

## Financial transformation through digitalisation: India's dual path of cash and cashless transaction

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**Abstract.** *India has been actively pursuing digital financial transformation, and the government has implemented various initiatives to promote a cashless economy. The recent demonetization policy led to a significant push towards digital payments and a surge in the usage of digital wallets, mobile banking, and other cashless methods. These digital transformations aimed to enhance financial inclusion by providing banking and financial services to a larger population segment, especially in rural areas. Despite the push for digital transactions, certain challenges persisted, especially the existence of physical cash. This paradox is evident in many economies worldwide, including India. This study tries to analyze the trend towards the digital financial transformation of the Indian economy and prove the paradoxical situation of the cash-based economy. The study also examines the impact of digital infrastructures (DI) and payment modes and channels (PMC) on total digital payment (TDP) in India.*

**Keywords:** digital financial transformation, unified payments interface, digital financial services, digital infrastructures, payment modes and channels.

**JEL Classification:** G29, O16, O30, O39.

## 1. Introduction

The digital financial transformation of the Indian economy has been a significant and transformative journey over the past few decades. The advent of technology and the widespread use of the internet have played a pivotal role in reshaping the financial landscape of the country (Sahi, Khalid, Abbas, & Khatib, 2021). Digital financial services (DFS) encompass a broad spectrum of financial activities facilitated through digital channels, offering convenience, accessibility, and efficiency (Ahmad, Majeed, Khan, Sohaib, & Shehzad, 2021; Angamuthu, 2020). It has brought unbanked and under banked populations into the formal banking system. The government's push for financial inclusion, coupled with technological advancements, has propelled the country into a new era of digital finance.

The journey of digital financial transformation in India can be traced back to the early 2000s when the introduction of Internet banking marked the initial foray into the digital realm. It allowed customers to conduct financial transactions online, marking the first step towards digital financial inclusion. The subsequent years saw the emergence of mobile banking and electronic payment systems. Launched in 2014, PMJDY aimed to ensure financial inclusion for all by providing access to essential banking services, credit, insurance, and pension. The initiative played a crucial role in bringing a large section of the population into the formal banking system. However, the real turning point came with the demonetization drive in 2016, which catalyzed the widespread adoption of digital transactions (Niranjan, 2017). It allowed customers to conduct financial transactions online, marking the first step towards digital financial inclusion. The rise of fintech companies brought about innovative digital lending platforms. These platforms leverage technology to assess creditworthiness and disburse loans quickly, catering to the financial needs of a wide range of individuals and businesses.

The digital financial transformation of the Indian economy represents a remarkable journey marked by innovation, government initiatives, and societal adaptation. The digital transformation of financial services has enhanced overall economic efficiency. Faster and more accessible financial transactions create a more dynamic and responsive economic environment (Angamuthu, 2020). However, one of the significant challenges is the existing digital divide, with rural areas and specific demographics lagging behind in digital literacy and access to digital infrastructure. The increasing reliance on digital platforms raises cyber security concerns. The collection and use of personal data in digital financial transactions have raised privacy concerns. The success of digital financial services depends on robust technological infrastructure. Improving connectivity, especially in remote areas, and addressing infrastructure gaps are critical for the sustainable growth of digital finance (OECD & IDB, 2016).

Despite the rapid expansion of digital financial transactions in India, cash still accounts for the major share of payment transactions (Golden & Cordie, 2022; Mahajan & Singla, 2017; Thomas & Krishnamurthi, 2017). India observed a simultaneous growth of the cash economy and digital payments, which created a paradoxical situation. This situation created a lesson for policymakers who imagined all cash was shady and that digital must necessarily dent the cash economy.

## 2. Literature Review

Many studies have underscored a correlation between cashless (digital) payments and economic growth, suggesting that transitioning from a cash-based economy to a cashless one could potentially save GDP for governments. These studies have emphasized that adopting cashless payment systems has been pivotal in driving economic growth and development within countries (Adedokun & Ağa, 2021; Asli Demircuc-Kunt Leora Klapper & Singer, 2017; Hasan, Atif Aman, & Ashraf Ali, 2020; D. B. Humphrey, Pulley, & Vesala, 2016; D. Humphrey, Willeson, Lindblom, & Bergendahl, 2009; Kumari Neetu & Khanna, 2017; Sharma, 2020; Tee & Ong, 2016; Zandi, Koropecykj, Singh, & Matsiras, 2016). Electronic transactions enhance efficiency, transparency, and accountability while eliminating cash-related fraud. Additionally, they foster innovativeness, which is a crucial component of economic growth and development (Kaoje, Nabila, Idris, Gambarawa, & Ubandawaki, 2020; Khairun, N.K., & Yasmin, 2010; Kumari Neetu & Khanna, 2017; OECD, 2016; Patil, 2018; Simon Oyewole, Gambo, Abba, & Ezekiel Onuh, 2013; Zandi et al., 2016). While digital payments offer a secure and convenient method for making transactions and serve as a gateway to technical innovation within the global economy (OECD, 2018; Slozko & Pelo, 2015), various literature highlights the challenges associated with transitioning towards a cashless economy driven by digitalization. These challenges predominantly encompass factors such as insufficient knowledge, awareness, and connectivity alongside issues of digital financial illiteracy, security and privacy concerns, additional service charges, and inadequate financial infrastructure (Ergün, 2018; Fetu, 2019; Finconet, 2016; Garg & Panchal, 2017; GLEC, 2017; Hasan et al., 2020; K, 2018; Khairun, N.K., & Yasmin, 2010; Khurana, 2017; Kumari Neetu & Khanna, 2017; Lusardi, 2015; Lyons, 2021; Ozili, 2018; Patil, 2018; Shen, Hueng, & Hu, 2020; Singhraul & Garwal, 2018; Thomas & Krishnamurthi, 2017; Vives, 2019).

