Payment and Settlement Systems in India

Journey in the Second Decade of the Millennium

2010-20

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2019 20

Suggestions & feedback are welcome
Email : helpdpss@rbi.org.in

Foreword

"Take up one idea. Make that one idea your life; think of it; dream of it; live on that idea. ... This is the way to success." - Swami Vivekananda[1].

This Booklet is a narrative of how the carefully thought out steps taken by the Reserve Bank of India (RBI) have resulted in transforming India into a country riding the crest of a wave in the evolution of digital payments. Chief among those steps was the conceptualisation and establishment of institutions - Institute for Development and Research in Banking Technology (IDRBT), National Payments Corporation of India (NPCI) and Clearing Corporation of India Limited (CCIL) - that laid the foundation of India's payment systems. The bouquet of digital payment products that is now available in the country and that enriches the consumer experience with choices, convenience and confidence in the digital payment ecosystem, owes a lot to these institutions.

Over the course of this journey, significant upgradation was achieved by way of enhancement of acceptance infrastructure, boost to financial inclusion and adoption of digital modes for Government payments backed by the national identity authentication, Aadhaar framework. To win the trust of customers, an expanding payment system was overlaid with a reliable supervision and settlement mechanism. Interoperability among payment systems facilitated unparalleled ease of transactions while robust customer protection measures have made India's retail payment system one of the safest in the world. The journey has only just begun, but India is already seen as a player at the global forefront in the domain of digital payments.

This Booklet, which focusses on the decade 2010-20, gives the legal and regulatory environment underpinning the digital payment systems, the various payment system choices available to consumers, extent of usage and so on. The Booklet also takes up a self-analysis of the domains explored and territories not charted through the course of this journey. To place things in perspective, an exercise was undertaken in 2019 to benchmark India's payment systems with 20 other countries.

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[1] *Karma-Yoga: On Life, Work and Spirituality, by Swami Vivekananda*

While realising that 'well begun is half done', RBI is mindful of the challenges ahead. Various initiatives are underway to realise India's vision on payment systems. RBI seeks to usher in a payment ecosystem that enables safe, quick and affordable digital payments to everyone across the length and breadth of the country as well as in the universe of cross-border payments and transactions.

I congratulate the efforts of the Department of Payment and Settlement Systems of RBI in bringing out this comprehensive Booklet which can even serve as a reference document for those interested in following payment system developments in the country.

Shaktikanta Das
Governor
Reserve Bank of India

Foreword

Payment systems are not only the lifeline of an economy but are increasingly being recognised as a means of achieving financial inclusion and ensuring that economic benefits reach the bottom of the pyramid. In view of the above India has enacted a separate law for Payment and Settlement Systems which has enabled an orderly development of the payment eco-system in the country. The first Payment and Settlement Systems Vision announced by the Reserve Bank in 2001, and successive vision statements every three years later, have made sure that payment and settlement systems receive focussed attention.

The present state-of-the-art payment systems that are affordable, accessible, convenient, efficient, safe and secure are a matter of pride for the nation. The systems and efforts have not only resulted in a rapid growth in digital payments, but have also led to unique innovations. Small steps taken over time have transformed into giant strides in respect of payment and settlement systems and retail payments space.

To document these achievements for the wider public, the Reserve Bank has prepared this Booklet which contains payment systems managed by the country and developments in this sphere in the last one decade. The Booklet attempts to cover all payment systems in India, their enablers, institutions that run these systems and supporting infrastructure acceptance. The challenges encountered, and prospects are also touched upon. I congratulate the Department of Payment and Settlement Systems for undertaking this initiative.

B. P. Kanungo
Deputy Governor
Reserve Bank of India

Foreword

The decade of 2010-20 can be termed as the decade of payments in India. There have been many defining moments that transformed the payments ecosystem of the country and attracted international recognition.

During the decade, the country has witnessed the introduction of innovative payment systems, entry of non-bank players, and a gradual shift in the customer behaviour from cash to digital payments. We have an unique secure and interoperable Unified Payments Interface (UPI) for retail payments, biometric based as well as the QR code-based payments.

Throughout this journey, the Reserve Bank has played the role of a catalyst and facilitator, regulator and supervisor, as the occasion demanded, towards achieving its public policy objective of developing and promoting a safe, secure, sound and efficient payment system. Reserve Bank has always fostered innovation and growth of payment and settlement systems without deviating or losing its focus towards constant improvement in safety, security, soundness, efficiency and effectiveness. All these efforts have resulted in availability of a wide choice of 'anytime and anywhere' interoperable payment systems for the common man at reasonable rates.

Reserve Bank had earlier come up with a Booklet on its payment systems in the years 1998 and 2008. Building on the earlier exercises, this Booklet is an attempt to spread awareness about the various developments around payments landscape in the country during the last decade. It gives an overview of the products, players, infrastructure and institutions in the payments ecosystem along with regulatory measures of Reserve Bank. It also offers the reader a peek into the future of the payment systems in the country. Efforts of the team in the Department of Payment and Settlement Systems to bring out this concise yet comprehensive Booklet deserve appreciation.

T. Rabi Sankar
Executive Director
Reserve Bank of India

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Preface

India has been enjoying a healthy evolution of payment systems over the past three decades. This has been the result of the measured road maps periodically adopted by the Reserve Bank, as a developer in the initial years and as a catalyst and facilitator in later years. Though the advancements in the payment systems were gradual in the early days, the two decades of this century have truly witnessed a revolution.

From barter system to Unified Payments Interface (UPI), payment systems in India have come a long way. Our payment systems are not only best-in-class, but also offer a bouquet of systems suited to serve every Indian. Proactive regulation and supervision with safety and customer centric initiatives have been the hallmark of developments in the retail payments systems arena and it is a proud feeling to be recognised as a leader across the globe in this sphere.

Reserve Bank has been continuously setting goals and targets in the form of Payment Systems Vision document, every three years since 2001, presenting the road map for improving the payment systems of our nation. Empowering every Indian with access to a bouquet of e-payment options that is safe, secure, convenient, quick and affordable is Reserve Bank's Payment System's Vision for 2019-2021.

This Booklet takes us through the amazing journey of payment systems in India in the previous decade. A journey which has transformed the way banking is done in the country today. As Brett King, the author of 'Bank 4.0', rightly puts it: *"Banking is no longer somewhere you go, it's something you do."*

I take this opportunity to convey my kudos to the thought leaders in Reserve Bank, earlier and present, for nurturing and guiding payment system development. I and my team remain committed to continue this catalytic and facilitating role for enabling innovations in payment systems, while unyieldingly performing our responsibilities as regulator and supervisor. We rededicate ourselves to pursue this mission

relentlessly and place India at the highest pedestal amongst all countries in payments systems space for years to come. It has been my privilege and pleasure to be part of this memorable journey towards excellence.

P. Vasudevan
Chief General Manager
Department of Payment and Settlement Systems
Reserve Bank of India

Chapter 1

Introduction

1.1 The need for payments and settlements is as old as the need for goods and services. The earliest known Payment and Settlement System (PSS) was the barter system facilitating exchange through goods and / or services. With the concept of money, people progressed to settling their economic transactions using currency notes and coins. The evolution of the banking system and advent of bank accounts led to an easy and safe method for making payments by transfer of money through bank accounts. This transaction required a payment instrument, and cheque emerged as the primary instrument for payment transactions. Thus, started the tale of payment systems.

1.2 An efficient payment system promotes market efficiency and reduces the cost of exchanging goods and services. By the same token, its failure can result in loss of confidence in the financial system and in the very use of money.

1.3 In India, the oversight of the payment systems is entrusted to the Reserve Bank of India (RBI) where the Board for Regulation and Supervision of Payment and Settlement Systems (BPSS), chaired by the Governor, RBI, spearheads this responsibility. The creation of a new department viz., Department of Payment and Settlement Systems (DPSS) by RBI in the year 2005 to focus exclusively on payment and settlement systems, and subsequent legislation of the Payment and Settlement Systems Act, 2007 (PSS Act) set the stage for a new era in the history of payment systems in the country.

Payment and Settlement Systems Act, 2007

1.4 A sound and appropriate legal framework is a necessary requirement for efficient payment systems. The legal environment should include (i) laws and regulations of broad applicability that address issues such as insolvency and contractual relations between parties; (ii) laws and regulations that have specific applicability to payment systems (such as legislation on electronic signature, validation of netting, and settlement finality); and (iii)

the rules, standards, and procedures agreed to by all participants of a payments system. Considering the importance of regulation for the development and orderly functioning of not only financial services but also payment systems, the Payment and Settlement Systems Act was legislated in 2007. India is one of the few countries that has a specific payment systems law to *"..provide for the regulation and supervision of payment systems in India and to designate RBI as the authority for the purpose and for matters connected therewith or incidental thereto."* RBI's scope for regulation extends to the whole gamut of payment systems and instruments as also services provided by banks and non-banks.

1.5 In terms of Section 4 of PSS Act, no person other than RBI can commence or operate any payment system in India unless authorised by it. RBI has since authorised various Payment System Operators (PSOs) such as CCIL (financial market infrastructure - central counterparty), NPCI (retail payments organisation), card payment networks, cross-border in-bound money transfers entities, ATM networks, PPI issuers, Instant Money Transfer operators, TReDS platform providers and Bharat Bill Payment Operating Units (BBPOUs) to operate payment systems in the country. PSS Act and the Payment and Settlement Systems Regulations, 2008 framed thereunder, provide necessary statutory backing to the RBI to exercise oversight over the payment and settlement systems in the country.

Components of Payment and Settlement Systems

1.6 The Bank for International Settlements' (BIS) Committee on Payments and Market Infrastructures (CPMI) defines payment systems transactions to include the total transactions undertaken by all payment systems in the country. Considering this definition, payment systems transactions in India would comprise of transactions processed and settled through (a) Paper Clearing [Magnetic Ink Character Recognition (MICR), Non-MICR, Cheque Truncation System (CTS), Express Cheque Clearing System (ECCS)]; (b) Bulk electronic transaction processing systems like Electronic Clearing Service (ECS), with its variants Regional ECS and National ECS; National Automated Clearing House (NACH) - Debit and Credit; (c) Card Payments (Debit, Credit and Electronic); (d) Large Value [Real Time Gross Settlement

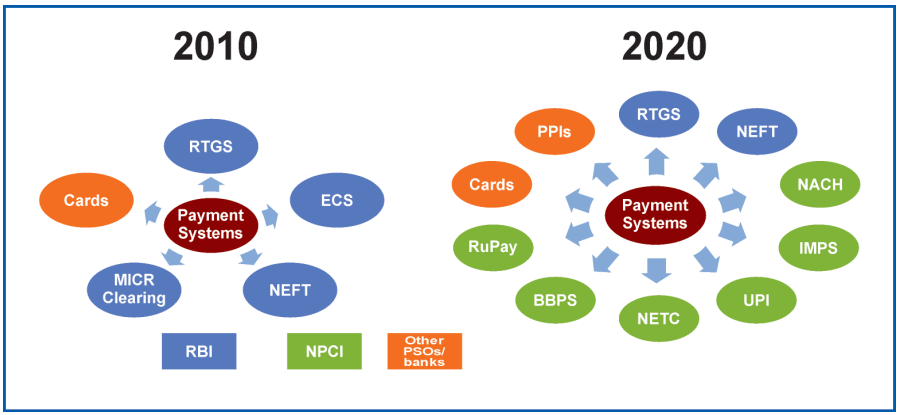
(RTGS)]; (e) Retail [National Electronic Funds Transfer (NEFT)]; (f) Fast Payments [Immediate Payment Service (IMPS), Unified Payments Interface (UPI)]; and (g) e-Money [Prepaid Payment Instrument (PPI) Cards and Wallets). Except (a) above and cash transactions, all other payments constitute digital transactions.

1.7 In addition to the above payment and settlement systems, RBI has also institutionalised a well-established clearing and settlement system for Government Securities.

1.8 The digital revolution is taking the world by storm and no other area has witnessed a metamorphosis as has been seen in the payment and settlement arena, resulting in a myriad of payment options for the consumer. In the last 10 years, India has witnessed an exponential growth in payment systems and a significant shift in payment preference.

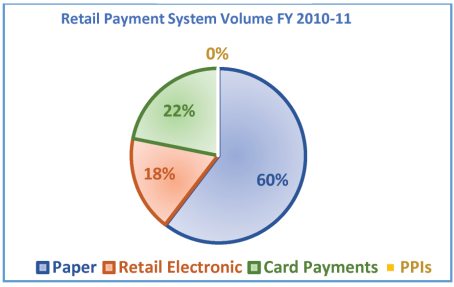
1.9 The shift in payment preference in the last 10 years is evidenced by the fact that the volume of paper clearing, which comprised of 60% of total retail payments in the financial year (FY) 2010-11, shrunk to 3% in the FY 2019-20. This striking shift in payment preference has been due to the creation of robust electronic payment systems such as RTGS, NEFT and ECS that has facilitated seamless real time or near real time fund transfers. In addition, this decade has witnessed introduction of innovative payment systems that provide instant credit to the beneficiary, with the launch of fast payment systems such as IMPS and UPI that are available to consumers round the clock for undertaking fund transfers, and introduction of mobile based payment systems such as Bharat Bill Payment System (BBPS), PPIs to facilitate payment of bills and purchase of goods and services and National Electronic Toll Collection (NETC) to facilitate electronic toll payments. The convenience of these payment systems ensured rapid acceptance as they provided consumers an alternative to the use of cash and paper for making payments. The facilitation of non-bank FinTech firms in the payment ecosystem as PPI issuers, BBPOUs and third-party application providers in the UPI platform have furthered the adoption of digital payments in the country.

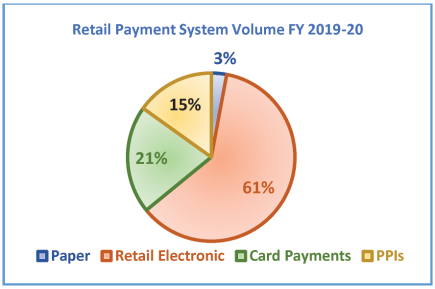
Table 1: India's payment systems

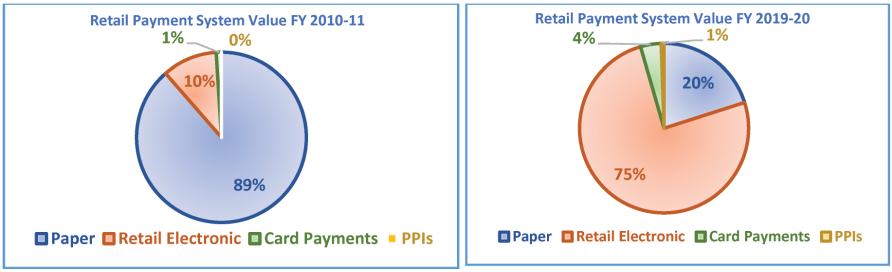


1.10 The advent of innovative electronic payment systems that leverage on technology which can be used through internet and mobile, has led to electronic payment systems dominating the retail payment space with around 61% share in terms of volume and 75% share in terms of value during the FY 2019-20. Increased mobile and internet penetration in the country has resulted in significant shift towards use of mobile / internet-based payment systems for effecting payments for purchase of goods and services. Introduction of lightweight acceptance infrastructure (QR codes) has further facilitated the use of mobile based payments across the country. Data shows that low value payments dominate the volume / turnover, and products that afford real time, instantaneous transfers are the most preferred modes of payment.

Table 2: Share of payment systems







Source: RBI Data

1.11 The last decade, therefore, has seen an explosion of payment systems with consumers having multiple options to choose from. In the approach towards payment system development in the country, safety and security has been of paramount importance to RBI; followed by efficiency, accessibility, affordability and convenience. Payment systems have always been regarded as a public good and an ancillary activity of banks which can be leveraged as a base to provide various other services. Given the sizeable populace of the country, the endeavour is to make the payments space a large-volume, low-average-value and low-cost game for sustained presence and continuance.

1.12 A study on payment systems is incomplete without touching some of the institutions which contributed to the efficacy and efficiency of the systems, notable among them being the Institute for Development and Research in Banking Technology (IDRBT) and the National Payments Corporation of India (NPCI) which have contributed to making India's payments ecosystem the showpiece that it is today. It is with great foresight that RBI not only established these institutions but also nurtured them till they were able to stand on their feet.[1]

1.13 This booklet is the third in the series of booklets on payment systems published by RBI. The first was taken out in 1998 and the second one in 2008. This booklet covers the journey of India's payments journey during

[1] *"We have been focusing our attention on developing the payment systems in the country for the past thirty five years, starting from the computerisation of clearing houses way back in early 1980s. Thanks to all these years' efforts, today we have a vibrant, innovating, efficient and secured payment ecosystem in the country."*

(Shri R. Gandhi, former Deputy Governor, RBI, 2015)

the past ten years. Major announcements during the ten year period are chronicled in Appendix 1. The trends in the payment systems in the past ten years are brought out in Appendix 2. In addition, the acronyms used through this booklet are referenced in Appendix 3.

Chapter 2

Institution Building

Institute for Development and Research in Banking Technology, Indian Financial Technology and Allied Services and Clearing Corporation of India Limited

Institute for Development and Research in Banking Technology (IDRBT)

2.1 During the initial reforms in the Indian banking and financial sector, a need was felt to develop an institute of higher learning, which would also provide information technology support to banks and financial institutions. Dr. Rangarajan Committee reports in the years 1984 and 1989 recommended computerisation of banking operations at various levels. Subsequently, a committee on "Technology Upgradation in the Payment Systems" was constituted in 1994 which recommended setting up of an Information Technology Institute for Research and Development as well as Consultancy in the application of technology to the banking and financial sector of the country. This led to the birth of IDRBT on June 10, 1996 as a Society under the Society Registration Act, with the objective to spearhead technology absorption in the banking and financial sector.

2.2 In its initial years, IDRBT primarily focused on developing and managing technology infrastructure for the banking and financial sectors. It developed the Indian Financial Network (INFINET), the Structured Financial Messaging System (SFMS), the Indian Banking Community Cloud (IBCC), the National Financial Switch (NFS), etc. These systems are the backbone around which PSS in India rally even today. IDRBT is also the Certifying Authority for digital certificates. Research and academic activities at this institute not only engendered the technical know-how for creation of these services, but also helped in training and updating skills in the banking sector.

2.3 IDRBT has recently undertaken focused initiatives on major areas of research on the systemic requirements of the banking system and has set up 6 state-of-the-art Research Centres for aiding and promoting research

and development work in the areas of Analytics, Cyber Security, Mobile Banking, Affordable Technologies, Cloud Computing and Payment Systems. The Research Centres are being constantly upgraded with latest systems, devices and tools to keep pace with the ever-changing technology trends. IDRBT has also emerged as a premier institution for imparting training to banks in the payments arena.[2]

Indian Financial Technology and Allied Services (IFTAS)

2.4 RBI had constituted an External Expert Review Committee (EERC), headed by its former Governor, Dr. C. Rangarajan for evaluating the activities of IDRBT and re-defining its role and suggesting a roadmap for the future. The EERC, which submitted its report in July 2009, recommended that 'to function as a primary institute of excellence in research and development in banking technology, IDRBT should shed its functions of providing various services by hiving off these services.' This led to the creation of IFTAS as a wholly owned subsidiary of RBI.

2.5 Accordingly, IFTAS took over INFINET, SFMS and IBCC services from IDRBT and commenced operations with the aim of providing uninterrupted 24x7 high-quality IT-related services to the Indian banking and financial sector.

2.6 IFTAS was created with the mandate to provide critical infrastructure services to RBI, banks, cooperative societies and other financial institutions. IFTAS now provides the following services:

(i) INFINET, the communication backbone of the Indian banking and financial sector.

(ii) SFMS, a robust messaging platform used in the RBI operated payment systems, i.e., RTGS and NEFT.

