

The Indian payments
handbook – 2023–2028

Preface

Dear readers,

We are pleased to bring out the half-yearly edition of 'The Indian payments handbook' for the period 2023–2028. Like the previous three editions, this half-yearly publication focuses on the latest trends in India's fast evolving digital payments industry.

We have analysed the trends of different digital payment instruments during the first quarter of FY 2023–2024.

We have also looked into some of the existing challenges faced by different stakeholders – customers and payment service providers (PSPs) – and the potential mitigants.

Our handbook draws inspiration from the Government's and the RBI's vision for the growth of digital payments in India. We have tried to analyse the different initiatives taken by the Reserve Bank of India (RBI) and their possible outcomes. We have also looked into the latest innovations in India's digital payments industry and shared our views on how they are redefining this industry and laying the foundation for Payments 3.0.

We have also talked about some of the major challenges that the ecosystem stakeholders in India currently face and tried to explore ways in which those can be resolved.

We hope you will find this report to be a useful and insightful read.

Regards,

Mihir Gandhi

Partner and Leader – Payments Transformation
PwC India

Executive summary

Digital payments in India have seen unparalleled growth in the last decade. In ‘The Indian Payments Handbook – 2022 - 2027’,¹ we analysed how different payment instruments are evolving and identified some of the developments in the payments space which have the potential to act as a catalyst for the future growth of this sector. We also examined changes in consumer preferences and the shift to digital modes for various transaction types.

This publication is a half-yearly update on ‘The Indian Payments Handbook 2022 - 2027’ edition. In it, we have analysed the various payment instruments – key trends, growth and impediments. We also look at the innovations and trends that are likely to transform the digital payments industry in India and the opportunities for various ecosystem participants in the future.

Digital payments in India continued to have a healthy YoY growth rate of 58% in FY 2022 - 2023 compared to FY 2021 - 2022. UPI continues to be the flag bearer of this growth story, accounting for over 75% of retail digital payments in India. Amongst cards, credit card transaction volumes saw a YoY increase of 30% in FY 2022 - 2023 compared to FY 2021 - 2022, while debit card transaction volumes saw a YoY decline of 13% in the same time period.

India has taken an approach to regulate and innovate, strengthen the current payment rails, and look out for opportunities which will boost future growth in the industry. Financial institutions have invested heavily to migrate to asset-light infrastructure by moving towards cloud-based storage and services. In addition, they have placed fraud detection and mitigation at their core to provide a safe and secure transaction experience to customers. India has also invested in modern payment systems like Central Bank Digital Currency (CBDC) and plans to set up emergency payment systems like a lightweight payment and settlement system (LPSS). While the digital payments industry in India is growing, it also faces certain challenges such as an increase in frauds, limited access to customers in the hinterlands, stress on stakeholder profitability and need to increase customer awareness. The RBI, along with PSPs, has been working to address these issues by introducing innovative solutions. The LPSS payment rail conceptualised by the RBI in its annual report 2022–23 seeks to deal with unforeseen natural calamities or any other form of disruption. The RBI has also recently envisaged a digital public tech platform for frictionless credit and conversational payments in UPI in its latest statement on development and regulatory policies.

With their technical expertise, FinTechs play a crucial role in the overall development of the digital payments industry in India and are building solutions to address the existing challenges faced by different stakeholders. With the help of artificial intelligence (AI) and machine learning (ML), they are building solutions to better protect consumers from frauds and money laundering. To promote and grow the FinTech industry in India, the RBI has shared its intent to regulate the sector and adopt a more focused approach.

Adoption of CBDC has the potential to change the way people transact and pave the way for the evolution of digital payments for specific use cases in both wholesale and retail. Amongst other benefits, CBDC helps in reducing the cost involved in transactions as there are fewer stakeholders involved. This is going to be critical for cross-border payments, especially for low-value transactions, as CBDC transactions will have a lower transaction cost and enable faster realisation of payments by recipients. India is amongst the few countries performing a pilot on retail and wholesale CBDC. Going forward, there are still a few considerations from the design, technology and regulatory perspective, with many potential use cases to be explored.

We are at an exciting time in the Indian digital payments space – while much has already been done by various stakeholders, with the right focus and approach as well as supportive policies and innovation, India’s leadership position on the global stage can be secured in the years to come.

1. <https://www.pwc.in/assets/pdfs/the-indian-payments-handbook-2022-2027.pdf>

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Introduction

To achieve the nation's vision of transforming into a developed country by 2047, it is imperative that all citizens be brought under an organised financial ecosystem. Digital payments in India have been successful in making India a more financially inclusive country. With digital payments seeing rising adoption, India is becoming a less cash-dependent country.

Digital payments are helping the growth of other industry sectors (both B2B and B2C) by eliminating the challenges involved in cash transactions. This has made it easier and faster to realise the transactions in the recipient's financial books. As a result, digital payments have been able to reduce the cost of funds required in these industries. Innovations in the payments lifecycle are resulting in sustainable growth in industries such as education, transportation, healthcare, insurance, automobile, manufacturing, banking, e-commerce and aviation. The benefits of digital payments are enjoyed right from a small neighbourhood kirana shop to a large conglomerate handling high-value complex receivables and payouts.

Over the last five to seven years, as digital payments adoption increased with the introduction of new use cases and innovative products by payment service providers (PSPs), we have seen huge growth in most of the digital payment instruments. The growth of UPI payments has driven the overall growth story of digital payments in India and is expected to maintain its high growth trajectory, given the Reserve Bank of India (RBI) and National Payments Corporation of India's (NPCI's) sustained efforts to introduce innovative features. Acceptance of UPI has grown not only in India but across the globe, with various partnerships being forged. National Electronic Toll Collection (NETC) and credit cards also continue to grow at a significant rate. Debit card transactions have seen degrowth in FY 2022–2023 compared to FY 2021–2022. The same trend is also observed in the first half of FY 2023–2024. This can be attributed mainly to customers' preference to pay through UPI or credit cards over debit cards.

To ensure that the industry has sustainable growth, it is important to address some of the challenges that it currently faces, such as an increase in frauds, a need to increase customer touchpoints and awareness, and stress on profitability for industry players. The industry has seen a rise in the number of small-value transaction frauds. In addition, the nature of fraudulent activities has evolved over the last five to seven years. While the numbers are still low compared to global figures, appropriate steps need to be taken to reduce these frauds. Customer awareness becomes paramount so that necessary steps can be taken to avoid fraudulent incidents and enable victims to promptly report such incidents through relevant channels. Additionally, a robust fraud management solution needs to be implemented across the industry to better identify, avoid and report such incidents.

Further, the industry is evolving with modern payment systems such as CBDC, and also plans for to set up emergency payment systems such as a lightweight payment and settlement system (LPSS). In its annual report for 2022–23,² the RBI conceptualised the LPSS payment rail to deal with unforeseen natural calamities or any other form of disruption. The RBI also recently envisaged a digital public tech platform for frictionless credit and conversational payments in UPI in its latest statement on development and regulatory policies.

