A Detailed Analysis of Selected Digital Payment Systems in India

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Abstract

The world is getting digitalized in all its aspects ; so is India. The payment systems in India have also been digitalized and their use is steadily on the rise. Digital payment systems are going to drive the growth story in the financial sector. We, in this explanatory research paper, attempted to perform a detailed analysis of selected digital payment systems from the universe of digital payments systems available in India. We concluded that the digital payments in India are increasing at a rapid pace, however, cash still remains a preferred mode of payment and transactions. Transaction failures, systems delays, and lack of proper infrastructure were identified as the prime hurdles being faced by the industry. We suggested going hyper local in order to improve the awareness of digital payments from grassroot levels and launch an aggressive campaign for adopting digital payments by drawing parallels to the Swachh Bharat campaign, make some changes in payment systems, and digitize the government-to-government (G2G) and government-to-person payments (G2P) to save on various costs.

Keywords : **digital payments, demonetisation, retail payments, payment and settlement systems**

JEL Classification : E42, G2, G53, L5

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Payment and settlement systems form the backbone of the financial system and the economy, and hence, it becomes inevitable that they remain healthy, robust, and shock proof. Efficient payment and settlement systems are essential for the financial system as they lubricate the financial and real economy and ensure trust in the system. India possesses one of the most advanced and most tech - savvy digital payment ecosystems in the world.

Demonetisation was a large event that propelled the use of digital payments in India. Digital payments have been gaining traction due to the proactive role played by the government, regulatory support, fintech, innovation, and advent of ease of operating & safety. The aim of this research study is to understand the trend in the digital payments systems after demonetisation. The study is purely based on secondary data analysis, which gives it a much wider field arena as compared to the traditional research through surveys or questionnaire. We have attempted to provide a ringside view of the trends in the digital payments systems, which at the current juncture are missing from all other research being done in the area.

While the vibrant journey of digital payments promises an energetic future, there are some limitations too. The

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adoption of digital payments requires constant tinkering and nudging with the behaviour of people to make it a habit. Digital payments transaction fraud hurts the industry as a whole and dents its integrity. Nevertheless, we are going through a transformational journey of adopting digital payments in our daily lives in India.

Literature Review

The pace of accepting digital payments got a huge support from the demonetisation drive of the government in the month of November 2016. Promotional offers that offered cashbacks and incentives helped to deepen the adoption of digital payments and more and more customers took the benefit of the same (India Brand Equity Foundation, 2018).

The tremendous growth in the digital payments sector is driven by factors like convenience in paying, increasing smartphone penetration and usage, rise of fintech players, progressive regulatory policies, and increasing adoption of digital payments by consumers themselves (IBEF, 2019).

KPMG (2019), in its report of 2019, stated that the global digital payments market size is expected to touch USD 10.07 trillion by 2026. All the stakeholders namely government, regulators, banks and financial institutions, merchants, mobile payments service providers, and investors have played a key role in enabling the digital payment revolution through leveraging on the mobile payment ecosystem.

Demonetisation was an inflection point for the digital payments industry (Mukherjee et al., 2019). The Indian payments industry is expected to grow five fold by 2023 to USD 1 trillion. Speed and ease of access and attractive cashbacks are the reasons behind the widespread adoption of digital wallets by consumers.

Razorpay (2020) in their blogpost stated that tier 1 cities are the current growth engines for the growth of fintech and digital payments and tier 2 and tier 3 cities are also catching up the race quickly. The digital payments wave is riding on the back of metropolitan cities and Bengaluru is the most digitized city. Lack of consumer trust is one of the biggest challenges for financial services in markets where there is less penetration of digital payments.

Reserve Bank of India (2019a) in their vision report mentioned that the time period from 2015–2018 witnessed introduction of new and innovative systems, and a distinctive shift from paper to electronic payment modes, sizable increase in transaction turnover, and international recognition. Paper-based clearing instruments have de-grown and continuous growth is being witnessed in individual segments of retail electronic payments such as NEFT, IMPS, and card transactions. Consumer behaviour has been driving growth of digital payment systems as more and more consumers are embracing mobile technology. Connectivity issues remain a big dragging factor which can hamper the growth of digital payments.

Reserve Bank of India (2019b) in the report chaired by Nandan Nilekani, popularly known as Nandan Nilekani Committee, showed that per capita digital transactions rose from 2.4% in 2014 to 22.42% in 2019, and have the potential to grow to 220% in 3 years. Digital payments as a percentage of GDP increased from 561% in the year 2014–2015 to 769% in the year 2018–2019. The Committee recommended setting up of Acceptance Development Fund (ADF) to be used for acquiring infrastructure beyond tier-III cities to expand the acceptance infrastructure across the country. The Committee also recommended setting up a machine-driven online dispute resolution system to handle complaints and increase the consumer confidence in digital transactions.

Reserve Bank of India (2020) in its report of assessment of progress of digitisation from cash to electronic noted that India's growing use of retail digital payments, along with the thorough resurrection of its cash economy, indicates a shift in its relationship with cash which can be evidenced by steep growth in the retail digital payments. The adoption of card payments is supported by innovations in the form of contactless payments and tokenisation technologies hence contributing to the growth. Innovation is making domestic payments increasingly convenient, instantaneous, and ubiquitous. Speed, convenience, and competition are shaping the future of payments.

Table 1. ***India's Digital Payments Infrastructure : A Story in Numbers***

Particulars of Payment System / Transactions	Count
Number of ATMs (As of 30-07-2020)	2,48,943
RuPay enabled PoS terminals (As of 30-07-2020)	50,08,000
Members banks of IMPS (As of 30-07-2020)	498
Banks live on Unified Payments Interface (UPI) (As of 30-07-2020)	155
Entities live Aadhaar Enabled Payment System (AEPS) (As of 30-07-2020)	120
Banks live on National Automated Clearing House (NACH) (As of 30-07-2020)	1320
Direct bank members of National Financials System (NFS) (As of 30-07-2020)	113
Banks live on National Electronic Toll Collection (NETC) (As of 30-07-2020)	26
Agent - Institution Digital Apps / Website live on Bharat Bill Pay (As of 30-07-2020)	45
Number of debit cards outstanding (As of April 2020)	82.9447 Crore
Number of credit cards outstanding (As of April 2020)	5.7360 Crore

Source : Reserve Bank of india data on Payment and Settlement System, National Payments Corporation of India website.

Cathcart (2020) mentioned that the Unified Payments Interface (UPI) system has set a national open standard for all of India's banks that technology companies can adopt on equal and level-playing field. It has also set new benchmarks on security and efficiency. UPI is a world-class payments system that can also anchor a broader suite of fintech applications like micro-pensions, digital insurance products, and flexible loans etc.

Methodology

This descriptive research performs a preliminary investigation of the underlying trends in the digital payment systems. The paper focuses to examine *what* are the underlying trends instead of *why* these trends are happening. The research was conducted from January – July 2020. We surveyed a number of reports, articles, and official statistics to look into the nitty-gritties of digital payments, especially after demonetisation. We have also provided general and specific suggestions to increase the digital footprint in the Indian economy.

