world's largest real-time retail payment system. By FY 2024–25, UPI accounted for approximately 81% of India's retail digital payment volume, highlighting its key role in the country's payment ecosystem.

Several government initiatives including Digital India, the Jan Dhan Yojana, the Aadhaar card, increasing smartphone penetration, affordable internet, and fintech innovations have accelerated the use of UPI. During the COVID-19 pandemic, contactless digital payments further boosted UPI usage as individuals and businesses transitioned to cashless transactions.

Between 2019 and 2025, UPI witnessed significant growth in transaction volume and value, promoting financial inclusion, improving transparency, reducing transaction costs, and increasing economic efficiency. UPI has also facilitated merchant digitization, the growth of e-commerce, peer-to-peer payments, and government benefit transfers. UPI'S expansion into international markets further demonstrates its growing global recognition as an ideal digital payment system.

This research analyzes UPI'S contribution to India's digital economy using secondary data from official reports and published literature. The findings of this research are expected to provide insights into UPI's role in promoting digital financial inclusion and sustainable economic growth.

1.1 Objectives of the Study

This article pursues five objectives:

- To document the growth of UPI transaction volume and value between 2019 and 2025.
- To examine the expansion of bank participation and application-level market structure.
- To analyse the structure of transactions across person-to-person (P2P) and person-to-merchant (P2M) categories.
- To analyse the impact of UPI on cashless transactions and digital commerce.

- To discuss the policy and infrastructural factors underlying UPI's growth and remaining challenges.

II. LITERATURE REVIEW

The rapid growth of the Unified Payments Interface (UPI) has attracted major academic and policy attention. Researchers have examined UPI from different perspectives, including technology adoption, digital payments, financial inclusion, consumer behavior, and economic development. Most studies conclude that UPI has substantially transformed India's payment ecosystem through real-time, low-cost, and interoperable digital transactions. Recent reviews also emphasize that UPI's ease of use, interoperability, and security have accelerated its adoption while supporting the Government of India's vision of a less-cash economy.

Table 1. Review of Selected Literature

Author(s)	Year	Study Focus	Major Findings	Research Gap
Venkatesh et al.	2020	Digital payment adoption	Perceived usefulness and ease of use significantly influence adoption.	Limited post-pandemic evidence.
RBI	2021	Digital Payments	Digital payments upgrade financial inclusion and payment efficiency.	Limited emphasis on UPI's long-term economic impact.
Kumar & Sharma	2021	Consumer Behaviour	Smartphone penetration increased UPI adoption.	Rural adoption not comprehensively examined.
NPCI Reports	2022	UPI Performance	Continuous growth in transaction volume and merchant acceptance.	Mostly descriptive statistics.
Singh & Gupta	2022	Financial Inclusion	UPI expanded access to banking for underserved populations.	Lack of macroeconomic assessment.
RBI Annual Report	2023	Payment Systems	UPI became India's dominant retail payment system.	Future sustainability challenges remain.
Patil et al.	2023	FinTech Innovation	FinTech partnerships accelerated digital payments.	Limited comparative analysis with other payment systems.
Sahoo et al.	2024	Literature Review	UPI improved accessibility, security, and financial inclusion.	Need for empirical trend analysis using recent data.
Chandak & Shukla	2024	UPI Adoption	Adoption influenced by convenience, interoperability, and mobile penetration.	Limited secondary data analysis covering 2025.
Goyat & Nandal	2024	Growth Analysis	UPI exhibited exponential growth in transaction volume and value.	Requires extension with the latest official statistics.

III. RESEARCH GAP

Although several studies have examined UPI adoption, digital payment behavior, and financial inclusion, significant research gaps remain.

- Most prior studies focus on consumer adoption rather than the broader transformation of India's digital economy.
- Many analyses use data only up to 2022 or 2023, leaving recent developments inadequately captured.

- Limited research integrates official secondary data from NPCI, RBI, and Government reports over a longer period.
- Few studies comprehensively evaluate UPI's contribution to digital commerce, financial inclusion, and cashless transactions within a single framework.
- Emerging challenges such as cybersecurity, digital fraud, infrastructure constraints, and long-term sustainability have received insufficient discussion.