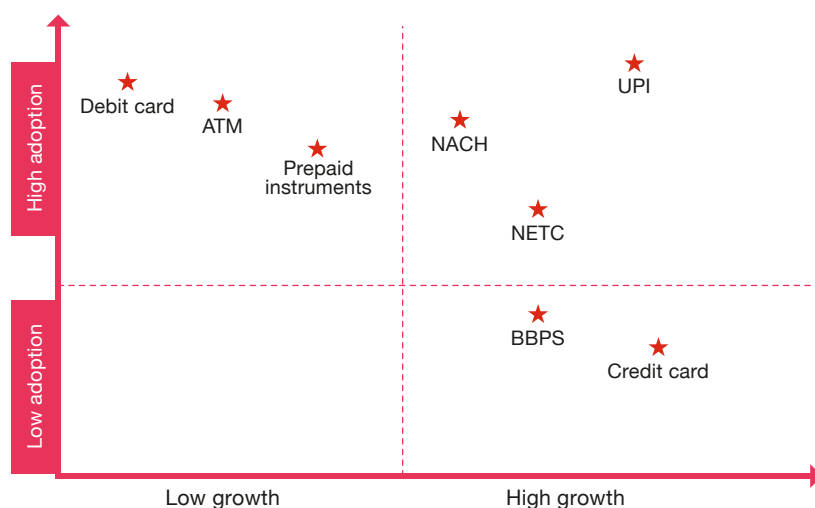
The adoption of Central Bank Digital Currency (CBDC) is another disruptive solution that has the potential to change the way people perform both retail and wholesale transactions. Amongst other benefits, CBDC helps in reducing the cost involved in transactions due to the involvement of fewer stakeholders. Cross-border transactions on CBDC, especially those of low value, will have lower transaction costs and result in faster realisation of payments by recipients. India is amongst the few countries performing a pilot on retail and wholesale CBDC. Moving forward, there are still a few considerations from the design, technology and regulatory perspectives, with many potential use cases to be explored.

2. <https://www.rbi.org.in/Scripts/AnnualReportPublications.aspx?year=2023>

Indian payments industry in FY 2023–24 (half-yearly)

India has become a leader in digital payments in recent years because of the creation of an environment that makes it easier to embrace and use digital payment modes. It has a very high rate of digital payment adoption as compared to other nations, and as a result, many other nations want to learn from the country and leverage its learnings and design choices. The value of digital payment transactions increased by 58% in a single year, from INR 71.97 billion in FY 2021–22 to INR 113.94 billion in FY 2022–23.³

Mapping of payment instruments with respect to growth and adoption



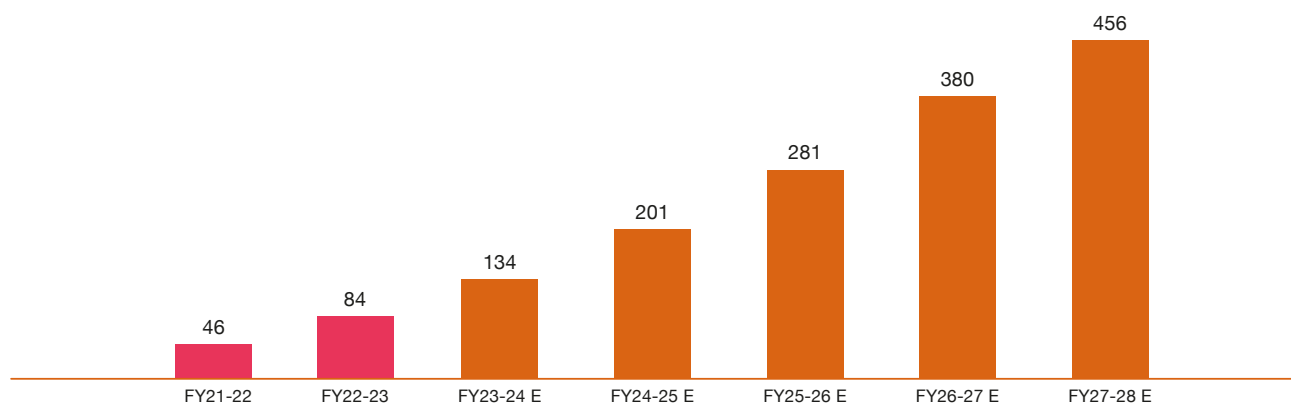
New-age products like Unified Payments Interface (UPI), National Electronic Toll Collection (NETC) and National Automated Clearing House (NACH) have been received well by consumers and are expected to see further growth in the next five years.

³ <https://www.rbi.org.in/Scripts/PSIUserView.aspx?Id=21>

A. UPI

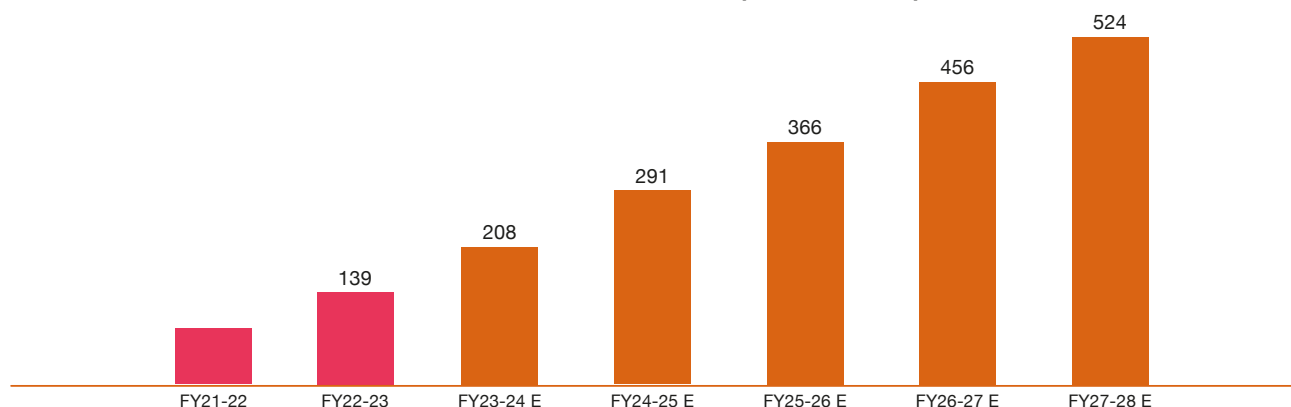
Payments made via UPI increased by 80% over the previous fiscal year. UPI accounted for more than 75% of the total transaction volume of India's retail digital payments in February 2023. In the first quarter of FY 2023–24, transaction volume reached 24.9 billion and transaction value reached INR 39.7 trillion.

Transaction volume of UPI (in billion)



Source: RBI, NPCI, PwC analysis

Transaction value of UPI (in INR trillion)



Source: RBI, NPCI, PwC analysis

India's journey towards becoming a less cash nation has largely been driven by the growth of UPI. In May 2023,⁴ UPI accounted for over 78% of total retail digital payments in India and as per our estimates, it is expected to contribute 90% of total retail digital payments in India by FY 2026–2027.⁵

UPI started in FY 2016–2017 as a payment method for small ticket-size person-to-person (P2P) and person-to-merchant (P2M) transactions. It has now expanded to a mode for real-time cross-border payments and is even replacing ATM cash withdrawals using physical cards. This year's edition of our payments handbook⁶ has listed the different features and use cases that have been developed to further increase adoption of UPI.

4. <https://www.rbi.org.in/Scripts/PSIUserView.aspx?Id=24>

5. <https://www.pwc.in/assets/pdfs/the-indian-payments-handbook-2022-2027.pdf>

6. <https://www.pwc.in/assets/pdfs/the-indian-payments-handbook-2022-2027.pdf>

The RBI's and the NPCI's blended focus on continuous innovation and stabilising the existing framework has resulted in the widespread adoption of UPI, with around 260 million users currently in India.⁷ NPCI's focus on building a strong technology stack and a huge network of PSPs has helped in making UPI amongst the safest and most secure payment methods across the globe. With UPI now going global, the growth is expected to further increase in the coming years. While the Government of India continues to engage with other countries for the expansion of UPI, other key participants in the ecosystem should focus on faster implementation and integration of the payment rails of these countries with UPI. This will be key to providing a seamless customer experience and uptake in terms of transaction volumes. With a recent tie-up with France, UPI has expanded its presence outside Indian shores. This is in addition to existing tie-ups with nations such as Singapore, the United States, Australia, Canada, Hong Kong, Oman, Qatar, Saudi Arabia, the United Arab Emirates and the United Kingdom. The Indian government aspires to get the support of all G20 countries to facilitate worldwide UPI-based payments. In February 2023, the RBI announced that eligible travellers from G20 nations could access UPI in India as they will be issued with prepaid instrument (PPI) wallets to use UPI service at merchant outlets. This will be extended to all countries in the future. Currently, wallets can be obtained at three international airports: Mumbai, Delhi and Bangalore. To support this, two banks and two non-banks are issuing wallet-based services to travellers. This will be further explored by other partners in the future.

