



# An Empirical Study Of Digital Payments And Their Impact On The Indian Economy

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## Abstract:

The Indian economy has been witnessing a profound transformation in its payment landscape, driven by the rapid adoption of digital payment systems. Over the past decade, technological innovations, policy initiatives, and behavioural shifts have accelerated the move from cash-based transactions to digital modes. Digital payments encompass a variety of platforms such as Unified Payments Interface (UPI), mobile wallets, Aadhaar-enabled Payment Systems (AePS), point-of-sale (PoS) transactions, debit and credit cards, internet banking, and QR code-based payment systems. This paper examines the evolution of digital payments in India, the drivers of their adoption, and their impact on economic growth, financial inclusion, transparency, and cost efficiency. Using secondary data from RBI reports, NPCI statistics, and global studies, the paper analyses the correlation between digital transaction volumes and macroeconomic performance indicators. The findings indicate that while digital payments have led to significant improvements in efficiency and transparency, challenges remain in the form of rural infrastructure gaps, cyber risks, and uneven digital literacy. The paper concludes by offering recommendations for strengthening the digital payments ecosystem to maximize its contribution to the Indian economy.

**Key words:** Point of sale, Platforms, Financial inclusion, Transparency.

## Introduction

India's payment ecosystem has historically been dominated by cash, with over 85% of transactions in value terms being cash-based as recently as 2011. However, in the last decade, there has been a dramatic shift toward digital modes of payment. This shift has been driven by a combination of factors: Policy push (e.g., Digital India initiative, Jan Dhan Yojana, demonetization in 2016).

Technological innovation (e.g., launch of UPI in 2016). Changing consumer behaviour due to smartphone penetration and affordable mobile data. According to the Reserve Bank of India, the total number of digital transactions in India reached 14,726 crore in FY 2023–24, compared to just 593 crore in FY 2015–16, indicating a compound annual growth rate (CAGR) of over 45%. India's payment ecosystem has historically been dominated by cash, with over 85% of transactions in value terms being cash-based as recently as 2011. However, in the last decade, there has been a dramatic shift toward digital modes of payment. This shift has been driven by a combination of factors including policy pushes such as the Digital India initiative, Jan Dhan Yojana, and demonetization in 2016, technological innovation such as the launch of UPI in 2016, and changing consumer behaviour due to smartphone penetration and affordable mobile data. According to the Reserve Bank of India, the total number of digital transactions

in India reached 14,726 crore in FY 2023–24, compared to just 593 crore in FY 2015–16, indicating a compound annual growth rate of over 45%.

The importance of digital payments extends beyond convenience;

- a) Economic formalization.
- b) Reduction in transaction costs.
- c) Financial inclusion of underserved populations.
- d) Transparency and improved governance.
- e) This research explores these aspects comprehensively.

## Evolution of Digital Payments in India

The digital payment landscape in India has evolved in four distinct phases:

### Pre-2010: Early Initiatives

Before 2010, digital payments in India were limited to card-based payments and basic internet banking services. Usage was concentrated in urban areas and among higher-income groups.

### 2010–2015: Foundation Building

The launch of Aadhaar created the foundation for biometric authentication in payments. The National Payments Corporation of India (NPCI) expanded infrastructure for interbank transactions. Mobile banking started to gain traction.

### 2016–2020: Policy Push and Adoption Surge

Demonetization (2016) forced a sudden shift toward non-cash transactions. UPI launch revolutionized peer-to-peer and merchant payments. Mobile wallets like Paytm, PhonePe, and Google Pay expanded rapidly.

### 2020–Present: Acceleration via Pandemic and Fintech

COVID-19 restrictions increased the need for contactless payments. UPI crossed 1,000 crore transactions per month by late 2023. Integration of digital payments with e-commerce, transport, and public services expanded usage.

### Gaps identified in literature:

- a) Limited focus on rural adoption challenges.
- b) Need for empirical evidence on long-term macroeconomic impact.

### Objectives of the study

- a) To analyse the growth trends in digital payments in India.
- b) To assess the economic impact of digital payments on GDP, transparency, and financial inclusion.
- c) To identify the key challenges and barriers to adoption.

## Methodology

**Type of Study:** This paper consist descriptive and analytical type of study.

**Population:** Present study consist all the online payment modes which are operated in India.

**Sampling Method:** Simple random sampling methods are used to choose sample from the population.

**Type of Data:** Secondary data were used from RBI, NPCI, NITI Aayog, World Bank, Ministry of Finance, and peer-reviewed journals.

**Statistical Tools:** statistical tools such as Trend analysis, correlation studies, and averages are used to give meaning full suggestions.