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[2] *"India can boast of many institutional firsts in the financial sector that became the toast of the world. CCIL, NPCI and IDRBT come to my mind readily. Each of them had played stellar roles. The earliest and the most important one among these was the IDRBT that with its unique mandate laid the foundation for digitisation of the financial sector in India by providing a safe and secure India network on par with international standards and continues to be the backbone infrastructure of the Indian financial sector."*

*- (**Shri G Padmanabhan, former Executive Director, RBI, 2019**)*

(iii) IBCC, a specialised community cloud for the banking and financial sector.

(iv) Global Interchange for Financial Transactions (GIFT), a one-stop integrated PSS providing an end-to-end straight-through processing (STP) of payment messages (inter-bank transactions) between the source bank & destination through the Central Bank.

Clearing Corporation of India Limited (CCIL)

2.7 CCIL is a Financial Market Infrastructure (FMI), authorised by RBI under the PSS Act, to operate various payment systems and function as a Trade Repository (TR) for specified instruments. CCIL has been granted the status of a Qualified Central Counterparty (QCCP) in the Indian jurisdiction.

2.8 CCIL was setup in April 2001 to provide guaranteed clearing and settlement for transactions in money, government securities, forex and derivative markets. CCIL also provides non-guaranteed settlements for rupee interest rate derivatives and cross currency forex transactions (through CLS Bank). CCIL is, therefore, authorised to operate the following payment systems, (i) securities (outright, repo and tri-party repo), (ii) forex [USD-INR (cash, tom, spot) and cross currency CLS], (iii) forex forward (USD-INR), and (iv) rupee derivatives [rupee interest rate swaps (IRS) and forward rate agreements (FRA)].

2.9 CCIL acts as a TR for all over the counter (OTC) transactions in the forex, interest rate and credit derivatives segments. CCIL also acts as a TR for (i) secondary market trades in Certificates of Deposit / Commercial Papers (ii) market repo / reverse repo transactions in Corporate Bonds / Certificates of Deposit / Commercial Papers / NCDs of original maturity of less than one year and (iii) primary market issuances of Commercial Paper by the respective Issuing and Paying Agent (IPA).

2.10 CCIL also acts as a reference point for important benchmarks used by the market under the aegis of the benchmark administrator, Financial Benchmarks India Limited (FBIL) like MTM prices, ZCYC rates and Spot rates.

2.11 The operations of CCIL are covered in detail in Chapter 14.

Chapter 3

Institution Building - Umbrella Organisation

National Payments Corporation of India (NPCI)

3.1 RBI, in its Vision for Payment Systems 2005-08, envisioned the need for an umbrella organisation for all the retail payment systems in the country, with the objective of optimally using the resources through consolidation of existing infrastructure and building new infrastructure to enable national reach in a seamless manner. It envisaged constituting an umbrella organisation to have a robust technology platform and provide service of high quality to customers at an affordable price structure.

3.2 Thus, NPCI was set up, with guidance and support of RBI and the Indian Banks' Association (IBA), as an umbrella organisation for retail payments system in India. It was incorporated in December 2008 as a Section 25 company (not-for-profit company) under Companies Act, 1956 (now Section 8 of Companies Act, 2013) with the aim to operate for the benefit of all member banks and their customers, create infrastructure for operating pan-India systems with high availability and scalability to process increasing volumes of retail electronic payments, etc. India is one of the few jurisdictions to have attempted this and over the period of 10 years, the share of transactions handled by NPCI is a testimony to the success and criticality of this initiative, probably the first of its kind across the globe!

3.3 NPCI started with 10 core promoter banks (State Bank of India, Punjab National Bank, Canara Bank, Bank of Baroda, Union Bank of India, Bank of India, ICICI Bank, HDFC Bank, Citibank N. A. and HSBC) as shareholders. In the year 2016, the shareholding of NPCI was broad-based to include more banks representing all sectors. As on date, the number of shareholders of NPCI is 67, comprising 11 public sector banks, 18 private sector banks, 5 foreign banks, 10 cooperative banks, 7 Regional Rural Banks (RRBs), 4 Small Finance Banks (SFBs), 2 Payment Banks (PBs) and 10 PSOs.

3.4 In December 2013, NPCI was entrusted with the task of operating CTS on behalf of RBI. It also took over from IDRBT in December 2009, the task of managing NFS which operated an ATM network having 37 members with

50,000 ATMs. It has grown to a network of 112-member banks connecting over 2.3 lakh ATMs as at end-December 2020. These two activities are the main revenue source for NPCI on the strength of which it has been able to expand its operations and invest in innovative ideas and systems.

3.5 The retail payments space has further developed and matured with a variety of systems introduced and operated by NPCI. With the aim of touching lives of every Indian, NPCI has rolled out a variety of innovative retail payment products viz., IMPS, RuPay card scheme, UPI, NACH, Aadhaar-enabled Payments System (AePS), Aadhaar Payments Bridge System (APBS), NETC, *99# (USSD based) and BBPS. Further, NPCI's alliance with international network partners (Discover Financial Services, Japan Credit Bureau and China Union Pay) has paved the way for international acceptance of RuPay.

Table 3: Progress made by NPCI in the retail digital payments space

*Note - *CTS operations were handed over to NPCI in 2013*

3.6 Widespread adoption of NPCI's retail payment products has made NPCI truly an umbrella organisation for retail payment systems. NPCI's retail payment products have also provided an impetus to RBI's vision of a 'less-cash' society and of empowering every Indian with access to a bouquet of e-payment options that is safe, secure, convenient, quick and affordable. NPCI has been yet another successful experiment and experience in the Indian payment systems space.

NPCI International Payments Limited

3.7 Over the years, the retail payment systems of NPCI have gained widespread acceptance across the country and generated enormous interest from other jurisdictions as well. In order to bestow undivided attention to the global outreach of NPCI payment systems, a subsidiary, viz., NPCI International Payments Limited (NIPL), was established in April 2020. NIPL is tasked with the responsibility of exporting, in consultation and co-ordination with RBI, NPCI's indigenously developed offerings to foreign markets. To begin with, the primary focus of NIPL is the internationalisation of RuPay and UPI.

Chapter 4

Paper Clearing

4.1 The Banking Regulation Act, 1949 defines "banking" as *the accepting, for the purpose of lending or investment, of deposits of money from the public, repayable on demand or otherwise, and withdrawal by cheque, draft, order or otherwise.* Payment by means of cheque is, therefore, embedded in the very definition of banking. Paper-based payment systems historically occupy an important place in any country's payment landscape as initially, apart from cash, cheque payment was the only available alternative. 'Clearing' of cheques required a centralised payment and settlement system, which facilitated payments made through cheques by netting through participating member banks, without going through the tedious task of individually settling each and every cheque / instrument.

Magnetic Ink Character Recognition (MICR)

4.2 The cheque clearing systems have evolved from manual clearing system to MICR clearing systems in mid 1980s, which brought in automation, standardisation and efficiency in cheque clearing process. MICR instruments with Magnetic Media Based Clearing Systems (MMBCS) technology facilitated carrying out of 'clearing' activity electronically, wherein clearing data was processed electronically with physical cheques exchanged alongside. To further ease up the process, High Value Clearing (HVC) was introduced during the eighties for clearing cheques of value of Rupees one lakh and above. This clearing was available at select large centres in the country till it was discontinued in the year 2009.

4.3 Following implementation of Core Banking Systems (CBS) in banks, Speed Clearing was launched in the year 2008, for local clearance of outstation cheques drawn on core-banking enabled branches of banks, which drastically reduced the turnaround time for clearing of outstation cheques.

Cheque Truncation System (CTS)

4.4 CTS enables use of the image of cheque for payment processing thereby eliminating the need for physical movement of cheques, with

concomitant benefits of reduced turnaround time for clearing of cheques, particularly more so in case of outstation cheques. During the year 2008, RBI conducted a pilot study in New Delhi on the possibility of introducing CTS. Based on the learnings and outcomes of this pilot study, in February 2010, CTS-2010 standards were framed to enhance and standardise the security features on cheque forms. Mandatory features were specified including paper & watermark (at manufacturing stage), void pantograph and bank's logo with UV ink (at printing stage), field placements of a cheque, colours and clutter-free background, prohibiting alterations / corrections on cheques, pre-printed account number, etc. Apart from these, banks were given the leeway to include suitable desirable features provided the mandatory security features are not compromised. Banks were advised to issue only CTS-2010 standard cheques henceforth. After the successful run in New Delhi, CTS was introduced in the rest of the country, at Chennai in September 2011, to cover CTS clearing in southern and eastern zones, and Mumbai in April 2013 covering the western zone, with New Delhi covering CTS clearing in the northern zone.

4.5 In CTS, the presenting bank / collecting bank captures the MICR data and scans the images of the cheque as per CTS specifications and instruments are cleared on the basis of these digitally signed encrypted images. To facilitate CTS clearing, amendments were made to the Negotiable Instruments Act, 1881 to legalise electronic movement of cheques, retention of cheque by the presenting banker and placing the onus of verifying prima facie genuineness of the cheque to be truncated on the bank receiving the payment.

4.6 All sixty-six MICR centres operating across the country were subsumed in grid-based CTS clearing and MICR clearing was discontinued with effect from July 2014. As on date, all 1219 non-MICR clearing houses have been migrated to CTS.

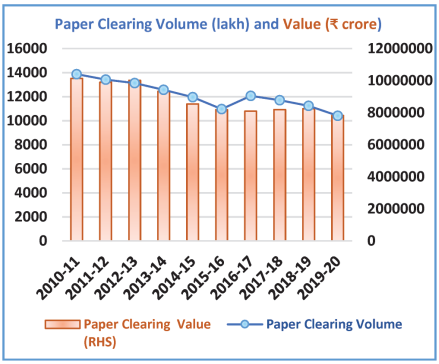
4.7 The concept of a panel for resolution of disputes (PRD) for speedy and timely resolution of disputes between member banks was drawn up by RBI in September 24, 2010 to handle disputes. Each grid has its PRD; the President of the Grid is ex-officio chairman of PRD who is assisted by four other members representing member banks. The scope

of the dispute resolution mechanism is limited to interpretation, scrutiny and resolution of disputes within the ambit of rules, regulations, operational and procedural guidelines relating to the payment products, various instructions issued by the system providers, instructions and directions issued by RBI. The resolution given by PRD is binding on the disputing banks, unless an appeal is made to the Appellate Authority against judgement of PRD.

4.8 To further augment customer safety in cheque payments and reduce instances of fraud occurring on account of tampering of cheque leaves, a mechanism of *Positive Pay* for all cheques of value of ₹ 50,000 and above was announced in September 2020. Under this mechanism, cheques will be processed for payment by the drawee bank based on information passed on by its customer at the time of issuing the cheque. In the Centralised Positive Pay System (CPPS), customers, after issuance of cheques will provide details of issued instrument/s to their banks. The data received will be uploaded in NPCI's CPPS system by the member bank. During the presentment, cheques presented will be validated by clearing house against CPPS data base. If any difference is observed while matching results, the clearing house will put a specified flag with the cheque data. Since CPPS will be the central repository for all participating banks, validation and provision of the flag at the time of clearing process will enable banks to save time in clearing process. It will be an add-on facility to contain any occurrence of fraud. The facility was implemented from January 01, 2021.

4.9 To conclude, India has a fast and efficient cheque processing system. Standardisation of cheque forms and the cheque clearing system in the country made it the most efficient and best in the world in terms of its T+1 clearing and settlement cycle across the length and breadth of the country. Cheque truncation eliminated the associated cost and time for movement of physical cheques, reduced the time for collection and brought in efficiency to the entire activity of cheque processing.

Table 4: Growth and share of paper clearing



Source: RBI Data

Chapter 5

Digital Payments Enablers

5.1 RBI has always been the primary enabler of digital payments in India. From conceptualisation to execution, investment in knowledge and technology for payment systems involving large scale capital expenditure {MICR, CTS, ECS, large value payments (RTGS), retail payments (NEFT), etc.}, RBI has donned many hats, that of owner, operator, catalyst, regulator, et al.

5.2 India has followed the "bank-led" model with banks at the fore-front of payment systems operations, as it was felt that being adequately regulated, banks were better placed to take the payment systems forward.[3] The approach has been to involve banks where float is involved, while non-banks can participate with fee as their income source. Easy access, swift absorption / adoption of new technology and innovation, quality of infrastructure, etc., are crucial elements for ensuring safe and quick payments which help in building confidence in the payment systems. The dual model followed in India combined the "trust" that the banks offered with the innovations of non-banks to upscale digital payments.

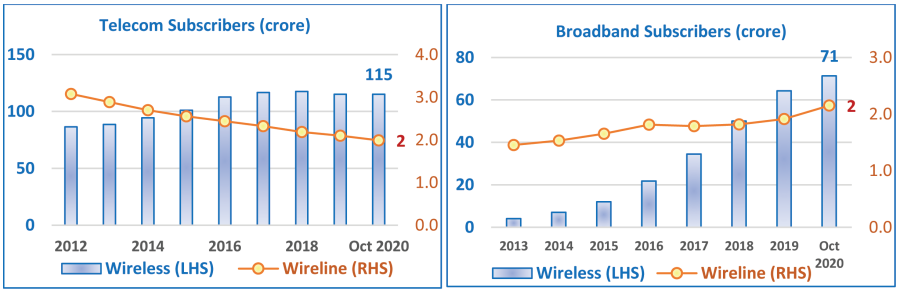
Mobile Phones and Internet

5.3 The growth of infrastructure in India has been phenomenal over the past decade, most notably in the spread of mobile cellular network. The increasing mobile density and mobile internet users are being leveraged upon by payment systems providers, both banks and non-banks, to offer payment services which is accessible over mobile and internet. Along with internet banking, banks have been offering mobile banking services through all three channels - short message service (SMS), Unstructured Supplementary Services Data (USSD) and mobile applications.

[3] *"Banks and non-banks are partnering to offer the combination of trust and innovation to the Indian consumer. This "best of both worlds" approach has resulted in tremendous growth in the number of digital payments, which is expected to continue."*

(Shri Shaktikanta Das, Governor, RBI, 2020)

Table 5: Telecom and Internet Subscribers in the country



Source: Telecom Regulatory Authority of India (TRAI) Data

5.4 As at end of October 2020, India had over 115.1 crore wireless telephone subscribers resulting in a tele-density of 84.90%. The urban tele-density and rural tele-density was 136.65% and 58.72%, respectively, which is growing. Increase in smartphone usage has also helped accelerate the adoption of digital payments. Further, it has led to numerous innovations in payment mechanisms, such as tokenisation and scanning of Quick Response (QR) code for making payments using smartphones.

5.5 Internet usage is on the rise in India. While the average Indian, until 2013, spent more on voice services than on mobile data services, a significant share of an average mobile bill now pertains to data charges according to a report by the Internet and Mobile Association of India (IAMAI). As at the end of October 2020, there were over 71.3 crore and 2.1 crore wireless and wireline broadband subscribers, respectively. The increase in internet penetration has facilitated and also accelerated the adoption of digital modes of payments. With rapidly increasing penetration of 3G and 4G, even in remote areas, India is witnessing a "Digital Revolution" which is surely but steadily evolving into a "Digital Payments Revolution." Recent evidence indicates that Indians consume on an average about 10 GB data every month.

Bank Accounts

5.6 The number of deposit accounts has grown to 235 crore as at end March 2020. These include deposit accounts in all commercial banks including Local Area Banks (LABs), PBs, SFBs, RRBs and Cooperative Banks in the country. The availability of bank accounts played a key role in initiating digital payments from / to such accounts.

Aadhaar

5.7 Since its launch in 2009, Aadhaar, a unique identification number has been issued to over 127 crore individuals across the country. "Aadhaar" enabled e-KYC (electronic-Know Your Customer) has resulted in an exponential growth of digital payments in India. The use of Aadhaar has also been leveraged for authenticating payments to merchants as well as transactions made through Business Correspondents (BCs). The coverage of Aadhaar biometric identification has witnessed increased use in Government to Person (G2P) payments and has helped reduce leakages from the system by expunging fake beneficiaries. These payment systems have helped migrate cash payments to electronic form.[4] Aadhaar has been subject to many a legal tussle and its acceptance and use in payments has seen a see-saw battle over the years. Ironically though, many other jurisdictions see Aadhaar as a successful experiment. Availability of biometric identification (fingerprints) with face and iris scans can be leveraged to push digital payments to exponential levels, of course privacy and other concerns have to be given due consideration.

Debit and Credit Cards

5.8 In India, credit cards are considered taboo and viewed more as products for the elite. Over the past 10 years, during the period between FY 2010-11 and FY 2019-20, the number of debit cards issued increased from 22.78 crore to 82.86 crore, of which around 30 crore comprised of RuPay debit cards issued to Basic Savings Bank Deposit (BSBD) account holders. During the same period, the number of credit cards issued also increased from 1.80 crore to 5.77 crore. Increase in cards has facilitated growth in both online and physical PoS terminal based card payments resulting in an increase in digital transactions.

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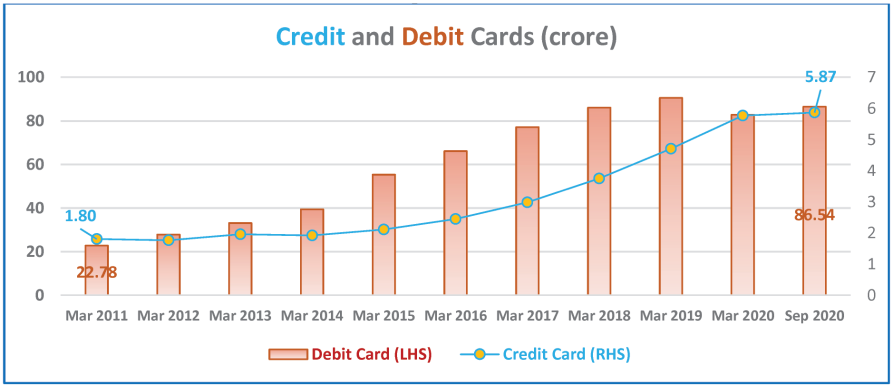
[4] *"Digital disruptions will continue to transform the banking sector. Initiatives undertaken by the Government, the Reserve Bank and the industry have led to a radical shift towards ubiquitous digitisation, which has provided an impetus to adoption of technology. There is a unique confluence of several positives like demographic dividend, JAM trinity, etc., that would further support rapid digitisation of financial services in India."*

(Shri Shaktikanta Das, Governor, RBI, 2020)

5.9 Banks issued new cards to comply with the requirement to convert all existing Magstripe cards to Europay Master Visa (EMV) Chip and Personal Identification Number (PIN) compliant cards by December 31, 2018 and subsequently removed deactivated cards from their systems, resulting in a reduction of debit cards outstanding in the FY 2019-20. The consolidation of public sector banks also contributed to this reduction.

Table 6: Debit and Credit Cards Outstanding



Source: RBI Data

Chapter 6

Standards and Identifiers

6.1 Standardisation is vital in payment systems as the adoption of identifiers, uniform standards and formats help eliminate frictions and inefficiencies in processes. Considering the importance of standards in the payments space, RBI has prescribed standards for many payments and has been instrumental in developing a few others. Adoption of these standards and identifiers have contributed in making the payment systems the force they are today.

Magnetic Ink Character Recognition (MICR)

6.2 MICR, is a character recognition technology used in the banking industry to streamline the processing and clearance of cheques and other documents. MICR code is a 9-digit code printed on cheques using technology that uniquely identifies the bank and branch participating in an Electronic Clearing System (ECS). The MICR code comprises, (i) the first three digits representing the city (city code) - they are aligned with the PIN code used for postal addresses; (ii) the next 3 digits representing the bank (bank code); and (iii) the last 3 digits representing the branch (branch code). Cheques with MICR code are run through MICR reader and sorter machines, thereby enabling faster processing, sorting and clearing.

6.3 MICR clearing was introduced in India in mid 1980s and this standardisation aided in automating the cheque clearing process thereby making it efficient.

INdian FInancial NETwork (INFINET)

6.4 In order to upgrade the country's payment and settlement systems, RBI had taken the initiative of providing a communication backbone in the form of the satellite based INFINET using VSAT technology to the banking and financial sectors. The task of designing and developing the communication network was entrusted to IDRBT. The Closed User Group (CUG) Network uses VSAT technology and is a Time-division multiplexing (TDM) / Time-division multiple access (TDMA) network with STAR topology for Data and with Demand Assigned Multiple Access-Single Channel Per Carrier (DAMA-SCPC) overlay with mesh topology for voice and video traffic.

