

Cashless economy: the impact of digital innovation in India

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Abstract

Digitalization has brought a revolutionary change in every walk of life, giving the average person many digital options for payment and settlement. ICT enabled the transformation of our banking system from paper to virtual mode, facilitating speedy and secure fund transfers. Post-demonetization (8th November 2016) cashless economy got a boost, and about 98 per cent of transactions have now become cashless. A cashless policy empowers industries, leading to an increase in employment opportunities and reducing cash-oriented fraud. Reserve Bank of India- Digital Payments Index (RBI-DPI) was recorded at 349.30 as of March 2022 against 304.06 for September 2021, indicating significant growth, rapid adoption and deepening of digital payment across the nation. During Financial Year 2021-22, digital transactions surged to 7195 crores, with the value increasing to Rs. 17.44 billion. There is a strong need to make policies for protection against cyber-attacks, encourage digital literacy, and ensure adequate rural penetration of internet connectivity and banking infrastructure, with awareness among rural masses to strengthen organized indigenous markets. The article aims to present an insight into the journey of a cashless economy and its impact of digital innovation in India's financial system.

Keywords: Cashless, Economy, Digital transactions, RBI, Internet connectivity, Empowerment

Introduction

The world is at the push of a digital-driven revolution which will dominantly transform the way people live, work, interact and socialize. With the unprecedented pace of "digitization" and "digitalization" growth in developed and developing nations and with diverse usages of ICT in different spectrums to produce desirable benefits to mankind holds a prominent position in the digital transformation of the Indian economy. As a steppingstone towards this revolutionary move, the Government of India launched "Digital India", a flagship programme in 2015 to create a more digitally enhanced ecosystem with a focus on creating and enabling a digital infrastructure for every citizen of the nation as the foundation utility, e-governance and digital services to the reach of end consumers, and digital Empowerment by promoting the goal of "Faceless, Paperless and Cashless"⁷. To achieve this, the Indian Government focused on ensuring high-speed Internet connectivity, access to mobile phones, opening bank accounts for every citizen, availability of real-time services via online platforms, financial transactions through cashless and digitalized networks, and most importantly, ensuring digital literacy and availability of digital resources even in the rural parts of the nation.

India has always been a cash-centric economy. However, the revolutionary move on 8th November 2016, with the announcement of "demonetization", changed the scenario by curbing 86 per cent of the currency in circulation by banning ₹500 and ₹1000 notes without an adequate supply of new paper currency. Due to the cash crunch, people shifted towards using digital payments. About 95 per cent of transactions were done using cash before demonetization, and within a month of demonetization, the number of online transactions witnessed a surge of 271 per cent¹⁷. A cashless economy is one of the emerging concepts of the modern economy laid on the foundation of digitalization. It can be defined as "A transaction layout that aims at reducing (and not eliminating) total physical currency circulating in the economy while encouraging more digital based transaction that includes

direct debit, credit and debit cards, Immediate Payment Service (IMPS), National Electronic Funds Transfer (NEFT) and Real Time Gross Settlement (RTGS)". This technological breakthrough will help to decrease tax evasion, curb black money and fake currency, save time in real-time transactions and mitigate risk.

It is imperative to make every individual financially literate to precisely plan their financial decisions as it directly impacts the nation's economic growth. Financial literacy means understanding the basic financial concepts and the knowledge and skills required to make efficient financial planning and decisions by using the available financial products and resources to get maximum benefit²

Journey of Cashless Economy in India

Although the cashless economy is the buzzword of the current economy, its stepping stone was laid down long back by the Indian Government in 1996 by introducing an online banking system in different ICICI bank branches. Recognizing the benefit and ease of work, it was in 1999 that banks like HDFC, IndusInd and Citi availed online banking facilities. Subsequently, the entire banking system in India adopted net banking services in an increasing trend. This new transformation in the banking sector could be marked as the beginning of the digitalization era in India⁵. However, this was limited to big business firms and industries in metro cities. Different institutions were set up to overcome the challenges and facilitate an easy and smooth payment system under the jurisdiction of the Indian Government.

Clearing Corporation of India Limited (CCIL): CCIL was established in April 2006 under the authorization of the Central Bank of India, Reserve Bank of India (RBI). CCIL acted as a Financial Market Infrastructure (FMI) to provide smooth clearing and settlement of trades in the money market, government securities, forex, and derivative markets.

National Payments Corporation of India (NPCI): The Reserve Bank of India (RBI) and the Indian Banks' Association (IBA) formed NPCI in the year 2008. Since then, it has acted as an umbrella organization for creating a robust payment and settlement infrastructure in India using ICT. It started its journey with ten core promoter banks as its stakeholders, and gradually this expanded over the years with the involvement of more banks. Since its launch, it has been able to introduce vivid products, namely IMPS, RuPay card scheme, UPI, Aadhaar Enabled Payments System (AePS), Aadhaar Payments Bridge System (ABPS), NACH, NETS and BBPS. To meet the global outreach and primarily internationalization of RuPay and UPI. NPCI launched International Payments Limited (NIPL) in RuPay and UPI. Through this organization's continuous effort and the vision of digital India, RuPay is now gaining a global identity.

Adding to the industrial mechanism, the Digital India programme launched in 2015 enhanced the digital transformation by acting as a catalyst and bridging the digital divide. The nine pillars of growth identified by the flagship programme, viz., Broadband highways, Universal access to mobile connectivity, Public interest access programme, e-Governance, Information for all, Electronic manufacturing, IT jobs and Early harvest programmes, transformed the digitalization process in the financial as well as all the major sector and is still expanding. On 29th February 2016, the Ministry of Finance introduced guidelines for payment through cards and digital means to improve the ease of conducting digital transactions and reduce the risk associated with it⁸. Adding to this, the Reserve Bank of India released the "Payment and Settlement System in India: Vision 2018" document on June 2016 to create a roadmap and encourage online payments. With the announcement of demonetization on the eve of 8th November 2016, people readily moved towards online payment modes to avoid a cash crunch. Since then, Government has been taking proactive steps to promote the technologically aided payment system and make India less cash-centric

by promoting Unified Payment Interface (UPI), launching indigenous platforms like Bharat Interface for Money (BHIM), Campaigns like *Digi Dhan Abhiyan*, *Jan Dhan Yojana* and Aadhaar Pay. As the world was facing devastating hardship when the COVID pandemic set in and people had to restrict themselves to the four walls, consumers started opting for digital payments for their daily necessities in emergencies. As an outcome, UPI transactions in India grew in double digits during the lockdown phase. Recently there has been a slowdown in growth owing to the rise in transaction decline and technical glitches at banks¹³. New technologies are gaining recognition in the payment ecosystem by focusing on the positive side of this digital wave. India is expected to create up to \$1 trillion of economic value from the digital economy by 2025¹¹.