Significant progress has been made in transitioning India into an inclusive digital financial system during the last eight years (Bhatt, 2020; RBI, 2020). According to the World Payments Report 2020 by Capgemini, India's digital payments market is expected to reach \$500 billion by 2025. Many policy initiatives and programmes were introduced to move towards a digital-based cashless economy. The Pradhan Mantri Jan Dhan Yojana (PMJDY)

was launched in 2014 with the aim of providing banking facilities to all households in the country. The scheme has been successful in bringing millions of unbanked people into the formal banking system, which has helped increase the penetration of digital payments in the country.

Following India's demonetization in November 2016, the impetus for advancing towards a cashless economy became apparent (Khurana, 2017; Mahajan & Singla, 2017; Som, 2017). Advocates argue that transitioning to a cashless economy can effectively mitigate issues such as black money, currency counterfeiting, terrorism, and corruption. Moreover, it is believed to enhance the country's economic trajectory, fostering inclusive growth. (Garg & Panchal, 2017; Patankar, Vyas, & Tyagi, 2017; RBI, 2021). Another significant development in India's payment system has been the introduction of the Unified Payments Interface (UPI) in 2016. UPI is a real-time payment system that allows users to transfer money between bank accounts instantly, using a mobile phone. The system has been a game-changer in the Indian payments landscape, with several new players entering the market and driving innovation. Additionally, the pandemic led to an unprecedented surge in the adoption of digital financial services, facilitating greater digital financial inclusion. As a result, there was a significant expansion in digital transactions and payments, further overshadowing the traditional cash economy (Ganiger. V. Sunitha : B. Ranganatha, 2017; RBI, 2020).

Despite the growth in digital payments, cash still dominates India's payment system. According to a report by KPMG, cash transactions accounted for over 90 per cent of all transactions in India in 2019 (KPMG, 2019). This is in stark contrast to countries like Sweden and Norway, where cash transactions account for less than 10 per cent of all transactions (Bhargava & Singh, 2020). The high level of cash usage in India can be attributed to several factors, such as the lack of digital infrastructure in rural areas, the low level of financial literacy, and the reliance on informal channels for financial transactions. Several studies, including those by Al-dalaien (2017), Dahiya & Kumar (2020), S. Goel (2018), Khaki & Sangmi (2017), and Mazzotta et al. (2018), have highlighted that despite efforts towards a cashless economy, its impact remains limited in rural India. Factors such as inadequate financial and digital infrastructure, low levels of general and financial literacy, and a lack of understanding pose significant challenges (Chandwani et al., 2016; R. Goel et al., 2019; Rajanna, 2018; Thomas & Krishnamurthi, 2017). Consequently, cash continues to dominate both in terms of transaction volume and payment value, especially for small transactions (Matheny et al., 2016; Mazzotta et al., 2018; RBI, 2020). Recent indicators, such as the total amount of money in circulation, the cash-to-GDP ratio, and ATM withdrawals, show an increase, underscoring the persistence of cash-based transactions (RBI, 2020).

### 3. Objectives of the Study

This research paper delves into the evolving trends and advancements in digital payment transactions within India, examining the factors contributing to the nation's transition towards a cashless economy. It raises the critical question of whether the envisioned cashless society will materialize or if traditional currency will persist as a cornerstone of everyday transactions, as it has for decades. The study also tries to identify the role of payment modes and channels, and digital infrastructure on total digital payments in India.

### 4. Sources of Data and Methodology

To analyze trends in digital payment transactions in India over time, the study used secondary data published by the Reserve Bank of India on various payment indicators from 2015-16 onwards. The digital payment indicators, namely Credit Transfers - RTGS, Credit Transfers - Retail, Debit Transfers and Direct Debits, Card Payments, Prepaid Payment Instruments and Total Digital Payments, were considered in terms of volume and value for the analysis.

Similarly, analyzing a cash economy involves examining various indicators to gain insights into the prevalence and characteristics of cash transactions. Using the secondary data on various indicators, namely cash in circulation, Cash to GDP Ratio and Cash withdrawal from ATMs, published by RBI from 2010 onwards.