6.5 The primary objective of INFINET for the banking and financial sector was to enhance efficiency and productivity on the one hand and provide state-of-the-art customer services through innovative delivery channels such as internet banking, home banking, etc., on the other.

Structured Financial Messaging System (SFMS)

6.6 SFMS, developed by IDRBT, is a domestic messaging standard used for financial messaging in India. SFMS is an Electronic Data Interchange (EDI) for banks and it uses INFINET as the communication medium. Various intrabank applications use the SFMS to improve efficiency and speed in fund transfer, MIS reports, information reports, etc. SFMS is also the universal platform for carrying messages pertaining to the centralised payment systems, thus, meeting the requirements of both retail and large value fund transfers.

6.7 The basic architecture of SFMS is a 4-tiered with hub connected to bank gateways, which are connected to bank servers. The bank servers in turn are connected to offline branches. The SFMS messages from a bank branch to another bank branch will be delivered via bank gateways and the hub. Intra-bank messages are however, switched at the bank gateway level and are not required to be routed to the hub.

Indian Financial System Code (IFSC)

6.8 Indian Financial System Code (or more commonly known as IFSC) is a 11-digit alpha-numeric code used to uniquely identify a bank and its branches with (i) the first 4 digits representing the bank; (ii) the 5th character is zero; and (iii) the last 6 digits representing the specific branch code. The IFSC is mandatory for fund transfers through various payment systems (RTGS, NEFT, IMPS), as it helps to identify the destination of the beneficiary bank and branch.

6.9 Since the implementation of core-banking systems by banks with all branches connected to a centralised system, RBI now allocates only the primary IFSC representing bank code, and banks can create / modify / delete additional IFSCs for their own branches through IFTAS. The updates are circulated by IFTAS to all member banks to ensure the same reflects in their systems.

6.10 There are discussions on whether MICR has outlived its purpose of existence and whether there is scope for two sets of identifiers to exist - MICR and IFSC.

ISO 20022

6.11 ISO 20022 is a multi-part International Standard prepared by ISO Technical Committee TC68 Financial Services. ISO 20022 is an emerging global and open standard for payments messaging. It creates a common language and model for payments data across the globe. India's RTGS was the first large value payment system in the world to be implemented adopting the ISO 20022 standard for messaging.

Society for Worldwide Interbank Financial Telecommunication (SWIFT)

6.12 SWIFT is the world's leading provider of secure financial messaging services. SWIFT has become the industry standard for syntax in financial messages. Messages formatted to SWIFT standards are read and processed by many financial processing systems, whether the message travelled over the SWIFT network or not. SWIFT standards have been used across the globe for domestic and international financial messaging services. In India, the SWIFT messaging standards are used for all cross-border payment transactions.

Legal Entity Identifier (LEI)[5]

6.13 LEI is a 20-character, alpha-numeric code (based on the ISO 17442 standard), to uniquely identify legally distinct entities that engage in financial transactions. It points to key reference information that enables clear and unique identification of legal entities participating in financial transactions and also contains information about an entity's ownership structure and thus answers the questions of 'who is who' and 'who owns whom'.

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[5] *"Adoption of global best practices to improve market integrity is another important aspect of regulation. In the last couple of years, the Legal Entity Identifier (LEI) system has been implemented in a phased manner in all financial markets, including derivative markets regulated by the Reserve Bank, as well as for bank loans. We believe transparency of financial markets will greatly improve once the LEI system is used widely."*

(Shri Shaktikanta Das, Governor, RBI, September 2019)

6.14 LEI was first made mandatory in India by RBI in June 2017 for all participants in OTC derivative markets (rupee interest rate derivatives, foreign currency derivatives and credit derivatives). Following a gradual approach for adoption of LEIs in India, RBI has further mandated LEIs for non-derivative markets (government securities markets, money markets and non-derivative forex markets) and for large corporate borrowers (with total exposure of more than ₹ 50 crore to banks). The implementation for OTC derivative markets and large corporate borrowers has been completed. In case of non-derivative markets, it was implemented in a phased manner.

6.15 As of now, around 16 lakh LEIs have been issued across the world. LEIs can be issued to an Indian Company by any Local Operating Unit (LOU) across the world including Legal Entity Identifier Limited (the local LOU). As on December 31, 2020, 47,677 Indian Companies have been issued LEIs (32,008 by LEIL and 15,669 by other LOUs).

Chapter 7

Digital Payments

7.1 [6]More digital payment options are now available to consumers. Systems that offer near instant person-to-person retail payments are increasingly available around the world. Many payment systems in India now operate 24 hours a day, seven days a week. All these developments have nudged the consumer towards digital payments because of the convenience they offer.

Electronic Clearing Service (ECS)

7.2 In the mid-eighties and the early-nineties, RBI took various initiatives to bring in technology-based solutions to the banking system. One such initiative introduced in 1990 was the ECS (Credit) scheme for handling bulk and repetitive payment requirements like salary, interest, dividend payments, etc. of corporates and other institutions. RBI later introduced an ECS (Debit) scheme to provide a faster method of effecting periodic and repetitive collections of utility payments by companies. To consolidate the ECS system, RBI introduced the National Electronic Clearing Service (NECS) and the Regional Electronic Clearing Service (RECS).

7.3 With introduction of NACH by NPCI, most of the ECS centres migrated to it barring a few locations. The last remaining ECS centres were also fully migrated to NACH by January 31, 2020. The shift from ECS to NACH was smooth and non-disruptive. With this, the glorious life of ECS and its variants (RECS and NECS) came to an end, after having served the nation with distinction for 25 years.

National Automated Clearing House (NACH)

7.4 NACH is a centralised ECS system operated by NPCI. NACH was formed to consolidate multiple ECS systems running across the country into one centralised system. It operates both NACH Credit and NACH Debit payment systems. NACH credit, like ECS credit, is used for making one-

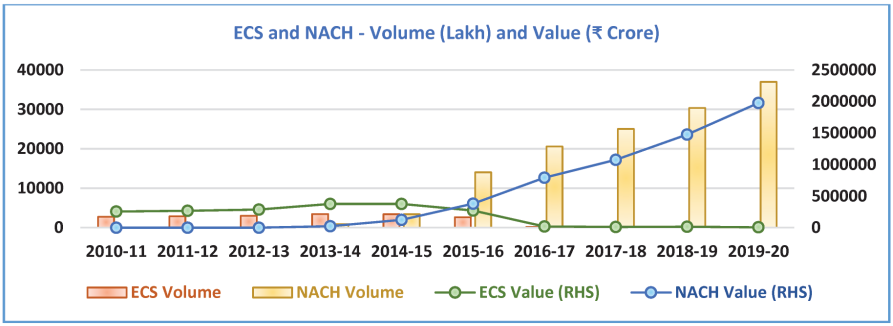
[6] *"India has been always been a country which has fostered innovation and development in the area of payment and settlement systems. The past decade has witnessed the blossoming of a myriad of payment systems, all for the convenience of the common man".*

(Shri B. P. Kanungo, Deputy Governor, RBI, 2018

to-many credit transfers, such as payment of dividend, interest, salary, pension, distribution of subsidies, etc. NACH Debit operates to collect transaction from many accounts to one destination account e.g., collection of various utility payments pertaining to telephone, electricity, water and gas charges, etc. It also facilitates collection of periodic instalments towards loans, investments in mutual funds, insurance premium, etc.

7.5 The destination banks and accounts are identified based on account number, IFSC or MICR codes. NACH works on the strength of mandates given by customers for allowing debit to their accounts at specified frequency. Apart from paper mandates, paperless mandates can also be created electronically. The system also identifies the destination account based on Aadhaar number, through APBS leg of NACH. NACH is the most popular and prominent mode of direct benefit transfer (DBT) credits to beneficiaries.

Table 7: Growth of NACH



Source: RBI Data

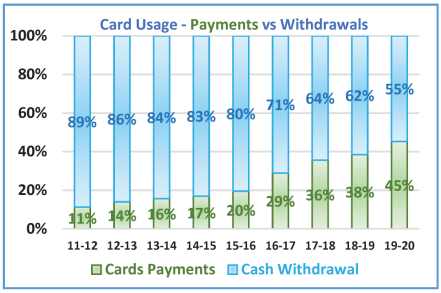
Card (debit and credit) Payments

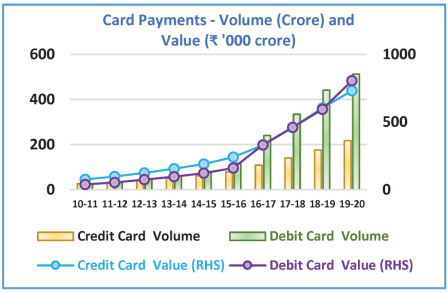
7.6 Card payment is an important payment instrument which has replaced the use of cash at least at retail outlets and e-commerce sites. Like in other parts of the world, Indian consumers are now frequently using cards for payments, even for smaller transactions. This is driven, in part, by more people holding cards and greater availability of PoS terminals. In comparison to credit cards, debit cards are much more popular in India. Some of the reasons for this exhibited partiality towards debit cards have been identified to be, (a) low demand due to Indian households being traditionally oriented

towards savings, rather than credit culture; (b) supply concerns, especially with majority of the labour force occupied in the unorganised sector and card issuers less keen to take higher credit risks; and (c) the Indian ethos to pay for goods and services on purchase instead of running up credit lines. Yet another cultural observation is, people do not wait for the credit period to be over; instead pay ahead of the deadline, and in many cases, even keep a favourable (credit) balance in a credit card account.

7.7 Debt and credit card based payments registered a CAGR of 35% and 33% in terms of volume and value, respectively over the last 10 years. To encourage usage of cards, card infrastructure is required to be robust, strong and secure. Mandating the issue and use of only EMV chip and PIN-based cards has helped build public confidence as it provides more security than the 'Magstripe only' cards. The adoption of card payments has also been supported by innovations in the form of contactless payments and tokenisation technologies.

Table 8: Card Usage Trend in India





Source: RBI Data

Contactless Cards

7.8 One of the innovations in the card payments ecosystem is the use of contactless technology, which allows cardholders to "Tap and Go". These cards are becoming increasingly popular. To provide convenience in use of such cards, RBI permitted relaxation in Additional Factor of Authentication (AFA) in case of Card Present (CP) transactions using Near Field Communication (NFC)-enabled EMV Chip and PIN cards for small values (up to ₹ 2,000/-). Transactions beyond this limit can be processed in contactless mode, but with AFA. This relaxation in AFA is, however, not

applicable for ATM transactions (irrespective of transaction value) and Card Not Present (CNP) transactions, i.e., online transactions. The limit was subsequently revised to ₹ 5,000/- effective from January 01, 2021.

National Common Mobility Card (NCMC)

7.9 NCMC was launched in March 2019, as a combo card offering a combination of a Debit / Credit with a prepaid card where the Debit / Credit component would be used in the online environment whereas the prepaid component would be used in the offline environment, wherever offline payments are permitted. The offline prepaid transactions would be affected without AFA which was permitted only for the transit payments to begin with, owing to the fast checkout time required for such transactions. Combo cards, while offering convenience of not having to carry multiple cards in your wallet, raise issues relating to uncertain regulatory turf because of multiple masters (government, RBI, metro operators, et al) which have to be addressed through coordination.

RuPay Cards

7.10 RuPay is a home-grown card payment network which was introduced in the year 2012 through NPCI. The drive for a less cash economy in the wake of demonetisation in 2016 and issue of RuPay cards for BSBD accounts has increased user acceptance in the interiors of the country where paying with a card was a novelty just five years back. RuPay has its popular debit card and its increasingly accepted credit version as well.

7.11 Countries that encourage domestic cards have been observed to be faster in moving away from cash. India is a late entrant to the domestic card market and in 2017, the share of RuPay was only 15% of the total cards issued in India. However, as on November 30, 2020, with about 60.36 crore RuPay cards issued by nearly 1,158 banks, the market share of RuPay has increased to more than 60% of total cards issued. A significant proportion of RuPay cards is in the nature of debit cards with only 9.7 lakh credit cards issued as on November 30, 2020.

7.12 RuPay started its international foray through its acceptance and issue in Bhutan achieved with the integration of the Bhutan Financial Switch with NFS. To increase its acceptance around the world, RuPay has tied up with

other payment networks like Union Pay (China), JCB (Japan), NETS (Singapore), BC Card (South Korea), Elo (Brazil) and DinaCard (Serbia), in addition to Discover and Diner Club and has thus made its presence felt across 195 countries across the globe.

Large Value Payment System (LVPS) - Real Time Gross Settlement (RTGS)

7.13 Large value systems are the most critical component of the national payment systems as they can generate and transmit disturbances of a systemic nature to the financial sector. Large value payment systems are, therefore, systemically important FMIs and critical for smooth functioning of the financial system.

7.14 India's LVPS, the RTGS system was introduced in March 2004 and is owned and operated by RBI. RTGS was subsequently enhanced to the Next Generation-RTGS (NG-RTGS) built on the ISO 20022 standards with advanced features such as hybrid functionality, liquidity management functions, future date functionality, scalability, etc. NG-RTGS was a pioneer in implementing ISO 20022 standards.

7.15 As the name sounds, the transactions settle real-time on a gross basis in the books of RBI. RTGS also settles Multilateral Net Settlement Batch (MNSB) files emanating from ancillary payment systems such as CCIL and NPCI. RTGS accounts for majority of value of transactions settled in Indian payment systems; average value of a RTGS transaction has always hovered around a crore of rupee, if not more. RTGS is available for customer transactions between 7:00 am and 6:00 pm and for inter-bank payments from 7:00 am to 7:45 pm. RTGS is available round the clock with effect from December 14, 2020. Implementation of RTGS 24x7 is expected to facilitate global integration of Indian financial markets, support India's efforts to develop international financial centers and provide wider payment flexibility to domestic corporates and institutions.

7.16 Access to RTGS is decided on the basis of the Access Criteria guidelines issued by RBI. The entities have to comply with specific requirements like, (i) membership of INFINET / SFMS / domestic SWIFT network; (ii) maintenance of current account and settlement account with

RBI; (iii) maintenance of Subsidiary General Ledger (SGL) account with RBI. Membership of RTGS is open to all licensed banks and any other institution as may be decided by RBI. Members that may not be in a position to comply with the membership requirements can access the system through sub-membership route.

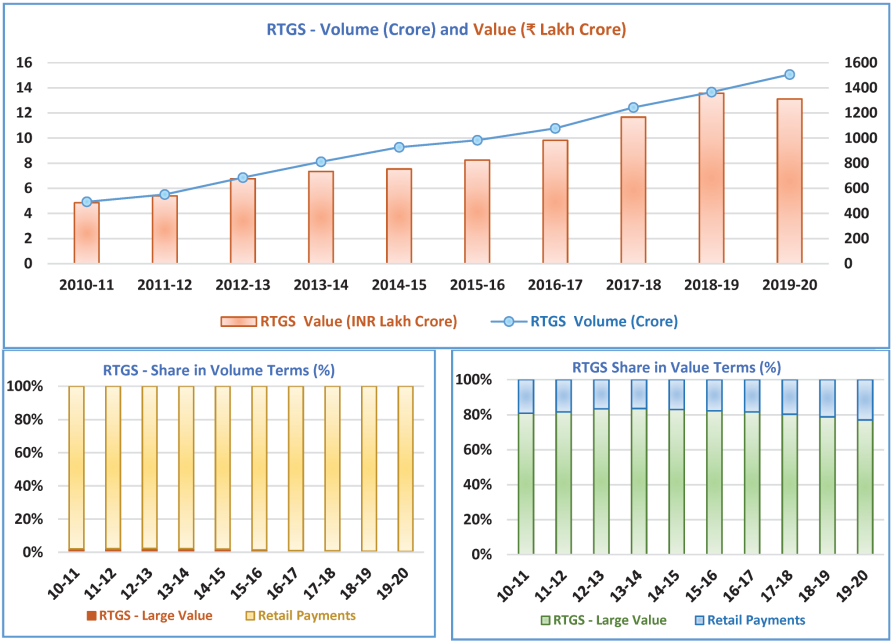
7.17 There are primarily four types of participants in RTGS viz. (i) central bank - exclusively for RBI (ii) regular participant - all types of facilities to be provided (e.g. banks), (iii) restricted participant - some particular type(s) of facilities to be provided (e.g. Primary Dealers) and (iv) clearing house for settlement of MNSB file. Domestically located banks, domestically located non-banks, domestically located broker-dealer, domestically located FMIs and branches of foreign banks located in India have direct access to RTGS in India.

7.18 Access to RTGS is available through any of the three options viz., thick-client, Web-API (through INFINET or any other approved network) and Payment Originator (PO) module. The choice of options for connecting to RTGS is based on the volumes and business requirements of a member.

7.19 To overcome short-term requirement of funds (during RTGS business day) for settlement of the transactions, RBI also grants access to intra-day liquidity (IDL) to RTGS members for settlement of their payment transactions in RTGS. IDL is invoked automatically for eligible participants as and when they do not have the required funds in their settlement account. However, participants are required to ensure availability of eligible collaterals with RBI. IDL facility availed by a participant is automatically reversed by the RTGS system on availability of sufficient funds in the settlement account of the participant (above a threshold level).

7.20 RTGS can be accessed by customers through web-based portal and proprietary network and transactions can also be initiated physically at participants' locations. These features make the system robust and have led to its acceptability and usability. With effect from July 1, 2019, RBI waived the processing charges and time varying charges levied by it on banks for outward transactions undertaken using RTGS.

Table 9: Growth and Share of RTGS



Source: RBI Data

National Electronic Funds Transfer (NEFT)

7.21 NEFT, as part of the Centralised Payment Systems (CPS), is a retail payment system owned and operated by RBI. At the time of its implementation in November 2005, NEFT was started with only eight member banks. As at the end of December 2020, NEFT system covers a network of 222 member banks and their 1,70,996 branches. These member banks also extend NEFT facility to customers through sub-members. There is no floor or ceiling for the amount that can be transferred in a single transaction, because of which NEFT has emerged as a popular hybrid payment system, with average transaction value of approximately ten lakh rupees.

7.22 In alignment with RBI's Payment System Vision 2019-2021, to provide uninterrupted availability of safe, secure, accessible and affordable payment systems, NEFT was made available as a round the clock fund transfer facility without any holiday with effect from December 2019. NEFT is a straight through process, which operates in 48 half hourly batches 24x7,

and credits are made into destination account based on beneficiary's unique account number. As laid down in the NEFT procedural guidelines, the beneficiary's account must be credited, or transaction returned to the originating bank within 2 hours of settlement of the respective batch. In case of delays in either credit to the beneficiary account or return of the transaction to the originating bank, penal interest at repo rate plus 2% has to be paid to destination account. NEFT has led the way for other payment systems to operate and is expected to change the entire facet of Indian banking with multiple products designed around it to cater to the round-the-clock users.

7.23 In addition to fund transfers, customers of member banks use NEFT for purchase of goods and services, utility bill payments, payment of statutory dues, etc. Walk-in customers can also avail of NEFT fund transfer facility, against cash payment up to ₹ 50,000/-. NEFT is a unique hybrid payment system as it carries with it the characteristics of both a retail and a large value payment system, offering round the clock transfers with no floor or ceiling on the amounts that can be transferred.

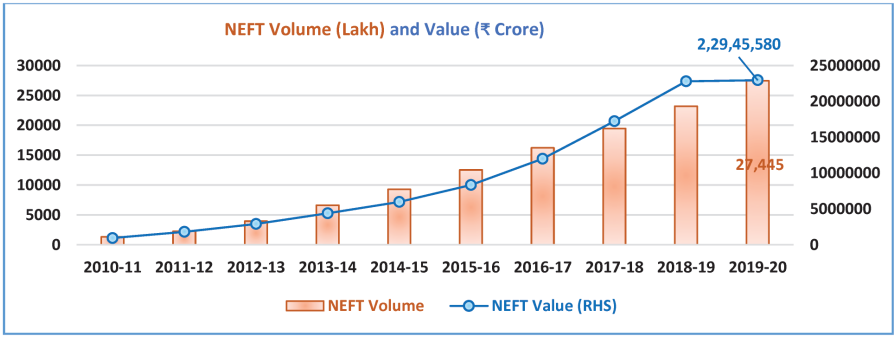
7.24 The member banks maintain current account with RBI which is used to settle inter-bank settlement obligations. The banks are eligible for intra day liquidity facility and liquidity support against eligible securities in an event of shortfall.