Role of ICT in a Cashless Economy

Although digitalization in the banking sector is attributed to a monetary evolution, ICT is a major player in this transformation journey from traditional banking to online banking⁹. With the complete support of ICT, India can move towards a cashless economy as it helps create a practical instrumental framework for the financial sector. ICT has improvised the system with RBI by introducing concepts like Automated Data Flow (ADF), Cloud computing, information security, data acquisition and Foreign Exchange Transaction Electronic Reporting Systems (FETERS). To enable global integration and stay at par with the international banking system, RBI has also established the Department of Information Technology with a vision to use ICT to create a safe, secure, and protected banking ecosystem. The Central Government's Information Technology Sub Committee (ITSC) also extends its guidance and support to the RBI's IT cell to resolve issues²⁴.

Requisite for Cashless Payment

Reserve Bank of India has always been the pioneer in enabling and promoting digitalization, be it conceptualization, execution, or investment in technology to enhance the payment system. Therefore, RBI acts as the owner and regulator of this system. To enable a quick,

safe and secure payment system, the adoption of new technology and innovation, easy access and quality infrastructure plays a major role.

- i. **Mobile Phones and Internet connectivity:** The growth of digital Infrastructure in terms of the spread of mobile cellular networks, mobile accessibility and internet penetration has significantly improved over the past decades in the country. All the financial institutions in India offer banking services through channels like USSD, internet banking, message services and mobile-based application. The internet penetration of 3G, 4G and recently, to some parts, 5G networks and smartphone usage, even in remote areas, had facilitated this digital revolution. Reports show that mobile cellular connections and total internet users surged to 1.1 billion and 658 million, respectively, by the end of April 2022. On average, Indians consume about 10 GB of data every month.
- ii. **Bank Accounts:** The availability of bank accounts plays a major role in the evolution of digital payment. This includes deposit bank accounts in all the commercial banks in the country.
- iii. **Aadhaar:** The launch of Aadhaar, a unique identification number for every citizen of the nation and enabling e-KYC (electronic Know Your Customer) has catalysed digitalization. Authentication of Aadhaar using biometrics is mandatory for making merchant payments or business correspondents.
- iv. **Banking Cards (Debit/Credit):** Since Financial Year 2010-11, there has been a considerable increase in the issue of debit and credit cards. RuPay cards issued for Basic Savings Bank Deposit hold a major share of the debit cards issued by the bank. The card increase has facilitated physical and online card-based payments and helped grow a cashless economy.

Cashless Payment System

In India, cashless transactions started around the 1980s with the launch of credit cards. With the increased demand, new virtual businesses and mobile applications joined the race to offer instant retail payments. Some of the digital payment methods available to consumers are as follows⁴:

- i. **Banking Cards (Debit/Credit/Prepaid/Travel and Other Cards):** Banking cards were first introduced by the Reserve Bank of India as credit cards to ease transactions. Today, various banking cards like debit cards, prepaid cards, credit cards, and travel cards are available for the convenience of consumers. Examples: Visa card, Master card and RuPay cards
- ii. **Unstructured Supplementary Service Data (USSD):** USSD was launched in 2016 to avail mobile banking services in basic feature mobile phones without internet connectivity. USSD aims to provide financial inclusion to every common person in the country. Customers can avail of services such as an inter-bank account to account fund transfer, balance enquiry, mini statement and other services from the transaction menu that appears on dialling *99#.
- iii. **Unified Payments Interface (UPI):** UPI was launched by the National Payments Corporation of India in 2016. It combines multiple bank accounts into a single mobile application (of the participating bank) to provide several banking features, a Virtual address and seamless merchant payments. It also offers "Peer to Peer" payment requests that can be scheduled and paid as needed and convenient. Each participating bank provides its own UPI App for different mobile platforms.
- iv. **Mobile Wallet:** Mobile Wallet falls under the prepaid payment instrument (PPI) category. In this category, Paytm wallets have gained massive acceptance since their launch. A mobile wallet is the same as an individual wallet, but the cash is stored in digital

format by linking individual bank accounts to the digital wallet. Some companies offering such services are Mobikwik, SBI Buddy, mRuppee, Airtel money and Jio money.

- v. **Bank Prepaid cards:** Prepaid cards are reloadable cards that work on the principle of "Pay Now, Use Later," *i.e.* it allows the user to spend the amount pre-deposited in the card. To some extent, such cards offer better security than regular banking cards.
- vi. **Point of Sale (PoS):** Point of Sale (PoS) is provided by the Merchant Establishment (ME) to carry out merchant payment of goods and services through credit/debit cards and UPI.
- vii. **Aadhaar Enabled Payment System (AePS):** AePS offers a payment model led by the bank that permits interoperable financial transactions at PoS terminals through the business correspondent of participating banks using unique Aadhaar authentication.
- viii. **Mobile Banking:** Mobile banking is an app-based platform a financial institution provides to carry out different financial transactions. Each licensed bank provides its mobile banking app after getting the required permission from the Reserve Bank of India.
- ix. **Micro ATMs are portable devices business correspondents use** to carry out their financial transactions using card swipe machines. These bring ease in carrying out day-to-day business without payment hindrance.
- x. **Internet Banking:** Electronic payment system provided by financial bodies and banks to carry out financial transactions through their online portal or website. It is also known as virtual banking or e-banking. Under this category, there are different types of financial transactions like National Electronic Fund Transfer (NEFT), Real Time Gross Settlement (RTGS), Electronic Clearing System (ECS) and Immediate Payment System (IMPS).

Types of Financial Transactions

National Electronic Fund Transfer (NEFT): NEFT is a retail payment system implemented in the year 2015 and is owned and operated by RBI. NEFT emerged as the most popular payment system as it has no ceiling attached to the amount per transaction and

provides a safe, secure and affordable payment system round the clock. Since 2019, RBI has waived the NEFT processing charge, which was earlier collected from the member banks.

Real-Time Gross Settlement (RTGS): RTGS was launched in 2004 and is considered India's large-value payment system (LVPS). It is also owned and operated by the RBI. As the name suggests, the transactions are carried out in real-time on a gross basis in the book RBI. To facilitate global integration and more comprehensive payment flexibility, RTGS is available round the clock, *i.e.* 24*7. To promote financial transactions using RTGS, RBI also waived the processing charges and time-varying charges that were earlier applicable.

Electronic Clearing System (ECS): ECS was introduced by the RBI in the early 1990s to handle bulk and repetitive periodic utility payments like salary, dividend payments and interest of different institutions for over 25 years. Later, with NPCI, the umbrella organization to carry out robust payment and settlement, ECS was smoothly shifted to the National Automated Clearing House (NACH) by 31st January 2020.

National Automated Clearing House (NACH) is a centralized system that operates both NACH credit and NACH debit by consolidating multiple ECS systems across the country into one. NACH credit deals with credit transfers like salary, pension, distribution of subsidies, dividend payment etc. At the same time, NACH debit collects utility payments and periodic instalments towards loans and mutual funds' investments.

Immediate Payment System (IMPS): IMPS is a multi-channel payment system that offers real-time 24*7 fast money transfer between the remitter and the beneficiary. India is the fourth country to adopt this payment system after South Korea, the UK and South Africa. Earlier, when it was launched, both parties needed to be registered for mobile banking. Later, it was upgraded to avoid hindrance to its growth by enabling other options like a bank account number linked with an Aadhaar number and IFSC code.