This study addresses these gaps through extensive secondary data analysis covering the period 2019–2025, using official datasets and published reports.

IV. RESEARCH METHODOLOGY

This is a purely secondary-data analysis; no primary survey or transaction-level data were collected. Quantitative data relating to UPI transaction volume, transaction value, bank participation, and application-wise market share were compiled from publicly available statistical releases by the NPCI (2026a, 2026b), PIB (2026), and confirmed with industry aggregators such as Statista, CoinLaw, and Oxygen Wallet, which themselves obtain data from NPCI's monthly bulletins. To maintain consistency, Calendar-year figures (January–December) have been used throughout the analysis, except where a source explicitly reports financial-year (April–March) data, which is noted accordingly. Year-on-year (YoY) growth rates have been calculated from the compiled volume and value series. Since published figures are periodically revised by NPCI in subsequent bulletins, there may be slight differences of 1–2% between sources; the figures reported here reflect the latest published values as of mid-2026.

V. FINDINGS

5.1 Growth in Transaction Volume and Value

UPI's growth since 2019 has been exponential rather than linear. Annual transaction volume increased from approximately 10.79 billion transactions in 2019 to 228.3 billion in 2025, while the corresponding transaction value rose from ₹18.17 lakh crore to ₹299.7 lakh crore during the same period (NPCI, 2026a; PIB, 2026).

Table 2 summarises the year-wise trend, and Figure 1 presents the same data graphically.

Table 2. Year-wise UPI Transaction Volume and Value in India, 2019–2025

Year	Transaction Volume (billion)	Transaction Value (₹ lakh crore)	YoY Volume Growth (%)
2019	10.79	18.17	
2020	22.33	41.03	107.0
2021	38.75	71.87	73.5
2022	74.05	125.94	91.1
2023	118.30	182.84	59.8
2024	172.20	246.82	45.6
2025	228.30	299.70	32.6

Figure 1
Growth of UPI Transaction Volume and Value in India (2019–2025)

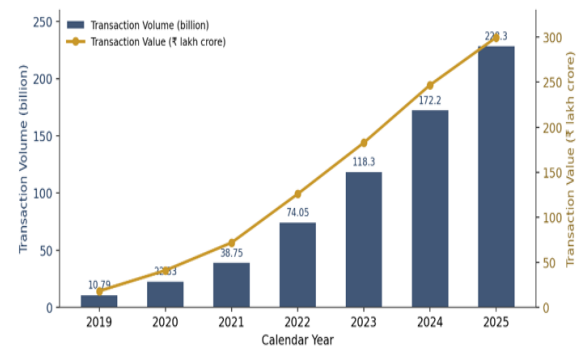


Figure 1. Growth of UPI transaction volume and value, 2019–2025. Source: NPCI (2026a); PIB (2026).

Figure 1 shows the growth trend in UPI transaction volume and value between 2019 and 2025; both indicators show consistent and robust growth over the study period, reflecting the increasing adoption of UPI as a preferred digital payment platform in India.

The compound annual growth rate (CAGR) of transaction volume over this period exceeds 68%, although the pace of growth has slowed as the base has expanded. As shown in Figure 2, year-on-year volume growth peaked at over 100% in 2020 partly due to a low-base effect and accelerated digital adoption during the COVID-19 pandemic after which it stabilized at a significant annual growth rate of 30–45% in 2023–2025. According to Industry estimates, UPI could process nearly one billion transactions per day by FY 2026–27, with transaction value projected to reach ₹532 lakh crore by 2029 (Meetanshi, 2026).

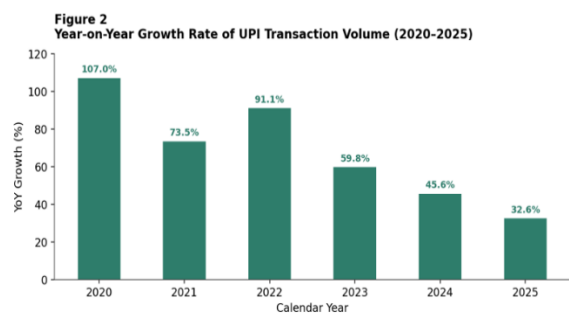


Figure 2. Year-on-year growth rate of UPI transaction volume, 2020–2025. Source: Author's calculation based on NPCI data (2026a).