7.25 The Indo Nepal Remittance Scheme uses NEFT as the channel for one-way transfers of funds to Nepal in partnership with State Bank of India (SBI) and is intended to help Nepali migrant workers in India to send remittances back home.

7.26 The banks are required to send positive confirmation messages to the originator conveying successful credit of the transaction.

7.27 With effect from July 01, 2019, RBI waived NEFT processing charges which was collected from member banks. In addition, with effect from January 1, 2020 member banks were mandated not to levy any charge on NEFT transactions initiated online using mobile apps or internet banking by savings bank account holders.

Table 10: Growth of NEFT



Source: RBI Data

Fast Payments

7.28 Payment systems are becoming faster and more convenient. Notwithstanding its many features, NEFT is not tagged as a 'fast payment' system. Fast payments are defined by two key features, speed and continuous service availability, wherein transmission of the payment message and the availability of final funds to the payee occur in real time or near-real time and are available on as near to a 24-hour and 7-day (24/7) basis as possible. Currently, IMPS and UPI are the two existing 'fast payments' in India with the latter driving the retail payments volume; the two systems handle 8.35 crore transactions on a daily basis for value of ₹ 22,854 crore in December 2020. This excludes the transactions handled by NEFT, though the debate continues as to why these cannot get included as a fast payment system since the processing and final settlement in NEFT is handled on a batch basis with half hourly settlements.

Immediate Payment Service (IMPS)

7.29 IMPS is a 24*7 'fast payments' system that was introduced in 2010. India was the fourth country after South Korea, UK and South Africa to introduce such a payment system. The system provides for real time transfer of funds between the remitter and beneficiary with a deferred net settlement between banks. The system facilitates push transactions with a per-transaction limit of ₹ 2 lakh.

7.30 IMPS is a multi-channel system that can be accessed using mobile, ATM, internet banking, bank branches, BCs, etc. Besides banks, the

system allows non-bank entities such as PPI issuers to participate and facilitate remittances from wallets to the recipient bank accounts. Initially, the system required both the remitter and the beneficiary to be registered for mobile banking which was inhibiting the growth. Hence, the system was upgraded to enable remittance of funds by using other parameters such as account number and IFSC (like NEFT) or by using bank account linked Aadhaar number.

Unified Payments Interface (UPI)

7.31 UPI is a mobile based, 365x24x7 'fast payment' system wherein users can send and receive money instantly using a Virtual Payment Address (VPA) set by the user itself. The unique feature of VPA based transaction is the secure aspect of UPI architecture as it obviates the need for sharing account or bank details to the remitter. It supports person to person (P2P) and person to merchant (P2M) payments and can be used over smart phone (app based), feature phone (USSD based) and at merchant location (app based).

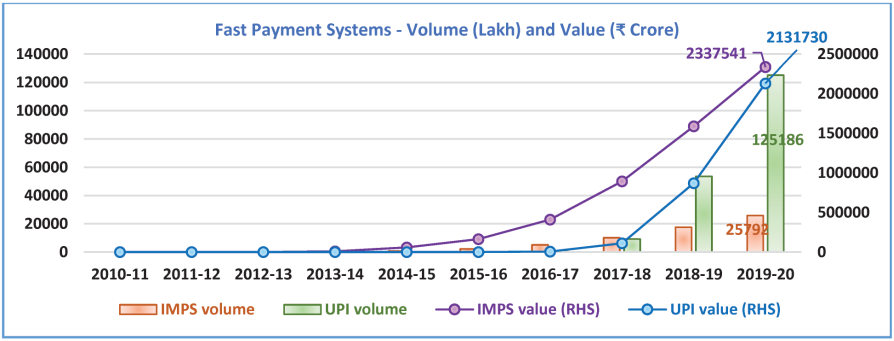
7.32 UPI facilitates immediate money transfer through pull and push payments, merchant payments, utility bill payments, QR code (scan and pay) based payments, etc. Non-financial transactions such as mobile banking registration, balance enquiry, etc., can also be carried out using UPI. It powers multiple bank accounts into a single mobile application of any participating bank / non-bank Third Party Application Provider (TPAP). Funds can be transferred using VPA or account number with bank code (IFSC).

7.33 The framework of UPI comprises of NPCI as network and settlement service provider, banks as Payment System Providers (PSPs), and as issuer banks and beneficiary banks; apart from TPAPs such as Google Pay, Truecaller, WhatsApp, etc. Non-bank PPI issuers have also been allowed to provide this facility in an interoperable manner to their PPI wallet holders.

7.34 Transactions are carried out through mobile devices with two factor authentication using device binding and a UPI PIN as security. The UPI PIN is encrypted using Public Key Infrastructure (PKI) technology while the transaction

data is stored in encrypted format in app provider's system. The system that went live in September 2016 with a transaction limit of ₹ 1 lakh was upgraded to UPI 2.0 in 2018 with a per transaction limit of ₹ 2 lakh and a few additional features to enhance customer convenience, safety and security of transactions. UPI has grown to be the fastest payment system in the world with many jurisdictions eager to replicate the system. Given its popularity and acceptance, there are many innovations possible to extend UPI to desktop browers, feature phones, offline payments as well as recurring payments.

Table 11: Growth of Fast Payments



Source: RBI Data

Aadhaar Enabled Payment System (AePS)

7.35 AePS is operational since January 2011. It allows online interoperable transactions at Micro-ATM through the BCs of any bank using Aadhaar authentication. Under this system, Aadhaar number is used not only to identify the beneficiary but also to authenticate transactions. The biometric based authentication is done by Unique Identification Authority of India (UIDAI) while NPCI does the switching, clearing and settlement of financial transactions.

7.36 The financial services offered through AePS include cash withdrawal, cash deposit, balance enquiry, Aadhaar to Aadhaar fund transfer. The non-financial transactions include - Demographic Authentication, Best Finger Detection (BFD) and e-KYC.

e-Money

7.37 e-Money is prepaid value stored electronically, which represents the

liability of the e-money issuer (a bank, an e-money institution or any other entity authorised or allowed to issue e-money in the local jurisdiction) and which is denominated in a currency backed by an authority. In India, e-Money is PPIs issued as Wallets and Cards.

7.38 PPIs are instruments that facilitate purchase of goods and services, remittance facilities, etc., against the value stored in / on such instruments. Banks and non-bank entities can issue PPIs in the country after obtaining necessary approval / authorisation from RBI under the PSS Act. The Master Direction issued in 2017 and subsequent revisions, lays down the eligibility criteria and the conditions for operation of PSOs involved in the issuance of semi-closed and open system PPIs in the country.

7.39 In India, PPIs which can be issued are of three types:

a) Closed System PPIs: These are PPIs issued by an entity for facilitating purchase of goods and services from that entity only. The issuance and operation of such instruments is not classified as a payment system and does not require approval / authorisation from RBI.

b) Semi-closed System PPIs: These PPIs are used for purchase of goods and services, including financial services, remittance facilities, etc., at a group of clearly identified merchant locations / establishments which have a specific contract with the issuer (or contract through a payment aggregator / payment gateway) to accept PPIs as payment instruments. These instruments do not permit cash withdrawal, irrespective of whether they are issued by banks or non-banks. To provide further flexibility, semi-closed PPIs are further classified as, (i) PPIs up to ₹ 10,000/- where minimum details of PPI holder are obtained (minimum-detail PPI); (ii) PPIs up to ₹ 10,000/- with loading only from bank account; and (iii) PPIs up to ₹ 1,00,000/- where know your customer (KYC) of PPI holder is completed (full-KYC PPI).

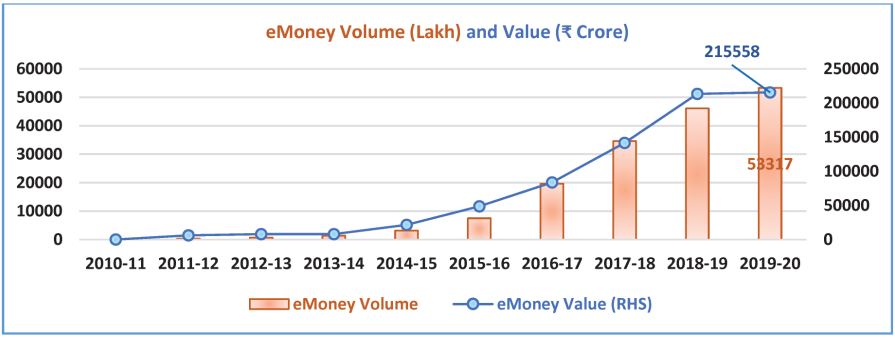
c) Open System PPIs: These are PPIs issued only by banks (approved by RBI) and are used at any merchant for purchase of goods and services, including financial services, remittance facilities, etc., and permit cash withdrawal at ATMs / PoS / BCs. Open System PPI can be of one type i.e., KYC compliant PPIs with balance up to ₹ 1,00,000 at any point of time.

7.40 A new type of PPI was introduced in December 2019, which can be loaded / re-loaded only from a bank account and / or a credit card, and can be issued based on essential minimum details sourced from the customer. Such PPIs can be used only for purchase of goods and services and not for funds transfer. The amount loaded in such PPIs during any month should not exceed ₹ 10,000 and the amount outstanding at any point of time should not exceed ₹ 10,000. Further, the total amount loaded in such PPI during the financial year shall not exceed ₹ 1,20,000.

7.41 Interoperability has been allowed among PPIs which provides access to a wide number of merchants among the PPI holders and vice-versa, without the need for multiple on boarding by various issuers and acquirers. While consumers have benefited from convenient payment option and pricing benefits (cashback / discounts), it is the 'cost-effectiveness' that appeals to the merchants as the cost associated with e-Money acceptance including setting-up infrastructure and transaction fees is much lower compared to traditional card-based payment system.

7.42 Demonetisation in November 2016 was a game-changer for e-Money as people switched to electronic-modes of payments resulting in a year on year growth of 162.5% in the year 2016. While medium to large-value transactions continue to be made through digital banking channels and cheques, the low-value day-to-day transactions shifted to e-Money. The trend continued in succeeding years, viz., an increase of 76%, 33% and 15% in volume in FYs 2017-18 and 2018-19 and 2019-20 respectively, showing a perceptible shift towards e-Money.

Table 12: Growth of e-Money



Source: RBI Data

Unstructured Supplementary Services Data (USSD)

7.43 With growing mobile density, banks started offering mobile banking services to their customers using the USSD channel through bilateral tie-ups with individual telecom providers. To obviate the need for multiple bilateral tie-ups and to ensure interoperability across banks and telecom providers so that all customers / subscribers could benefit from USSD-based services, a common platform offering USSD-based mobile payments services was set-up through NPCI in 2013.

7.44 With the launch of USSD 2.0 along with BHIM on December 30, 2016, UPI is now available for non-internet based mobile devices (smartphone as well as basic phones) in the form of dialling option (*99#). Currently, financial, non-financial and certain value-added services (Aadhaar linking status & PMJDY A/C Overdraft Status) are offered through this service. The USSD has since been subsumed into the broader UPI platform.

Interoperability

7.45 Interoperability is the technical compatibility that enables a payment system to be used in conjunction with other payment systems. Interoperability allows the issuers, the system providers and the system participants in different systems to undertake, clear and settle payment transactions across systems without participating in multiple systems.

7.46 Interoperability is the corner stone of payment systems in India. Interoperability across instruments, networks and infrastructure as evidenced in the interoperability of ATMs, PoS, Mobile Banking, PPIs, QR codes, BBPS, etc., has enabled use of any card on any PoS or ATMs, use of mobile banking products independent of mobile network operator, enabled QR code payments and bill payments irrespective of app provider and many more such instances resulting in optimum and efficient use of available infrastructure, decreased cost and increased convenience.

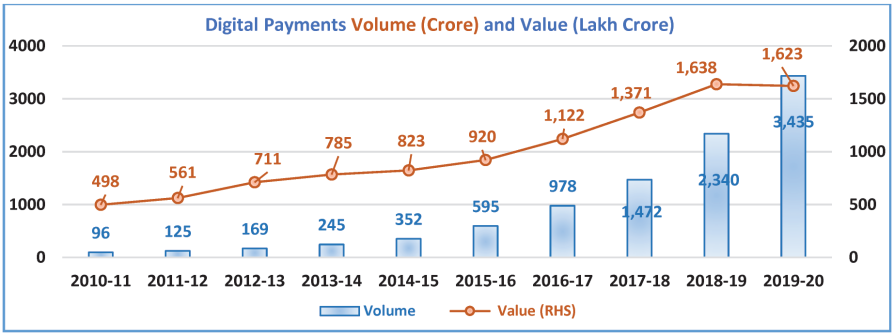
Growth of digital payments

7.47 The acceptance and growth of digital payments has been exponential over the years. From 498 crore transactions with a value of 96 lakh crore handled during FY 2010-11, digital payments have grown to 1623 crore

transactions with a value of 3435 lakh crore in the FY 2019-20. This represents a CAGR of 12.54% and 43.01% in terms of volume and value, respectively.

7.48 Global Data, a data and analytics company, in its 2017 Consumer Payments Insight Survey, observed that India is one of the top markets globally in terms of digital cash adoption with 55.4% survey respondents indicating usage of digital cash. India is followed by China and Denmark. The adoption level in India is much higher compared to many of the developed markets such as the US and the UK, where consumers predominantly use cards.

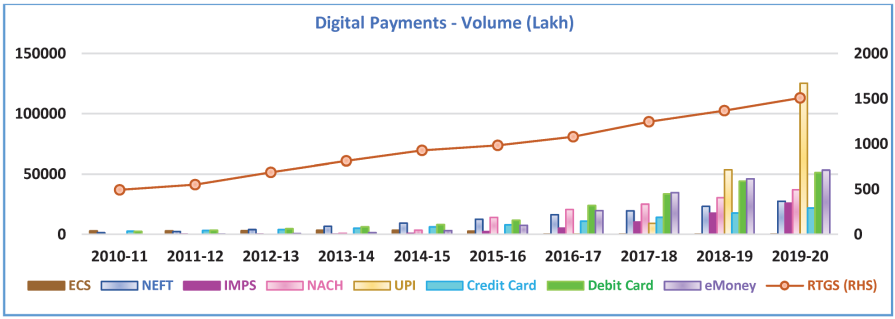
Table 13: Digital Payments in India

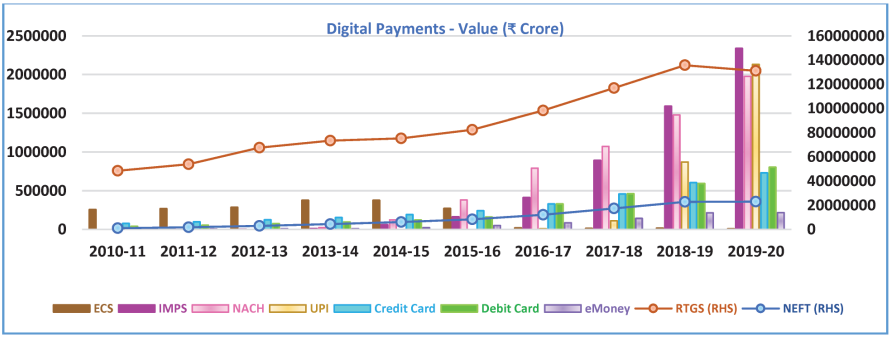


Source: RBI Data

7.49 Within the digital payments, retail electronic payments comprising credit transfers {NEFT, fast payments (IMPS and UPI)} and direct debits (ECS, NACH) have shown a rapid growth over the past ten years at a CAGR of 55% and 43% in terms of volume and value, respectively. e-Money issued in the form of wallets and prepaid cards demonstrated an increased adoption with a CAGR of 91% and 56% in terms of volume and value, respectively in the past 9 years.

Table 14: Digital Payment Systems in India





Source: RBI Data

7.50 The most effective way to exponentially increase the digital payments is to target the generation which is most responsive to technology and digital age[7]. Since India has a large population of millennium children (individuals born between 1982 and 2004) or currently referred to as the "heads down" generation, the aptitude for digital products is large. This generation has little brand loyalty and is ready to try out new payment systems / channels when the rewards are good. PSPs will have to design products and plans which would help drive and sustain mass adoption and engagement.

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[7] *"Retail payments ecosystem has not only evolved over the last twenty five years but has also taken a revolutionary trajectory in many areas. Whether it is fast payments (IMPS) offered through multiple access channels (mobile, net banking, ATM, branch, IVR, BC, etc) or mobile banking / payments, cheque clearing or card payments security aspects, our systems are comparable with the best in the world, which is no mean achievement for a country like ours despite challenges in the form of migrating large segments of cash transactions to electronic, financial inclusion, awareness and financial literacy, customer protection, etc."*

(Shri R Gandhi, former Deputy Governor, RBI, 2016)

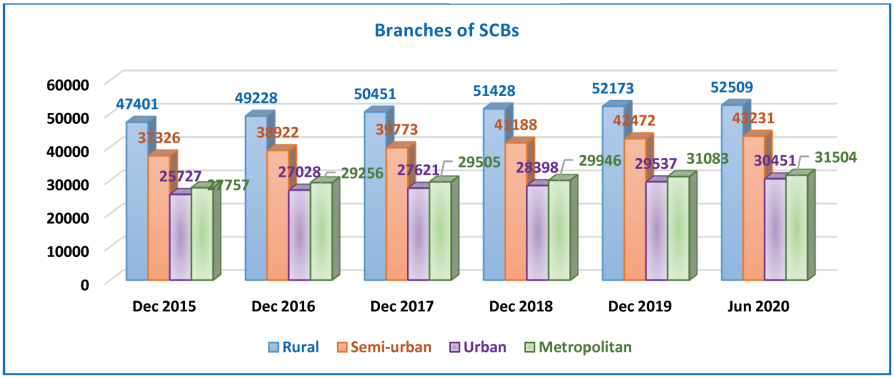
Acceptance Infrastructure

8.1 Infrastructure is the key requirement facilitating both cash dispensation and electronic payments. While it is true that bank branches and ATMs facilitate cash transactions, the former also facilitate electronic payments and the latter acts as a confidence factor that cash is available when required and there is no need to keep or hoard physical cash. PoS terminals and mobile phones directly aid electronic transactions.

Bank Branches

8.2 The last 10 years have witnessed a CAGR of 6% in the number of branches of SCBs across the country. The increase in branches, especially in rural and semi-urban areas has been an enabler for instilling banking practices in these areas which aids digital payments.

Table 15: Branches of Scheduled Commercial Banks (SCBs) - India



Source: RBI Data

Automated Teller Machines (ATMs)

8.3 Equivalent to cash, ATMs are terminals that allow authorised users, typically by using a card, to access a range of services such as cash withdrawals, balance enquiries, transfers of funds and / or acceptance of deposits. ATMs primarily form a part of cash infrastructure, but their deployment is necessary to ensure that cash is available when needed.

8.4 ATMs have progressed from being only cash dispensing machines as they also facilitate digital bill payments and card to card transfers. Banks can now offer all their products and services through ATM channel, provided adequate checks are put in place to prevent the channel from being misused to perpetuate frauds on banks / genuine customers. In addition, features like interoperable cash deposit and card to card funds transfer are enabled at ATMs. Bill payments have also been enabled by some banks at their own ATMs (i.e., for "on-us" transactions). A pilot on QR code-based cash withdrawals from ATMs is underway.