Major instruments promoting Cashless Economy in India

- i. **RuPay:** RuPay is the country's first global card payment system initiated by the National Payment Corporation of India (NPCI) in 2012. RuPay derives from two words, "Rupee" and "Payment", indicating that it is India's indigenous card payment system. It provides wider acceptance, a secure network and protection against anti-phishing. It is one of the major instruments that promote the vision of a cashless economy by offering e-payments. RuPay offers scheme cards, classic and platinum cards that offer user benefits like international acceptance, health and wellness coverage and merchant offer. More than 1100 banks issue RuPay cards across the country. With the innovation flow, RuPay card has also developed RuPay Virtual Card, RuPay Global Card, RuPay Contactless Card, and Bharat E-commerce Payment Gateway. RuPay Contactless card facilitates offline wallet payment service across all utilities with the vision of "One Nation, One Card". As per the reports of RBI, by the end of January 2022, over 651 million RuPay debit cards were dominating the market with a share of more than 65 per cent of the total debit cards issued. However, the RuPay credit card holds a share of less than 3 per cent¹⁸.
- ii. **UPI:** Unified Payment Interface (UPI) is India's first Unified payment gateway for real-time online payment transactions launched by the NPCI in 2016. It works on a well-built architecture framework with standard Application Programming Interface (API) specifications¹².UPI brings multiple bank accounts into a single mobile application, allowing seamless money transfer and merchant payment from a single platform. It also offers features like "peer-to-peer" and "peer-to-merchant" pay requests. The pilot program was initially launched with 21 member banks by Dr. R. Raghuram G. Rajan on 11th April 2016. With the pilot programme's success, almost all the banks started introducing UPI-enabled apps. UPI's payment security, as per the guidelines laid down by the RBI, uses two-factor authentication, where the device

fingerprint works as the first, and UPI PIN is the second. UPI is one of the most preferred modes of payment, with over a billion monthly transactions. By the third quarter of 2022, UPI clocked over 19.65 billion transactions in volume and INR 32.5 trillion in value. The total no. of UPI QR stood at 216.43 million, registering an increase of 81 per cent compared to September 2021. Among the top, UPI Apps in 2022, PhonePe, GPay and Paytm Payments Bank App accounted for 94.8 per cent of total UPI transactions volume and 93 per cent of UPI transactions value²³.

- iii. **JAM Infrastructure:** JAM infrastructure refers to the Indian Government initiative to link Jan Dhan accounts opened under the PMJDY scheme, Aadhaar card and mobile numbers to ensure access to government subsidies, financial services and insurance. Since its launch, JAM has served as the bedrock of many government monetary initiatives by reaching out to citizens in the utmost corners of the nation. Under the JAM infrastructure, a total of 19.72 crore bank account was opened, and 16.8 crore RuPay cards were issued under the *Jan Dhan Yojana* scheme, second, Aadhaar linkage helped in getting accounts verified through e-KYC and lastly, mobile through which Information about subsidies, deposits and government benefit schemes was timely delivered even in regional languages. Thus, the JAM infrastructure (*Jan Dhan Yojana*, Aadhaar cards and mobile) was a catalyst in implementing a cashless economy.

Growth of India's cashless ecosystem

Over the past decades, digital payment has witnessed exponential usage and social acceptance growth. Studies show that there has been a surge in the number of users adopting mobile banking and Internet banking by 99 per cent and 18 per cent, respectively, between March 2019 and September 2021. In the Financial Year 2010-11, the country's digital

transactions were 96 crores, valued at Rs. 4.98 billion. During Financial Year 2021-22, the same surged to 7195 crores, with the value increasing to Rs. 17.44 billion.

During Financial Year 2010-11, the payments system was dominated by paper currency. However, with the growth in digital awareness, literacy and infrastructure landscape, the share of payments through paper currency declined, and the number of electronic payments increased considerably. A comparison of retail transaction methods in terms of volume share during 2010-11 and 2021-22 is presented in Fig. 2 and 3.

Despite the digital expansion, cash remains the preferred transaction method, as indicated by the decrease in average value per digital transaction. The amount of cash in the economy can be attributed to the increase in cash withdrawals under different initiatives and beneficiary schemes by the Government in rural areas. Also, most business firms still prefer cash payment for day-to-day transactions⁶

By September 2022, 23.06 billion transactions in volume and INR 38.32 trillion in value were processed through Debit and Credit cards, Prepaid Payment Instruments (PPI) like mobile wallets and prepaid cards, and UPI. UPI transactions include peer-to-peer (P2P) and peer-to-merchant (P2M) transactions. UPI P2M emerged as the preferred payment mode with a market share of 34 per cent in volume and 17 per cent in value. As per the Economist Intelligence Unit Report 2021, UPI led India to stand out as a global leader in the real-time payment market, followed by China and South Korea. Seeing the success of UPI, many countries like Brazil, Bahrain, Saudi Arabia, Singapore, the United States and European Union are now trying to adopt UPI in their market as well¹³.

One of the biggest moves by the Indian Government in 2022 was the launch of the Central Bank Digital Currency based on blockchain technology. According to our Honourable Finance Minister, Smt. Nirmala Sitharaman, "Digital currency will help to create an efficient and inexpensive currency management system. "India's digitization efforts have also been

applauded by the chief economist of the International Monetary Fund (IMF), Pierre-Olivier Gourinch, who said, "Digitisation is helping along several dimensions. One is financial inclusion because many people in countries like India are unbanked. Furthermore, having access to digital wallets is a way in which they can enter into transactions that are not just cash transactions. Digitalization will be a game changer for India as it has allowed the Indian Government to do things that would have been difficult to do otherwise"¹⁹.

Impact of cashless economy on the Economic Growth of India

Cashless transactions are believed to be a major force in economic development and significantly benefit both emerging and developed economies. According to a report by economic analysts, the Digital India initiative could boost our GDP by around \$1 trillion by 2025. Past studies suggest that cashless payments increase operational efficiency while decreasing operational costs, resulting in better revenue and business growth. When the economy has an effective payment system, macroeconomic indicators will show positive effects such as GDP growth, employment generation, labour productivity, growth in several businesses and revenue leakages for the Government. There is also an increase in the efficiency of financial markets and the financial system as a whole, which enhances consumer confidence and enables trade in goods and services. According to a McKinsey report, the digital economy is expected to generate between 60 and 65 million jobs by 2025¹. To validate the impact of digital payments on India's economic growth, the present study analyzed the causal relationship between digital payments and economic growth in India during the period of 2013 to 2021 by using Ordinary Least Square Regression. Economic growth is quantified using a proxy – real Gross Domestic Product (GDP) while RTGS, Clearing Corporation of India Ltd (CCIL) operated systems, paper clearing, electronic retail clearing, Card payments, and Prepaid Payment Instruments (PPIs) are the proxies used to quantify digital payments in India. The real GDP information and digital payments data have

been collected from the Reserve Bank of India database. The formulated multiple regression model has been presented below

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + e$$

where

Y= the logarithm of real gross domestic product for India at the time t

X₁ is the total value of RTGS for India at the time t

X₂ is the total value of CCIL Operating system for India at the time t

X₃ is the total value of paper clearing for India at the time t

X₄ is the total value of electronic retail clearing for India at the time t

X₅ is the total value of card payments for India at the time t

X₆ is the total value of PPIs for India at the time t.