Analysis and Results

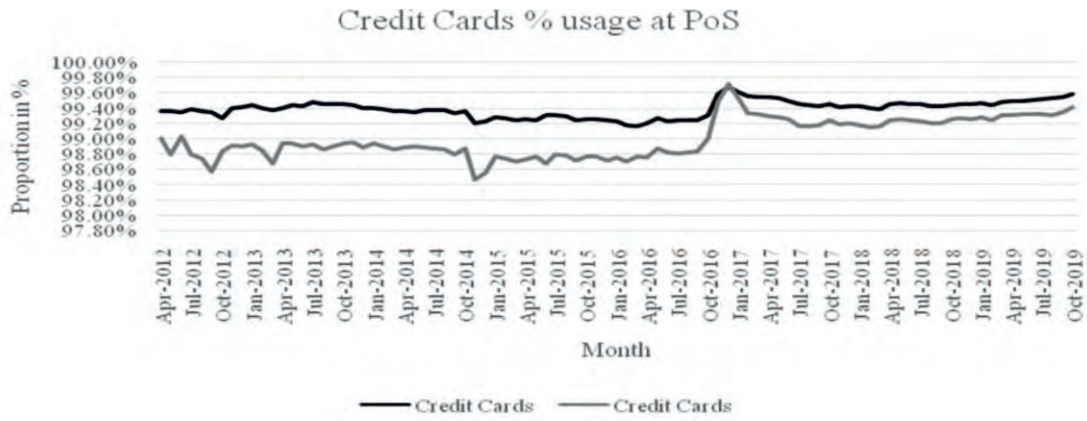
Credit Cards

As depicted in Figure 1, the usage of credit cards, in both value terms as well as volume terms, is mostly being done at PoS machines. Generally, this is a good sign that the usage of credit cards is being done in the right manner.

As shown in Figure 2, the average transaction value of credit cards has been increasing at PoS machines, which clearly shows the recurring usage of credit cards. The increase has been supported by increasing numbers of PoS machines being employed by merchants and vendors.

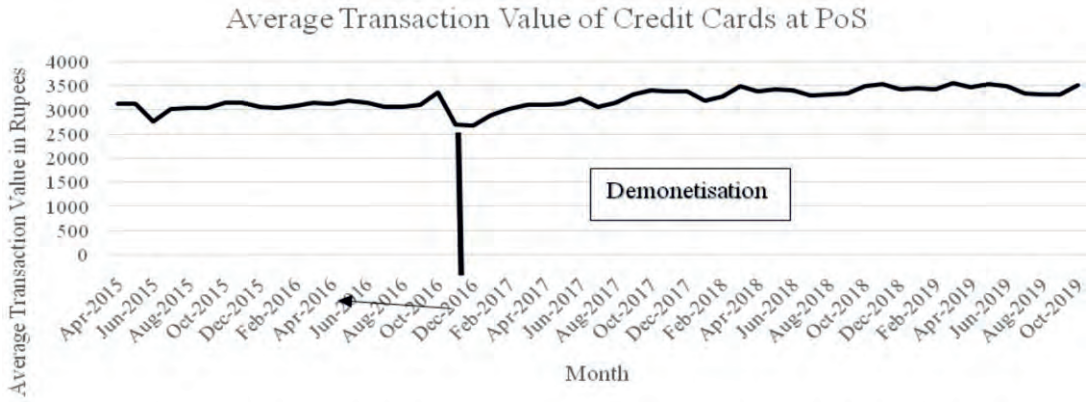
As depicted in Figure 3, the increasing usage of credit cards shows the preference of plastic money instead of using cash. The rise in average transaction values prove that there has been a significant rise in the usage of credit cards and a rise in ticket size of transactions because of increasing penetration of credit cards in India.

Figure 1. ***Credit Cards Usage at PoS***



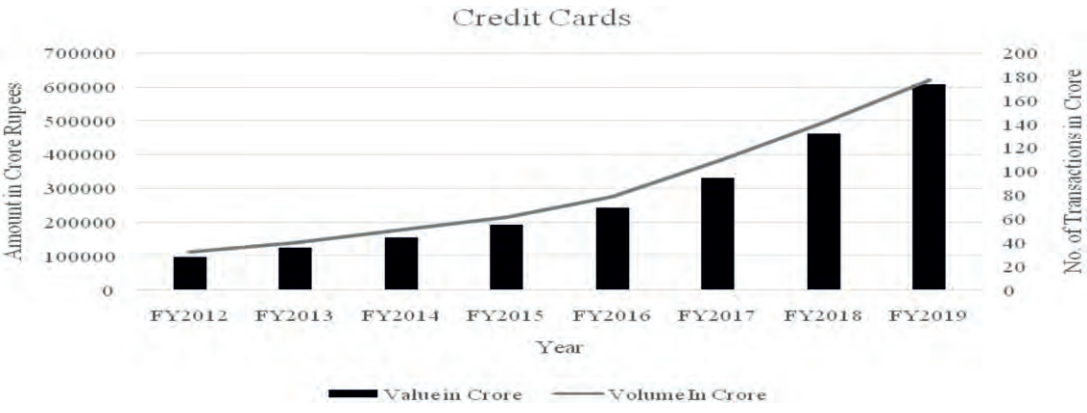
Source : Reserve Bank of India (2019a). Data calculated by the authors.

Figure 2. ***Average Transaction Value of Credit Cards***



Source : Reserve Bank of India (2019a). Data calculated by the authors.

Figure 3. ***Overall Usage of Credit Cards***



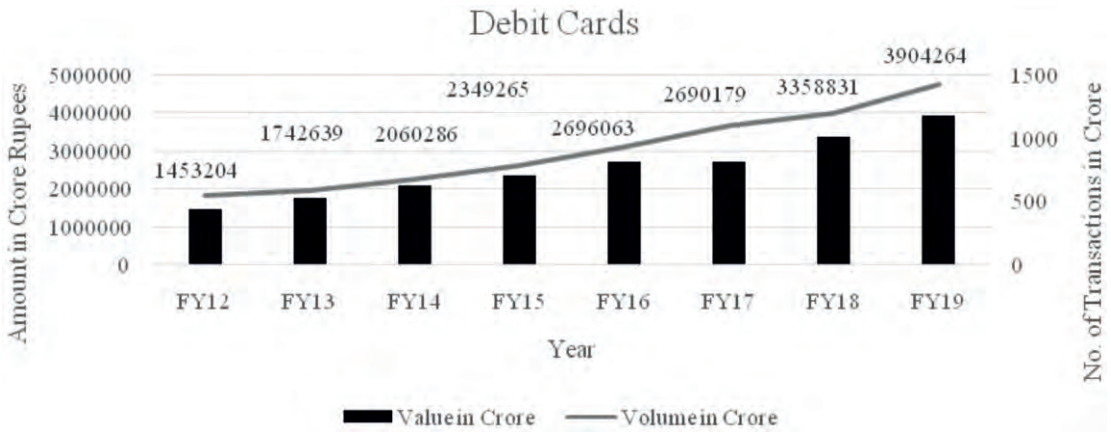
Source : Reserve Bank of India (2019a). Data calculated by the authors.

Debit Cards

As shown in Figure 4, there has been a constant rising trend in the volumes since FY12 with only one year where the volumes consolidated a bit. The usage of debit cards has been constantly rising and augurs well for our country and economy as we are seeing a perceptible shift in the use of cash for making transactions.