White Label ATMs (WLAs)

8.5 ATMs registered a healthy growth in numbers but their deployment was predominantly in Tier I & II centres. To facilitate expansion of ATMs in Tier III to VI centres, it was decided in 2012 to permit non-bank entities to set up, own and operate ATMs and such ATMs were called WLAs. The WLA operator's role is confined to acquisition of transactions of all banks' customers by establishing technical connectivity with the authorised shared ATM Network Operators / Card Payment Network Operators. The criteria for distribution of these WLAs in various tiers was fine-tuned in 2019 to provide more thrust on remote centres by stipulating a revised proportion of deployment of ATMs in the ratio of 1:2:3 for Metro & Urban: Semi-Urban: Rural Regions. As on November 30, 2020, there were 2.34 lakh ATMs and 0.25 lakh WLAs.

Micro-ATMs

8.6 Micro-ATM is a device used by a BC to connect to his / her bank, authenticate customers and perform transactions. Although, it is called micro-ATM, it does not have cash storage or dispensation facilities. The cash balances are reflected online but physical cash is deposited with or handed out by the BC.

8.7 Micro-ATMs are based on a bank-led model for financial inclusion, where the Aadhaar infrastructure is an overlay on the existing banking and payments infrastructure. The basic interoperable transaction types that a micro-ATM supports are deposit, withdrawal, funds transfer, balance enquiry and mini-statement. The means of authentication supported by a

micro-ATM are (i) Aadhaar + Biometric; (ii) Aadhaar + OTP; (iii) Card + Biometric; (iv) Card + OTP; and (v) Card + PIN. An account holder can access his bank account through a micro-ATM using any of these methods and perform transactions supported by it.

8.8 The roles of various participants in deployment of a micro-ATM network are as follows:

a) Issuing bank: The issuing bank is the bank that owns the customer relationship, and stores account details in its CBS. The customer banks with the issuing bank and interacts with it for any queries, it serves as a touch point for dispute resolution. It authorises transactions and carries out transactions that the customer initiates.

b) Acquiring bank: The acquiring bank is the bank that owns the BC relationship at the transaction point.

c) Business Correspondent (BC): A BC is appointed by the bank providing access to basic banking services using micro-ATM. Banks may either appoint an individual BC or a corporate BC, who further can appoint sub-agents.

d) Technology Service Provider (TSP): TSP provides technology to the Acquiring Bank to support BC operations.

e) Multilateral switch: The multilateral switch is used in the case of 'off-us' transactions to provide interoperability. It routes transactions from the acquiring bank to the issuing bank, and routes the authorisation, settlement and reconciliation messages. An 'off-us' transaction in case of funds transfer may involve multiple banks, viz., the acquiring bank, the issuing bank, and the recipient's bank and the process is put through by the multilateral switch. This multilateral switch is operated by NPCI and other interbank switch vendors.

f) UIDAI: The Aadhaar platform will support the micro-payments platform by providing methods for secure authentication of an individual, using the Aadhaar number and demographic data, biometrics, OTP, etc. The secure authentication provided by the UIDAI facilitates interoperability among micro-ATM devices operated by different banks, much like the existing ATM network.

8.9 IBA, IDRBT, NPCI and UIDAI are the custodians of the micro-ATM standards. RBI being the regulator of payment systems, regulates the micro-ATM payments platform as well. As on November 30, 2020, there were 3.57 lakh micro-ATMs.

8.10 Micro-ATMs have added impetus to financial inclusion efforts as banks can rely on BCs to reach the unbanked regions of the country. Customers can access secured banking facilities at their doorstep. Micro-ATMs through BCs are cost effective retail model of banking vis-à-vis the more sophisticated ATM operations. Micro-ATMs being linked to bank's CBS, facilitate real time online tracking of transactions resulting in quicker detection of anomaly (failed / disputed transaction) and resolution. It also facilitates government's programme of direct cash transfer.

Point of Sale (PoS) Terminals

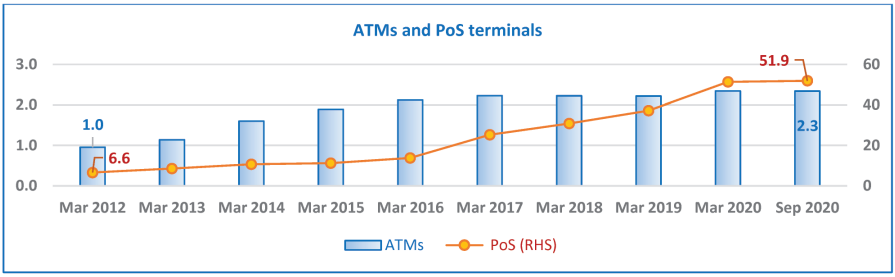
8.11 PoS terminals are devices typically used at a retail location to capture payment information electronically and - in some cases - on paper vouchers. To encourage usage of cards, card infrastructure, viz., PoS terminals are required to be robust, strong and secure.

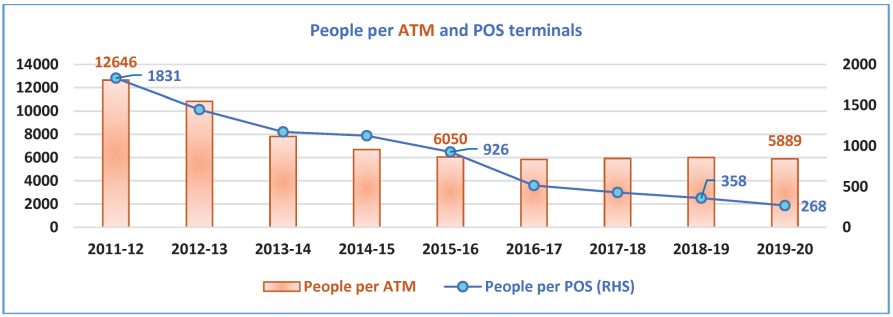
8.12 As on November 30, 2020, there were 54.19 lakh PoS terminals deployed across the country. While India made considerable progress with reference to the absolute number of PoS terminals deployed, the number of persons served by a PoS terminal continues to be high at approximately 250. In order to increase the acceptance infrastructure, which also includes installation of PoS machines, RBI has announced the operationalisation of a Payments Infrastructure Development Fund (PIDF).

8.13 Cash can be withdrawn at PoS terminals using debit cards / open loop prepaid cards issued by banks. The limits for such withdrawal are up to ₹ 1000/- per day in Tier I and II centres and up to ₹ 2,000/- per day in Tier III to VI centres. Customer charges, if any, on such cash withdrawals should not be more than 1% of the transaction amount.

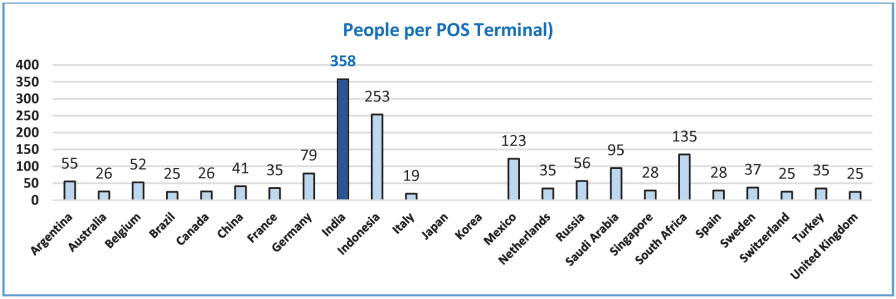
8.14 ATMs and PoS terminals have grown at a CAGR of 10% and 26%, respectively over the past 9 years. While the number of ATMs (a "cash" infrastructure) has grown at a low pace, the growth of non-cash infrastructure, mainly depicted by PoS, has been significant. This has given further fillip to digitisation.

Table 16: ATMs and PoS terminals





Source: RBI Data



Source: CPMI Red Book

Quick Response (QR) Code

8.15 Another important acceptance infrastructure gaining popularity is the digital PoS or the QR code. Bharat QR has grown as a lightweight, low cost method to bring merchants into the acceptance network. A QR code-based payment is a contactless payment method where a payment is performed by scanning a QR code from a mobile app. When a QR code is scanned, the merchant / customer details get auto-populated which is used for performing a transaction.

8.16 To address the issue of multiple QR codes, a common standard, named Bharat QR standard, was formulated collectively by Mastercard, NPCI and Visa. It is a common interoperable solution for card payments in both physical and electronic form. Subsequent developments have resulted in formulation of dynamic QR codes which are more user friendly and safe. In August 2016, NPCI launched UPI with UPI QR code specifications. Apart from Bharat QR code, there are other QR codes in existence, viz., PayTM, MobiKwik, etc. They are based on the same ISO / IEC 18004 standard with some customisation done by each of them to create proprietary QR codes.

8.17 QR code-based payments are widely prevalent in the country and is expected to increase substantially in the coming years which along with physical PoS terminals will facilitate the rapid adoption of digital payments. As on November 30, 2020, over 7 crore payment QR codes (Bharat QR, UPI QR as well as proprietary QRs of other PSOs) were deployed of which 30.46 lakh pertained to Bharat QR.

8.18 The cost of deployment of QR code (print of the QR code) is negligible as compared to other acceptance infrastructure like physical PoS terminal which increased the growth of QR code deployment in the country. As there are several QR codes, an assessment was considered necessary of the need for having so many QR codes and merits of their coexistence or convergence from both systemic and consumer viewpoint. Accordingly, a committee comprising of experts in the QR code domain was constituted to examine the impediments in adopting a common QR code; identify the challenges in mandating interoperability across proprietary QR codes and provide options to overcome such challenges; and assess the scope of improvement in existing QR codes like Bharat QR as a convergent QR code in terms customisability for futuristic technologies like Internet of Things (IoT) based payments.

8.19 Based on the recommendations of the Committee, in order to streamline the QR code infrastructure, instructions were issued by RBI in October 2020 that going forward, only the two interoperable QR codes (Bharat QR and UPI QR) would continue and all PSOs using proprietory QR were required to shift to one of the interoperable QRs by March 31,

2022. It was also stated that new QR codes should be interopearable ab-initio. Further, going forward, PSOs were advised to not launch any new propietory QR codes.

Payments Infrastructure Development Fund (PIDF)

8.20 The digital payments ecosystem has made substantial progress with networked bank accounts, bank branches, cards, mobile phones and a resilient payments infrastructure. The acceptance side, however, continues to be plagued with limited availability, mostly due to high costs.

8.21 The PSS Vision 2019-21 envisaged the creation of an Acceptance Development Fund to subsidise acquirers for deploying PoS acceptance infrastructure in tier-3 to tier-6 centres to address the supply side issues. This was also recommended by the Committee on Deepening of Digital Payments (CDDP) chaired by Shri Nandan Nilekani. RBI has place set up PIDF, the focus of which is to increase the acceptance infrastructure (both PoS and digital) with enhanced emphasis on Tier VI and Tier V centres followed by Tier IV and Tier III centres as also the north-eastern region.

8.22 Contributions to the corpus and yearly accruals to the fund will be made by RBI, issuers and card networks and the fund will be administered by RBI. Government payments, fuel pumps, PDS shops, healthcare, kirana shops will be identified for deployment, especially in the targeted geographies. PIDF would support multiple payment acceptance devices / infrastructure supporting underlying card payments, such as MPoS (mobile PoS), GPRS (General Packet Radio Service), PSTN (Public Switched Telephone Network), QR code-based payments. An Advisory Council under the Chairmanship of Deputy Governor, RBI has been constituted and specific sub-committees have been formed for effective monitoring of the implementation of PIDF. PIDF has been operationalised from January 2021.

Chapter 9

Government Payments

9.1 Government payments play a critical role in the development of a national payment system especially in developing economies. Government payments can facilitate economic growth and trigger innovation in the underlying payment system infrastructure while enhancing public policy goals such as efficiency, transparency, security of payments as well as financial inclusion.

9.2 The Economist Intelligence Unit in its 2018 Government e-Payments Adoption Ranking had ranked India 28th amongst 75 countries and termed India's performance as "Intermediate." Aadhaar biometric identity system, introduced in the year 2009 has been a major facilitator in electronification of Government payments. With approximately 127 crore Indians enrolled in Aadhaar, it is recognised as the world's largest biometric identity system. By linking welfare and other transfers to the unique 12-digit ID numbers tagged to biometric markers, Aadhaar, as claimed by the government, has helped reduce leakage (for example through graft by middlemen) and also helped in identifying fake beneficiaries.

Aadhaar Payment Bridge System (APBS)

9.3 APBS, a component of NACH, which uses Aadhaar number for electronic crediting of government subsidies and benefits in Aadhaar-linked bank account, was implemented in 2012. Aadhaar mapper, a repository of Aadhaar numbers managed by NPCI, is used for routing the APBS transactions to the destination banks based on the unique IIN (Institution Identification Number) of destination bank. The bank, in turn, credits the amount to the desired account number based on the Aadhaar number of the beneficiary.

9.4 The system has led to electronification of large number of government payment transactions which were predominantly done either in cash or cheque. Besides transferring the benefits and subsidies under DBT schemes, it also serves the goal of financial inclusion.

Empowering Social Security Schemes through payment systems

9.5 Government's social security schemes like pension, subsidies, income support, etc., require bulk processing of payment instructions in an efficient and scalable manner. For efficient transmission of objective, the payment systems should be capable of end-to-end automatic processing of payment instructions without manual intervention, thereby ensuring direct benefit transfer to the intended beneficiary. Hence efficient payment systems bring overall transparency and public trust to these schemes.

9.6 NACH platform operated by NPCI serves this purpose. NACH platform is used by banks, financial institutions, corporate and government departments for handling high volume and low value credit / debit transactions which are generally repetitive in nature. As on November 30, 2020, 1315 banks are the direct members of NACH, while there are also several other banks which participate in NACH system through sub-membership model. NACH provides options to member banks for routing their credit (ACH credit) / debit (ACH debit) transactions using IFSC / MICR Code / IIN codes etc. Many social schemes such as Pradhan Mantri Kisan Samman Nidhi (PMKISAN), The Pradhan Mantri Shram Yogi Maandhan Yojana (PMSYMY), Pradhan Mantri Laghu Vyapari Maan-dhan Yojana (PMLVMY) and Pradhan Mantri Kisan Maandhan Yojana (PMKMY), etc., were rolled out using NACH platform.

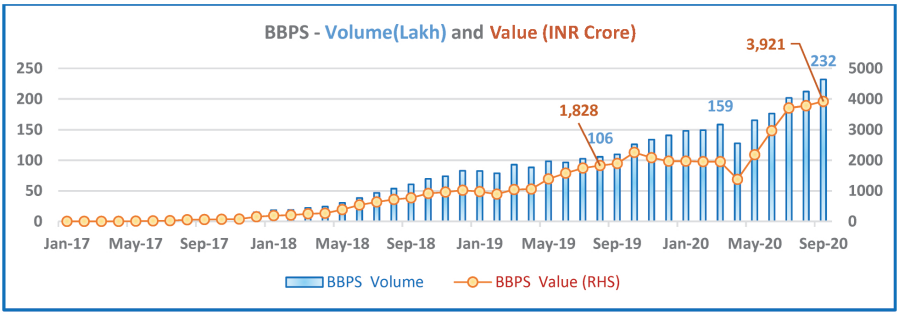
Bill and Toll Payments

Bharat Bill Payment System (BBPS)

10.1 To integrate the fragmented bill payment market in the country, BBPS was conceptualised to offer interoperable and accessible bill payment services to customers through a network of agents with multiple payment modes and instant confirmation of payment. Pilot phase of BBPS was launched on August 31, 2016 and BBPS live operations commenced from October 17, 2017. It offers "anytime anywhere" bill payment service to customers using online payments as well as through a network of physical agent locations. Initially, five mandatory biller categories were allowed under BBPS, viz., electricity, water, gas, telecom (landline, mobile post-paid, broadband) and Direct-to-Home (DTH).

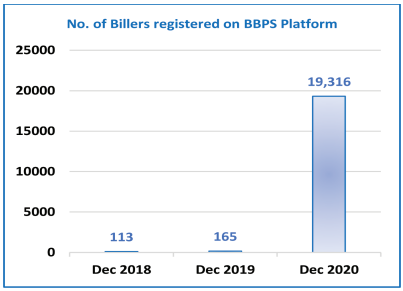
10.2 RBI's paper on Benchmarking India's Payment Systems observed that only 3% of the population in India used the internet to pay utility bills in the year 2017. To ensure availability of digital options for paying bills, BBPS was extended in September 2019 to include as eligible participants all categories of billers, on a voluntary basis, who raise recurring bills (except prepaid recharges).

Table 17: BBPS Trends



Source: NPCI Data

As on December 31, 2020			
Category	**Live Billers**	**Category**	**Live Billers**
Electricity	77	Loan Repayments	115
DTH	5	FASTag Recharge	13
Mobile PostPaid	13	Cable	3
Landline Postpaid	9	Education	18936
Broadband Postpaid	25	Housing Society	18
Gas-Pipeline	24	Municipal Taxes & Services	9
LPG Gas	3	Subscription Fees	4
Water	35	Hospital and Credit Card	2
Insurance (Life, General, Health & Others)			25



Source: NPCI Data

10.3 BBPS framework consists of two types of entities carrying out distinct functions:

a) Bharat Bill Payment Central Unit (BBPCU): BBPCU is responsible for undertaking clearing and settlement activities and define necessary operational, technical and business standards for the entire system and all its participants. At present, NPCI is the only entity designated as BBPCU.

b) Bharat Bill Payment Operating Units (BBPOUs): BBPOUs are authorised operational entities for facilitating bill payments online as well as through a network of agents. These entities are required to adhere to the standards set by the BBPCU. The tiered structure could be further strengthened through an effective agent network/s of the BBPOUs. The BBPOUs on-board billers on the one hand while providing various customer interfaces for interoperable bill payments on the other hand.

National Electronic Toll Collection (NETC)

10.4 To reduce the current trend of large scale cash-based toll collections, the Government of India has mandated the use of "FASTag" based toll payments, which is facilitated through NETC, an electronic interoperable system for toll collection. NPCI is authorised to operate the NETC system.

10.5 The FASTag, issued by a bank or the Indian Highways Management Company Limited (IHMCL) and affixed on the vehicle, is linked to an underlying payment instrument - bank account (savings, current), non-bank PPIs, cards, UPI, etc. This FASTag can then be used for payment

of toll at plazas acquired by the same or some other bank. Going forward, FASTags can also be used for other payments such as for parking charges, fuel purchases, etc., in an interoperable environment.

Table 18: Progress of NETC

Particulars	December 2018	December 2019	December 2020
Number of FASTags Issued (lakh)	38.22	116.66	229.02
No. Of Tolls Enabled			
1) National Highways	460	587	673
2) State Highways	7	32	85
3) City	0	19	25

Source: NPCI Data

Chapter 11

Trade Receivables Discounting System (TReDS)

11.1 Micro, Small and Medium Enterprises (MSMEs) play an important role in the economic fabric of the country. The sector had been facing constraints in obtaining adequate finance, particularly in terms of their ability to convert their trade receivables into liquid funds. To address this pan-India issue, setting up of and operating TReDS was conceptualised.[8]

11.2 TReDS is a payment system authorised under the PSS Act. It is a platform for uploading, accepting, discounting, trading and settling invoices / bills of MSMEs and facilitating both receivables as well as payables factoring (reverse factoring). MSME sellers, corporate and other buyers, including Government Departments and PSUs, and financiers (banks, NBFC-Factors and other financial institutions, as permitted) are direct participants in the TReDS and all transactions processed under this system are "without recourse" to MSMEs.

11.3 Initially, three entities were authorised to operate TReDS. To encourage innovation and competition through increased participation, 'on-tap' authorisation was introduced in October 2019. New players would be authorised considering the merits of the proposal and assessment of potential for additional entities.

11.4 RBI has not made it compulsory for any buyer, seller or financier to participate in TReDS. [9]The response has been tepid from the buyers' side. Reasons for their reluctance could range from internal processes, indifferent attitude towards payments to be made to MSMEs, balance sheet related compulsions, etc. In view of this, the Government has made it compulsory for certain segments of companies to mandatorily register as buyers on TReDS platform(s). The government directive, however, does not make it compulsory for these entities to perform transactions in TReDS.