The real GDP of India has been considered as a dependent variable while digital payments are considered as the independent variables in the OLS regression estimates, and also all the values of independent variables are logged values. The results presented in Table 5 exhibits that during the study period, Prepaid Payment Instruments (PPIs) (p-value 0.05) is the only independent variable which impacts the real GDP significantly while the other variables have no significant impact on the real GDP at 5 per cent level of significance. As the p-value of F statistic is 0.00, the prediction model under evaluation is significant at the overall level. Similar studies were carried out in the past by Ravikumar *et al*¹⁶. He concluded in his findings that retail payments had a significant short-run impact on real GDP throughout the study period. Consequently, over the long run, cashless payments may indirectly contribute to economic growth through speedy, lesser cost and more convenient commercial transactions.

Digital innovation will also help us to reduce our carbon footprint by reducing fuel consumption, waste management and creating greener workplaces, ultimately contributing

to a greener ecosystem. With the emergence of technologies such as artificial intelligence, the Internet of Things (IoT), cloud computing, blockchain and robotics, the government might capitalize on these new pathways to further fuel India's digital and technological prosperity. For instance, the ICT sector contributes to efficiently managing and utilising scarce and non-renewable resources, whereas Cloud technology minimizes carbon emissions by strengthening mobility and flexibility. The major changes in the technology space will affect the economic system and contribute to environmental changes²². Digital platforms can help farmers in terms of know-how (Selection of crops, seed variety), context (weather, plant protection, best cultivation practices) and correct market information (market prices, market demand, logistics).

Potential impacts of cashless payment on the economy

- **Creation of a formal and pure structure of economy:** It has been observed that cashless economy results in the establishment of a proper formal and functional economy in the country. When all the transactions are made clear, clean, and taxed, it may lead to the creation of a formal framework for the entire financial system, which will lead the country towards progress.
- **Maintenance Cost:** Another significant aspect is the maintenance in terms of storage of notes, money distribution through ATMs at different locations, security of the notes, and counterfeit note detection systems. It is reported the government spent roughly about 5 per cent of the GDP of India on maintenance costs. In a nutshell, we can save roughly 500 crores by this mean only.
- **Assist in reducing the high rate of organized crimes:** In an environment where cashless payments are widely used, illicit transactions may be easily traceable and tracked. The cashless economy assists the government in keeping a check on the free flow of cash by limiting the quantity of cash flowing through the system to reduce

activities such as armed robbery, corruption, kidnapping, and money laundering. The presence of a cashless economy will undoubtedly lead to the growth and development of the country through the collection of surplus taxes and spending of these taxes for the scheme's benefit.

- **Lowering commodity costs:** The cashless economy attempts to lower commodity costs by eliminating the black market and the proper tax deposit. All of this leads to the development of a system in which consumers may find a fair commodity market price.

Agriculture Sector

By bringing together different technological advancements, Digital innovation has revolutionized the face of the agricultural sector. Our Government has also supported this sector in every possible way to raise farmers' awareness about emerging technologies and enhance productivity. For instance, online bank accounts can offer farmers the income and spending data they need to qualify for lower-interest bank credit. Crop insurance may become more accessible to farmers due to digital land-registry records. Precision agriculture: "delivering real-time data to farmers' mobile phones" enables them to optimize fertilizer, insecticide, and other inputs, potentially increasing crop yields by 15 per cent or more. Farmers could use different types of online agricultural marketplaces after harvest to transact with a broader range of potential buyers. One such platform is the government's electronic National Agriculture Market (eNAM), which can potentially improve farmers' prices by 15 per cent. Combining these and other digital technologies in this vibrant sector might help food production keep up population growth and add \$70 billion to the economy by 2025³.

Digital Payment Index of Reserve Bank of India (RBI-DPI)

The construction of a composite Reserve Bank of India-Digital Payment Index (RBI-DPI) was initiated by the Reserve Bank and included in the sixth Bi-monthly monetary policy statement for 2019-20. The composite DPI was constructed using March 2018 as the base period, and it depicts the adoption penetration of digital payment in the payment system across the country²¹. It is calculated based on five parameters, namely i) Payment Enablers (weightage of 25 per cent), ii) Demand-side factors of payment infrastructure (weightage of 10 per cent), supply-side factors of payment infrastructure (weightage of 15 per cent), iii) Payment performance (weightage of 45 per cent), and iv) Consumer Centricity (weightage of 5 per cent). The sub-parameters within them are explained in Table 6. The DPI for March 2022 stood at 349.30 and recorded a CAGR of 28.42 per cent since 2018.

Payment Vision 2025 of RBI

To achieve a cashless economy, India has undergone huge technological development to produce one of the most modern payment systems in the world. Looking into the convenience of the common man, various safety and security measures have been addressed time-to-time to provide a better platform. RBI has played a major role in creating this structured payment ecosystem in India. Increased adoption of new technology and innovation has helped the country to reckon within the global payments space, not only in terms of growth in digital payments but also in the availability of safe, secure and efficient payment systems. Over 26 crores digital payment transactions are processed daily by our payment systems, of which the Unified Payments Interface (UPI) system processes more than two-thirds.

The current Vision document of RBI outlines the rough framework for the payments ecosystem up to December 2025. As we move towards realizing Payments Vision 2025, the action plan for enhancing digital penetration, cyber security and customer centricity should focus on the five pillars of (i) Integrity, (ii) Inclusion, (iii) Innovation, (iv)

Institutionalization and (v) Internationalization. Adhering to these five pillars will elevate cross-border payments by improvising constraints like cost, transparency, speed and accessibility. As a less-cash and less-card society unfold, simultaneous expansion in the basket of digital payment options would ensure Reserve Bank's approach to facilitate users with a seamless digital payment experience. This will also strengthen India's position as the global leader in the digital payments domain¹⁹.

Digital Penetration in India

Growing internet penetration, affordable data, technological breakthrough, and the government's emphasis on building digital infrastructure ensures faster delivery, better targeting, and improved accountability. India's core digital economy grew 2.4 times faster than the overall economy between 2014 and 2019. The government's emphasis on developing digital Infrastructure which ensures public availability of digital components for more participatory service delivery systems, promotes market-led innovations, enables more affordable & faster onboarding of services, and facilitates the development of more transparent systems has accelerated economic growth through higher financial inclusion, greater formalization, increased efficiencies and enhanced opportunities. As a result of addressing the rural-urban digital divide, the country now has over 1.17 billion mobile telecom customers, 600 million smartphone users, and 840 million internet connections. Figure depicts the rate of Internet penetration in India from 2013 to 2022, indicating that the rate of Internet penetration in India has climbed from 15.10% in 2013 to 48.70% in 2022. Fig. 7 depicts the rate of Internet penetration in India from 2013-2022, indicating that the rate of internet penetration in India has grew from 15.10 per cent in 2013 to 48.70 per cent in 2022.