The study also assesses the role of payment modes and channels (PMC), and digital infrastructure (DI) on total digital payments (TDP) in India. It uses monthly data from November 2019 to November 2023 published by RBI. The study used an OLS regression model with a dependent variable (TDP) and two predictor variables, DI and PMC. The model is specified as follows.

$$TDP = \beta_0 + \beta_1 DI + \beta_2 PMC + u_i$$

### 5. Growth of Digital Payment in India

Over the past years, India has made significant progress in its economic growth and development, with particular emphasis on digital payments. The government launched the 'Digital India scheme' in 2015, a pivotal initiative to transition India towards a cashless economy. Over the subsequent six years, considerable advancements have been made in establishing an inclusive digital banking system that is both cost-effective and reliable, bringing previously underserved rural populations into the economic mainstream. Following the events of 2010 and the subsequent demonetization, concerted efforts were

made by the government and the RBI to bolster the digital payment infrastructure and methods. Various policy measures such as the Pradhan Mantri Jan Dhan Yojana (PMJDY), Pradhan Mantri Jeevan Jyoti Bima Yojana (PMJJBY), Pradhan Mantri Mudra Yojana (PMMY), Pradhan Mantri Suraksha Bima Yojana (PMSBY), Skill India, Digital India, Stand up India, and Atal Pension Yojana (APY) were implemented to promote financial inclusion and digitalization. A major milestone in India's payment landscape was the Unified Payments Interface (UPI) launch in 2016, facilitating real-time bank transfers via mobile phones. The UPI has witnessed significant growth since its inception, with over 2.2 billion transactions totalling INR 4.6 trillion in January 2021 (RBI, 2021).

The adoption of cashless transactions through various platforms like UPI, IMPS, RTGS, NEFT, National Automated Clearing House (NACH), mobile wallets, Internet banking, QR codes, advanced payment systems, smart POS terminals, NETC (National Electronic Toll Collection) fastags, Bharat Bill Payment System (BBPS), and Prepaid Payment Instruments (PPIs) has furthered India's journey towards a cashless economy. The COVID-19 pandemic catalysed the rapid expansion of digital financial services, ultimately enhancing digital financial inclusion. These collective efforts have propelled India's transformation into a more cashless economy.

**Table 1.** *Payment System Indicators – Payment Systems (Volume in Lakhs)*

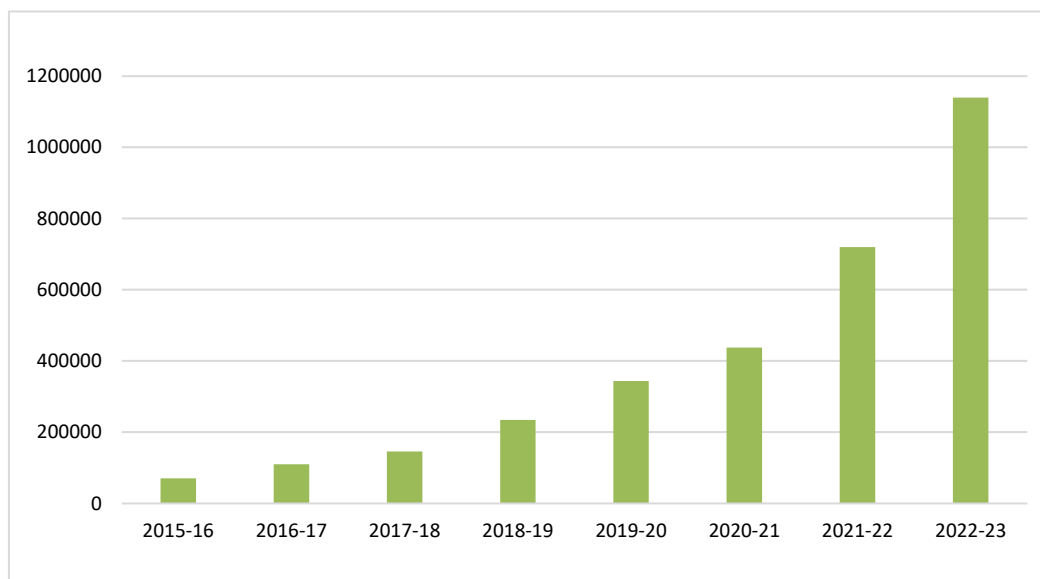
Financial Year	Credit Transfers - RTGS	Credit Transfers - Retail	Debit Transfers & Direct Debits	Card Payments	Prepaid Payment Instruments	Total Digital Payments
2015-16	983	31415	3515	27073	7480	70466
2016-17	1078	42229	7533	54501	19637	109912
2017-18	1244.6	54672.9	3788	47486	34591	145902
2018-19	1366	118750	6382	61769	46072	234339
2019-20	1507	206661	8957	73012	53318	343455
2020-21	1591.92	317867.74	10456.54	57786.60	49742.55	437445.36
2021-22	2078.39	577934.74	12189.49	61782.93	65782.75	719768.30
2022-23	2425.62	983620.84	15343.05	63324.72	74667.44	1139381.68

**Source:** RBI.

The total number of digital payments has consistently grown over the years, showcasing the growing acceptance of digital payment channels in the country (Table: 1). A constant increase in the volume of total digital payments from 70,466 lakhs in 2015-16 to 1,139,381.68 lakhs in 2022-23 shows substantial growth in digital transactions. The financial year 2022-23 stands out with a substantial increase in all indicators of digital payments compared to the previous years. It indicates a surge in the usage of digital payment systems. Retail credit transfers have witnessed a remarkable surge, indicating a shift towards digital payment methods in daily transactions. Prepaid Payment Instruments, such as mobile wallets and prepaid cards, have continuously expanded, suggesting their significance in the digital payment ecosystem.