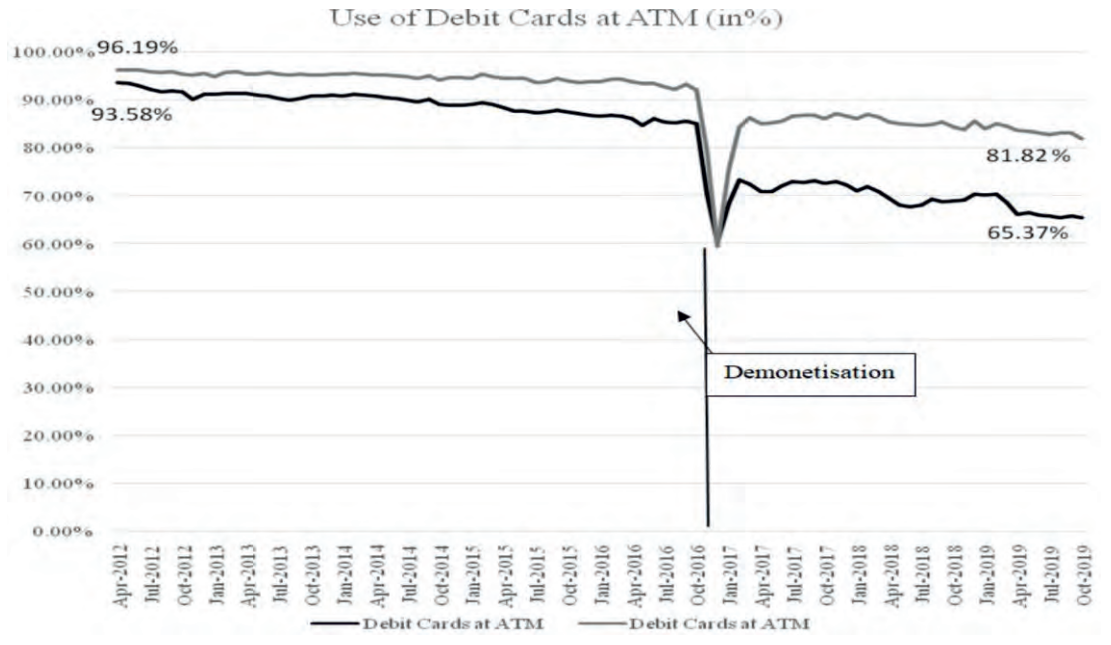
As shown in Figure 5, the decrease in volume is much larger than the decrease in value, this is surprising as lesser people are now accessing an ATM for withdrawing cash. The decrease in ATM value transactions is to the tune of almost 15%, which shows that while people have decreased their frequency to visit ATMs, but people are still withdrawing cash, and hence, the average transaction value has been rising bit-by-bit.

Figure 4. ***Overall Usage of Debit Cards***



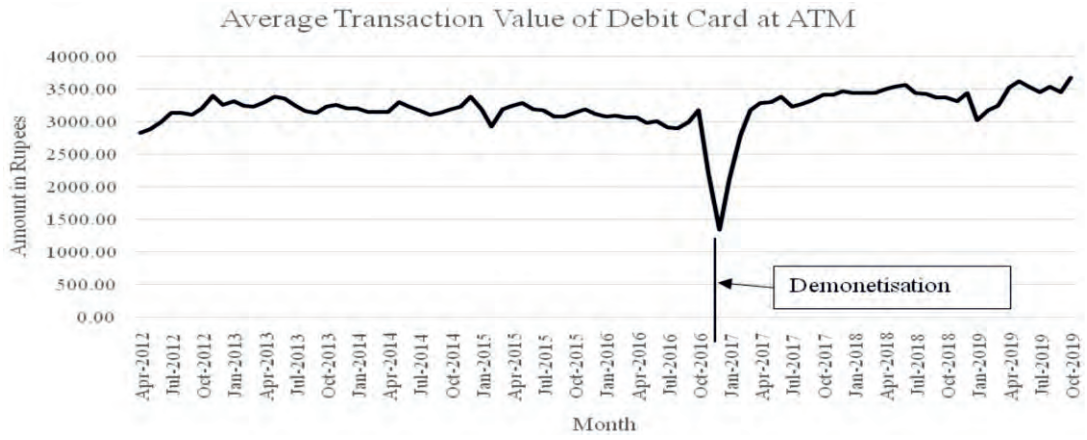
Source : Reserve Bank of India (2019a). Data calculated by the authors.

Figure 5. ***Debit Cards : Decreased Usage at ATMs in Value and Volume Transactions***



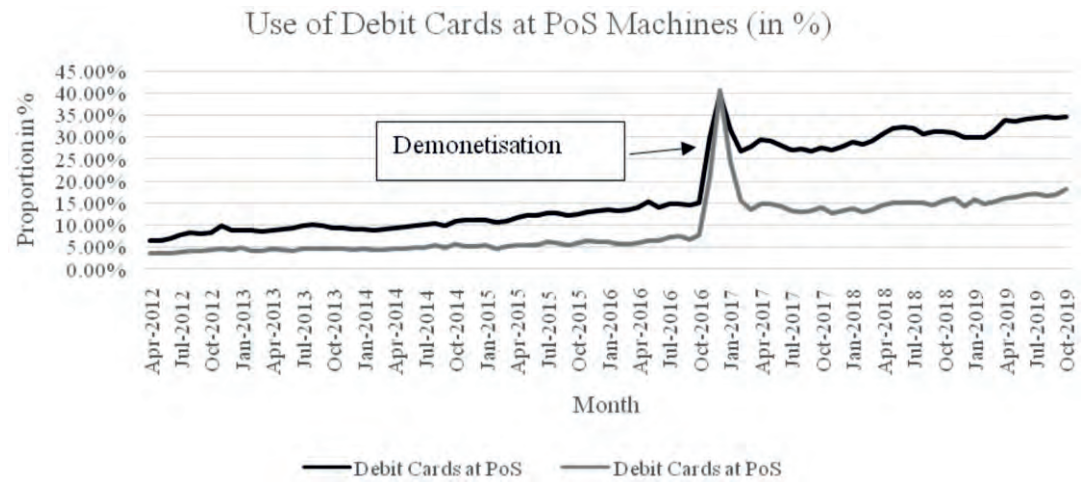
Source : Reserve Bank of India (2019a). Data calculated by the authors.

Figure 6. ***Average Transaction Values of Debit Cards at ATMs***



Source : Reserve Bank of India (2019a). Data calculated by the authors.

Figure 7. ***Usage of Debit Cards at PoS Machines***



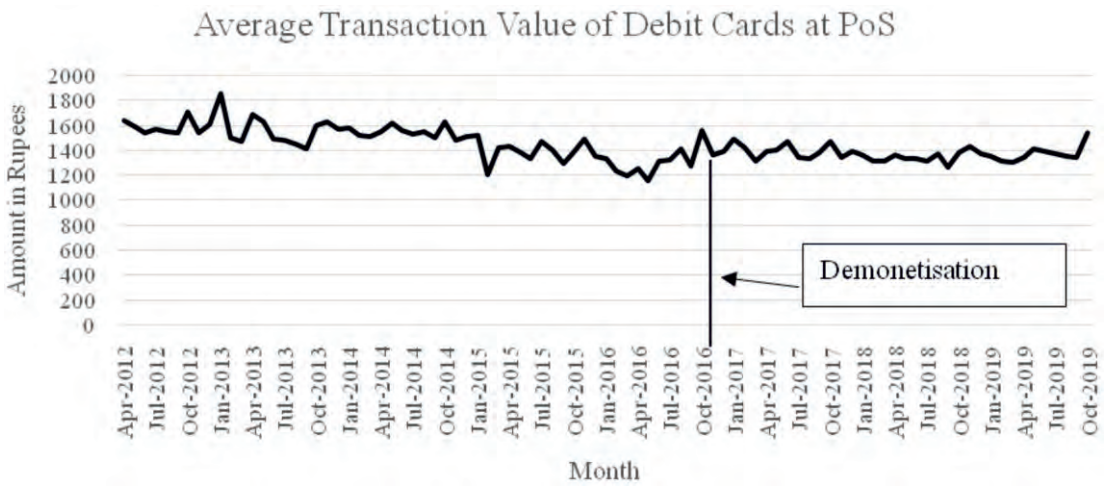
Source : Reserve Bank of India (2019a). Data calculated by the authors.

As can be inferred from Figure 6, the average transaction value has been inching up because of the dip in the volumes in the transactions performed through ATMs. Debit cards are slowly replacing the traditional banking channel for withdrawing cash as people use ATMs in place of visiting a branch for withdrawing money.

As depicted in Figure 7, the pace of rise in usage at PoS machines was much slower before the demonetisation, but has been inching up at a faster pace after demonetisation. This rapidly increasing trend can be attributed to acceptance in PoS machines by merchants and encouraging use by customers. This trend is expected to further increase because of progressive measures taken by the government to increase the usage of plastic money like debit cards, credit cards, etc.