Figure 2 illustrates the year-on-year growth rate of UPI transaction volume from 2020 to 2025. The growth rate peaked at 107.0% in 2020 and then gradually declined to 32.6% in 2025, indicating that UPI transactions continued to grow, but as the platform matured and achieved widespread adoption, the pace of growth slowed.

5.2 Expansion of Bank and Merchant Participation

A key driver of UPI's widespread expansion has been the rapid participation of banks as sender and beneficiary payment service providers (PSPs). From 44 banks at the time of UPI's launch in FY 2016–17, the number of banks has grown to 703 by FY 2025–26 (PIB, 2026). These include public sector banks, private banks, small finance banks, payment banks, and cooperative banks. This widespread participation has played a key role in expanding UPI's reach to semi-urban and rural India. It is supported by the Reserve Bank's Payments Infrastructure Development Fund (PIDF), which had deployed approximately 5.45 crore digital touchpoints in Tier-3 to Tier-6 centres by late 2025 (CoinLaw, 2026).

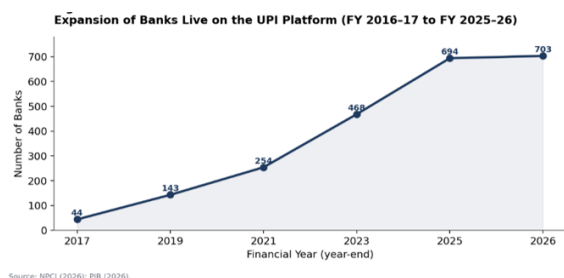


Figure 3. Expansion of banks live on the UPI platform, FY 2016–17 to FY 2025–26. Source: NPCI (2026a); PIB (2026).

For the merchants, UPI's zero merchant discount rate (MDR) policy for most transactions, implemented since January 2020, has been widely credited with increasing its acceptance by merchants, especially among small grocery stores and informal retailers who had previously found card-based infrastructure too expensive (Wikipedia, 2026). QR code usage is projected to reach approximately 678 million by mid-2025, and the number of acceptance points, equivalent to point-of-sale terminals, is projected to reach 11.2 million (Meetanshi, 2026).

5.3 Application-Level Market Structure

Despite many banks and third-party application providers (TPAPs) active on UPI, transaction volume remains limited to a few applications. Recently, by 2025, PhonePe and Google Pay together will account for approximately 79–80% of total transaction volume, with PhonePe alone estimated to process 45.5% of transactions (Oxigen Wallet, 2026). Table 2 and Figure 4 summarise the application-level market share.

Table 3. Estimated Market Share of Leading UPI Applications by Transaction Volume and Value, 2025

UPI Application	Volume Share (%)	Value Share (%)	Rank
PhonePe	45.5	46.8	1
Google Pay	34.0	33.2	2
Paytm	7.0	6.5	3
Navi / super. money	5.5	4.1	4
Other TPAPs & Bank Apps	8.0	9.4	5

Market Share of Leading UPI Applications by Transaction Volume (2025)

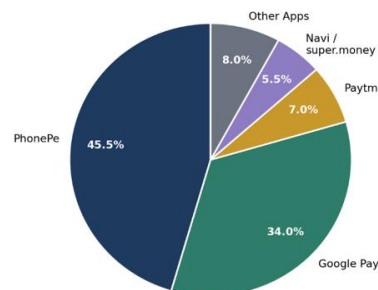


Figure 4. Market share of leading UPI applications by transaction volume, 2025 source: NPCI app-wise statistics (2025); Oxigen Wallet (2026).