Moving forward, we believe that the following will be key considerations for sustaining UPI's growth:

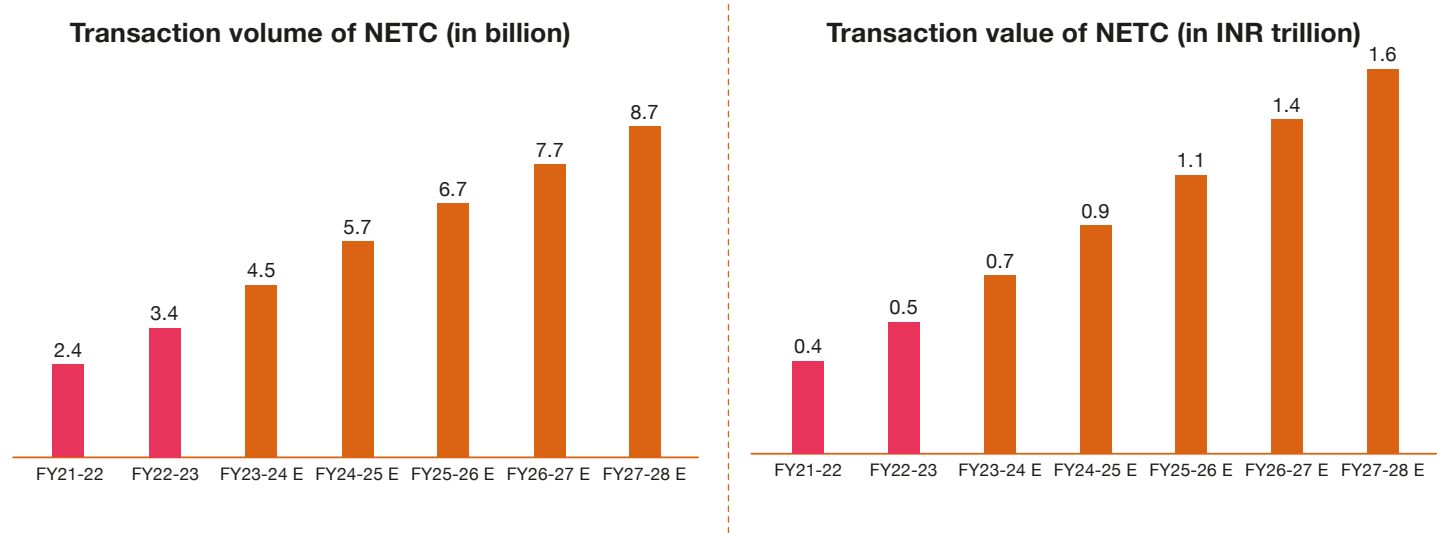
1  Increase the number of use cases to increase adoption from 30% of the population base to over 50% of the population.	2  Reduce UPI frauds by enhancing the fraud monitoring system and increasing awareness amongst UPI users.
3  Pivot from a compensation-based approach to a revenue-based approach.	4  Enhance the technology architecture to reduce payment failures across the entire ecosystem (not just NPCI).



7. <https://www.forbes.com/sites/zennonkapron/2023/04/10/is-indias-upi-real-time-payments-system-ready-to-go-global/?sh=57c429104d14>

B. NETC

The infrastructure of Indian roads has been continuously improved over the past several years as a result of the rising vehicle density. The expansion of digital transactions throughout the country has been significantly aided by the NETC scheme, which uses FASTags on moving vehicles. In FY 2021–22, NETC transaction volumes stood at 2.4 billion (84% rise YoY) worth INR 380.8 billion (67% YoY growth). NETC decreased the average wait time at toll booths by half to less than two minutes per car.⁸ The first quarter figures for NETC transaction volumes in FY 2023–24 reached 0.96 billion, accounting for INR 0.16 trillion in transaction value. The number of transactions is expected to increase at a 23% compound annual growth rate (CAGR) over the next five years, while transaction values are expected to increase at a 26% CAGR over the same time period since road travel is expected to increase and new use cases will be rolled out. Payment for parking at malls and airports through FASTags is also gradually increasing. Acceptance at public parking places and fuel payments using hand-held devices, etc., can further boost adoption.



Commercial fleet management:

The use case for NETC FASTag has grown beyond toll collection to parking, but its applicability in commercial fleet management could be further explored. FASTag may be designed to function as an expenditure management card for managing other expenses, i.e. gasoline and rest stops. This will allow an organised fleet and logistics companies to reduce their reliance on cash, assisting them in attaining a full view of all transactions and making expense management easier.

GPS-based toll collection system:

On 24 March 2024, the Union Minister of India announced a proposal to implement a new toll-collecting system, which will be implemented shortly. The Ministry of Transport and Roads is undertaking a pilot project for automatic number plate recognition systems (through automatic number plate reader cameras) to enable automated toll collection without stopping automobiles. This change will reduce waiting times even further, and tolls will be deducted based on the distance travelled by a vehicle on certain highways. This will be an upgrade to the current FASTags, which may become redundant for toll collection, but use cases like parking may still operate via FASTags if not integrated with the new system.

However, such improvements will necessitate infrastructure modifications to make NETC acceptable at sites such as gas stations and rest stops.

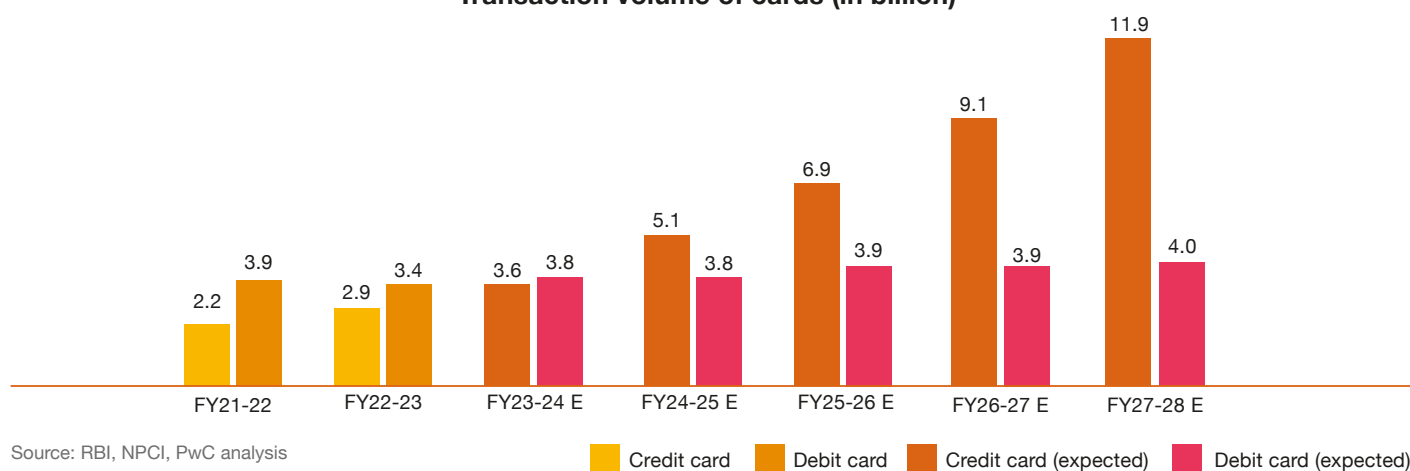
8. <https://www.pwc.in/assets/pdfs/consulting/financial-services/fintech/payments-transformation/evolving-toll-payments-landscape-in-india.pdf>