The constant growth across various digital payment indicators signifies a revived pace of digital transformation in India's payment landscape. It demonstrates a shift in consumer preferences towards digital modes of payment.

**Figure 1.** Total Digital Payments - Volume (Lakhs)



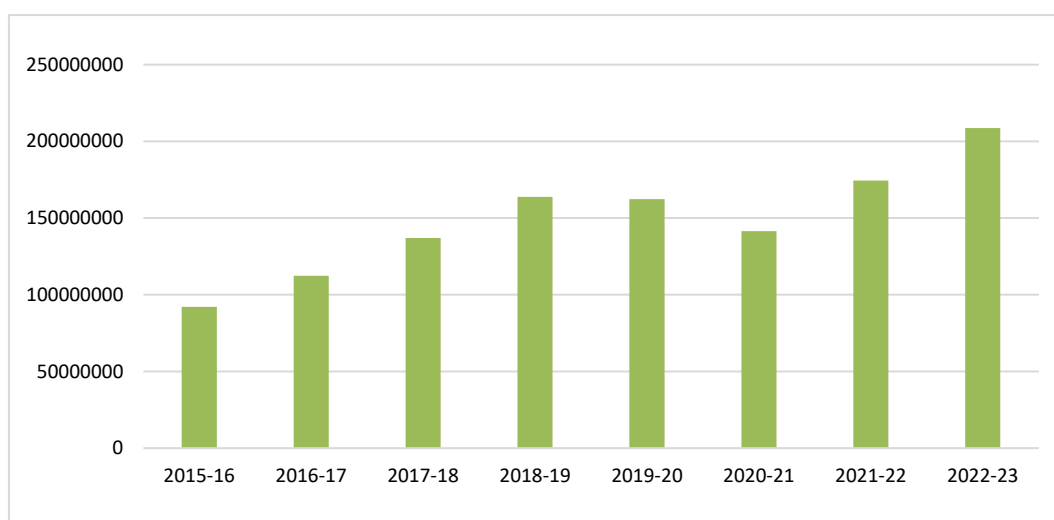
**Source:** RBI.

Table 2 presents the value of transactions across various digital payment indicators in India over consecutive financial years. The total value of digital payments has consistently increased over the years, reaching 208,684.87 Crores in the financial year 2022-23. The consistent growth in transaction values across different payment systems reflects the expanding use of digital payment methods for retail and high-value transactions. RTGS transactions contribute significantly to the total value of digital payments, reflecting the importance of high-value transfers in the overall digital payment ecosystem. Retail credit transfers contribute considerably to the overall value of digital payments, indicating their importance in everyday transactions. The increasing values across all digital payment categories reflect a changing economic landscape with a higher acceptance of digital payment methods. The trends may be due to economic factors, technological advancements, government policies, and changing consumer behaviour, contributing to the overall growth in digital payments.

**Table 2.** *Payment System Indicators – Payment Systems Value (in Crores)*

Financial Year	Credit Transfers - RTGS	Credit Transfers - Retail	Debit Transfers & Direct Debits	Card Payments	Prepaid Payment Instruments	Total Digital Payments
2015-16	82457800	9140800		448300	48800	92095700
2016-17	98190400	13232400	113629	742100	83800	112362329
2017-18	116712500	18814287	399300	919035	141634	136986756
2018-19	135688187	26097655	656232	1196888	213323	163852285
2019-20	131156475	28572100	826036	1535765	215558	162305934
2020-21	105599848.5	33504225.63	865520.099	1291798.632	197696.0849	141459089
2021-22	128657516.5	42728005.55	1034443.535	1701850.939	279416.4217	174401233
2022-23	149946286.1	55009619.51	1289611.061	2152244.508	287111.1648	208684872

Source: RBI.

**Figure 2.** *Total Digital Payments - Value (Crore)*

Source: RBI.

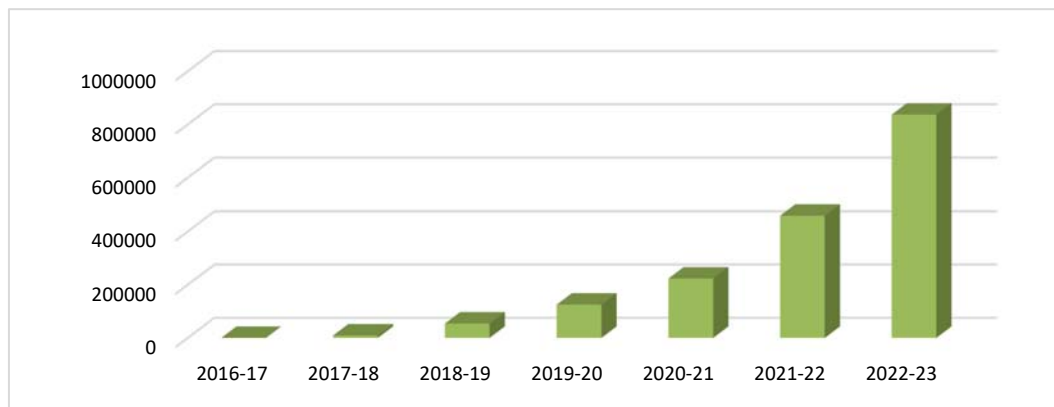
## 6. Growth of Unified Payment Interference (UPI)