To address concerns about over-concentration and systemic risk, NPCI has retained a policy proposal to limit the volume share of any single TPAP to 30%, though its implementation has been repeatedly postponed; by mid-2026, this limit was scheduled to take effect six months after a further relaxation granted in December 2024 (CoinLaw, 2026). NPCI has also approved additional TPAPs 20 in 2024 alone in an effort to dilute the PhonePe–Google Pay duopoly, and by May 2026 their combined share will fall below 80% for the first time since app-wise reporting began (CoinLaw, 2026).

5.4 Transaction Composition: P2P versus P2M

UPI transactions are broadly classified into person-to-person (P2P) transfers and person-to-merchant (P2M) payments. Table 4 shows that while P2M transactions account for the majority of transaction volume reflecting high-frequency, low-value retail and everyday purchases P2P transfers continue to dominate transaction value, consistent with their use for larger remittances, rent, and informal lending among individuals (PIB, 2026).

Table 4. Person-to-Person (P2P) versus Person-to-Merchant (P2M) Transaction Split, H1 2025

Segment	Share of Volume (%)	Share of Value (%)
Person-to-Person (P2P)	37	71
Person-to-Merchant (P2M)	63	29

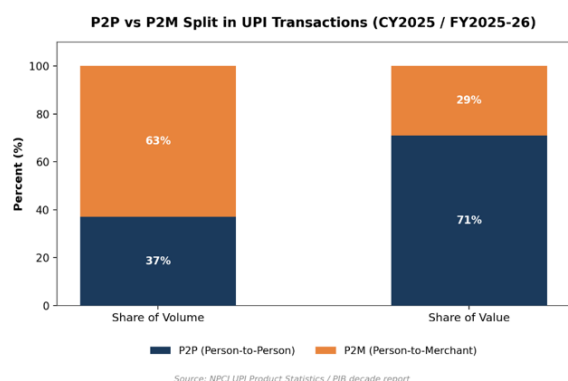


Figure 5: Person-to-Person (P2P) vs Person-to-Merchant (P2M) split by transaction volume and value, CY2025/FY2025-26.

Table 4 and Figure 5 show the distribution of UPI transactions between person-to-person (P2P) and

person-to-merchant (P2M). P2M transactions account for a higher share of transaction volume, 63%; P2P transactions account for a higher share of transaction value, 71%, reflecting higher-value transfers such as rent, remittances, and personal fund transfers.

5.5 International Expansion

In addition to its domestic market, UPI has been extended to several international markets, including Bhutan, Singapore, France, Mauritius, Sri Lanka, Nepal, United Arab Emirates, and Qatar, enabling cross-border acceptance for Indian travellers. (Meetanshi, 2026). NPCI's international arm has signed MoUs to help other jurisdictions, including Peru and Namibia, develop domestic instant payment systems like UPI, thereby establishing India's digital public infrastructure (DPI) stack as an exportable governance and technology model (Inc42, 2025).

Table 5: Selected UPI cross-border milestones, 2021–2026. Source: NPCI, PIB, GrabOn compilation.

Country	Milestone
Bhutan	First UPI QR acceptance outside India (July 2021)
Singapore	Linked with PayNow for instant cross-border transfers (Feb 2023)
France	First European acceptance point, launched at the Eiffel Tower (Feb 2024)
Mauritius	UPI and RuPay jointly launched (Feb 2024)
Sri Lanka	QR-based UPI payments via LankaPay (Feb 2024)
Nepal	Launched with Fonepay; extended to a P2P corridor in June 2026
UAE	Rollout across 60,000+ merchant locations (July 2024)
Qatar	Broader retail acceptance including Qatar Duty Free (2025)

VI. DISCUSSION

The trends described above suggest that UPI's expansion is driven by a combination of regulatory design choices, infrastructural investment, and behavioral changes driven by the COVID-19 pandemic. The zero-MDR policy, interoperability between banks and applications, and simplified onboarding (including QR-code-based merchant registration) have reduced the transaction costs of adopting digital payment for both consumers and small businesses. Furthermore, the continued expansion of 4G/5G mobile coverage and declining data costs (to an average of approximately ₹9.34 per

gigabyte by 2025) have created the necessary infrastructure conditions for a mobile-first payment system to scale nationally (Meetanshi, 2026).