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[8] *"…delay in getting payments is one the perennial problems faced by MSMEs. To address this issue, the Reserve Bank introduced TReDS in 2014. TReDS is an electronic platform where receivables of MSMEs drawn against buyers (large corporates, PSUs, Government departments) are financed through multiple financiers at competitive rates"* ***(Shri Shaktikanta Das, Governor, RBI, March 2020)***

[9] *"I would appeal to the ASSOCHAM to encourage and handhold all its members to participate in the TReDS platform."* ***(Shri Shaktikanta Das, Governor, RBI, March 2020)***

Cross-border Payments

Indo-Nepal Remittance Facilities Scheme

12.1 Based on the recommendations of the Committee on Modalities of Workers' Remittance between India and Nepal, the Indo-Nepal Remittance Facilities Scheme was launched in 2008 using NEFT. This cross-border remittance scheme provides a safe and cost-efficient avenue to migrant Nepalese workers in India to remit money back to their families in Nepal.

12.2 Nepalese citizens staying in India can avail of this service either as walk-in customers or as account holder and can remit up to ₹ 50,000 from any of the NEFT enabled bank branches in India. The money flows to a designated branch of SBI, which consolidates and transfers the amount to Nepal SBI Bank Ltd. (NSBL). NSBL disburses the remittance to beneficiaries in Nepal in the local currency either through the banking channel or a combination of banking channel and money transfer agencies in which payment is made to the beneficiaries against production of proof of identity as per KYC norms of Nepal.

12.3 Nepalese migrants are required to comply with KYC requirements at the time of sending the remittance. In case of remittance from bank account, no additional KYC is required. An originator in India is allowed to remit a maximum of 12 remittances in a year under the scheme. In case of return, transactions are transferred back by NSBL to SBI. Grievances (relating to non-credit or delay in credit to the beneficiary account or for complaints of any other nature) are addressed by the NEFT Customer Facilitation Centre (CFC) of the respective bank (the originating bank and / or SBI).

Money Transfer Service Scheme (MTSS)

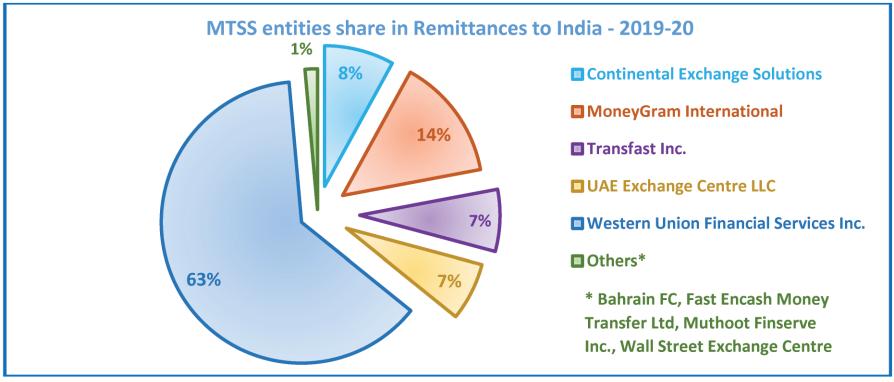
12.4 Inward remittances into India are received through various channels such as banking, postal, MTSS and Rupee Drawing Arrangement (RDA). India is the largest recipient of remittances in the world with around 11-12% of global remittance inflows.

12.5 MTSS is a quick and easy way of transferring personal remittances from abroad to beneficiaries in India. The scheme allows remittance from abroad to Indian families and foreign tourists visiting India. A cap of USD 2,500 per transaction and up to 30 remittances in a calendar year has been placed for an individual beneficiary.

12.6 MTSS involves a tie-up between reputed money transfer companies abroad known as Overseas Principal and agents in India known as Indian Agents. The Indian Agents can further enter into sub-agency agreements with entities, for undertaking money transfer business. DPSS authorises and regulates the MTSS operators. As on date, authorisation has been granted to nine Overseas Principals under MTSS. Oversight of the Overseas Principal is done mainly through analysis of off-site returns submitted by them. Agents and Sub Agents of the scheme are regulated and supervised in the RBI by its Foreign Exchange Department.

12.7 The overseas principal-wise share of remittances under MTSS in 2019-20 is depicted below.

Table 19: Share of entities in total remittance in 2019-20



Source: RBI Data

Task Force on Cross-border Payments (TFCBP)

12.8 CPMI constituted a task force on cross-border payments in December 2019 and RBI is a member of the task force. In line with the G20 mandate to coordinate and develop a roadmap to enhance cross-border payments, the task force had undertaken a detailed assessment of existing cross-border payment arrangements and challenges.

12.9 The main objective of the task force is to evaluate concrete measures for improvement of the cross-border payment system, by combining greater efficiency with financial inclusion, while addressing associated risks. The task force evaluated (i) areas for improvement of core payment infrastructures (including those provided by central banks), (ii) ways to foster interoperability, (iii) the role of innovative technologies, services and providers, and (iv) how payment system oversight and the role of central banks as a catalyst for change (e.g., by promoting adoption of international messaging / business standards) can support actions for improvement.

12.10 In the second stage of the project, the CPMI worked on these findings by creating building blocks of a response to improve the current global cross-border payment arrangements. RBI was involved in the following building blocks: (i) Adoption of harmonised API protocols for payments data exchange, as the primary penholder; (b) Actions for improved (direct) access to payment systems (including to RTGS), by banks, non-banks and payment infrastructures, as a peer reviewer and (c) Reciprocal liquidity arrangements across central banks (liquidity bridges), as a peer reviewer.

12.11 The focus in the third stage was to build a clear work plan to deliver real improvements in cross-border payments. This roadmap was developed by the Financial Stability Board (FSB), in coordination with the CPMI and other relevant international organisations and standard-setting bodies. The roadmap identified specific actions under each of the building block identified in Phase 2 with established milestones and timelines. Further, authorities responsible for carrying out the actions were also identified. The roadmap provides a high-level plan, which sets ambitious goals and milestones, and is designed to allow for flexibility and adaptation, while ensuring that the safeguards in terms of secure processing and legal compliance are observed. It encompasses a variety of approaches and time horizons, in order to achieve practical improvements in the shorter term while acknowledging that other initiatives will need to be implemented over longer time periods.

12.12 RBI's PSS Vision 2019-21 envisaged enhancing global outreach of its payment systems, including remittance services, through active participation

and co-operation in international and regional fora by collaborating and contributing to standard setting. RBI, in close collaboration with the Government and NPCI, is working in the direction of expanding the reach of UPI and RuPay globally. In this connection, it has written to other central banks highlighting the features of UPI as an efficient and secure system which can be used to transform retail payment mechanisms globally and at the same time promote financial inclusion. UPI system has the potential to evolve into a cheaper and quicker alternative to available channels of remittance for cross-border payments as well, whether related to retail remittances or small-value trade transactions. It could, in future, provide the basis for a stronger bilateral business and economic partnership with other jurisdictions.

12.13 The Reserve Bank has also participated in the regional outreach programs where the features of UPI and the possibility of leveraging on the UPI system to facilitate cross-border transactions was presented to participants. The Reserve Bank is collaborating with BIS to organise outreach events / webinars to spread awareness about the potential of UPI and encourage adoption of UPI / RuPay cards across jurisdictions.

Chapter 13

Third Party Payment Providers

Third Party Application Providers (TPAPs)

13.1 TPAPs refer to (API), which are either standalone applications or applications that add functionality to an existing parent program / system. In the financial space, third party apps are often connected to a banking application to provide a variety of services. A third party app sends a request to the linked banking application for permission to access the user's bank details, which is further relayed by the banking application to the customer to authenticate the request. These apps provide flexibility and freedom to consumers to select solutions they find most convenient to meet their financial needs.

13.2 TPAPs are the best examples of public-private partnership and underscore the importance of fintech in the payments' ecosphere. CDDP appreciated the partnership between banks and non-banks and noted that the latter are responsible for expanding the range of payment services available to the Indian consumer on account of their technology and customer centric innovation. This "best of both worlds" approach has contributed to the recent growth in digital payments, and is expected to grow further. This architecture balances regulatory safety and innovation as it combines the safety and trust of banking institutions with the informality and convenience offered by non-banks.

13.3 In the payment space, third party service providers are primarily in the form of payment gateways, payment aggregators and TPAPs in UPI. The UPI ecosystem is designed for banks. Only a banking entity can directly interact with the UPI switch. However, non-banking entities can participate by partnering with a banking entity which is already on UPI platform, and developing their own APIs referred to as third party apps. The role of these entities is more in the nature of facilitator for transactions as the entire operational and financial liability of transactions originated through third party app lies on the bank. There are over 20 TPAPs (eg., Google Pay, WhatsApp etc.) in UPI. Around 200 crore UPI transactions are undertaken each month, of which a significant share are originated through the third party apps.

13.4. Leveraging further on the system, a multi-bank model has been introduced for large TPAPs which allows them to tie-up with multiple banks to act as PSPs. As in the case of single bank model, the TPAPs provide only customer interface, while the transactions continue to be processed through the underlying PSP bank.

Payment Aggregators (PAs) / Payment Gateways (PGs)

13.5 A typical online payment transaction requires the involvement of several intermediaries like banks and non-banks which act as merchant aggregators. PAs, provide PG services and engage in other technology driven value-added activities. PAs and PGs are entities that facilitate e-commerce sites and merchants to accept various payment instruments from customers for completion of their payment obligations without the need for merchants to create a separate payment integration system of their own. In this process, while PAs also handle funds, PGs provide only technological infrastructure. While banks and other PSOs are directly regulated by RBI, the PAs and PGs were not.

13.6 Given the critical role of these intermediaries in payment transactions, PAs have been brought under regulations while baseline technology specifications have been laid down for PGs. Banks provide PA services as part of their normal banking relationship and hence do not require a separate authorisation from RBI. Non-bank PAs will now require authorisation from RBI under the PSS Act. e-commerce market places selling goods of various merchants on their platform are exempted from these guidelines. However, if an e-commerce market place is providing aggregation services, it will have to segregate the PA services from other businesses and apply for authorisation for continuing PA services.

13.7 The guidelines mandate that a proper Customer Grievance Redressal and Dispute Management Framework is put in place along with a strong risk management system with adequate information and data security infrastructure for prevention and detection of frauds in order to make the payment systems safe, secure and robust systems and ensure customer protection.

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Chapter 14

Settlement Systems

Securities Settlement - Clearing Corporation of India Limited (CCIL)

14.1 CCIL is a FMI, authorised by RBI under the PSS Act to operate various payment systems and function as a TR. CCIL has been granted the status of a Qualified Central Counterparty (QCCP) in the Indian jurisdiction.

14.2 As a risk mitigation measure, CCIL has constituted the following subsidiaries for undertaking activities not relating to its role as a central counterparty (CCP):

a) Clearcorp Dealing Systems (India) Limited (CDSL) was set up in June, 2003 to provide dealing systems / trading platforms for repo, tri-party repo, money market instruments and forex exchange transactions. The subsidiary was set up to separate the risk bearing activities of CCIL viz., clearing and settlement from its dealing activities.

b) Legal Entity Identifier India Limited (LEIL) was set up in 2015 as a Local Operating Unit (LOU) for issuing globally compatible LEI in the Indian financial market.

Government Securities Segment

14.3 The secondary market outright, repo and tri-party repo trades (settlement on T+0 to T+2 basis) are undertaken on order matching platforms i.e., Negotiated Dealing System-Order Matching (NDS-OM), Clearcorp Repo Order Matching System (CROMS) and Triparty Repo Dealing System (TREPS), respectively. Further, OTC trades reported on NDS-OM and CROMS, are also cleared and settled by CCIL on a "net" basis with CCIL arriving at a single funds and securities settlement obligation for each member for each settlement date. CCIL acts as a CCP for all trades ensuring guaranteed settlement with multilateral netting benefits. The funds settlement is through a settlement bank or RBI, for members maintaining a current account with the Designated Settlement Bank (DSB) or RBI, as the case may be. With effect from November 5, 2018, Collateral Borrowing and Lending Obligation (CBLO) was replaced

by tri-party repo under the Securities segment.

Forex Segment

14.4 CCIL settles all inter-bank cash, tom, spot and forward USD / INR transactions on guaranteed basis through a process of multilateral netting. Trades done on Fx-Clear and Fx-Swap trading platforms as well as inter-bank transactions concluded bilaterally by clearing participants that are reported to CCIL flow to CCIL's settlement system. The trades are validated and matched trades that pass an exposure check are 'accepted' for settlement. Novation occurs at the point in time when the trade is accepted for guaranteed settlement and the net amount payable to or receivable from CCIL in each currency is arrived at, member-wise, following the multilateral netting procedure.

14.5 CCIL settles the net positions of the members on a Payment versus Payment (PVP) basis with the INR leg settled through the member's current account at RBI and the USD leg settled through CCIL's USD account with its settlement banks.

Forex Forward Segment

14.6 Interbank forex forward trades with residual maturity up to 13 months are eligible for guaranteed settlement under forex forward segment. Forward trades concluded on Fx-swap trading platform and OTC trades reported by the members flow to CCIL for clearing and settlement. Two days prior to settlement , i.e., on S-2 day, the net position of each member is computed for all underlying trades accepted for guaranteed settlement for the relevant settlement date.

Rupee Derivatives (IRS) Segment

14.7 CCIL extends guaranteed settlement of trades in IRS and FRA referenced to Mumbai Interbank Offer Rate (MIBOR), and Mumbai Interbank Overnight Indexed Swaps (MIOIS) benchmarks. Instruments covered under IRS and FRA are IRS - fixed float and basis swaps referenced to MIBOR and MIOIS with maximum maturity of 10 years and FRA with maximum maturity of 10 years. CCIL also commenced clearing of IRS trades referenced to MIFOR benchmark with maximum maturity of 5 years

from November 19, 2018.

Continuous Linked Settlement (CLS)

14.8 CCIL offers non-guaranteed settlement of cross currency transactions through CLS Bank on a PVP basis. The settlement is through a third party arrangement.

Directions for central counterparties (CCPs)

14.9 Directions on governance of domestic CCPs authorised to operate in India by RBI: Governance provides the processes through which an organisation sets its objectives, determines the means for achieving those objectives, and monitors performance against the objectives. To ensure appropriate governance standards in CCPs, RBI issued directions on the broad principles underlying governance of CCPs covering the composition of the board, roles and responsibilities of the board, appointment of Directors, constitution of Committees, etc.

14.10 Directions on networth requirements and ownership of CCPs: CCPs should have sufficient networth to cover potential general business losses and continue to provide services as a going concern. RBI stipulated a networth of ₹ 300 crore for authorisation / recognition of any CCP desirous of operating in India. Further, in line with the Principles for Financial Market Infrastructures (PFMIs), CCPs are required to hold liquid net assets funded by equity capital equal to minimum of six months of current operating expenses. With regard to ownership of the CCP, shares of an authorised CCP can be held only by persons who are users of the authorised CCP. CCIL is compliant with the requirements laid out for networth and ownership of CCPs.

Chapter 15

Settlement Processes

15.1 Settlement can be defined as the process of transferring of funds through a central agency, from payer to payee, through participation of their respective banks or custodians of funds. The two key elements for payment processing are payment order or message requesting the transfer of funds to the payee and the actual transfer of funds between the payer's bank and the payee's bank. Settlement systems can be classified based on (i) time - designated-time (or deferred) settlement systems and real-time (or continuous) settlement systems and (ii) amount - gross settlement and net settlement. India has multiple payments and settlement systems, for both gross and net settlement systems.

15.2 Participants in PSS are exposed to two risks that need to be addressed, viz., credit risk and liquidity risk. Credit risk, which may occur due to default of a counterparty, is the risk that a counterparty will not meet an obligation when due. Liquidity risk is when a counterparty will fail to settle an obligation for full value when due, but will do so at some unspecified time thereafter. Both credit and liquidity risks together constitute settlement risk.

Gross Settlement

15.3 A gross settlement system is one in which the settlement or funds transfer occurs individually as and when each payment transaction is processed in the system. Each transaction is settled on a one-to-one basis without bundling or netting with any other transaction. In some countries, there are systems in which the final settlement of transfers occurs at the end of the processing day without netting the credit and debit positions on a transaction-by-transaction basis. Such systems are called end-of-day gross settlement systems. In the RTGS systems, usually operated by a country's central bank as it is seen as a critical infrastructure for a country's economy, the inter-member payments settle on a 'real' time and a 'gross' basis in the books of the central bank.

15.4 Since RTGS does not have a settlement lag, it eliminates settlement risk. The liquidity risks in RTGS are managed through IDL extended to

members by RBI against fully collateralised Indian government securities held by the members in their IDL-SGL account. IDL is extended free of interest. IDL has to be reversed by the end of the day and failure to do so is subject to penal interest on outstanding balances.

Net Settlement

15.5 In a net settlement system, many transactions are accumulated and offset against each other, with only the net differential being transferred between members. A participating member's net settlement position, debit or credit, as the case may be, is calculated, on either a bilateral or a multilateral basis, as the sum of the value of all the transfers it has received up to a particular point in time minus the sum of the value of all the transfers it has sent. Multilateral net settlement makes it easier for members to manage their liquidity.

15.6 A few clearing institutions send net transfer information to settlement institutions several times a day in batches for processing which are called MNSB files. NEFT settlement works on net-settlement in batches, with 48 batches of settlement over a span of 24 hours, the first and last batches taking place at 0030 hours and midnight, respectively.

Deferred Settlement

15.7 In NEFT, the beneficiary customer receives the funds only after final settlement takes place between members. However, in a few systems like UPI and IMPS, while funds are credited to the beneficiary customer immediately, the inter-bank settlement is done later according to a pre-defined settlement cycle which at present takes place four times a day. This is called Deferred Settlement and in the case of IMPS and UPI, the settlement.

15.8 In IMPS, a transaction is received at NPCI for routing to beneficiary bank / PPI only after the remitting bank has debited the remitting customer's account. Therefore, the risk of a remittance being made with the remitting customer not having adequate funds is addressed. The transaction is credited to beneficiary account on message being received by destination bank. From the members' perspective, MNSB files are generated by NPCI based on these messages which are also received by NPCI as the settlement agency. Final interbank settlement by debiting the

sending bank and crediting the beneficiary bank takes place on a net basis.

Settlement Guarantee Mechanism

15.9 Deferred Net Settlement (DNS) systems may expose participants to credit and liquidity risks for the period during which settlement is deferred. Settlement finality is only achieved at the end of designated settlement cycles in DNS systems and thus if there is no settlement guarantee, either by the system or its participants, there is no certainty that the payments will be settled until that point in time. If a participant fails to meet its payment obligation when due, some or all processed payments could be unwound, thereby exposing participants to liquidity risk and possibly credit risk.

15.10 To mitigate these risks, the settlement agency operates a Settlement Guarantee Fund (SGF). The SGF provides a cushion for any residual risk and operates like a self-insurance mechanism wherein members themselves contribute to the fund. In the event of a member failing to meet its settlement obligation, on the settlement date and thereafter, then the fund is utilised to the extent required for successful completion of the settlement. The remaining participating member banks will make contribution towards sharing of loss in accordance with the defined loss sharing mechanism put in place. This eliminates counter-party and settlement risks as the settlement takes place on time irrespective of default by isolated members.

Unwinding

15.11 In a scenario where supervisory action undertaken on a participating member bank by imposing restrictions on a member bank indicates that a fraudulent / erroneous transaction was undertaken that needs to be reversed, the member positions or specific transaction may need to be removed from the settlement file of the payment system by unwinding the position in the system. This unwinding of payment transactions from the settlement file is essential for risk mitigation to eliminate settlement risk. However, unwinding is undertaken sparingly, only in case of exigencies, with the aim to ensure safety and security of payment systems.

Chapter 16

Approach to Regulation

16.1 RBI has always adopted an inclusive, participative, responsible and responsive (to market conditions) approach to framing its payment systems regulations. It balances customer security with innovation and evolution of technology through its forward - looking vision for regulation. The legal basis for regulations emanates from Section 3 of the PSS Act which states that the Reserve Bank shall be the designated authority for the regulation and supervision of payment systems under this Act.