UPI is a revolutionary payment system that facilitates inter-bank transactions and is widely used for peer-to-peer money transfers, bill payments, and other transactions. Figure 3 & 4 highlights the significant growth of UPI transactions both in volume and transaction value, indicating a wide acceptance and adoption of UPI-based payments in India. The volume of UPI transactions has seen remarkable growth from 179 lakhs in 2016-17 to 8,37,144 lakhs in 2022-23. It designates an exponential increase, indicating a widespread adoption of UPI transactions as a preferred mode of payment. The UPI transaction in terms of value has also followed a similar trend, growing from 69,000 crores in 2016-17 to 13,91,500 crores in



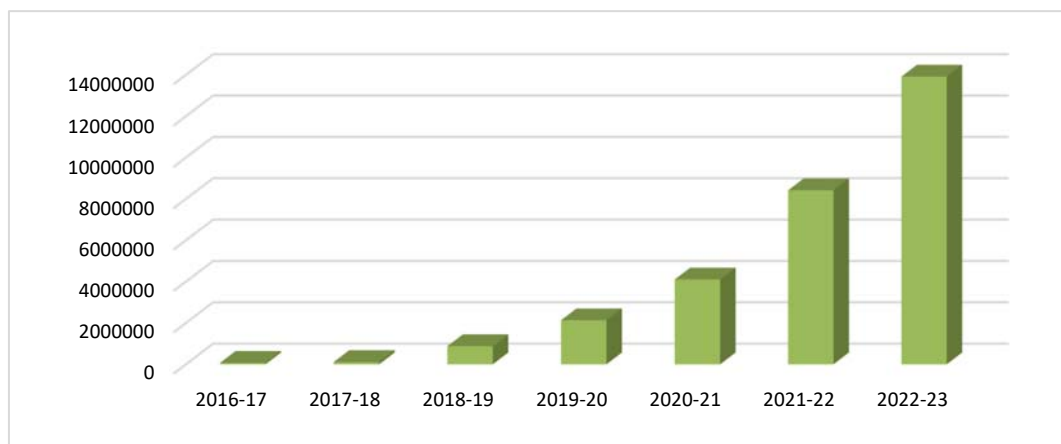
2022-23. The increase in transaction numbers and values across these years is a testament to the success and popularity of the UPI system in the country. The growth in UPI transactions is attributed, in part, to government initiatives promoting digital payments, financial inclusion, the push towards a less cash-dependent economy and the availability of various UPI-based apps offered by banks and third-party providers. It can also be linked to technological advancements and increased nationwide smartphone penetration. The ease of making UPI transactions through mobile apps has made digital payments accessible to a larger population segment. Further, the COVID-19 pandemic accelerated the adoption of digital payments in India, with more people turning to online transactions for safety and convenience.

**Figure 3.** Volume of UPI Transaction (Lakhs)



Source: RBI.

**Figure 4.** Value of UPI Transaction (Crore)



Source: RBI.

## 7. Determinants of Digital Payment in India

The developments of digital payments are closely connected with the availability and effectiveness of payment modes and channels and the strong digital infrastructure. It plays a crucial role in shaping the total digital payment landscape of India. It facilitates efficient, robust, convenient, affordable and safe financial transactions, such as interoperable digital payment systems and distribution networks, digital identification and robust security platforms are equally critical for the expansion of digital payments (GPFI, 2016; Huang & Dollar, 2022). Payment modes and channels (PMC) refer to the various ways digital payments can be made, such as mobile applications, online platforms, and point-of-sale devices. Measuring digital infrastructure (DI) in India typically involves assessing the availability, accessibility, and reliability of key components that support digital payments. This can include indicators such as the number and geographical coverage of digital payment service providers, the quality and speed of internet connectivity, the presence and usage of digital payment acceptance devices (e.g., point-of-sale terminals), the penetration of smart phones and other digital devices, and the reliability of power supply to support uninterrupted digital transactions. It encompasses the technological framework, network connectivity, and supporting infrastructure that enable seamless and secure digital transactions. The items included in total digital payments by RBI are credit transfers (RTGS, AePS, APBS, ECS Cr, IMPS, NACH Cr, NEFT, UPI) and debit transfers (BHIM Aadhaar Pay, ECS Dr, NACH Dr, NETC), card payments (credit and debit cards) and pre-paid instruments.

The R-value estimated in the model is 0.889 (a), indicating a strong positive correlation between the predictor variable payment modes and channel (PMC) and digital infrastructures (DI) and the dependent variable (Total digital payment). The closer the R-value is to 1, the better the model fits the data. R Square (Coefficient of determination) is 0.790, suggesting that approximately 79 per cent of the variance in the Total Digital Payment is explained by the predictors PMC and DI. The standard error of the estimate is 0.09614, which represents the standard deviation of the residuals. A lower value indicates a better fit. The Durbin-Watson statistic tests the presence of autocorrelation in the residuals. The value of 1.659 is between 0 and 4, suggesting a mild positive autocorrelation. A value around 2 indicates no strong autocorrelation.