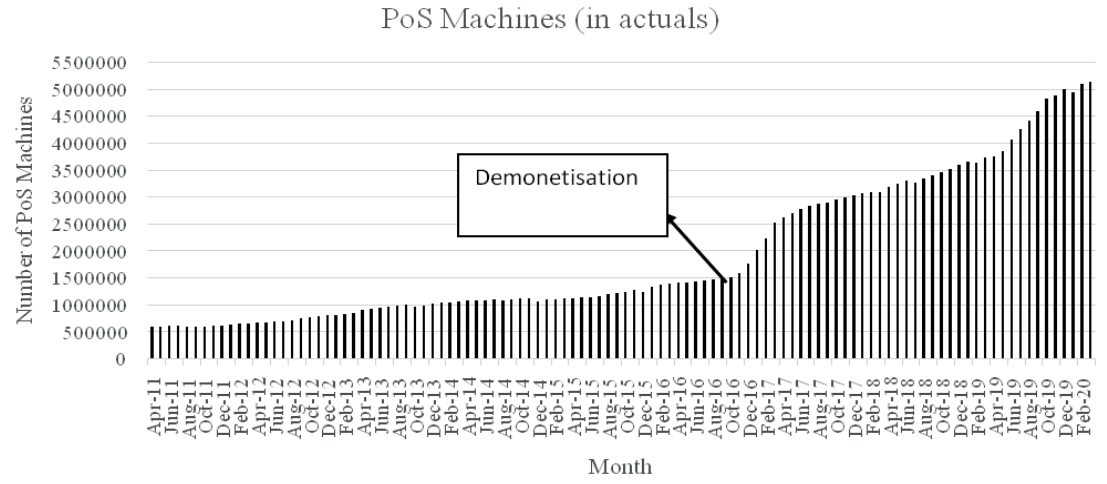
As shown in Figure 8, the usage of debit cards at PoS machines was actually consolidating before the demonetisation, stabilised then after, and thereafter has shown an increasing trend. This increase in usage is attributed to the rise in footprint of PoS machines, its acceptance, and penetration in areas other than tier-I and tier-II cities.

Figure 8. ***Average Transaction Value of Debit Cards at PoS***



Source : Reserve Bank of India (2019a). Data calculated by the authors.

Figure 9. ***PoS Machine Numbers Have Grown at a Magnifying Space, Especially After Demonetisation***



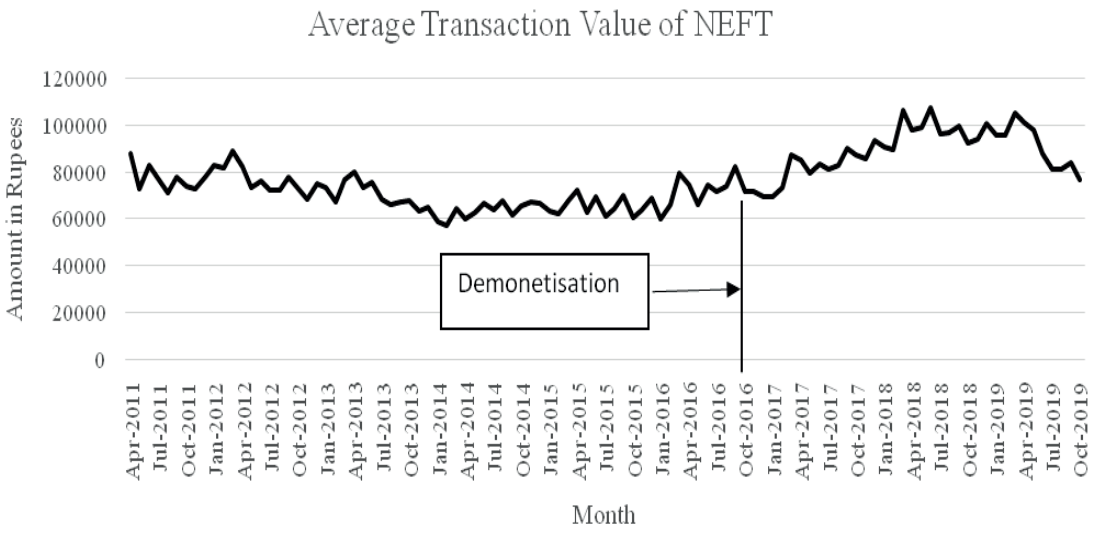
Source : Reserve Bank of India (2019a). Data calculated by the authors.

As can be inferred from Figure 9, the growth of PoS machines before demonetisation was increasing, but at a slow and steady pace. After the demonetisation, the actual PoS numbers have grown at a much faster pace as compared to the pre-demonetisation period. PoS machines are expected to rise further due to innovation in PoS machines, which can accept money through UPI and digital wallets, apart from credit cards and debit cards.

National Electronic Fund Transfer (NEFT)

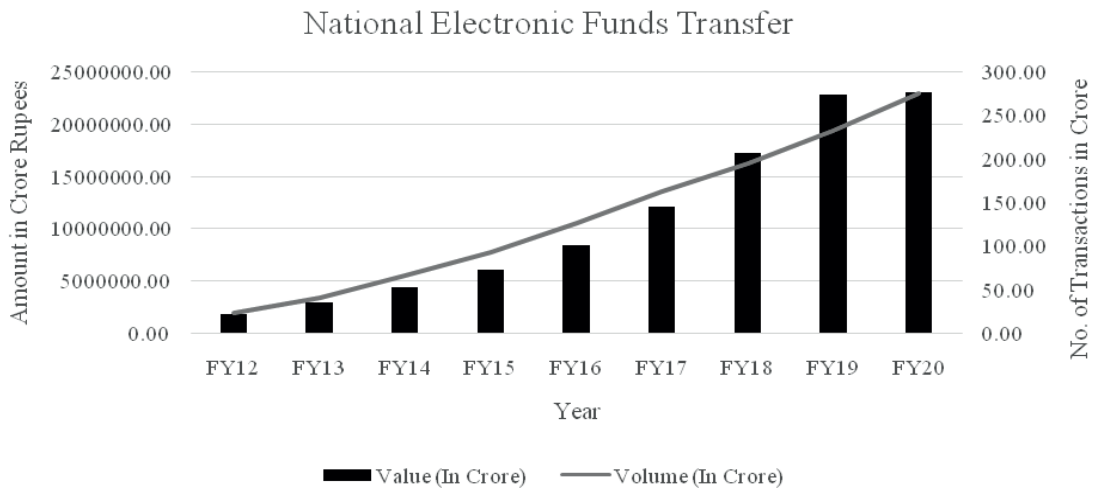
As shown in Figure 10, the average transaction values declined from April 2011 – April 2014. It then remained within a stable range. The rising trend started after January 2016 and is inching up. The constant rise in the average transaction values right after demonetisation explains the fact that NEFT was welcomed by users.

Figure 10. ***Average Transaction Values of NEFT have Increased After Demonetisation***



Source : Reserve Bank of India (2019a). Data calculated by the authors.

Figure 11. ***NEFT has Shown Electrifying Growth in the Past Years***



Source : Reserve Bank of India (2019a). Data calculated by the authors.