C. Cards

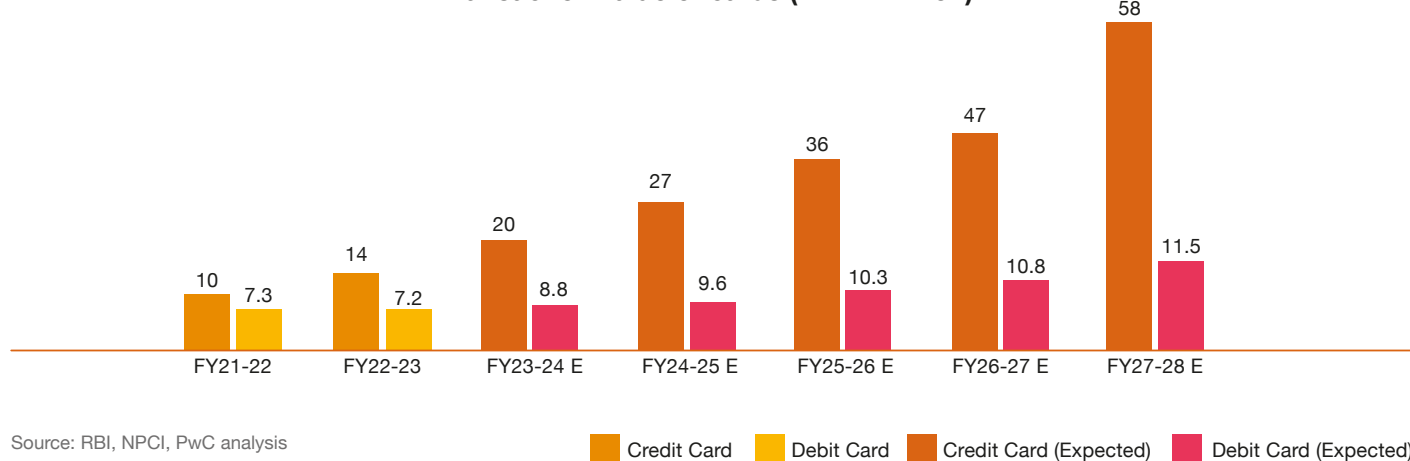
The card business is still expanding substantially. Cards – debit and credit – remain one of the most popular payment methods for online retail transactions. In FY 2022 - 23, credit card transactions increased by 30% YoY, with transaction value increasing by 47% YoY. Credit cards continue to grow in FY 2023 - 24, with transaction volume and value reaching 0.79 billion and INR 4.10 trillion respectively in first quarter of FY 2023 - 24. Debit card transactions, on the other hand, decreased by 13% in transaction volume and 1% in transaction value YoY in FY 2022 - 23. The trend continues in FY 2023 - 24 as the transaction volume stood at 0.66 billion and transaction value reached INR 1.58 trillion in the first quarter of FY 2023 - 24.⁹

The recent history of digital payments in India showcases the growing prominence of credit cards. Month-on-month data shows that transaction volumes of credit cards surpassed those of debit cards in the month of January and have continued to do so in FY 2023 - 24. The major reason behind this shift is the availability of a 30 - 45 days interest-free credit period and other features, i.e. cashback and reward points along with multiple other saving opportunities. Tech innovations like contactless cards, UPI on credit cards, combined with the wide acceptance of credit cards, have boosted the growth in the number of transactions and customer base.

Transaction volume of cards (in billion)



Transaction value of cards (in INR trillion)



9. <https://www.pwc.in/assets/pdfs/consulting/financial-services/fintech/payments-transformation/evolving-toll-payments-landscape-in-india.pdf>

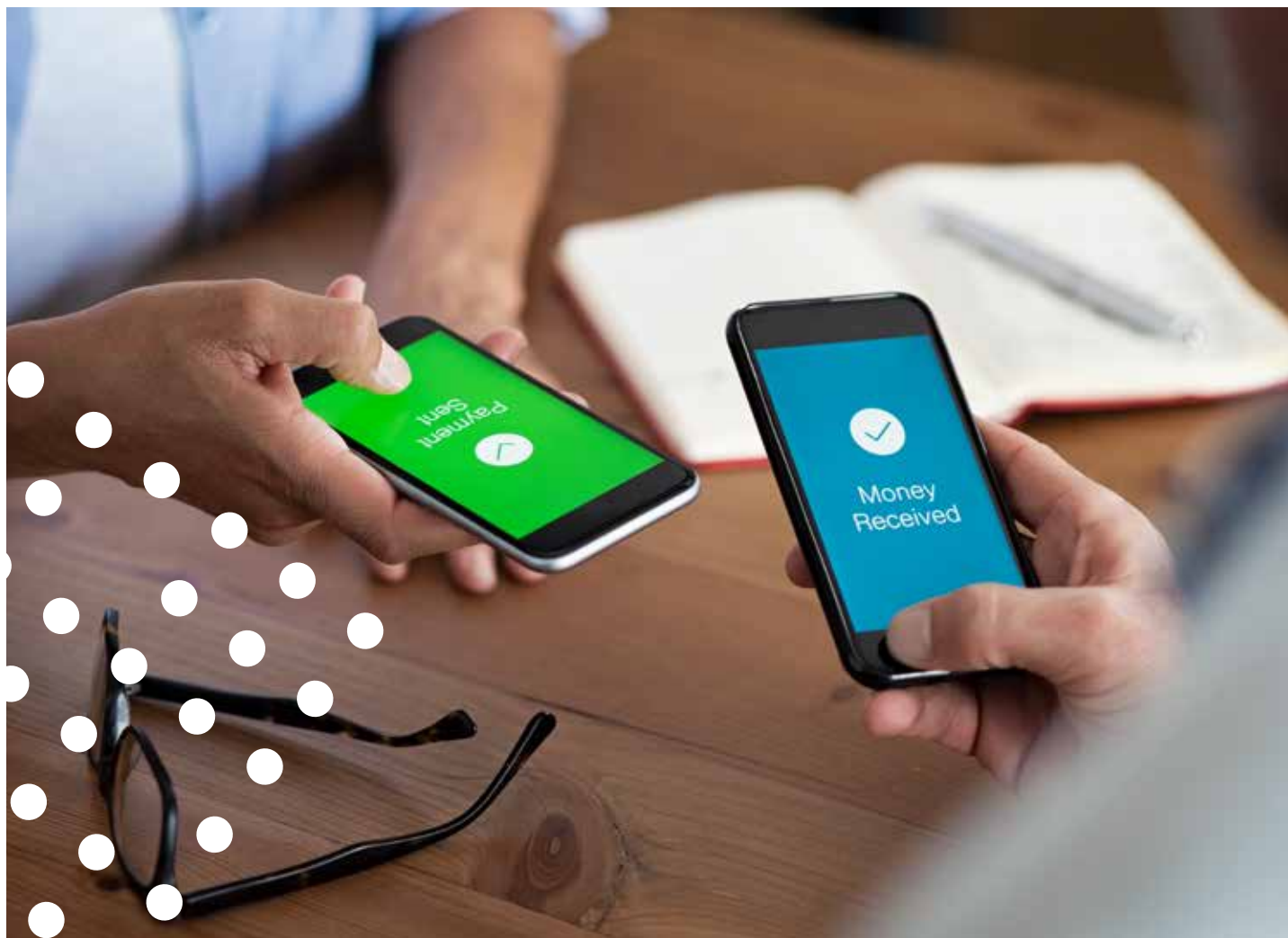
Freedom in card network selection

The RBI has released a draft guideline giving consumers the ability to change their card network not only while opting for a card, but also at any time while holding it. This guideline will come into effect from 1 October 2023. This move will propel issuers to offer multiple card networks. Another idea is to eliminate the exclusivity contract provisions used by card networks to prevent issuers from providing cards on other networks.