**Table 3. Model Summary**

R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
.889 <sup>a</sup>	.790	.778	.09614	1.659

The ANOVA (Analysis of Variance) table assesses the overall statistical significance of the regression model. The F-statistic is a ratio that tests the overall significance of the regression model. The F-statistic is 67.514. The p-value associated with the F-statistic is very low (0.000a), indicating that the overall regression model is statistically significant.

**Table 4.** ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	1.248	2	.624	67.514	.000 <sup>a</sup>
Residual	.333	36	.009		
Total	1.581	38			

The coefficient for DI is 0.087. It represents the change in the total digital payment (TDP) for a one-unit change in the DI predictor. The t-statistic for DI is 0.727, and the associated p-value (Sig.) is 0.472. The p-value is less than 0.05, suggesting that the coefficient for DI is statistically significant at conventional significance levels. The tolerance for DI is 0.869, and the Variance Inflation Factor (VIF) is 1.151. These values are within an acceptable range and suggest no significant multicollinearity issues.

**Table 5.** Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	8.680	1.177		7.378	.000		
DI	.087	.120	.060	.727	.472	.869	1.151
PMC	.441	.042	.865	10.546	.000	.869	1.151

The coefficient for Payment Modes and channels (PMC) is 0.441, representing the estimated change in the dependent variable (TDP) for a one-unit change in the PMC predictor. The t-statistic for PMC is 10.546, and the associated p-value (Sig.) is 0.000. The p-value is less than 0.05, indicating that the coefficient for PMC is statistically significant. The tolerance for PMC is 0.869, and the Variance Inflation Factor (VIF) is 1.151. These values also suggest no significant multicollinearity issues.

The study suggests that digital infrastructures, payment modes and channels significantly influence total digital payments. Understanding these relationships can inform strategic decisions about digital infrastructure development and payment channel optimization. Given the positive impact of digital infrastructures on total digital payments, policymakers may consider prioritizing investments in digital infrastructure development. It includes improving broadband access, enhancing network reliability, and fostering technological advancements to facilitate a seamless digital payment experience. Similarly, recognizing the significant influence of payment modes and channels on total digital payments, policymakers should encourage diverse payment modes and channels. It may involve supporting the adoption of digital wallets, contactless payments, and other innovative payment solutions to cater to the preferences and needs of a broad spectrum of users.

## 8. Cashless versus Cash Based Economy

Despite the growth in digital payments, cash continues to play an important role in India's economy. While the Indian government has taken steps to promote digital transactions through initiatives like demonetization, it also recognizes the practical coexistence of cash. Currency in circulation (CIC) has grown steadily over the years, indicating the vibrancy of cash. The statistic that 70 per cent of account owners in India used cash for merchant payments in 2021 suggests that, despite the surge in digital payment initiation, a significant proportion still preferred or relied on cash when transacting with merchants. The coexistence of both digital and cash payments suggests a multi-modal payment landscape in India.

Factors like a large unbanked population, infrastructure limitations, and financial/digital literacy contribute to cash relevance. A substantial portion of India's population remains unbanked or underbanked, especially in rural areas. Lack of access to formal banking services, including the absence of bank accounts, makes cash transactions necessary for these individuals. In many parts of India, especially in rural and remote areas, there are challenges related to basic infrastructure such as electricity, internet connectivity, and point-of-sale (POS) terminals. The absence of these facilities makes it difficult for people to engage in digital transactions, leading them to rely on cash. Limited awareness, inadequate digital financial literacy and understanding of digital payment methods among a significant portion of the population contribute to the preference for cash. Trust in the security and reliability of digital payment systems is a significant factor. Concerns about fraud, hacking, and other security issues may deter people from fully embracing digital transactions. Cash is often perceived as a more cost-effective option for small-value transactions than digital payments, especially when considering transaction fees associated with the latter.

## 9. Cash in Circulation

The amount of currency in circulation is subject to change based on economic conditions, government policies, public preferences and shifts in payment behaviour. While promoting digital payments is often associated with reducing cash usage, the extent to which cash in circulation decreases. However, the Indian economy has observed simultaneous growth in both the cash economy and digital payments. This phenomenon suggests that the adoption of digital payments hasn't necessarily resulted in a proportional reduction in the use of cash. It is analysed using the indicator of cash in circulation by estimating the volume and value of cash in circulation in the Indian economy. The RBI regularly releases currency data in circulation, including coins and notes.

**Table 6.** *Cash in Circulation & Cash to GDP Ratio*

Year	Cash in Circulation (Volume) lakhs	Growth Rate	Cash in Circulation (Value) in Cr	Growth Rate	Cash to GDP Ratio
2010	565490	-	788299	-	12.3
2011	645770	14.2	935856	18.72	12.2
2012	693820	7.44	1052800	12.5	12.22
2013	735170	5.96	1164800	10.64	11.98
2014	773300	5.19	1282900	10.14	11.58
2015	835790	8.08	1428900	11.38	11.62
2016	902660	8	1641500	14.88	12.08
2017	1002930	11.11	1310200	-20.18	8.67
2018	1023951	2.1	1803700	37.67	10.7
2019	1087594	6.22	2110892	17.03	11.31
2020	1159768	6.64	2420975	14.69	12.05
2021	1243671	7.23	2826863	16.77	14.41
2022	1305326	4.96	3105721	9.86	13.7
2023	1362137	4.35	3348228	7.81	12.57