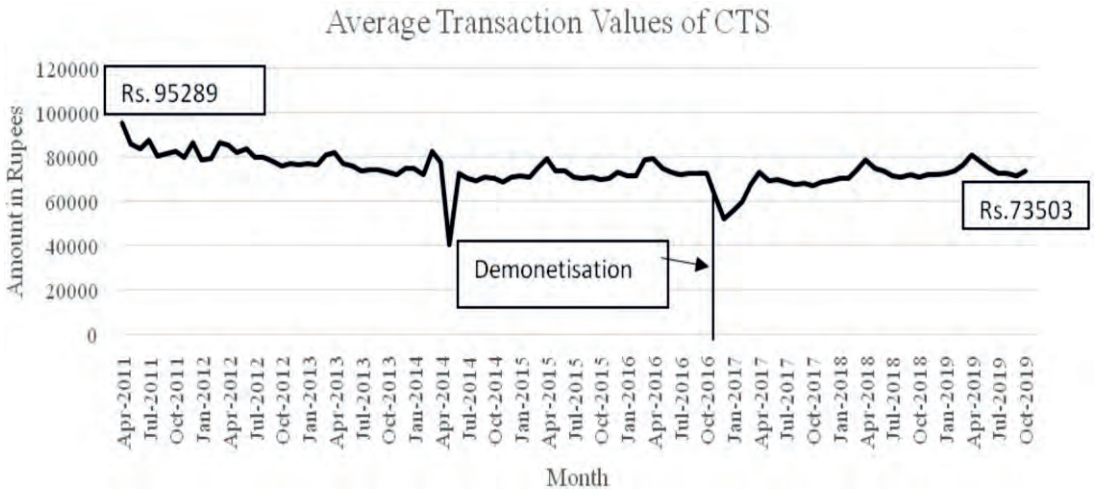
Interestingly, it has again shown a decreasing trend, which can be attributed to emergence of other real time payment transfer systems.

As can be inferred from Figure 11, the volume trajectory has been quite interesting, a straight line blended with upside trend suggesting sustained and recurring usage. The largest of the gains were made in FY18 and FY19, which is a welcoming trend and a testimony of its increasing usage. With transactions heading towards the 300 crore benchmark, it is going to be exciting to witness how it pans out in the next 2 years.

Cheque Truncation System (CTS)

As shown in Figure 12, there was a dip in the average transaction values from around ₹ 95,289 to ₹ 73, 503. This is

Figure 12. ***Average Transaction Values of CTS Have Been Steadily Decreasing***

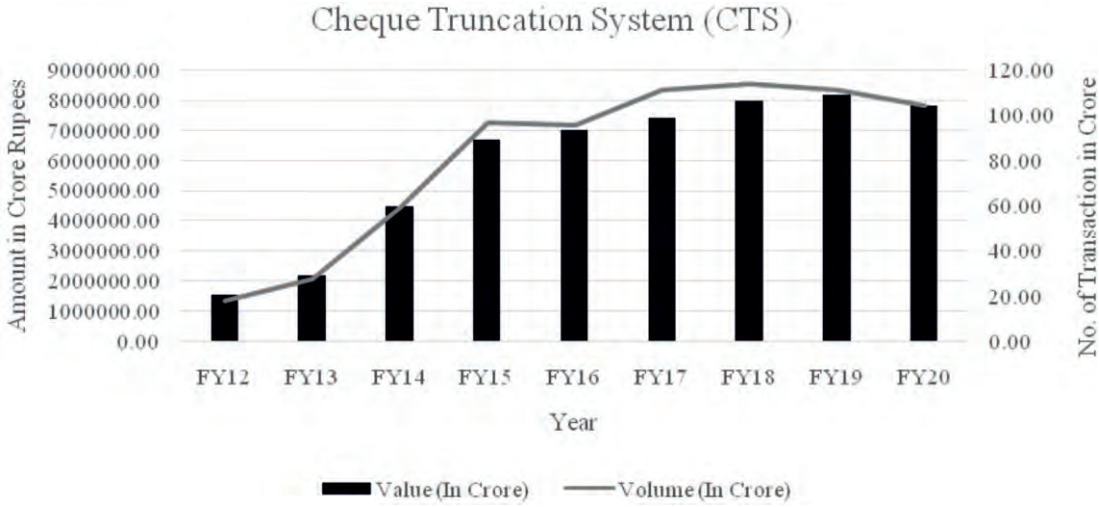


Source : Reserve Bank of India (2019a). Data calculated by the authors.

an appreciable trend in the sense that lesser use of cheques for payments and transfers helped people to move away from the paper clearing instruments to digital clearing payment systems, especially in the high ticket and bulk payments category such as CTS. The trend also reveals that after having dipped immediately after the demonetisation of 2016, it recovered quickly and also a rise in the average transaction value is witnessed. While the use of paper clearing is still better than using cash, using digital payments can be more beneficial to the economy because of the significant costs related to cheque printing, paper clearing system, and maintenance of records. Using the digital payment modes can eliminate the need of the paper clearing infrastructure to a large extent and can also lead to faster settlements.

As visible from Figure 13, the decreasing use of cheques is a good indication for the payment and settlement systems because of various costs associated for maintaining infrastructure related to the cheque clearing system.

Figure 13. ***Use of Cheques in Volume and Value Terms***



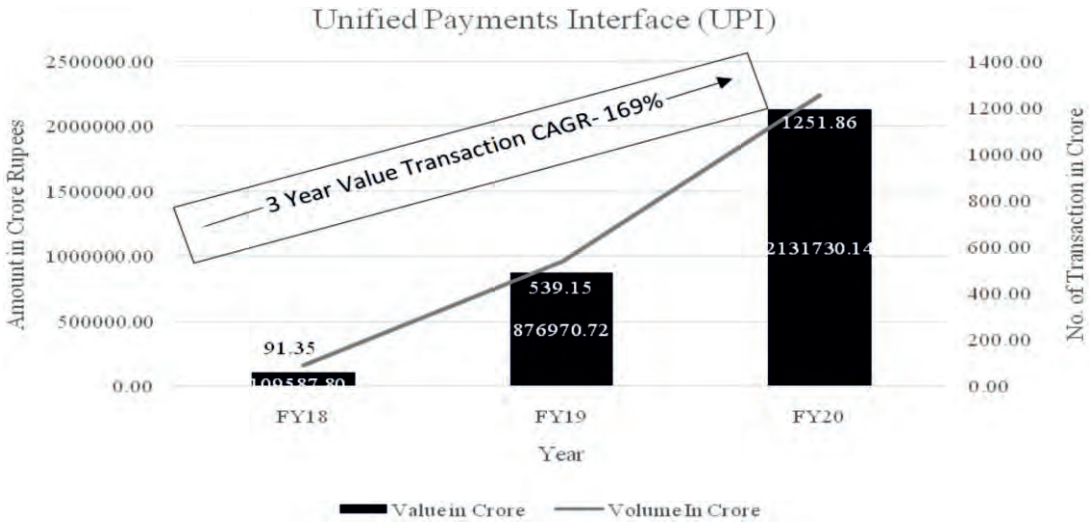
Source : Reserve Bank of India (2019a). Data calculated by the authors.

India is one of the countries which still rely on cheques to a large extent. After increasing for a couple of years starting from FY17 till FY19, the volume and value of CTS decreased in FY20. Possible reasons would be quicker settlements in other modes of payments such as RTGS, NEFT, or IMPS. CTS comes with a delay in settlement cycle, and hence, its preference in daily usage has been on a decline.

Unified Payments Interface (UPI)

As visible from Figure 14, UPI has witnessed phenomenal rise right since its launch. The value transactions rose by eight times in just one year. Increased adoption of UPI was supported because of encouraging help from the payment system regulator, which provided the much-needed propulsion to the UPI, as it was more advanced, secure, and convenient. UPI removed many of the limitations of digital wallets and enabled features such as interoperability, instant fund transfer, lower merchant discount rates (MDR), etc. UPI got additional room to grow when government waived off the MDR on UPI and Rupay and also made it mandatory to have digital payment options for firms having turnover of more than ₹ 50 crore.

Figure 14. ***Unified Payments Interface (UPI) - Firing all Cylinders and Gaining Tremendous Traction in India***



Note : UPI data excludes the transactions having debit/credit to the same account for the month of August 2018 onwards.