This deliberate effort to bridge the gap between rural and urban internet penetration has borne positive outcomes. We have added more internet subscribers in rural areas than to

their urban counterparts. The 200 per cent increase in rural internet subscriptions between 2015 and 2021, compared to 158 per cent in urban areas, demonstrates the government's increased emphasis on achieving rural and urban digital connectivity to the same level. This has resulted from dedicated digital drives across rural areas through ambitious government schemes such as the flagship BharatNet Project Scheme, Telecom Development Plan, Aspirational District Scheme, initiatives in North-Eastern Region through Comprehensive Telecom Development Plan (CTDP), Production Linked Incentive (PLI) for telecom and networking products and initiatives towards areas affected by Left Wing Extremism (LWE) etc. To further develop digital linkages at the grassroots level and improve the consumer experience similar to that of urban centres, a project to achieve penetration of a 4G wireless network in uncovered villages across the country has been approved. This initiative will provide 4G mobile services in 24,680 uncovered communities in remote and challenging places, while 6,279 villages will be upgraded to 4G from 2G/3G.

Capacity building and awareness programme for promoting a Cashless economy

In order to promote a cashless economy, the following steps have been taken up by Government and RBI:

- i. Creating awareness and educating people about the vision of the Digital India campaign, i.e., "Cashless, Faceless and Paperless".
- ii. Central Government, with the cooperation of State/UTs, is looking to improve payment acceptance infrastructure to enable citizens to pay by various modes such as Internet banking, mobile banking, and mobile applications. It is also hosting sessions on the mechanism of digital financial services such as UPI, IMPS, AadhaarPay and PoS machines and awareness programmes on government policies.
- iii. The Government is also advising all financial institutions and Payment Service Providers to undertake awareness campaigns for the promotion of secure payment

practices and generate information security awareness through traditional means of publicity as well as emergent means such as social media platforms.

- iv. In order to ensure the safety and security of digital payments, various steps have been taken by the Government and RBI. MeitY has integrated Digital Payment Grievances with the Ministry of Consumer Affairs (MoCA). The platform is live and receiving Digital payment related grievances from all the major onboard banks and financial service institutions.
- v. In a move to digitally empower millions of Indians in rural areas and educate them about how to do cashless transactions, MeitY launched the scheme titled "*Pradhan Mantri Gramin Digital Saksharta Abhiyan (PMGDISHA)*". Under the scheme, it has also launched a new scheme entitled "Digital Finance for Rural India: Creating Awareness and Access through Common Service Centres (CSCs)". It also carries out Newspaper campaigns, Digital Theatre Campaigns, FM Radio campaigns and hoarding campaigns to promote digital payments².
- vi. About 93 per cent of our country's rural population is deprived of digital transactions due to the absence of digital payment infrastructure. The Central Government is focusing on expanding digital infrastructure in collaboration with National Bank for Agriculture and Rural Development (NABARD) by extending financial support to eligible banks for developing 2PoS devices each in 1 lakh villages with a population of less than 10,000.
- vii. The Indian Farmers Fertilizer Cooperative Limited (IFFCO), the world's largest fertilizer cooperative, has initiated a PAN India outreach programme to educate farmers about digitalization and government subsidies through live demonstrations and interactive sessions.

SWOT Analysis of the Cashless Economy

STRENGTHS

- i. One-Stop Payment Portal
- ii. Maintains Transparency
- iii. Financial Inclusion
- iv. Higher Revenue
- v. Curb Black money or illegal transaction

WEAKNESSES

- i. Digital Literacy
- ii. Lack of Digital Infrastructure
- iii. Transaction limit
- iv. Limited availability of PoS terminals
- v. The internet penetration rate is low compared to the global median

OPPORTUNITIES

- i. Strong banking network
- ii. Leads to the entry of tech giants and the emergence of new business models
- iii. According to a report published by Deloitte, the Indian e-commerce market is expected to capture 11.4 per cent of the Indian market by 2026
- iv. By 2025, India's digital payment industry is projected to grow, leading to more enhanced payment system
- v. Help India to become a global leader in a cashless economy

THREATS

- i. Cybercrime
- ii. Weak Grievance redressal system
- iii. Economic singularity
- iv. Risk of Identity theft

- v. It can also influence people's "*Propensity to save*."

Conclusion

Cash is always considered the king of transactions, but this scenario is changing as the world adopts a cashless society. India is also making efforts to convert their cash economy to a cashless economy. The slow pace of the Indian economy towards a cashless economy calls for development, diversification and global competitiveness by employing new ICT techniques and blockchain technologies. Undoubtedly, the cashless economy comes with unavoidable risks, security concerns and privacy glitches at the initial stage, as new challenges arise simultaneously with the advancement and adoption of new technological development. This seems to dominate our country due to internal and external factors. Irrespective of the Government's efforts, there are still many obstacles on the path to a cashless economy.

The path to a cashless economy is not as simple as it seems, as implementation has many bottlenecks like enhancing the digital payment landscape, digital divide, digital literacy, consumers changing perception and market confidence. There is a need to strengthen the collaboration between consumers, financial institutions and Government so that digital expansion can be easily carried out. Digital inclusion plays an advanced role in bridging the digital divide. The Indian Government should take adequate measures to educate people and improve the security mechanism for better implementation and progress of the cashless economy. Equality between cash and cashless transactions is probably a long race game. However, there are means of getting closer to it by creating an incentive structure for that switch through better enforcement of a cashless economy.