**Source:** RBI.

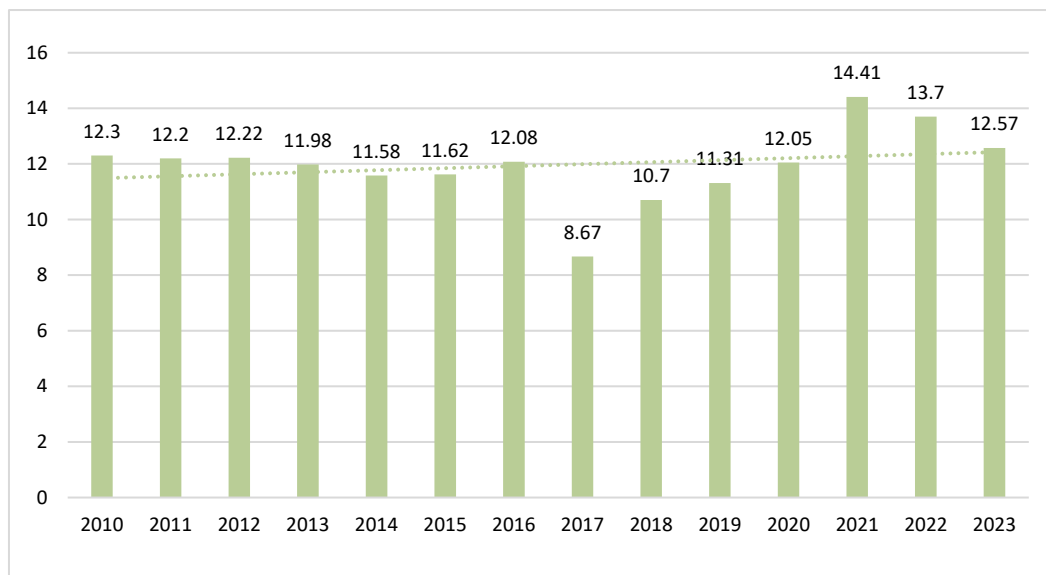
The volume and value of banknotes in circulation in India for various years, along with their respective growth rates, are given in Table 6. The data underscores the continued importance of physical currency in the Indian economy and highlights the challenges of transitioning to a less cash-dependent society. There has been a consistent increase in the volume of banknotes in circulation over the years, reflecting a growing demand for physical currency. Notable growth rates are observed in 2017, 2016, and 2015, indicating significant increases in the volume of banknotes during these years. The year 2017 saw a considerable increase in the volume of banknotes but a negative growth rate in the value of banknotes. This discrepancy may be attributed to the demonetization policy implemented in late 2016, which led to the replacement of high-denomination currency notes. The value of banknotes has also been rising, showing an increasing trend in the monetary worth of physical currency in circulation. A substantial growth rate in 2018 stands out, suggesting a surge in the value of banknotes that year. The increasing trend in banknotes' volume and value suggests sustained demand despite efforts to promote digital transactions.

## 10. Cash to GDP Ratio

The cash to GDP Ratio provides insights into the proportion of physical currency (cash) in circulation relative to the gross domestic product (GDP) of a country. It is represented as a percentage and can offer valuable information about the reliance on cash transactions in the economy. The data shows fluctuations in the cash to GDP Ratio over the years, indicating changes in the scale of cash transactions compared to the overall economic output. There was a notable decline in the Cash-GDP Ratio in 2017, dropping to 8.67 per cent due to the demonetization policy in 2016, where RBI invalidated high-denomination

currency notes. Demonetization led to a temporary drop in the supply of physical currency in circulation. The years following demonetization (2018 onwards) show a gradual increase in the cash to GDP Ratio, suggesting a recovery in the use of physical currency relative to the size of the economy. The ratio has experienced an increase in recent years, with values ranging from around 10.7 per cent (2018) to 14.41 per cent (2021). Despite efforts to promote digital transactions, the cash to GDP Ratio indicates the resilience of cash usage in the Indian economy. The ratio has remained significant, suggesting that most economic transactions still involve physical currency.

**Figure 5.** *Cash to GDP Ratio*



Source: RBI.

## 11. Cash Withdrawal from ATM

ATMs are widely accessible across urban and rural areas, making withdrawal data provide real-time insights into the actual demand for physical cash. It reflects the immediate need for physical cash by individuals. It is expected that the increasing popularity of digital payment methods may result in reduced reliance on cash withdrawals from ATMs. People may be using alternative digital channels for transactions. Analyzing cash withdrawal habits can offer insights into consumer behaviour, spending habits, and preferences for using physical currency.