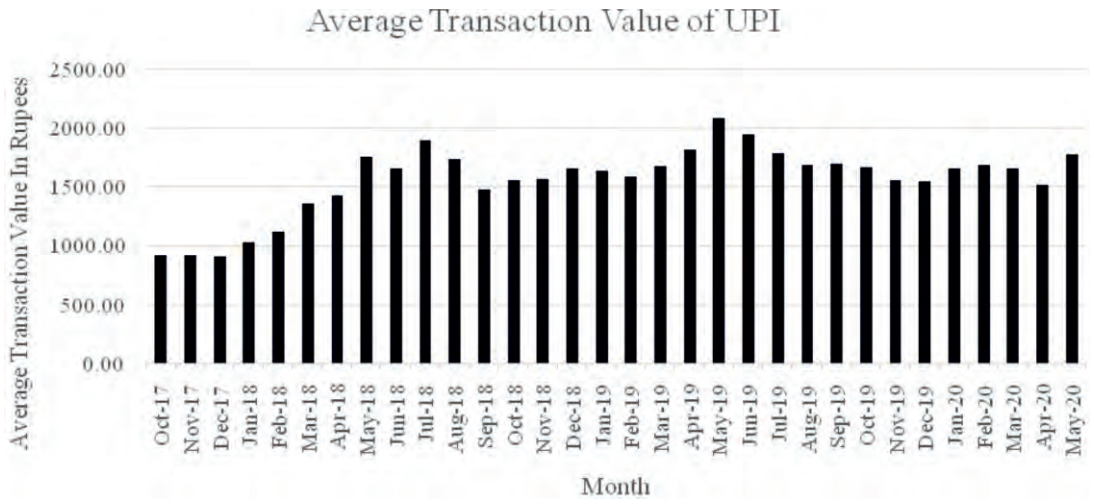
Source : Reserve Bank of India (2019a). Data calculated by the authors.

As visible from Figure 15, the trend depicts that there has been volatility in the average transaction value of UPI. Despite this, the average transaction value has been more than ₹1500, except in one month. This shows that there is some stability in the usage of the payments system and that these levels can be considered as an omnipresent floor of average transaction values.

It can be inferred from the data that the usage of UPI is being done for small ticket transactions like grocery bills, dairy transactions, and for other purposes such as recharges, tickets, bill payments, and for peer-to-peer transactions (P2P). It is important to note that when small ticket payments are made through digital payments channel, it implies a concrete shift in the instrument used for spending.

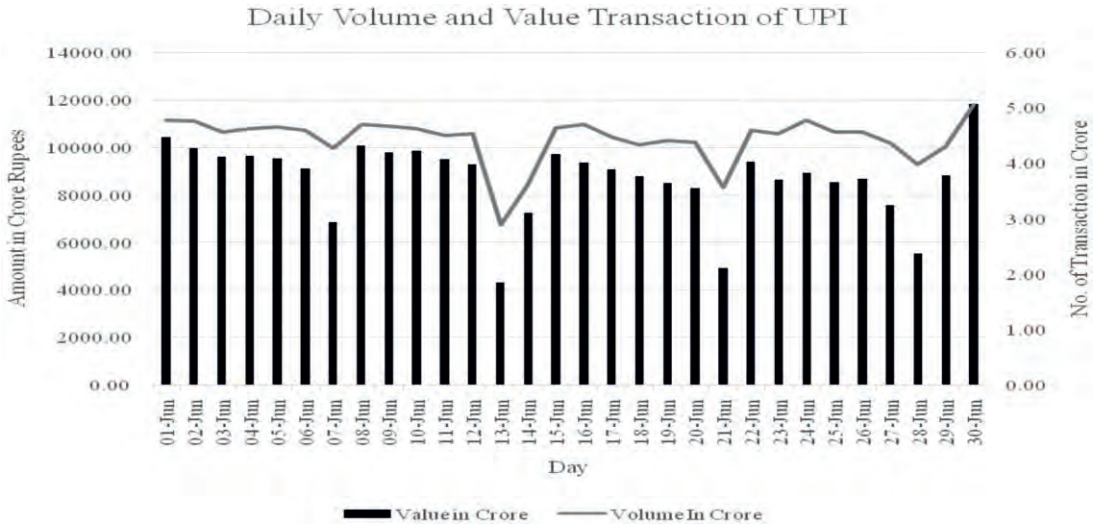
Figure 16 shows that the transfer values display some interesting trend in the average transfers via UPI in a

Figure 15. ***Average Transaction Values of UPI Have Been Volatile***



Source : Reserve Bank of India (2019a). Data calculated by the authors.

Figure 16. ***Daily Transactions of UPI Have Been Volatile, Yet Stable***



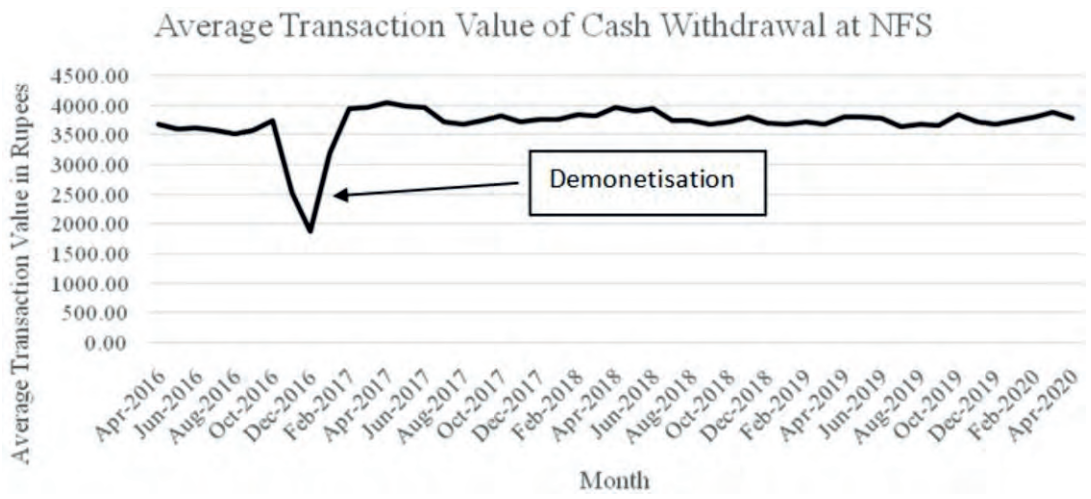
Source : Reserve Bank of India (2019a). Data calculated by the authors.

day. The transfer value was above ₹ 8,000 crore on 25 days out of 30 days in the month of June 2020. It is a sign of the adoption of UPI payment system for small ticket but high volume transactions. The volume of UPI transactions has been volatile similar to value transactions, and from a ringside view, it remained above 4 crore transactions (volume) in a day (June 2020). This implies that the usage of UPI in some sense has created a particular floor on the usage front for volume as well as value transactions.