This move would have a significant impact on card networks, which gave incentives to banks and non-banking financial companies (NBFCs) to issue cards on their networks. However, with the new rule, card networks must now give issuers and customers appealing propositions with respect to discounts, exchange rates and offers. This move would also have an impact on issuers since they will lose out on exclusive contracts and issuance milestones defined by card networks. Views on this proposal were sought from stakeholders by 4 August 2023. However substantial changes to this regulation are unlikely.

UPI on credit cards

UPI payments and credit cards have picked up pace, and the combination of the two payment rails is creating a buzz in the market. Currently, only one network provider has the authority to issue cards linked with UPI. Other network schemes will be launched in later stages of deployment. This move has provided more flexibility to customers and also enabled users to use UPI in rural areas, where credit cards were not accepted by merchants because of merchant discount rate (MDR) rates and point of sale (PoS) machine unavailability. Unlike debit card payments, UPI payments will attract reward points and cashback. In addition, there will be no fuel surcharge on UPI payments. This will ensure that the customer spends more and saves more as well.

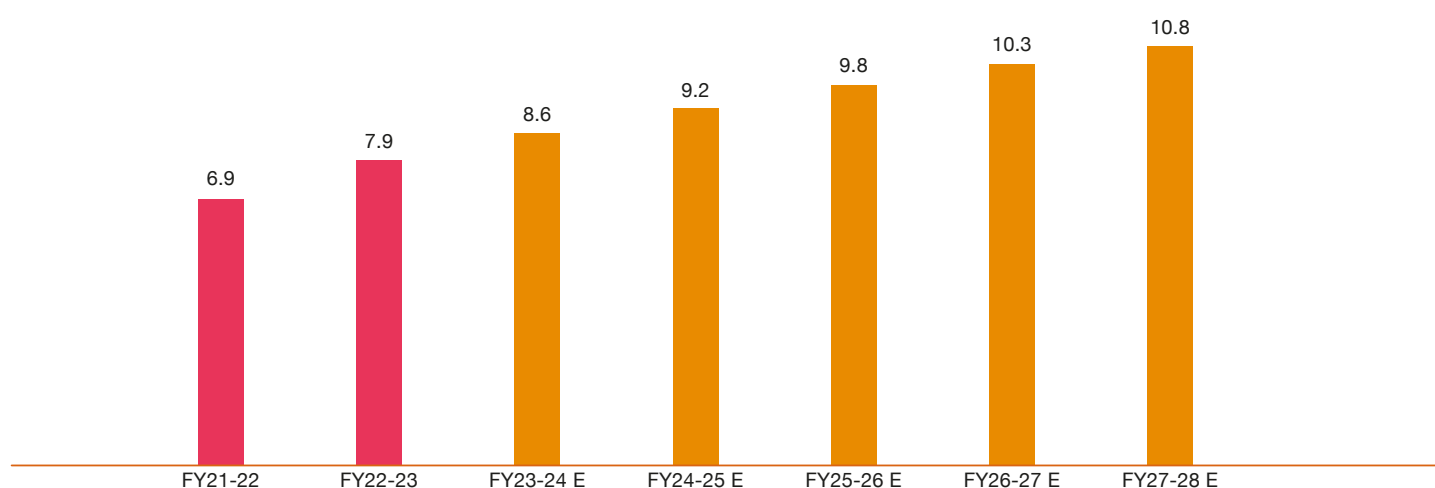


D. Prepaid instruments (PPIs)

Prepaid cards are a convenient method to pay. Because of the increasing usage of smartphones and the internet, India has achieved tremendous advances in the e-commerce industry in the past ten years, resulting in an increase in the use of prepaid cards for online purchases. These instruments can be easily opened without many documents, which is an added benefit. In FY 2022–23, PPIs handled 7.9 billion transactions worth INR 3.7 trillion. The number of transactions is expected to increase further at a CAGR of 7% in the future. The major reason for transaction volume growth is the significant growth in the number of wallets and digital gift cards issued by FinTechs. With business travel returning to pre-pandemic levels, use of prepaid cards for expense management has started to increase as it provides better control. This will boost growth of PPIs in the future.

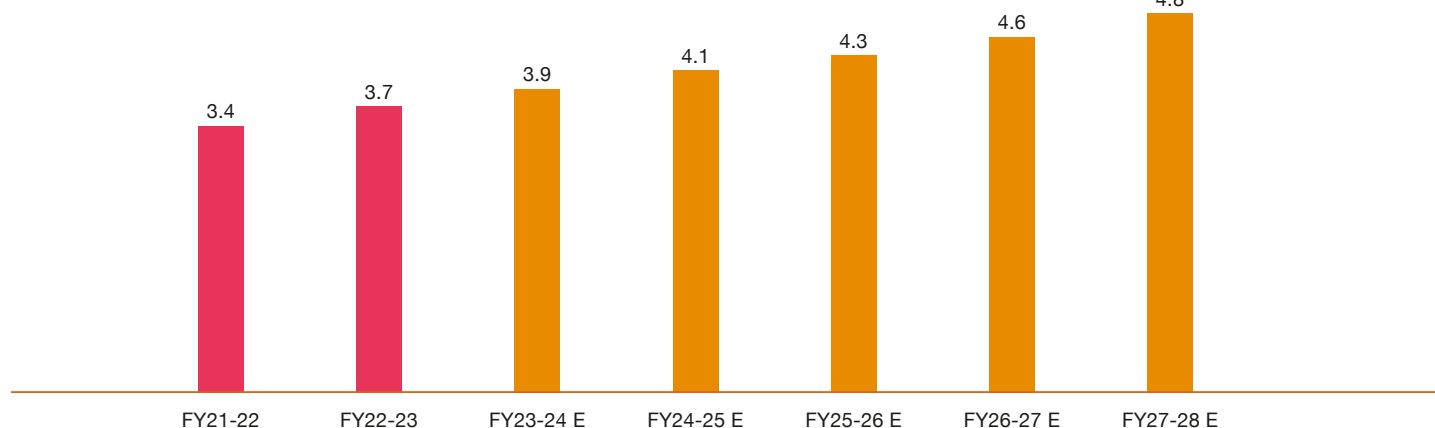
While gift cards and travel cards have seen encouraging growth, the transaction value of m-wallets is showing signs of recovery after a drop in FY 2022–23. The RBI's statement about distribution of wallets to travellers¹⁰ would increase the number of transactions as well as their value. As more partners are able to provide wallets at multiple locations, issuance will rise in the future, improving the transaction experience of travellers. Prepaid forex cards are a preferred transaction mode for people travelling abroad as they are able to transact in the local currency of the visiting country. Easy availability through Authorised Dealers (AD-II) and Full-Fledged Money Changers (FFMCs) at airports and online availability through online travel agents (OTAs) have been vital to the increased adoption of prepaid forex cards. The RBI is additionally pushing to expand the use of e-RUPI vouchers. These initiatives will allow a broader range of customers to use the services and will increase the penetration of digital payments.