**Table 7.** Cash Withdrawal from ATM

Year	ATM - Credit		ATM - Debit		ATM Credit+Debit	
	Volume (in actuals)	Value (in Rs'000)	Volume (in actuals)	Value (in Rs'000)	Volume (in actuals)	Value (in Rs'000)
Dec-15	534094	2748527.592	708001000	2204614958	708535094	2207363485
Dec-16	375943	880910.8861	630466234	849340864.6	630842177	850221775.5
Dec-17	713363	3340599.193	761931584	2640389161	762644947	2643729760
Dec-18	875230	4032349.065	914307302	3139012998	915182532	3143045347
Dec-19	892582	4226391.974	646212550	2904237201	647105132	2908463593
Dec-20	502048	2466890.843	580060844	2705057022	580562892	2707523913
Dec-21	590456	2952303.320	589655460	2796765922	590245916	2799718225
Dec-22	812830	3920545.477	585032896	2789271573	585845726	2793192118
Oct-23	853926	4126373.247	568338459	2762893258	569192385	2767019631
Nov-23	789341	3912313.823	550575141	2750323988	551364482	2754236302

Source: RBI.

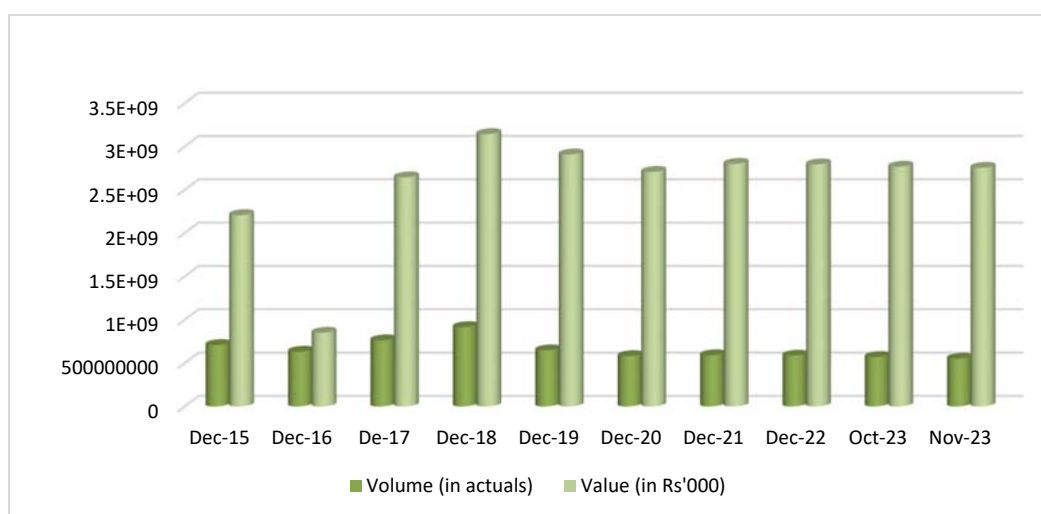
**Figure 6.** Cash Withdrawal from ATM (Debit+ Credit Cards)

Table 7 provides information on the volume and value (in Rs'000) of cash withdrawals from ATMs using credit cards, debit cards, and the combined total. Both the volume and value of credit card transactions changes over time. Notably, there is an increase in December 2017 compared to the preceding months. Similar fluctuations are observed in the volume and value of debit card transactions. December 2018 recorded the highest volume and value of cash withdrawals, indicating a peak in the demand for physical currency. However, from 2019 onwards shows a notable decrease in volume and value compared to the previous year. Various factors, including changes in consumer behaviour, economic conditions, or digital payment trends, may influence this decline. This could be influenced by ongoing trends favouring digital payments or other factors affecting cash usage. From December 2020 to December 2021, there is relative stability in both volume and value, with slight fluctuations. This period may reflect a consistent demand for cash

withdrawals. The data shows that a significant amount of cash is still being withdrawn from ATMs, even though there might be fluctuations in the volume and value over different periods. While there may be ongoing efforts to promote digital payments and reduce cash dependence, the data indicates that a substantial portion of the population continues to rely on cash for various transactions.

## 12. Conclusion

The digital financial transformation in India has witnessed substantial growth, characterized by technological advances, government initiatives, and societal adaptation. The journey, initiated in the early 2000s with internet banking, gained momentum through mobile banking, electronic payments, and transformative initiatives like PMJDY and demonetization. The growth of fintech companies further fuelled innovation in digital lending platforms, contributing to financial inclusion. While digital payments have surged, cash transactions remain prevalent, posing a challenge to achieving a completely cashless economy. The literature review indicates a correlation between cashless payments and economic growth, emphasizing the positive impact on efficiency, transparency, and innovation. However, challenges such as digital illiteracy, inadequate infrastructure, and cyber security concerns persist. Analysing payment system indicators reveals consistent growth in digital transactions, reflecting changing consumer preferences. UPI has emerged as a game-changer, showcasing exponential growth in both volume and transaction value. The study identifies digital infrastructure and payment modes/channels as significant determinants of digital payments, emphasizing their role in shaping the landscape.

Despite these strides, cash's resilience is apparent through metrics like cash in circulation, cash to GDP ratio, and ATM withdrawals. Factors such as a large unbanked population, infrastructure limitations, and trust issues contribute to the coexistence of digital and cash payments. In the journey for a cashless society, policymakers must address existing challenges, enhance digital literacy, and invest in robust infrastructure. While digital payments are on the rise, recognizing the population's diverse needs and fostering a multi-modal payment landscape is crucial for sustainable growth in India's digital finance journey.



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