National Financial Switch (NFS)

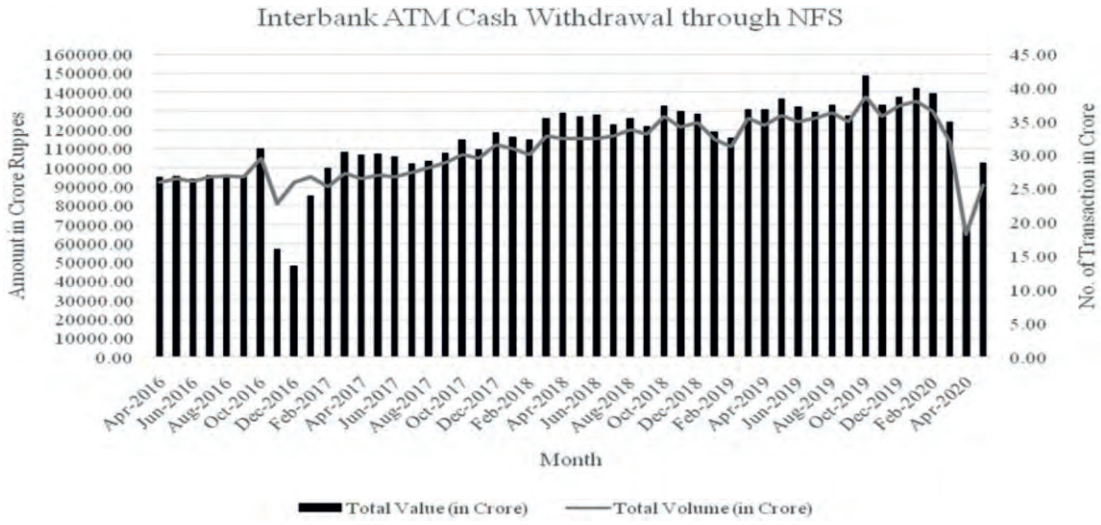
As can be inferred from Figure 17, by looking at the larger trend before and after demonetisation, the average

Figure 17. ***Average Transaction Values of ATM Cash Withdrawals***



Source : National Payments Corporation of India data on Retail Payments. Data calculated by the authors.
Data obtained from :
NPCI Website Link: https://www.npci.org.in/
UPI Data Link inside NPCI Website: https://www.npci.org.in/what-we-do/upi/product-statistics
IMPS Data Link inside NPCI Website: https://www.npci.org.in/what-we-do/imps/product-statistics

Figure 18. ***Cash Withdrawal Through NFS Has Been Increasing***



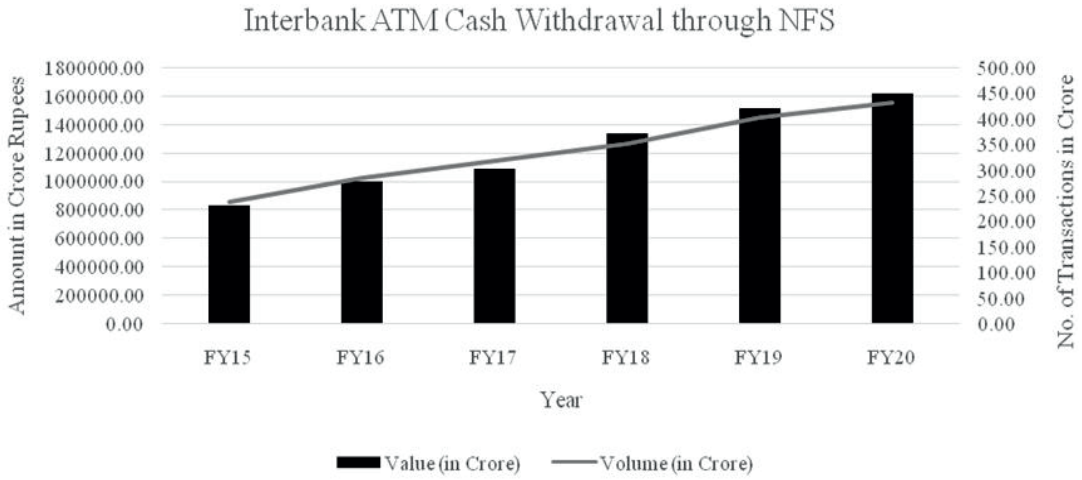
Source : National Payments Corporation of India data on Retail Payments. Data calculated by the authors.
Data obtained from :
NPCI Website Link: https://www.npci.org.in/
UPI Data Link inside NPCI Website: https://www.npci.org.in/what-we-do/upi/product-statistics
IMPS Data Link inside NPCI Website: https://www.npci.org.in/what-we-do/imps/product-statistics

transaction value dipped significantly in the demonetisation month and recovered quickly. In the period after the demonetisation, the average transaction values have remained range bound. While the ideal situation would have been decreasing the usage of cash and hence a dip in average transaction value, this doesn't mean that there has been no progress in decreasing the usage of cash, since the average transaction values have remained range bound, in-turn this is a good signal that we are going in the right direction, albeit at a slower pace.

As visible from Figure 18, the trend is worrying because of the fact that we have not been able to move away from cash despite the availability of a large universe of digital payment instruments. Demonetisation and the COVID-19 pandemic have resulted in temporary decrease in the usage of cash. The COVID-19 trend is yet to be seen as it can/cannot bring perceptible change in cash usage, but there is a ray of hope that cash usage may go down in the upcoming time period.

As can be inferred from Figure 19 and Table 2, the overall cash withdrawals have increased, but the growth

Figure 19. ***Overall Cash Withdrawals Have Increased But the Growth Rates Have Tapered***



Source : National Payments Corporation of India data on Retail Payments. Data calculated by the authors. Data obtained from :
NPCI Website Link: https://www.npci.org.in/
UPI Data Link inside NPCI Website: https://www.npci.org.in/what-we-do/upi/product-statistics
IMPS Data Link inside NPCI Website: https://www.npci.org.in/what-we-do/imps/product-statistics

Table 2. ***Growth Rates of National Financial Switch***

Year	Volume Growth	Value Growth
FY16	19.49%	20.23%
FY17	11.74%	8.26%
FY18	10.51%	23.47%
FY19	14.67%	13.24%
FY20	7.32%	6.78%

Source : National Payments Corporation of India data on Retail Payments. Data calculated by the authors. Data obtained from :
NPCI Website Link: https://www.npci.org.in/
UPI Data Link inside NPCI Website: https://www.npci.org.in/what-we-do/upi/product-statistics
IMPS Data Link inside NPCI Website: https://www.npci.org.in/what-we-do/imps/product-statistics

rates have tapered off from high double digits to high single digits. This is an encouraging trend as the decrease in cash withdrawals (growth rate decline) may throw some indication towards lesser use of cash.

Challenges for the Digital Payment Platforms and Infrastructure

↳ **Transaction Failures and System Delays :** Transaction failures still haunt the digital payment platforms due to which their ability to further capitalize on users for increasing the frequency of digital payments faces a serious hurdle. Digital payments need to be seamless and secure in order to gain the trust so that more and more people can be brought into the net.

↳ **Cyber Frauds :** This is another haunting hurdle that has kept the new users on an edge and kept the digital payment providers on their toes. Cyber frauds not only result in monetary loss, these also increase the mistrust in using digital payments in daily life. Frauds, especially related to UPI and plastic money (debit cards and credit cards), has set up a red-flag which needs urgent attention of the policy makers, regulators, and the participants of the infrastructure to take preventive measures in order to eliminate this operational risk.

↳ **Preference for Cash :** Cash has been so entwined in our daily lives that it has become an arduous task to decrease its use and frequency of using cash for making payments. While there has been a significant rise in the use of digital payment modes and digital payments per se, yet it is far from making a place in our lives. It has covered a lot of ground, especially in the urban areas, where there is higher adoption of digital payments, partly due to higher financial literacy and partly due to better infrastructure and points of usage.

↳ **Lack of Adoptability in Rural Areas :** While the urban footprint of digital payments has improved significantly, we are still very far from achieving a comparable feat in the rural areas. The bulk of the blame can be attributed to faulty infrastructure and lack of quality service, which results in lower adoption of digital payments in the rural areas. Moreover, due to lack of trust, incomplete awareness, and low financial literacy, these factors act as a deterrent in further adoption of digital payments.

↳ **Financial Sustainability and Viability of Cashbacks and Incentives to Increase the Usage of PoS :** A lot of the digital payments are riding on the back of cashbacks and incentives given by the digital wallets as well as the payment platforms. Giving cashbacks for adopting digital payments in the initial stage is a type of nudging behaviour to make people adopt digital payments, but it can threaten the financial sustainability of these firms who are burning a hole in their pockets to make people adopt digital payments. The viability of cashbacks and incentives needs to be limited once the payment system operator/participant has substantial traffic on the platform.