**Scope of the study:** Covers India's digital payment landscape from 2015 to 2024, focusing on major instruments such as UPI, cards, wallets, and Aadhaar-enabled systems

## **DATA ANALYSIS AND INTERPRETATION**

### **Growth trends in digital payments**

**Table no.01**

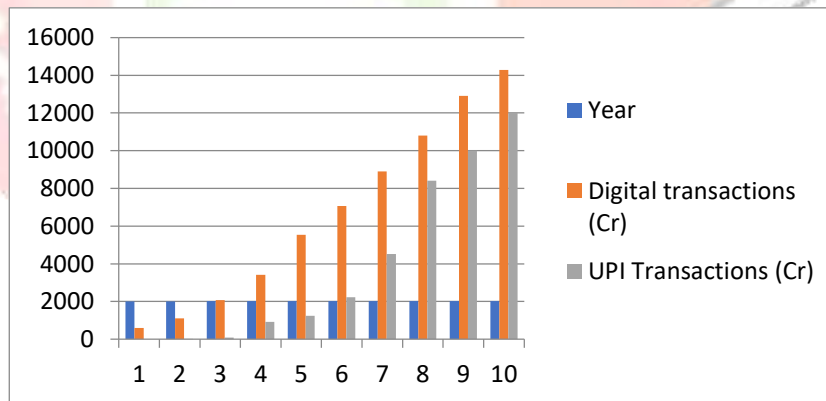
**Table shows Year wise growth digital transaction and UPI transaction**

Year	Digital transactions (Cr)	UPI transactions (Cr)
2015	593	0
2016	1100	2
2017	2071	91
2018	3423	915
2019	5537	1240
2020	7070	2233
2021	8900	4520
2022	10800	8400
2023	12900	10000
2024	14276	12000

Above table depicts the year wise digital transactions and UPI transactions. It shows a significant growth in digital transactions and UPI transactions from 2015 to 2024.

**Diagram no.01**

**Diagram shows Year wise growth digital transaction and UPI transaction**



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### **Correlation Coefficient Calculation**

X	593	1100	2071	3423	5537	7070	8900	10800	12900	14276
Y	0	2	91	915	1240	2233	4520	8400	10000	12000

Using the given data, the correlation coefficient ( $r$ ) can be calculated as:  $r \approx 0.97$ . The correlation coefficient ( $r \approx 0.97$ ) indicates a strong positive correlation between digital transactions and UPI transactions. This suggests that as digital transactions increase, UPI transactions also tend to increase.

## Impact on Economic Growth

Digital payments increase economic efficiency by:

- a) Reducing transaction time and costs.
- b) Enhancing liquidity flow in markets.
- c) Supporting small businesses in accessing wider markets.

The RBI's 2023 report estimated that every 10% increase in digital transaction volume could lead to a 0.2–0.3% rise in GDP.

## Financial Inclusion

UPI and Aadhaar-enabled Payment Systems have brought banking services to rural areas without requiring physical branches.

PMJDY accounts linked with digital payment apps have increased access to credit.

## Transparency and Governance

- a) Digital payments leave verifiable trails, improving auditability
- b) GST collections improved due to traceable transactions.
- c) Reduction in “black money” transactions.

## Cost Reduction in Currency Management

The cost of printing, distributing, and securing physical currency in India is estimated at over ₹21,000 crore annually. Digital payments reduce this burden significantly.

## Boost to Entrepreneurship and E-commerce

- a) Digital payments have fuelled the rise of e-commerce, online food delivery, ride-hailing, and gig economy jobs.
- b) Start-ups can accept payments instantly without heavy banking infrastructure.

## Challenges

- a) Cybersecurity Risks: Fraud, phishing, and hacking remain threats.
- b) Infrastructure Gaps: Unreliable internet in rural regions hinders adoption.
- c) Digital Literacy: Low awareness among older and less-educated populations.
- d) Interoperability Issues: While UPI is highly interoperable, some wallets and apps still limit cross-platform use.

## Recommendations

- a) Infrastructure Expansion: Strengthen internet penetration and power supply in rural India.
- b) Digital Literacy Programs: Public campaigns to educate users.
- c) Stronger Cybersecurity Frameworks: Multi-factor authentication, AI-based fraud detection.
- d) Policy Incentives: Tax benefits or subsidies for small merchants adopting digital payments.

## Findings

- ❖ Digital transactions: Show a consistent increase, with a growth rate of approximately 14-20% per annum.
- ❖ UPI transactions: Exhibit exponential growth, with a significant surge from 2017 onwards.
- ❖ UPI adoption: UPI transactions grew from 0 in 2015 to 12000 Cr in 2024, indicating widespread adoption and increasing popularity.

## Suggestions

- ❖ The growth in digital transactions indicates a shift towards online payment methods.
- ❖ UPI's rapid growth suggests its increasing acceptance and usage in digital payments.
- ❖ The data implies a significant transformation in the payment landscape, driven by technological advancements and changing consumer behaviour.



## Conclusion

The data highlights the growing importance of digital payments and UPI in the financial ecosystem. The trend is expected to continue, driven by increasing adoption and innovation in payment technologies. Digital payments are a transformative force in India's economic modernization. They have reduced dependency on cash, improved transparency, increased financial inclusion, and contributed to GDP growth. However, maximizing their potential requires addressing infrastructure, security, and literacy challenges. With sustained efforts, India could become a global leader in cashless transactions, setting a benchmark for emerging economies.

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