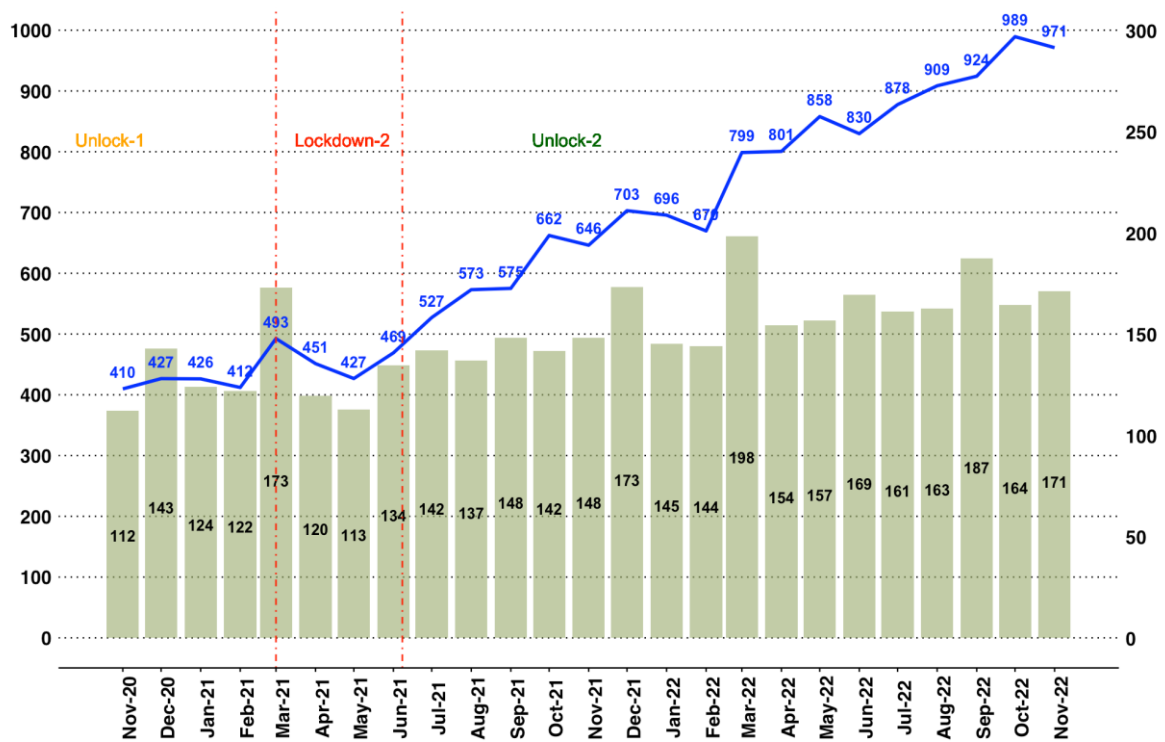
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Source: RBI Report on monthly payment system indicator 2022

Note: Digital payment volume (in crore) is represented by a line plot, and a bar plot represents Digital payment value (in lakh crore)

Fig. 1: Trend in Digital Payment Transactions (in terms of volume and value)

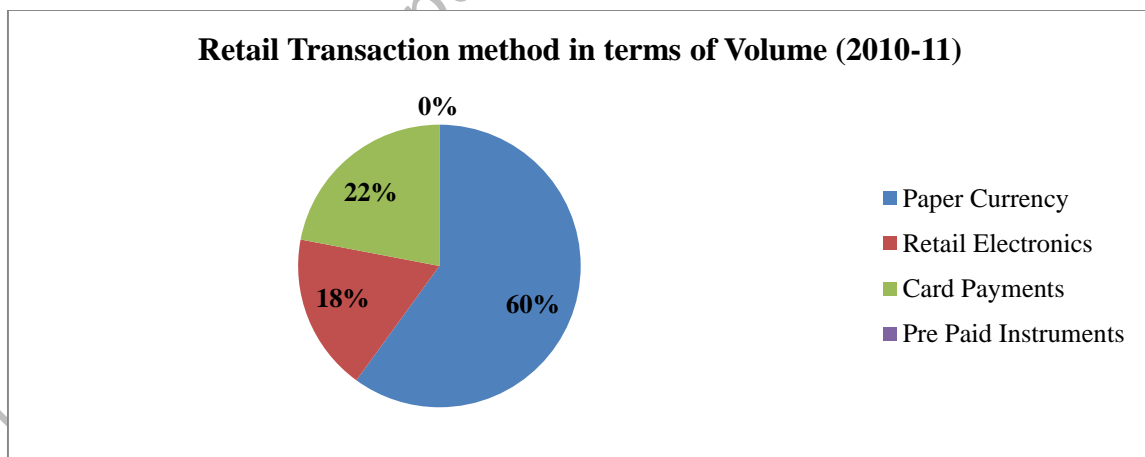
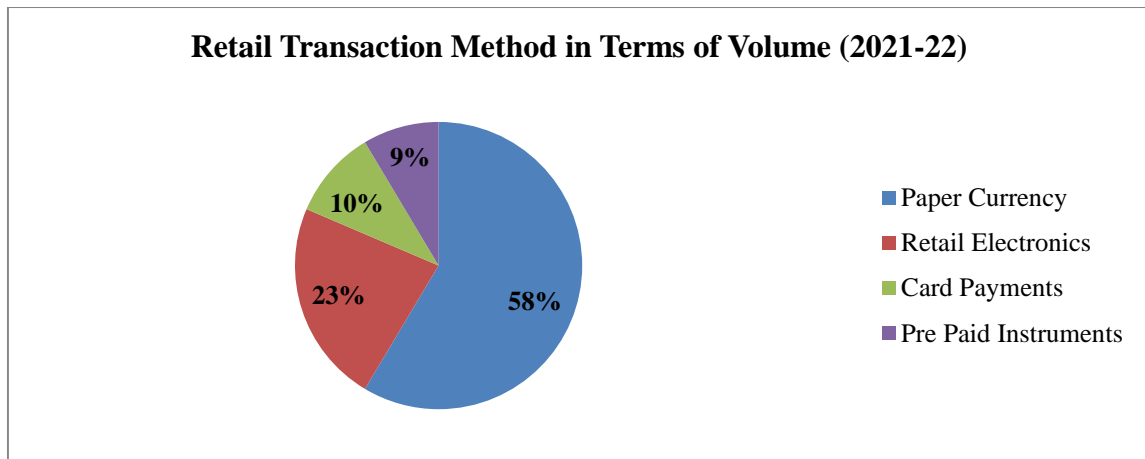
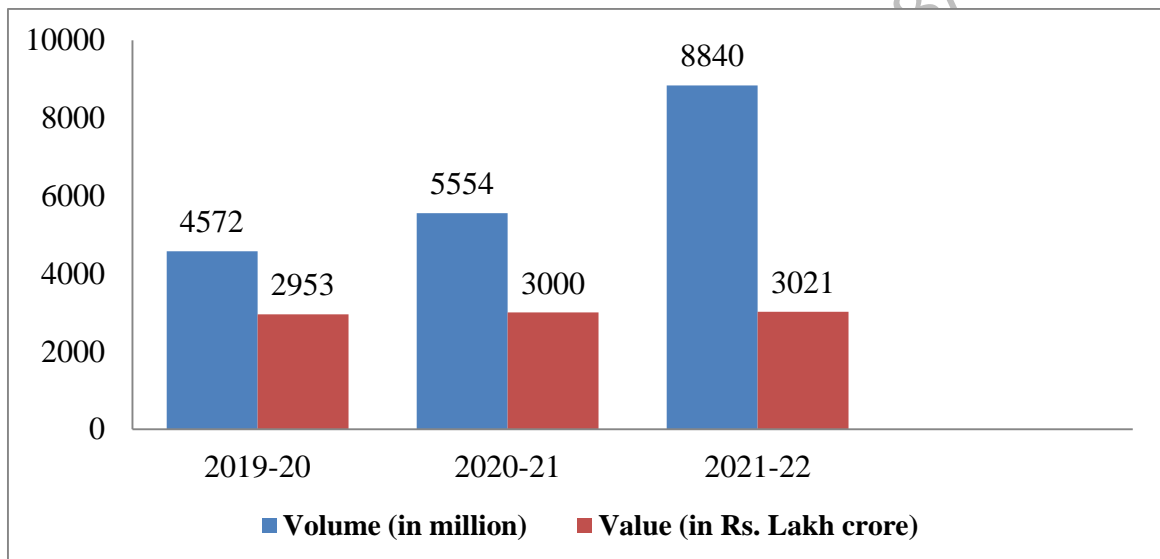