Transaction volume of PPIs (in billion)



Source: RBI, NPCI, PwC analysis

Transaction value of PPIs (in INR trillion)



Source: RBI, NPCI, PwC analysis

10. https://www.rbi.org.in/Scripts/BS_CircularIndexDisplay.aspx?Id=12452

Developments in digital payments and future growth potential

Digital payments have seen rapid adoption by consumers in India. Initiatives by various partners such as the RBI, the government and financial institutions have been crucial to reducing transaction times and providing customers with a better overall experience both before and after making a transaction. Efforts are being made to improve traditional systems by exploring the latest technologies such as cloud to speed up response times. In addition, new payment systems such as CBDC are being developed to boost future growth and catch up with other countries using these payment rails.

1. Unleashing the potential of cloud-based payment infrastructure

The payment business is evolving at an unprecedented pace. Financial institutions are adjusting to changing requirements and ever-increasing challenges by implementing a variety of technology advancements, one of which is migration to cloud. Institutions have begun to abandon conventional on-premises infrastructure in favour of the next-generation benefits of cloud computing.

Before cloud migration, financial institutions had legacy systems running as on-premises infrastructure that had to be configured for each business and was only available from a single location. A breakdown, such as a power outage or server malfunction, could result in massive losses. The consumer today expects that transactions are processed in real-time, with extraordinarily high throughput and minimal latency. Financial institutions need real-time actionable insights and dynamically run ML models which are compliant with regulations. This is possible with cloud computing services that come with a much lower price, less complexity and a lower implementation time compared to non-cloud-based systems.

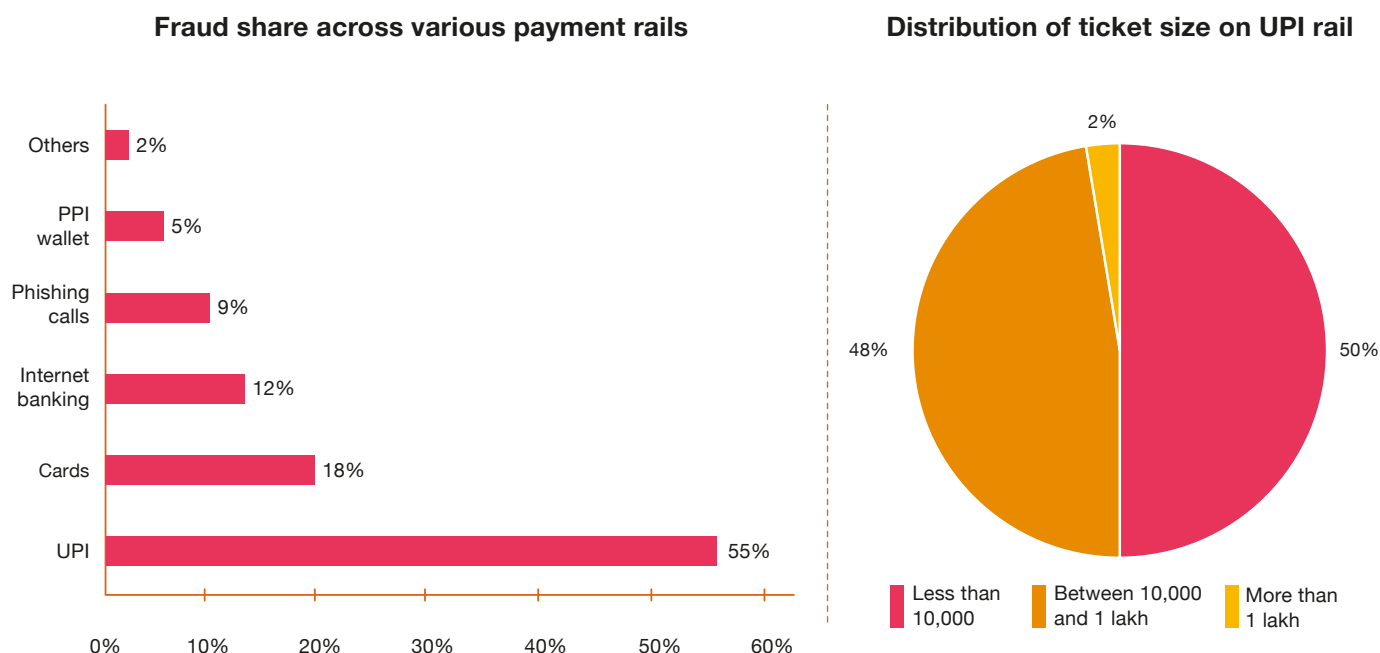
Benefits of a cloud-based system

 Cost-effective solution	 Ease of outsourcing	 Secure and compliant	 Real-time analytics
Services on pay-per-use basis	Management of infrastructure can be offloaded	Compliance with security policies of various countries and institutions	Analysis of large amounts of data in real time
Once implemented, flexibility to choose services at will without design changes	Scalable as per business/market factors	Easy mitigation and quick response to security threats and regulatory changes	Combination of multiple sources to perform trend mapping, detect anomalies using historical data and limit potential fraud
Maximisation of resource efficiency			

Some concerns that still need to be addressed are the dependency on internet connectivity, the risk of server access control being compromised in case of a public or shared cloud, and system maintenance performed by the service provider. As digital payment volumes continue to rapidly expand in the coming years, institutions would need to develop payment infrastructure that can manage and continually improve response times while handling varying peak loads and remaining cost-effective.

2. Fighting fraud: Modern measures to build trust in today's landscape

Amongst several causes of fraud, the most common one is an increase in the number of counterfeit merchants and websites which attract customers by offering products and services at a steeply discounted rate. Fraudulent access can take place across multiple platforms such as social media, knowledge, and media-sharing services, and goods platforms. It accounted for 57% of all fraud incidents in India in 2022.¹¹



With an increase in the adoption of an array of digital payments, there has been a proportionate increase in the risk of fraud, with UPI having the highest share in terms of volume. However, instances of UPI fraud are of lower ticket size (Figure 12). This means that while the total contribution of UPI looks significant, it is substantially lower in comparison to that of other payment rails.

The major hindrance in the entire fraud eradication process is unstructured data which takes a longer time to be read by machines, followed by data enrichment and structuring. This data is then operated on to capture fraud and discover its pattern. Platform frauds are executed via a variety of methods such as customer profiling, preferential treatment by employees for certain sets of customers, account takeover, device cloning, synthetic ID, malware, phishing, ransomware, or scams. Sim swapping, which is an advanced technique to obtain personal and sensitive data, is also a major contributor to financial fraud.

11. <https://www.thehindu.com/business/57-of-all-fraud-incidents-in-india-are-platform-frauds-pwc-india/article66838602.ece>

Reasons for occurrence of fraud and effects on organisations

Reasons for occurrence of fraud		Effect of fraud on banks, FinTechs and start-ups			
	Limited access to customer data		Financial loss		Loss of customer loyalty
	Limited data on device usage patterns		Loss of business		Regulatory actions and fines
	Limited behaviour pattern data		Loss of Investment(s)		Discontinuation of services
	Longer processing time		Damage to brand name		
	Unstructured data				
	Limited monitoring and alerting capability				

The fraud monitoring systems deployed across institutions are inefficient as intermediate procedures require human intervention. They can be improved by using digital technologies to ensure 24x7 monitoring and alerting capabilities. To address these shortcomings, the Government and the RBI have launched various initiatives:

Consumer Education and Protection Department (CEPD):

The department will run various awareness programmes throughout the year to educate end consumers.

RBI's fourth cohort on 'Prevention and Mitigation of Financial Frauds':

The RBI shortlisted six entities that will test their products in the sandbox environment.¹² These entities use AI and ML technologies to build solutions that aim to prevent and mitigate traditional and new types of frauds.

Amendment to Know Your Customer (KYC) master direction:

The RBI released an amendment to its KYC master direction circular to guide registered entities on enhancing their KYC process.