16.2 RBI prescribes best practices through its regulatory approach but has remained technology agnostic or technology neutral to enable the ecosystem to develop and adopt the best technology. The approach to payment system regulation has been bank-led with inclusion of non-banks over time to widen the scope, access and outreach of payment systems. The mobile banking regulations framed in 2008 were initially a 'bank-led' model and consciously technology neutral. Subsequently, non-banks were also allowed to be part of the domain.

16.3 RBI's inclusive, participative and responsive approach to regulation involves placing of discussion papers, concept papers and draft circulars / guidelines on its website for public comments and feedback. Each feedback received is examined and after due deliberations, appropriate inputs are included in the final guidelines / circulars / regulations so that they are in harmony with the stakeholder feedback and expectations to the extent possible. For some specific issues, committees are formed where industry nominees are invariably included as members, for their insights from the practitioners' point of view. The committee reports serve as guiding tools for framing regulations on specific issues. Industry consultation along with inter-regulatory and intra-regulatory coordination groups are made use of for broader areas involving cross-sectoral / cross-border issues which require consultative approach.

16.4 Just like forward guidance, speeches by the top management of RBI also give indicative guidelines or define regulatory expectations for payment system participants to set the tone for future actions in the ecosystem. In framing regulations, RBI has always been responsive to market expectations and global technology evolutions through collective and collaborative effort on the one hand, while at the same time also signalling an indicative path to the ecosystem to nurture the evolution in a desired manner.

Chapter 17

Governance in Reserve Bank

17.1 RBI as the central bank of India has taken several initiatives and plays the lead role for development of safe, secure, sound, efficient and accessible payment systems in the country. For effective governance of vast spread payment systems in a populous country like India, a tiered governance structure has been adopted by RBI. At the apex of the structure is BPSS, a sub-committee of the Central Board of RBI, and is the highest policy making body on payment systems in the country. BPSS is empowered to authorise and prescribe policies and set standards for regulating and supervising all the payment and settlement systems in the country. DPSS of RBI serves as the Secretariat to the Board and executes its directions.

17.2 Regulation and oversight of Payment and Settlement Systems (PSS) is guided by BPSS which was constituted as a Committee of the Central Board Directors of RBI, in terms of BPSS Regulations, 2005 and notified on February 18, 2005. BPSS started functioning from March 07, 2005 and with the promulgation of the PSS Act and BPSS Regulations, 2008 it has been functioning under the contours of PSS Act. As per regulation 9 of the BPSS Regulations, 2008, BPSS is ordinarily required to meet at least once in three months. BPSS submits a report on activities of the payment systems to the Central Board of RBI on an annual basis.

17.3 BPSS consists of the following members, namely, (a) Governor is the Chairperson of BPSS; (b) Deputy Governors, out of whom the Deputy Governor in-charge of the DPSS, is the Vice-Chairperson of BPSS; and (c) Not more than three Directors of the Central Board nominated by the Governor.

17.4 Two Executive Directors nominated by the Chairperson and the Principal Legal Adviser in RBI are permanent invitees to the meetings of BPSS. Person/s with experience in the fields of payment and settlement systems may be invited by BPSS to attend its meetings either as permanent or as ad-hoc invitee/s.

17.5 Section 4 of BPSS Regulations mandates the functions and powers for the Board, which includes the following matters:

a) the laying down of the policies relating to the regulation and supervision of the payment systems including electronic, non-electronic, domestic and cross-border payment systems affecting domestic transactions;

b) the laying down of the standards for both existing and future payment systems;

c) the authorisation of the payment systems;

d) the determination of the criteria for membership of the payment systems including continuation, termination and rejection of membership;

e) overseeing the administration of regulations and guidelines framed under the Act for the purposes of the above matters and the directions issued by the Bank from time to time to the operators of the payment systems and their members and taking such action as may be deemed necessary for ensuring the compliance;

f) creating necessary administrative structure within the existing rules and regulations for ensuring effective regulation and supervision of the payment systems;

g) such other matters as are deemed necessary for the effective regulation and supervision of payment systems.

17.6 It is 15 years since BPSS was constituted with the mandate to meet at least four times in a year. The 59th meeting of BPSS was the latest meeting held on September 23, 2020. The number of meetings conducted during the period since the formation of the Board, reflects the intent and attention bestowed by Reserve Bank towards this important governance function.

Empowered Committee

17.7 According to the directions of BPSS, major policy decisions are presented before it for approval while other routine matters are placed before an Empowered Committee constituted for that purpose. Decisions of the Empowered Committee are informed to BPSS.

17.8 The composition of the Empowered Committee is the Deputy Governor in charge of DPSS (as its Chairperson), the Deputy Governor in charge of supervisory departments and the Executive Director in charge of DPSS as

members. All the three members of the Empowered Committee would constitute the quorum for conduct of its meeting. DPSS would be the secretariat to the Empowered Committee and its functions are as under:

a) Authorisation of payment system for which policy has already been framed;

b) Determination of standards/membership criteria for participants for existing payment system;

c) Overseeing the administration of regulations and supervision, including minor changes in existing policy guidelines;

d) Other functions as and when delegated by BPSS.

Department of Payment and Settlement Systems (DPSS)

17.9 In the next layer is the oversight framework, as an effective oversight is the key to effective governance of payment systems in the country. A dedicated Oversight Division has been set up within DPSS at Central Office of RBI, and is entrusted with the responsibility of conducting oversight of all payment systems. In the third and last layer lie the four Regional Offices (DPSS, ROs) and the thirteen National Clearing Cells (NCCs), as extended arms of the DPSS, Central Office.

17.10 The Oversight Division at DPSS, Central Office is supported by DPSS cells set-up at four Regional Offices at Mumbai, Delhi, Chennai and Kolkata to conduct assessment / onsite inspection of FMIs / Retail Payment Systems (RPSs) for which skilled resources are drawn from other departments. While the DPSS Cells at four Regional Offices conduct on-site inspection of various retail payment systems and Cheque Clearing Houses, the Oversight Division at DPSS, Central Office carries out on-site inspection of FMIs and SWIPS (NPCI). The National Clearing Cells at 13 regional offices play the role of market intelligence and issuance of MICR (Magnetic Ink Character Reader) codes to member institutions of concerned clearing houses.

Chapter 18

Access Criteria

Access Criteria for Payment Systems requiring authorisation under PSS Act

18.1 RBI receives applications in terms of sections 4 and 5 of the PSS Act for authorisation of existing and proposed payment systems. Any non-bank entity desirous of setting up a payment system has to apply for authorisation in Form A (available on RBI website under the hyperlink https://rbidocs.rbi.org.in/rdocs/Forms/PDFs/PSSACRT130215.PDF) as prescribed under Regulation 3(2) of the Payment and Settlement Systems Regulations, 2008. The application should be accompanied by a non-refundable fee of ₹ 10,000/-.

18.2 Applications found complete in all respects and conforming to the provisions laid down, are considered and scrutinised broadly based on parameters such as (i) need for the proposed payment system or services proposed to be undertaken, (ii) technical standards or design of the proposed payment system, (iii) terms and conditions of operation of the proposed payment system including any security procedure, (iv) the manner in which transfer of funds may be effected within the payment system, (v) the procedure for netting of payment instructions effecting the payment obligations under the payment system, (vi) the financial status, experience of management and integrity of the applicant, (vii) interests of consumers, including the terms and conditions governing their relationship with PSPs, (viii) monetary and credit policies, (ix) customer grievance redressal mechanism and risk management framework, and (x) any other factor/s as are considered relevant by RBI.

18.3 The access criteria at the time of application for authorisation to set up various payment systems is tabulated below. Any application not fulfilling the basic eligibility criteria is returned. Further, if RBI refuses the authorisation under section 7(3) of the PSS Act, a refusal letter stating the reasons for refusal is sent to the entity which is given a reasonable opportunity of being heard.

Sr No.	Payment System	Eligibility Criteria		
		Financials (Net-worth as per last audited balance sheet)	Specific to Payment System	Common to All (Except Overseas Principal – MTSS)
1.	Prepaid Payment Instruments	1) ₹5 crore net-worth 2) A minimum positive net-worth of ₹15 crore to be achieved and maintained at all times by the end of the third financial year from the date of receiving final authorisation	Application should be made within 45 days of obtaining NoC from the respective regulator (if regulated by financial sector regulator)	1) Company registered under the Companies Act, 2013. 2) Entities with Foreign Direct Investment (FDI) / Foreign Portfolio Investment (FPI) / Foreign Institutional Investment (FII) shall meet the capital requirements as applicable under the extant Consolidated FDI policy guidelines. 3) The Memorandum of Association (MoA) must cover the specific activity. 4) Applicant shall submit a certificate in the prescribed format from their Chartered Accountants (CA) to evidence compliance with the applicable capital requirement 5) The entity must submit self-declaration and undertaking from all the Directors. Fit and Proper criteria will be assessed by RBI and its decision shall be final 6) The overall financial strength of the promoters / entity; sound technological basis to support its operations; management; governance etc. shall be other important criteria.
2.	Bharat Bill Payment Operating Units (BBPOUs)	₹100 crore net-worth (to be maintained at all times)	Applicant must have domain experience in the field of bill collection for a minimum period of one year.	
3.	Trade Receivables Discounting System (TReDS)	1) Minimum paid up equity capital – ₹ 25 crore 2) Non-promoters, to have shareholding up to 10 per cent of equity capital	-	
4.	White label ATM Operators (WLAOs)	₹100 crore net-worth (to be maintained at all times)	1) ATMs to be deployed in the following ratio: 1:2:3 for Metro & Urban: Semi-urban: Rural Regions. 2) Among the various regions, the ratio will be in favour of rural regions. If a WLAO deploys adequate ATMs in a rural region, it need not deploy ATMs in metro, urban or semi-urban regions to meet the ratio requirements. If a WLAO deploys ATMs in a semi-urban region, it shall deploy adequate ATMs in a rural region as per the ratio and may not deploy any ATM in a metro or urban region	
5.	Payment Aggregators (PA)	1) ₹15 crore Net-worth for new PAs applying for authorisation. A minimum positive net-worth of ₹25 crore to be achieved and maintained at all times by the end of the third financial year from the date of receiving final authorisation 2) Existing PAs – to achieve ₹15 crore net-worth by March 31, 2021 and ₹ 25 crore by March 31, 2023 and it shall be maintained at all times	1) Existing non-bank entities offering PA services must apply for authorisation on or before June 30, 2021. They can continue their operations till they receive communication from RBI regarding the fate of their application. However, E-commerce marketplaces providing PA services should not continue this activity beyond the deadline and if they desire to pursue this activity they must apply before the deadline 2) It is mandatory for PAs to adopt technology related recommendations given in Annex 2 of 'Guidelines on Regulation of Payment Aggregators and Payment Gateways' dated March 17, 2020 3) NoC from relevant regulator within 45 days of obtaining clearance (if regulated by financial sector regulator)	

Sr No.	Payment System	Eligibility Criteria		
		Financials (Net-worth as per last audited balance sheet)	Specific to Payment System	Common to All (Except Overseas Principal – MTSS)
6.	Overseas Principal – MTSS (Cross-border Money Transfer – in-bound only)	Minimum net worth of USD 1 million. Relaxation could be considered, if incorporated in FATF member country and are supervised by the concerned Central Bank / Government or financial regulatory authority.	1) The Applicant should be a registered entity, licenced by the Central Bank / Government or financial regulatory authority of the country concerned for carrying on Money Transfer Activities. The country of registration of the Overseas Principal should be AML compliant. 2) The arrangement should result in considerably increasing access to formal money transfer facilities at both ends. 3) Entity should be well established in the money transfer business with a track record of operations in well-regulated markets 4) Entity should be registered with the overseas trade / Industry bodies. 5) Entity should have a good rating from one of the international credit rating agencies 6) Entity should submit confidential reports from at least two of its bankers 7) Entity should submit a report certified by independent Chartered Accountants, regarding steps taken to comply with anti-money laundering norms in the home/ host country	----------NA---------

Point of Arrival (PoA) and Performance Metrices (PM)

18.4 RBI adopted a PoA and PM framework with a view to promote efficiency of payment systems. PoA refers to the assessment of a payment system over a time horizon to identify its relevance against certain identified attributes. The assessment helps ascertain the suitability and continued relevance of the payment system. PM examines performance of a PSO over certain parameters like business plan submitted at the time of application for authorisation, business and technical efficiency, contribution to the payments ecospace, etc. Adoption and implementation of the framework is expected to provide a robust environment that enables innovation and proliferation of safe, secure and efficient payment systems with adequate benchmarking of operators in terms of performance, utility, expectations, etc.

18.5 The approach adopted is to (a) specify goal-posts for an authorised payment system's PoA and PM based on which its continuance, or otherwise, in the ecosystem can be decided, including the need for addressing hurdles, if any, and / or facilitating its expansion, (b) define a set of targets for identified parameters to be fulfilled by the participants at the point of gaining access along with certain time based targets for monitoring the efficiency and effectiveness of the payment system participants. While 'a' above addresses the system-related aspects of performance, 'b' takes care of the participant-related aspects.

18.6 All payment systems / entities at the time of commencement of operation / authorisation would be assessed against the PoA / PM attributes periodically after their commencement of operations. The period of first assessment as well as periodicity of assessment may be decided on a case to case basis by the Department, depending on the credentials of payment system / entity and the sector in which it operates.

18.7 RBI has been evaluating new as well as existing systems and entities based on certain expectations and parameters. The PM broadens the scope of assessing the performance of the payment system entities. In a way, PoA and PM formalises these yardsticks by documenting them, thus, bringing in transparency and uniformity in examining the systems and entities at periodic intervals.

Perpetual Validity for Certificate of Authorisation (CoA) issued to PSOs

18.8 The RBI issues "on-tap" authorisation under the PSS Act to non-banks issuing PPIs, operating WLAs or the TReDS, or participating as BBPOUs. Authorisation (including renewal of authorisation) of such PSOs has been largely for specified periods up to five years. The limited period licences were found to lead to business uncertainty for PSOs and also involved avoidable use of regulatory resources during the process of renewal.

18.9 Over the years, Reserve Bank's oversight framework has developed into a more mature and comprehensive system, which clearly lays out oversight expectations and the methodologies adopted for oversight of

PSOs. The Reserve Bank has reviewed the policy and has started granting authorisation for all PSOs on a perpetual basis, subject to certain conditions. The perpetual validity of authorisation is expected to reduce licensing uncertainties and enable PSOs to focus on their business which will help enhance the payment ecosystem.

Introduction of cooling period

18.10 Cooling Period would be applicable for a period of one year in situations where (a) Authorised PSOs whose CoA is revoked or not-renewed for any reason; or (b) CoA is voluntarily surrendered for any reason; or (c) Application for authorisation of a payment system has been rejected by RBI; or (d) New entities that are set-up by promoters involved in any of the above categories. Given the regulatory discomfort emanating from such entities and to discipline them appropriately, it is desirable that the entity be debarred from operating any payment system during the duration of the cooling period.

Chapter 19

Supervision

Oversight Framework for Financial Market Infrastructures (FMIs) and Retail Payment Systems

19.1 The Committee on Payment and Settlement Systems (CPSS) and International Organisation of Securities Commissions (IOSCO) had, in April 2012, published 24 principles as part of its report titled "Principles for Financial Market Infrastructures (PFMIs)". The principles apply to all systemically important payment systems (SIPS), central securities depositories (CSDs), securities settlement systems (SSSs), CCPs and TRs (collectively "financial market infrastructures"). In line with this approach, the RBI adopted the above international standards and in June 2013, issued a policy document titled as 'Regulation and Supervision of FMIs regulated by RBI' which detailed the criteria for designating an FMI, applicability of the PFMIs to the FMIs, tools for oversight of FMIs and other related aspects.

19.2 Since then, the country has witnessed continuous expansion in the payment landscape not only in payment infrastructures but also in terms of volume and value of digital payment transactions. With an aim to better clarify RBI's oversight objectives and policies and in keeping with the commitment made in Vision 2019-2021, a revised policy document titled "Oversight Framework for FMIs and Retail Payment Systems" was released on June 13, 2020. The revised framework broadly covers the legal framework for oversight, definition and scope of oversight, oversight activities, supervisory considerations that have arisen since the time of the previous document and cooperation with other regulatory authorities, etc.

Offsite supervision

19.3 Off-site supervision of authorised payment systems is conducted using various tools, such as (a) analysis of prescribed data / information received on periodic basis from regulated entities, (b) fraud monitoring / system of alerts, (c) regular meetings with authorised PSOs, (d) market intelligence, and (e) oversight reports and surveys.

19.4 Presently, card payment networks, (other than NPCI) and Cross-border Money Transfer (in-bound service) operators are regulated and overseen through off-site supervision only as they are institutionalised in foreign jurisdictions. These entities are, however, required to submit, on an annual basis, a System Audit Report (SAR) of their entire systems, including the domestic infrastructure. RBI continuously engages with these entities to ascertain gaps, if any, in their risk assessments.

19.5 CCIL is an FMI and its oversight is done as per the oversight policy for FMIs. The offsite supervision of CCIL is undertaken through the following:

a) Self-Assessment: As a measure of enhanced transparency, CCIL is required to disclose its self-assessment in compliance with the PFMIs on an annual basis, as per the 'Disclosure Framework and Assessment Methodology', prescribed in the PFMIs. CCIL also publishes its quantitative disclosures on a quarterly basis as per the public disclosure standards for CCPs.

b) Assessment by external experts: CCIL undertakes a review of its risk models and risk management processes by external experts annually. The report submitted by the external experts is examined by the department.

c) External and / or internal audits of control measures: CCIL is required to undertake audits on an ongoing basis to verify risk control measures in existence, the suitability of such measures, effectiveness of the risk controls and adherence to the risk control measures. CCIL is required to submit to RBI the operational, technology and other audit reports as prescribed along with the compliance measures on a periodic basis. The scope and coverage of such audits are finalised in consultation with RBI.

d) System of alerts: RBI has mandated CCIL to put in place a mechanism for proactively reporting to it on a priority basis any abnormal events / developments, aberration, delays, incidents, etc., at the earliest possible time. The system of alerts is in place for

shortages, defaults, margin calls, imposition of any restrictions on members, etc., in any segment. This system of alerts helps track various risk events in a timely manner to prevent any disruptions in the functioning of CCIL.

e) Reports and Returns: RBI has prescribed periodic returns that are submitted by CCIL. Further, adhoc returns are also called for as and when necessary. This information / data are in addition to other information furnished by the entity, such as, audit reports, balance sheet, minutes of board meetings, etc.

f) Prior approval of changes: The offsite monitoring and surveillance also includes assessment of any changes / amendments to the rules, regulations, bye-laws, notifications, risk management framework of the FMIs, to ensure that such changes / amendment are within the accepted risk-management and efficiency standards. Similarly, introduction of new products or changes in the structure or operation of any existing product are assessed against the PFMIs and become effective only after approval by RBI.

Onsite Inspection

19.6 Onsite inspection complements the offsite monitoring mechanism, and are carried out on periodic basis as determined by RBI. It is based on the risk profile of the entity derived from its annual self-assessment. In addition to information furnished by the entity, market intelligence, if any, is also considered during inspection.

19.7 Currently, RBI conducts onsite inspection of CCIL, NPCI, authorised PPI issuers, White Label ATM Operators, ATM Network Operators, Instant Money Transfer Operator and TReDS Operators. Of these, CCIL and NPCI are assessed against the 24 PFMIs using the "Committee on Payments and Market Infrastructures - International Organisation of Securities Commissions (CPMI-IOSCO) - Assessment Methodology. Onsite inspection of CCIL is conducted annually, NPCI biennially, and others either annually or biennially or triennially depending on the size of their business and volume / value of transactions handled by them.