Fig. 2: Comparison of Retail transactions method in terms of volume in 2010-11



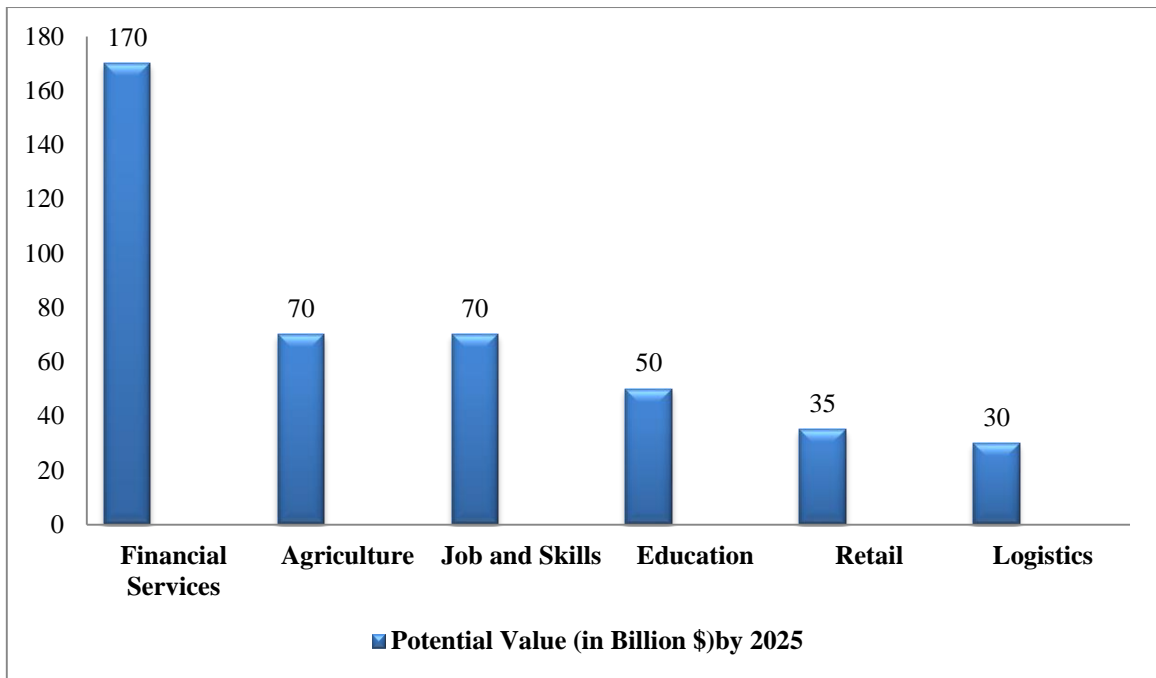
Source: NPCI

Fig.3: Comparison of Retail transactions method in terms of volume in 2021-22



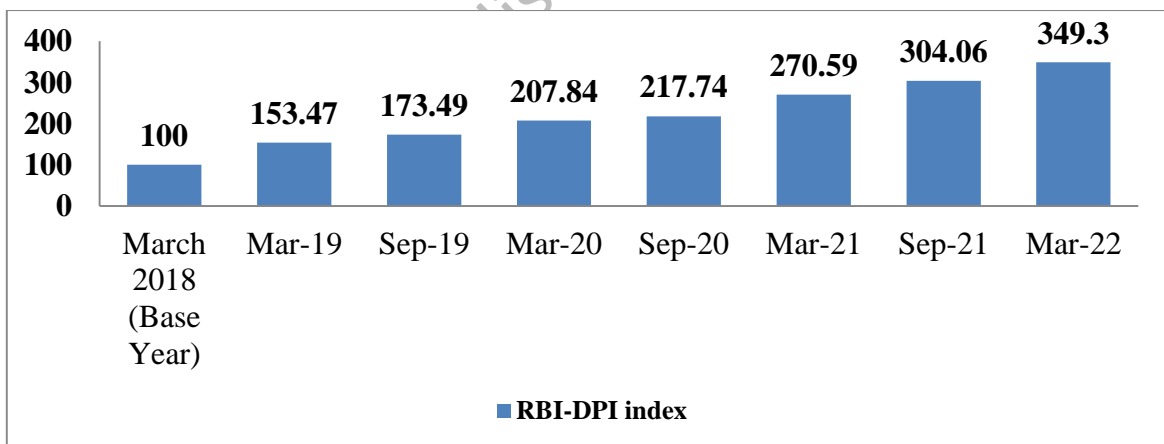
Source: RBI

Fig.4: Total Digital Transaction in India in terms of volume and value



Source: McKinsey Global Institute Analysis¹⁰

Fig. 5: Sector-wise growth in India by 2025 due to digital transformation



Source: Press Release of RBI

Fig. 6: RBI- Digital Payment Index (DPI)