Fraud reporting and sensitisation of NBFCs:

This reporting system has been introduced by the RBI for NBFCs to report fraud cases.

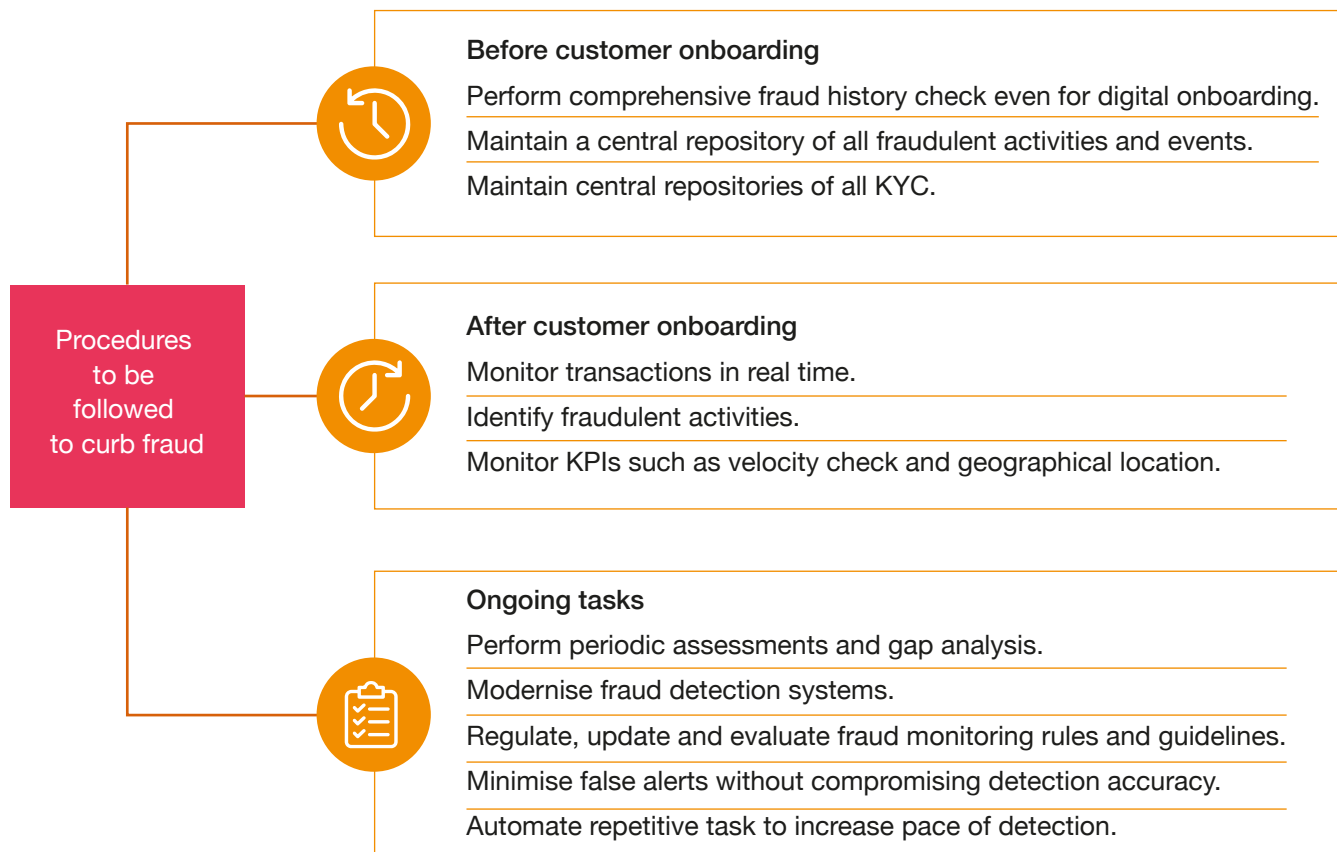


12. <https://www.thehindubusinessline.com/business-laws/rbis-sandbox-tests-for-fraud-proof-fintech/article66608800.ece>

The RBI released two draft master directions on outsourcing of IT services and IT governance, risk, controls and assurance practices.

Apart from these initiatives, the RBI has also launched various technology frameworks to curtail financial fraud such as Utkarsh 2.0, DAKSH and Centralised Information Management System (CIMS). To curb occurrences of fraud, start-ups and FinTechs can employ the base measures:

Necessary steps to curb fraud



Various solutions are available to counter the threat of fraud efficiently. These solutions offer fraud detection, including account takeover, identity proofing, real-time analytics, and protection against next-generation financial crimes.

3. What's next for CBDC in India?

CBDC is a digital form of legal tender that is issued by a central bank and can be exchanged with fiat currency. Central banks of many countries are currently exploring CBDCs as it is a risk-free and central bank-based asset that will gradually streamline global payments services.

In India, the RBI has chosen to opt for both retail and wholesale CBDC (wCBDC) for the pilot phase. Furthermore, an intermediate approach is being followed in the case of retail CBDC – where the RBI issues CBDC to licensed intermediaries who then distribute it further (similar to the cash distribution approach). The retail and wCBDC pilots were started in December 2022 and October 2022 respectively. The learnings from this pilot will help in clearing grey areas for stakeholders, bringing in more transparency, and decreasing the chances of failure in various stages of implementation, usage, and scaling.

Future considerations for CBDC in India

 Design considerations	 Technology considerations	 Regulatory considerations
Anonymity: The level of anonymity that retail CBDC holds will determine how close it is to cash. Use cases like microlending based on CBDC payments made by a user or MSME would require access to the digital footprint created by CBDC for underwriting.	Underlying technology: Currently, no DLT can offer scalability and performance to cater to the population of India. The API-based tier-2 layer cannot offer all the benefits of DLT. Security of CBDC tokens in the mobile CBDC wallet is crucial.	Incentive to use CBDC: Banks are seeking a business case to invest in CBDC infrastructure. Introduction of MDR or fees on UPI could make CBDC lucrative to end customers initially. Cross-border integration of CBDC networks requires countries to collaborate on various levels.

Retail CBDC currently offers P2P and P2M payments. The adoption of retail CBDC in the pilot is limited to 1 million users and 0.26 million merchants thus far, with approximately 7.7 million¹³ transactions after launch. This number is fairly small if true testing at scale has to be performed on retail CBDC. While efforts are being made to extend this limited user group by enabling payments to merchants with a standard UPI QR code, it is to be noted that the merchant would require a CBDC wallet at the back end to accept the CBDC token. The total number of transactions on wholesale CBDC stood at 1,329 as on 3 February 2023, which indicates that wholesale CBDC has been used on a limited scale to settle Government securities.

Potential future use cases for CBDC in India

Wholesale use cases			
Current	Future		
 G-Sec settlement wCBDC is currently used to settle G-Sec on T+0, eliminating the need for collateral and minimising the settlement risk. This reduces intra-bank transfer costs and time, and improves efficiency.	 Cross-border B2B payment wCBDC could address challenges of low speed, high costs and lack of transparency. wCBDC could accelerate the settlement and overcome time zone issues and exchange rate differences.	 Trade finance wCBDC can enable DvP and act as collateral to obtain financing as it can be easily be verified. wCBDC could streamline complex payment processes and enhance transparency.	 Settlement of securities/FX Traditional securities could be tokenised on DLT with ownership and transaction information embedded. The CBDC network can be leveraged to exchange documentation, making it transparent and tamper resistant.