↳ **Inevitability of Digital Infrastructure like Internet, Smartphones :** While the costs for setting up digital payment infrastructure have decreased, the initial expenditure is still significant because of the requirement related to internet connectivity & smartphones. While we have *99# USSD code service and AePS, which work with minimum digital infrastructure, there is dearth of accepting digital payments in offline mode, which if available, can help in further acceptance to digital payments.

↳ **Merchant Discount Rates and Costs Associated with Digital Payments :** Merchant discount rates (MDR) have been acting as a hindrance in accepting digital payments. The government has taken proactive steps in decreasing the cost related to digital payments and has eliminated merchant discount rates (MDR) on Rupay and

UPI BHIM for firms having turnover of more than ₹ 50 crore. This can give some boost to the firms and push firms towards accepting more and more digital payments.

Suggestions

For Increasing Adoption of Digital Payments

↳ The adoption of digital payments is much more in the urban areas and they are the heavy lifters of the digital payments. While substantial penetration is being witnessed in & beyond tier-2 and tier-3 cities, the need of the hour is to do more to make people adopt digital payments in their daily lives.

↳ We suggest that the current situation is opportune to think global & act local when thinking of digital payments. We suggest importing the best practices across the globe and try to implement the same in India.

↳ While there are enough safety system measures for securing the digital payments infrastructure from external shocks, the frauds happening in the system need to be prevented. These frauds pose a big threat to the infrastructure and the ecosystem remains exposed to further vulnerabilities.

↳ Funds can be released from Member of Parliament Local Area Development Scheme (MPLADS) for encouraging digital payments in a constituency or in areas where the footprint of digital payments is significantly low. This exercise can be performed via pilot experiments and implementing it on a limited basis. In the later part a, full-fledged exercise can be carried out after learning from the previous experiences about policy implementation, feasibility test, and its implementation success ratio.

For Spreading Awareness of Digital Payments and Financial Literacy

↳ The Reserve Bank of India has taken pro-active steps in curbing financial frauds, improving financial literacy through television advertisements, and using the print media ; nevertheless, much awareness still needs to be disseminated through every possible way to stop the cybercrimes related to digital payments.

↳ Going hyper local for spreading awareness on safety for digital payments and financial literacy can be sought by removing language barriers and communication gaps. Tying up with NGOs and spreading awareness through local cultural programmes such as *Lok Daayra* (in Gujarat) and by on-boarding the local charismatic and influential personalities can help to significantly increase the awareness quotient in rural areas.

↳ At the national level, proactive social media campaigns can be feasibly carried out by bringing in loop eminent personalities from diverse fields of science & technology, corporate leaders, sports persons, scientists and space researchers, temple priests and administration boards, erstwhile rulers & descendants of princely states, academicians, politicians, economists, members of the armed forces, regulatory bodies, and personalities with national eminence like civil awards recipients to promote digital payments in daily life.

↳ Introduce financial literacy chapters in schools' textbooks & in high schools to create awareness about financial health, financial well-being, and knowledge about financial products and services. Posters and infographics can be distributed and regular meetings can be organized in schools. Making the financial literacy test mandatory for higher secondary schools can help to inculcate the knowledge of digital payments from the right age and create enhanced awareness going forward.

↳ Make advertisements of cyber security and digital payments prominent in websites of government services.

Incentivising for ads in prominent applications and websites will work wonders. Disseminating information in bits and pieces on the back part of bus tickets, train tickets, payment bills, and payment receipts will help spreading awareness.

- Expenditure incurred by business enterprises for creating awareness on digital payments and imparting financial literacy can be made eligible for deduction under CSR expenditure.

- One of the largest needs is to digitize the government payments. Entirely digitized payment systems will facilitate frictionless government-to-government (G2G) payments which will save on administration and logistics costs, apart from monetary costs. This will increase the efficiency and save on agency costs which are currently paid by the Reserve Bank of India. This will also entail putting digital payment infrastructure from centre to grassroots level in the entire country and significantly improve governance in the country.

- Changes can be made in some of the payment systems to aggressively promote digital payments. For e.g., a floor amount can be introduced in the cheque system, above which only a cheque can be used. Initially some frictions and large-scale disruptions will be noticed, but implementing it in a phased manner can eventually decrease the use of paper clearing payment systems. The above said rule can be implemented in B2B transactions and then a trajectory can be developed to implement the same rule in B2C and P2P transactions after learning from the previous experience and making changes wherever required.

- With the electrifying growth of digital payments, payment systems are becoming bigger on volume and value basis. Constant monitoring of the fraud threats and creating a Central Fraud Database (CFD) will help to efficiently track the frauds and keep a dedicated record.

- With more and more people on-boarding the digital payments platform, it becomes necessary to have Online Dispute Resolution (ODR) mechanism which can effectively address all types of disputes that are emerging in the system. Rectifying those fractures in the system will ensure confidence about their safety of money and trust in the system. The Reserve Bank of India has constantly endeavoured on the dispute resolution front and has also operationalized digital payments ombudsman to specifically address disputes related to digital payments.

- We suggest including data of digital payments in the Census surveys so that relevant data regarding the ground adoption of digital payments can be accumulated and analyzed for decade-wide comparisons. This promulgates academicians, researchers, and policy makers for in depth research work.

- Fully digitize government-to-person (G2P) payments and organize channels for withdrawal of DBT (direct benefit transfer) payments and subsidies without the need of visiting a branch. DBT payments are often small ticket sized transactions, and hence, withdrawal through PoS machine or with the help of business correspondent (BC) channels can be worked out, especially in rural areas, targeting the high-volume areas first.

- Mapping each and every financial institution touchpoint such as banks, PoS machines, payment banks and small finance banks, ATMs, cash dispensers & recyclers, business correspondents, post offices, co-operative banks, and regional rural banks will help consumers and users to reach out to the respective party and carry transactions without any hassles.

Policy Implications

We suggest the regulators to encourage competition in the digital payments space and the government to play a proactive role in increasing the coverage and usage of digital payments. This will entail improved success of

financial inclusion and help the banking sector in banking the unbanked. Due to faster transmission of funds, it will enhance the monetary and financial stability of the economy. It will provide a more strengthened link between the financial economy and real economy and serve the advanced needs of commerce. It will encourage transparency and accountability and will also limit the dimension of the grey or parallel economy. It will provide propulsion to initiatives such as Digital India, Bharat Net, PMJDY, etc.

Limitations of the Study and Scope for Future Research

- The analysis is based on secondary data. Any error in the data captured can result into portraying a misleading or a different picture of the statistical analysis. We also felt the need of granular data, since it can help in getting deeper insights.

- Since the entire dataset consists of secondary data only, this is another limitation since primary research can help to substantiate or complement the findings from the secondary analysis.

Researchers, academicians, technocrats, policy makers and all those who are interested in this topic can perform further in-depth research and find some innovative ways to deepen the reach of our digital payments space and make it a daily life activity. Researchers and market participants can also formulate a nation-wide strategic model with detailed insights by looking at granular data and make digital payments more inclusive and effective in the future. Policy makers can also derive some insights from this model and implement it through policy intervention.

Authors' Contribution

Shyam Kakkad was responsible for the idea origination of the research project and was also responsible for performing numerical computations and quantitative analysis along with formation of figures and graphs with the help of Microsoft Excel. Harsh Jadhav was responsible for incorporating policy viewpoint, validation of the data, and the analysis. Shyam Kakkad found relevant reference material such as reputed reports from various organizations and Harsh Jadhav reviewed the relevant reports. Harsh Jadhav was also responsible for qualitative analysis of the report in consultation with Shyam Kakkad. Shyam Kakkad wrote the manuscript in consultation with a senior faculty of economics and the co-author.

Conflict of Interest

The authors certify that they have no affiliations with or involvement in any organization or entity with any financial interest, or non-financial interest in the subject matter, or materials discussed in this manuscript.

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