UPI's contribution to financial inclusion is significant, but its analysis should be interpreted with some caution. However, data from Redseer Strategy Consultants, cited in secondary sources, suggest that most new UPI users originate from Tier-2 cities and beyond (Wikipedia, 2026); transaction-value data continue to show geographic concentration in economically advanced states such as Tier-1 cities. (Meetanshi, 2026). This suggests that while UPI has expanded the base of digital payment users, high-value economic activities conducted through the platform remain geographically uneven.

The fact that even now, there is still a duopoly market structure existing among third-party apps raises the issues of systemic concentration risks, data management, and sustainability of a zero-MDR system for private payment intermediaries, whose business models rely on selling financial products such as loans and insurance services rather than charging fees for payment processing (Inc42, 2025). The fact that NPCI has come up with a 30% volume cap reflects this concern.

VII. CHALLENGES AND POLICY IMPLICATIONS

7.1 Challenges

Despite remarkable achievements, several challenges remain.

Challenge	Description
Cybersecurity Threats	Incidents of phishing, fraud, and identity theft are on the rise.
Digital Fraud	Fake payment screenshots, QR-code scams, and social Engineering attacks.
Digital Divide	Unequal access to smartphones and internet connectivity.
Infrastructure Issues	Network congestion during peak transaction periods.
Digital Literacy	Limited awareness among First-Time users.
Security Concerns	Security of user data and personal information.
Operational Sustainability	Ensuring Long-Term investment and Funding for Payment Infrastructure.

These challenges highlight the importance of continuous investment in technology, regulation, and consumer awareness to sustain UPI's growth.

7.2 Policy Implications

The findings suggest several policy implications for strengthening India's digital payment ecosystem.

1. Strengthening Cybersecurity

As transaction volumes continue to grow, investment in fraud detection, AI-based monitoring, and cybersecurity infrastructure should be increased to protect users from digital payment fraud.

2. Improving Digital Literacy

Digital payment awareness campaigns should be expanded, especially in rural and semi-urban areas, to improve financial and digital literacy.

3. Enhancing Rural Connectivity

Reliable internet connectivity and digital infrastructure should be strengthened in underserved areas to promote inclusive access to digital payments.

4. Supporting Small Merchants

Government agencies and financial institutions should continue to encourage small businesses to adopt QR-based payment systems through training and technical assistance.

5. Encouraging Innovation

Regulatory bodies should continue to support innovation in digital payment technologies while maintaining strong consumer protection standards.

6. Promoting International Expansion

The expansion of UPI into cross-border payment systems can strengthen India's position in the global digital economy and help accelerate international remittances.

VIII. CONCLUSION

Between 2019 and 2025, UPI evolved from an emerging domestic payment medium into the world's largest real-time payment system by transaction volume, processing over 228 billion transactions worth nearly ₹300 lakh crore in 2025 alone. Its growth reflects the consolidation of regulatory frameworks, increased participation of banks and merchants, declining data costs, and behavioural changes driven by the pandemic. UPI's progress has made it a central pillar of India's digital public infrastructure and a widely cited model for other countries seeking to build real-time national payment systems. Continued focus on addressing market concentration, geographic equity in usage, and platform monetisation will be critical to ensuring that the next phase of UPI's evolution is sustainable and broadly inclusive.

IX. LIMITATIONS OF THE STUDY

The following limitations have been identified in the study:

- It is based solely on secondary data available in reports and the literature.
- It does not make use of any primary survey or interviews.
- It has been done only for India.
- It analyzes the time period of 2019-2025 and does not assess beyond that period.

The accuracy of the analysis depends upon the availability of secondary data.

X. FUTURE SCOPE

Future research may:

- Conduct a comparative study of the UPI system with other international real-time payment systems like Brazil's Pix or PayNow of Singapore.
- Conduct primary surveys of customer satisfaction and behavior changes due to UPI.
- Study the effect of UPI on small and medium enterprises or rural entrepreneurship.
- The effect of AI and blockchain technology on digital payments.
- Analyze cross-border UPI adoption and its implications for international remittances.
- Study long-term economic effects of digital payment infrastructure on GDP growth and financial inclusion.

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