13. https://www.business-standard.com/article/economy-policy/rbi-s-retail-cbdc-generates-over-700-000-transactions-so-far-deputy-guv-123020801494_1.html

Current	Future		
 Retail payments CBDC is used for P2P and P2M payments in the current retail CBDC pilot. It offers instant settlement, and lowers the risk in clearing and settlement of retail payments.	 Automatic micropayments Programmable money feature of CBDC allows pay as per use of digital subscriptions and changes the all-or-nothing model of digital platforms today. Pay on delivery in e-commerce could be enabled using CBDC.	 Offline payments Payments in areas with limited or no network could be enabled using offline CBDC payments. Last-mile adoption can only be solved through offline channels like village self-help groups and Street-plays.	 Remittance Linking of CBDC networks across countries could enable cross-border and real-time remittance of CBDC with reduced cost.

4. LPSS: An alternative payment rail

In its annual report 2022 - 23, the RBI has conceptualised an LPSS, a payment rail to deal with natural calamities or any form of disruption. LPSS will be designed to operate with minimum staff and will be independent of traditional payment rails such as real-time gross settlement (RTGS), National Electronic Fund Transfer (NEFT) and UPI. The payment system will be activated only when required and can process economic transactions, such as those of the Government and the market, that are essential to maintaining the stability of the economy. This system will maintain a near 100% uptime for payments and settlements.

Advantages of the system

Lightweight infrastructure

The payment rail is planned to be operated only for the government to ensure the balance in the economy, so the infrastructure required will be less

High end

The plan is to use the best-in-class technology for the system which will allow a high level of safety and secure transactions.

Backbone during the emergency period

The transaction and communication infrastructure will be separate from the traditional payment systems which ensures the collapse of all the traditional systems will not affect the functioning of LPSS

However, in order to enjoy these benefits, a clear plan, including thorough testing and validation of operations under a variety of scenarios, will be required. In addition, there is a need for a policy that defines the scenarios and limitations in which LPSS can be operated.

FinTechs: A close look

India's start-up ecosystem is booming at a massive rate, especially in the FinTech sector. New players continue to enter the market, creating an overwhelming FinTech ecosystem and a thriving industry. At the same time, this results in intense competition and price wars.

The most prominent factors impacting the overall growth of FinTech and other financial Institutions are discussed below.

Funding and market acquisition: New players and entrants that aim to disrupt the market ignite price wars and increase promotional expenditure, leading to thinning profit margins. Continuous and multiple business and tech initiatives are required to maintain market value and increase the overall market share for players. In such conditions, capital plays a crucial role in ensuring the relevance of a FinTech company compared to its peers.

There is a substantial decrease in funding in the last year. Some of the reasons for this drop in funding are as follows:

1. Escalating inflation and macroeconomic tensions which are obstructing investors' ability to make substantial investment choices
2. Decline in the valuation of technology stocks and the disappointing financial performance of both established and emerging start-ups, which has reduced investor confidence
3. The RBI's enforcement actions against FinTech companies and its advocating for more stringent regulations impacting their operating and revenue model
4. FinTechs lacking a clearly defined strategy for growth and a path to becoming profitable.

While venture capitalists are a popular choice for funding among many FinTechs, others depend on various financial alternatives to self-finance their companies.

Effective governance and conscious adherence to regulations: Governance forms the backbone of any successful organisation, ensuring accountability, transparency and ethical conduct in an environment where innovations often outpace regulations. Having effective governance and consciously complying with regulations helps foster trust in the organisation, attract investors, safeguard customers and maintain financial stability.

Reasons for governance failure and non-compliance with regulations and their impact

Reasons for governance failure and non-compliance with regulations	Impact of governance failure and non-compliance with regulations
 Lack of oversight	 Financial instability
 Complex regulations	 Regulatory actions and fines
 Incentive misalignment	 Loss of investor confidence and customer trust
 Lack of transparency	 Reputational damage
 Poor risk management	 Systemic risks

Well-defined and enacted governance, while complying with regulatory requirements, is vital in the constantly changing and dynamic world of FinTech's. It requires a comprehensive and proactive approach that involves establishing clear policies, processes, governance frameworks and structures along with the required expertise to guide decision making and operations.

Operational excellence: In the quest to be market first or revolutionise the market in the absence of clearly defined regulations, most financial institutions embark on a journey without focusing on future operations. They end up with missing SOPs, inefficient reconciliation processes and systems, undefined roles and responsibilities of personnel, etc. The most common reasons for non-compliance with standardised policies and processes are as below:

- prioritising scaling of products and services over establishing standardised policies and procedures
- lack of resources, people or time for creating, documenting, and implementing rules and procedures
- FinTechs' reliance on external vendors for a range of services and products poses a challenge in terms of implementation of consistent policies and procedures
- inability to adopt standardised processes due to agility and an innovative spirit.

Operational excellence isn't a one-size-fits-all metric for FinTech companies. It's a multifaceted journey that requires consistent focus on customer experience, productivity, compliance, accurate financial records and streamlined processes. Reconciliation helps to identify inconsistent or inefficient processes, as well as ensure data integrity, comply with regulatory requirements and foster customer confidence. This makes it an important factor for achieving operational excellence.

Conclusion

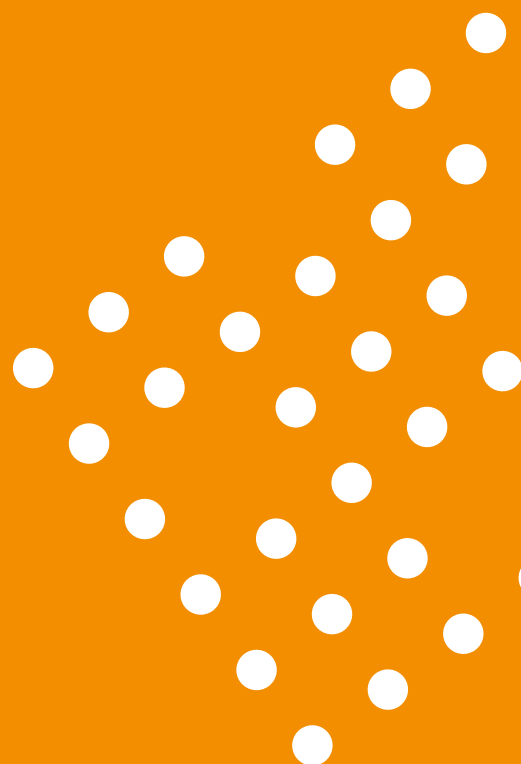
The growth trajectory of digital payments in India in the past six to eight years has been remarkable, and it is regarded as a global case study. This expansion has aided the country's transition from a cash-dependent to a less cash-dependent economy, with digital-first transactions being concentrated in metros, tier 1–4 cities and rural regions. Digital payments are likely to significantly permeate the Indian economy across all customer groups in the coming years, covering innovative use cases and strengthening current enterprises. Transaction volumes in retail digital payments across multiple instruments are estimated to double by FY 2026–27.

UPI will continue to grow as a national payments rail. The recent announcement by the RBI on the use of conversational AI and offline payments will reinforce the importance of UPI. Linkage of UPI with credit cards will further increase its use in retail payments, with small-value payments gradually shifting to credit cards.

Retail CBDC is a key focus area for the RBI. The addition of acceptance points and the onboarding of new customers will increase transaction volumes. Financial institutions and corporates will look forward to use cases in wholesale CBDC and their impact on revenue streams and cost elements.

The account aggregator framework and the recent RBI framework on frictionless credit will further streamline the process of credit appraisal. This will lead to the dissemination of credit to untapped market segments (i.e. people with no credit history) and business cards to micro enterprises where demand for credit is high. The impact of the initiative will be visible in tier-3 and below cities in the coming years.

We look forward to the next phase of this industry – with new product launches and changes, technology innovations, enabling policies and regulations, and customer safety measures that will help increase penetration and growth in the digital payments industry – and are excited to be part of this journey.



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About PwC

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