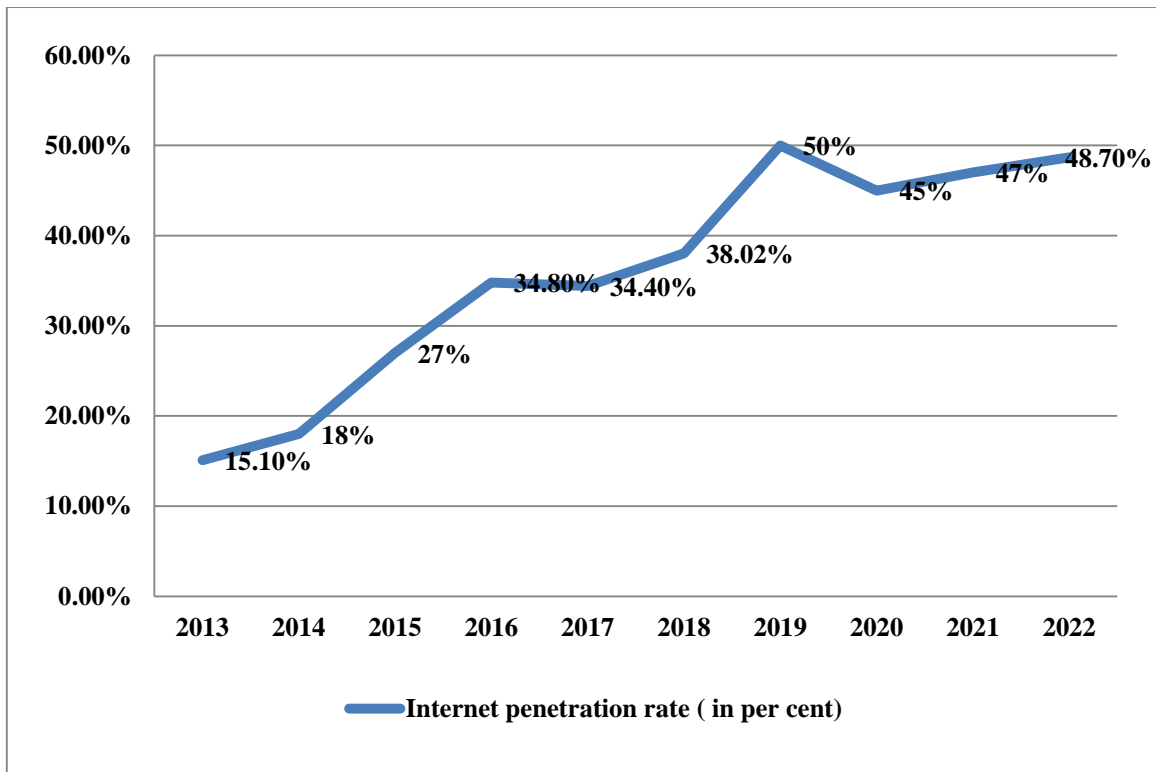


Fig. 7: Internet penetration rate (in per cent) in India from 2013 to 2022

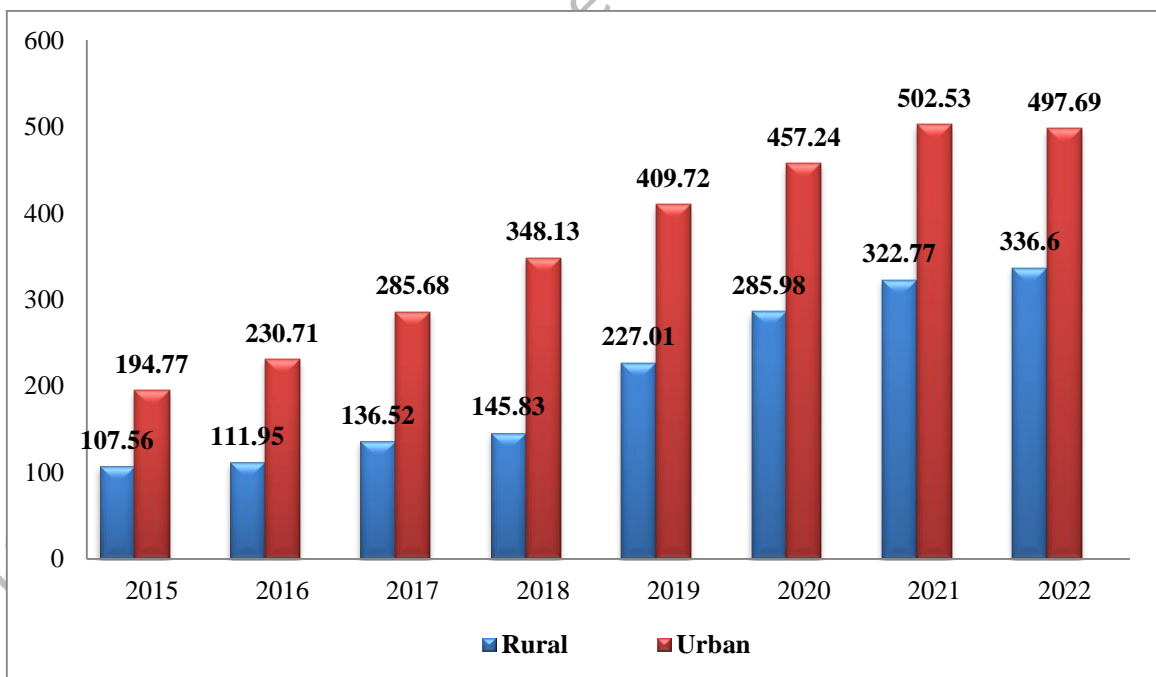


Fig. 8: Number of Internet connections in rural and urban India from the financial year 2015 to 2022

Table 1: Total UPI Transactions (2016-17 to 2021-22)

Year	Volume (in Millions)			Value (in Billion)		
	Total Financial Transactions	Total UPI transactions	% share	Total Financial Transactions	Total UPI transactions	% share
2016-17	7138.40	17.36	0.25	96626.07	69.47	0.07
2017-18	9857.60	915.23	9.28	113552.76	1098.32	0.97
2018-19	16806.25	5353.40	31.85	136719.23	8769.70	6.41
2019-20	35044.00	12518.62	35.72	169794.25	21317.30	12.55
2020-21	44414.90	22330.70	50.28	165529.97	41036.54	24.79
2021-22	72653.00	45956.10	63.25	181064.82	84157.32	46.48

Source: Compiled from NPCI

Table 2: Top five UPI Remitter Banks (November 2022)

Sl. No	UPI Remitter Banks	Total Volume (Mn)
1.	State Bank of India	1951.85
2.	HDFC Bank Limited	649.64
3.	Bank of Baroda	475.43
4.	Union Bank of India	447.27
5.	ICICI Bank	396.06

Source: NPCI

Table 3: Top five UPI Beneficiary Banks (November 2022)

Sl. No	UPI Beneficiary Banks	Total Volume (Mn)
1.	Paytm Payments Bank	1617.99
2.	Yes Bank Limited	1261.66
3.	State Bank of India	877.76
4.	Axis Bank Limited	541.43
5.	ICICI Bank	493.34

Table 4: Digital payment transactions in terms of volume and value (FY 2010-11 to FY 2021-22)

Year	Transaction Volume (Crores)	Transaction value (Lakh crores)
2010-11	96	498
2011-12	125	561
2012-13	169	711
2013-14	245	785
2014-15	352	823
2015-16	595	920
2016-17	978	1122
2017-18	1472	1371
2018-19	2340	1638
2019-20	3435	1623
2020-21	4374	1414
2021-22	7195	1744
CAGR	43.09	10.96

Source: RBI

Table 5: Ordinary Least Square (OLS) Regression

Variables	Coefficient	Std. Error	Probability
L_RTGS	-0.5737	0.2174	0.1186
L_CCIL_OS	-0.0774	0.0486	0.2525
L_PC	0.5531	0.1650	0.0787
L_CP	0.2151	0.0594	0.0686
L_ERC	0.2054	0.0897	0.1492
L_PPIS	0.0398	0.0097	0.0550
C	5.4699	0.7377	0.0177
R-squared	0.9994	F-Statistic	638.75

Adjusted squared	R-	0.9979	Prob (F-statistic)	0.00
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Table 6: Parameters and sub-parameters of RBI-DPI

Payment Enablers	Payment Infrastructure (Demand-side factors)	Payment Infrastructure (Supply-side factors)	Payment Performance	Consumer Centricity
Internet	Banking card	Bank and financial institutes	Digital Payment Systems: Volume and Value	Awareness and education
Mobile	Prepaid Payment Instrument (PPI)	Business Correspondents	Unique users	Security grievance
Aadhaar	Registered Mobile and Internet Banking	ATMs	Paper Clearing	Complaints
Bank Account	FASTags	PoS Terminals	Currency in Circulation	Cyber fraud
Merchant		QR Codes	Cash Withdrawals	System Glitches and downtime
Participants		Common Service Centres		Transaction declines