Central Payments Fraud Information Registry (CPFIR)

19.8 With rapid advancement in the payment ecosystem and advent of non-bank entities in the payment landscape, coupled with changing technologies and digital consumer demands, new trends in payment transaction frauds are coming to light. While payment system participants and PSOs have put in place advanced security systems to protect consumers, including real-time transaction analysis, behavioural biometrics on devices, tracking technology, etc., to help identify and prevent potential frauds, the payment industry continuously demands higher levels of fraud prevention services and security technologies. It is essential to appropriately capture information pertaining to all frauds relating to payment transactions processed through payment systems which would help put in place active risk management practices to fight online fraud on internet and on mobile devices.

19.9 Accordingly, RBI has created CPFIR, a web-based reporting platform to facilitate online payment fraud reporting by system participants.

19.10 The registry of all payment related frauds helps ascertain deficiencies in the systems and processes, enable strengthening of existing controls and helps in devising additional controls as part of sound and efficient risk management processes. Faster dissemination of information on payment frauds by RBI to system participants would facilitate introduction of necessary safeguards and preventive measures to ensure that adequate caution and controls are put in place by the system participants. The aggregated fraud data will also be published to educate customers on emerging risks.

Definition of Digital Payment Transactions and Dissemination of Granular Payment System Data

19.11 RBI has been publishing data on transactions carried out using various payment systems operated by authorised PSOs. In view of the rapid developments in the payment ecosystem and evolution of new systems, products and channels used to undertake digital payment transactions. RBI reviewed the definition of digital payment transactions. It also enhanced the scope and coverage of Payment System Indicators

published in its monthly RBI Bulletin to include recent payment systems and also disseminate granular details of payment transactions. Further, the payment transactions undertaken using different payment channels and details of payment system infrastructure are also disseminated. The data in the revised form and structure is being published in the RBI Bulletin from the month of January 2020 onwards.

Scope of System Audit Report (SAR)

19.12 Authorised PSOs are mandated to carry out a System Audit on an annual basis by a Certified Information System Auditor (CISA) qualified auditor and registered with the ISACA or by a holder of a Diploma in Information System Audit (DISA) qualification of the Institute of Chartered Accountants of India (ICAI).

19.13 Payment landscape has experienced extensive leveraging of advanced technology in facilitating processing of payment transactions by the PSOs as well as their service providers / intermediaries / third party vendors and other entities in the payment ecosystem. On the other hand, the number, frequency and impact of cyber incidents / attacks have increased manifold. In order to enhance the resilience of the payment systems and to bring in standardisation and ensure that relevant areas of information system processes and applications are covered, the scope of SAR was revised in January 2020.

19.14 The enhanced scope broadly covers Information Security Governance, Access Control, Hardware Management, Network Security, Data Security, Physical and Environmental Security, Human Resource Security, Business Continuity Management, System Scalability, IT Project Management, Vendor / Third Party Risk Management, Incident Management, Change Management, Patch Management, Log Management, Secure Mail and Messaging systems, Mobile and/or other Input / Output Device Management Policy, Security Testing and Source Code Review, Online Systems Security, Mobile Online Services (applicable for entities offering services through mobile applications), etc.

Penalty Framework

19.15 PSS Act empowers RBI to (a) impose penalty for a contravention

or a default and (b) compound contraventions of any of the punishable offences under the Act. In order to bring in transparency, RBI reviewed and revised the process of levy of penalty on authorised PSOs / banks under the PSS Act, on January 10, 2020. The revised framework centres around objectivity and transparency in the decision-making process. The decision to impose penalty and calculation of the penalty amount is based on a set of pre-defined objective criteria. Further, adequate opportunities are provided to the PSOs / banks to present their case.

Business Continuity Plan (BCP)

19.16 New situations like failure of a major bank, a pandemic situation, etc., bring out unique solutions and warrant an aggressive approach as well. BCP plans get tested in live scenarios and for extended periods. Such BCP plans include situations of non-availability of adequate and critical resources, places of normal operations, etc.

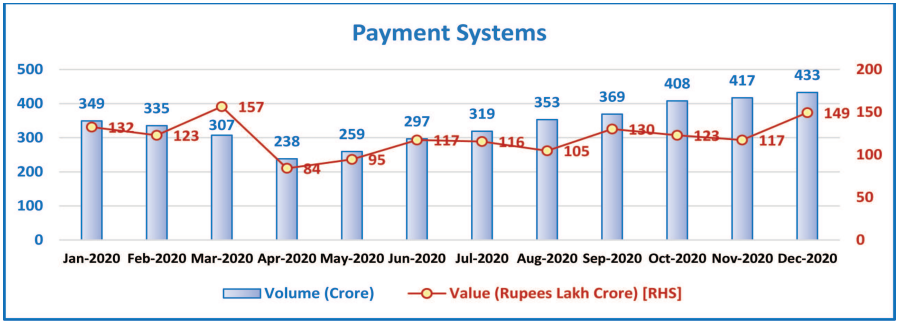
19.17 In view of the situation arising out of COVID-19 in March 2020, a host of unprecedented measures were taken to ensure seamless and unhindered operation of not only centralised payment systems (RTGS and NEFT) but also payment systems operated by other operators, like IMPS, UPI, NACH, CTS, cards, etc. Coordinated efforts with Government, PSOs and Regulated Entities (REs), including banks and non-banks, ensured uninterrupted functioning of all PSS operating across the country. Further, certain relaxations were given to REs to allow them to cope-up with the restrictions in physical movement.

19.18 The day-to-day operations of the RTGS system were shifted to be carried out from the Primary Data Centre (PDC). Staff performing critical functions pertaining to centralised payment systems were isolated in a quarantined environment at a hotel near the PDC with necessary travel arrangements in place. The hotel, PDC and vehicles were sanitised regularly to safeguard employee welfare. Two teams of staff, with an additional team on permanent standby, ensured seamless operations. Rotation of staff every fortnight after thorough screening by RBI in-house doctors, facilitated unhindered operations.

19.19 Sustained efforts were undertaken by the department to ensure that PSOs and their services were declared as 'essential services'. The Government DBT payments to help the poor and marginalised commenced on a large scale in April 2020 which was smoothly facilitated by the NACH-APBS.

19.20 CCIL implemented business continuity measures by entering into an arrangement with a hotel in the vicinity to provide accommodation exclusively for its key staff personnel. Similar arrangements were also in place at the on-city secondary site and the remote disaster recovery site with minimum staff essential to take over in case of any disruption in the activities at the primary site. The staff and participants were provided remote access to the systems through Virtual Private Network (VPN) facility to facilitate operations with skeletal staff working from office. Further, to minimise risks and to ensure that market participants maintain adequate checks and supervisory controls while optimising the thin resources and ensuring safety of personnel, trading hours for various markets were reduced / revised in April 2020.

Table 20: Performance during the Pandemic



Total Payments	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20
Volume	100	92	71	77	88	95	105	110	122	124	129
Value	100	127	68	77	96	94	85	106	100	96	122

Source: RBI Data

Note:
((i) Feb 2020 figures are considered as the base (100).
(ii) Months in green have Payment volume / value higher than the Pre-Covid-19 levels indicating recovery in Payment Systems.

19.21 RBI has also put in place a Standard Operating Procedure (SOP) to be followed when a bank is placed under All Inclusive Directions / or Moratorium so that payment systems can operate without any disruption. The SOP gets refined with every incident and is circulated amongst all the stakeholder departments in the Reserve Bank for co-ordinated and effective implementation in a seamless manner. The SOP was tested in the incident of March 2020 and modified with experience gained which ensured that payment systems operated smoothly after the November 2020 incident.

Chapter 20

Customer Protection, Convenience, Complaint Redress

20.1 Customer interest has always been the overriding principle for RBI. Some initiatives introduced decades ago in payment systems to safeguard the interests of customers are valid even today. Mandating PAs to open escrow accounts, AFA, e-mail / SMS alerts, digital ombudsman, etc., have not only added security to payment transactions but also increased customer confidence in PSS, thereby helping in increasing digital footprints.

Security for card transactions

20.2 Use of cards (both credit and debit) has been growing over the last few years. Non-empirical evidences show that cards are the first mode of on boarding a person into the digital fold. This makes it very important to ensure safety and security of card transactions so that frauds are minimised. To this end, RBI has been taking several measures to enhance the security of card transactions which has helped in containing card related frauds in India. These include the requirement of AFA for all online or CNP transactions, need to obtain PIN for physical / face-to-face or CP transactions, need to provide alerts to the cardholder for all card transactions, irrespective of the amount and channel, etc.

Additional Factor of Authentication (AFA)

20.3 Authentication is important to prevent fraudulent transactions in the e-Commerce environment. It improves (a) trust between the merchant and the customer, and (b) security in a world where cyber security has become a major issue. With effect from August 1, 2009, banks were mandated to ensure that online transactions using credit and debit cards are authenticated using AFA, the additional factor based on information not visible on the card. This mandate applies to all transactions using cards issued in India, for payments on merchant site where no outflow of foreign exchange is contemplated.

20.4 RBI has also mandated PIN based authentication for all card transactions at PoS terminals. This mandate for AFA / PIN is relaxed in case of PPI - Mass Transit System (PPI-MTS) transactions and also for contactless

transactions for values up to ₹ 2,000/- performed using NFC-enabled EMV Chip cards. The limit was subsequently revised to ₹ 5,000/- effective from January 01, 2021.

20.5 To prevent fraudulent withdrawal at ATMs, RBI has mandated requirement of PIN entry for every transaction, including balance enquiry transactions.

EMV Chip and PIN cards

20.6 An EMV chip is an embedded microprocessor chip in payment cards such as credit and debit cards which stores and protects cardholder data. EMV chip technology was originally developed by Europay, Mastercard and Visa (which is how the acronym EMV came to stay), with the EMV chip storing data on integrated circuits rather than in magnetic stripes. EMV chip card transactions improve security against fraud compared to magnetic stripe (magstripe) card transactions that rely on the holder's signature and visual inspection of the card to check for features.

20.7 RBI mandated the use of only EMV Chip and PIN based debit and credit cards with effect from January 1, 2019 and banks were advised to disable all magstripe cards issued earlier. Further, banks and WLAOs have been advised to ensure that all ATMs / micro-ATMs (which are enabled to handle card-based transactions) deployed by them are enabled for processing EMV Chip based transactions.

Online Alerts

20.8 In order to enhance the security of online card transactions, with effect from August 1, 2009, banks were required to put in place "Online Alerts" to the cardholder for all CNP transactions of the value of ₹ 5,000/ and above. This measure has been generally welcomed by customers, which enabled them to take prompt action if the card was misused and went a long way in arresting further perpetration of such fraudulent transactions. To further strengthen the system, banks were mandated to put in place with effect from June 30, 2011, a system of online alerts for all types of transactions irrespective of the amount, involving usage of cards at various channels.

Tokenisation

20.9 While performing a card transaction, a customer either enters the card details manually (for e-commerce transactions) or swipes / dips the card at a PoS terminal. There are situations when the card holder hands over the card to a staffer of a merchant establishment (say, a restaurant) for payment. There is a possibility of data breach and the card holder's data could be at risk and susceptible to misuse. One of the means of enhancing security is "Tokenisation", a process whereby a card's 16-digit Primary Account Number (PAN) is replaced with a unique alternate code (called as "token"). This token is unique for a combination of card, token requestor (i.e., third party app provider) and device (i.e., mobile, tablet, etc.). Thereafter, payment transaction is performed using the token, instead of the actual card data. Thus, in a tokenised card transaction, the actual card details are neither sought for nor captured at the merchant's end. This enhances safety and security of the card transaction.

20.10 In January 2019, RBI issued a framework for tokenisation of card transactions which allowed all authorised card networks to offer tokenisation services, irrespective of the app provider, use case, etc., subject to certain conditions and responsibilities. The use of tokenisation, however, does not dilute the instructions in place for AFA. Registration for tokenisation service is purely voluntary for customers and they need not pay any charges for availing this service. For the present, this facility is offered only through mobile phones / tablets.

Facility to switch on / off transaction rights

20.11 RBI continuously evaluates the systems in place to provide more safety to cardholders and the card transaction chain. The following additional safety measures were mandated that have come into effect from October 1, 2020:

a) At the time of issue / re-issue, all cards (physical and virtual) should be enabled for use only at ATMs and PoS devices within India.

b) For existing cards, issuers may take a decision, based on their risk perception, whether to disable the CNP / online (domestic and international) transactions, CP / face-to-face (international) transactions

and contactless transaction rights. Existing cards which have never been used for CNP / international / contactless transactions shall be mandatorily disabled for this purpose.

c) The issuers shall provide to all cardholders a 24x7 facility to switch on / off and set / modify transaction limits for all types of transactions, through multiple channels - mobile application / internet banking / ATMs / Interactive Voice Response (IVR), as also at branches / offices; alerts / information / status, etc., shall be sent to cardholders as and when there is any change in status of the card.

Positive Confirmation

20.12 In order to remove any ambiguity for funds transferred through NEFT, an element of positive confirmation was introduced with effect from March 1, 2010. The new message format was introduced to relay to the originating bank an acknowledgment containing the date and time of credit, immediately after the credit is afforded to beneficiary accounts. The originating banks, on receipt of positive confirmation from the destination banks, are required to initiate a mobile SMS or generate an e-mail to the originator to convey the fate of the transaction. Positive confirmation was mandated for RTGS with effect from January 15, 2019. This is a unique feature in NEFT and RTGS systems in India.

Data Storage

20.13 There has been a considerable growth in the payment ecosystem in India, particularly in the realm of digital transactions. Ensuring safety and security of payment systems has always been the cornerstone of RBI's approach towards payment system regulation and development.

20.14 Towards this end, and to have unfettered supervisory access to data stored with the system providers, as also with their service providers / intermediaries / third party vendors and other entities in the payments chain, RBI has, vide circular dated April 6, 2018 on "Storage of Payment System Data", mandated all system providers to store the entire data relating to payment systems operated by them in systems only in India. This data pertains to full end-to-end transaction details and information processed as part of the payment instruction. For the foreign leg of the transaction, if any,

the data can also be stored in the foreign country, if required.

Harmonisation of Turn-Around Time (TAT) for failed transactions

20.15 Many customer complaints are due to unsuccessful or failed transactions (caused by disruption in communication links, non-availability of cash in ATMs, time-out of sessions, non-credit to beneficiary's account due to various causes, etc.). The instructions on TAT and the compensation framework cover failed transactions at ATMs and non-credit / delayed return of transactions through NEFT and RTGS. Since there were no prescriptions for TAT for other authorised payment systems such as cards, UPI, IMPS, etc., there was no uniformity in reversing failed transactions.

20.16 Therefore, in September 2019, RBI introduced a framework on TAT and customer compensation for resolution of failed transactions across all authorised payment systems. The framework seeks to ensure, (a) reversal within a specified time without the need for lodging of complaint by the customer, and (b) compensation to customer for delay in reversal of such failed transactions, which are not directly attributable to the customer. Domestic transactions i.e., those where both the originator and beneficiary are within India, are covered under this framework. The salient features of the framework are:

a) the prescribed TAT is the outer limit for resolution of failed transactions;

b) definition of a failed transaction includes credits which could not be effected to the beneficiary due to lack of full information or lack of proper information and delay in initiating a reversal transaction;

c) wherever financial compensation is involved, it shall be effected to the customer's account suo moto, without waiting for a complaint or claim from the customer;

d) if the transaction is a 'credit-push' funds transfer and the originator's account is debited without a credit to the beneficiary account, a reversal should be effected within the prescribed time period failing which, a penalty has to be paid to the beneficiary;

e) if there is delay in initiation of a transaction at the originator bank's end beyond the TAT, penalty is to be paid to the originator.

e-Mandates / Standing Instructions - Cards / UPI / PPIs

20.17 A framework to facilitate e-mandates on cards and PPIs was issued in August 2019 to encourage digitisation of recurring payments like monthly subscriptions, insurance premia payments, systematic investment plans, bill payments, etc. It couples convenience with adequate safety like AFA for the first transaction, e-mandate registration, modification and revocation. This framework was subsequently extended to cover UPI based payments.

Cash withdrawals at merchant locations using PoS and UPI

20.18 For over a decade, banks had been permitted to extend small value "cash withdrawal" facilities at PoS devices at merchant establishments. Under this facility, using debit cards and open-loop prepaid cards, banks can, subject to approval by their respective Boards, permit cardholders to use PoS devices deployed by them for withdrawing up to ₹ 2,000/- per day per card in Tier III to VI centres (₹ 1,000/- per day per card at Tier I and II centres). The charges, if any, levied on the cardholders for this purpose should not exceed 1% of the transaction amount at all centres irrespective of the withdrawal limit. This facility provides an additional option to cardholders to withdraw cash from nearby merchant establishments; the merchants may earn extra income apart from circulating their cash collections without visiting a bank.

20.19 The facility of cash withdrawal at merchant locations was extended to UPI as well. It seeks to provide another interoperable solution for making cash available for contingent requirements of individuals as also enable better cash management avenues to merchants.

Digital Literacy - e-BAAT

20.20 Digital payments penetration and adoption need to be supported by digital literacy. In terms of PSS Vision 2019-21, RBI is committed to encourage greater use of electronic payments by all sections of the society to increase the digital footprints and achieve a "less-cash" payment ecosystem. As part of a customer centric approach, RBI's focus is on enhancing customer education and awareness, so that customer confidence in payment systems is reposed with usage combined with better awareness of the product and processes.

20.21 A well-informed customer base would also facilitate faster migration away from cash and other paper-based payments. To achieve this, it is RBI's endeavour to enhance customer awareness through structured electronic Banking Awareness and Training (e-BAAT) programs, in collaboration with all the stakeholders. The focus of e-BAAT program is basically to educate the masses to shift their focus of payments from paper to electronic payments through different modes. RBI is also creating customer awareness through press, A-V media and social media platforms e.g., RBI Kehta Hai and arranging media workshops.

Intervention in charges

Merchant Discount Rate (MDR)

20.22 MDR refers to the fee charged by an acquiring bank (bank that sets up the payment infrastructure) for providing the facility of accepting payments performed using cards, UPI, BHIM Aadhaar Pay, PPIs, etc. This fee is payable by merchants and MDR so charged, is divided among issuers (called as issuer interchange), card networks (called as network fee), acquirers and any other entity involved in payment transaction chain (like payment aggregators). Charging MDR is considered necessary to ensure viability of banks / service providers in the payments chain.

20.23 RBI issued a framework for MDR for debit card transactions which came into effect from September 2012. This framework was subsequently revised in 2017. The revised framework categorises merchants based on turnover, adopts a differentiated MDR for QR-code based transactions and specifies a ceiling on the maximum permissible MDR for both CP and CNP transactions. This framework is not applicable for credit cards, PPIs, UPI, BHIM Aadhaar Pay, etc.

20.24 As stated earlier, MDR should be borne by merchants and not passed on to the customers. After demonetisation, to promote digital transactions, the Central Government, till December 2019, reimbursed MDR charges on transactions with values up to ₹ 2000 made through debit cards, BHIM UPI and Aadhaar-enabled payment system. As per Central Government announcement, no charge, including MDR, shall be applicable on or after January 1, 2020 on payment made through prescribed electronic

modes, viz., debit card powered by RuPay, UPI (BHIM - UPI) and UPI QR Code (BHIM - UPI QR Code).

ATM Interchange

20.25 In order to enable citizens to have access to cash withdrawals on an 'anytime and anywhere' basis, ATMs have been deployed by banks during the last two decades. ATMs have gained prominence as a delivery channel for banking transactions in India. Commensurate with the branch network, larger banks have deployed more ATMs. Most banks have entered into bilateral or multilateral arrangements with other banks to have inter-bank ATM networks as banks prefer to deploy ATMs at locations where they have a large customer base or expect considerable use. It is but natural that banks levy charges for usage of the infrastructure set up by them. These charges, called ATM interchange charges / fees, are often passed on to the customers.

20.26 The charges levied on customers vary from bank to bank and also vary according to the ATM network that was used for the transaction. Consequently, a customer is not aware, beforehand, of the charges that would be levied for a particular ATM transaction, while using an ATM of another bank. To bring about transparency in charges, in March 2008, RBI brought out a framework of service charges, according to which, the charges that can be levied by banks for use of ATMs are as follows:

Type of transaction	Free	Customer charges	Interchange Fee
Off-Us transactions(including financial and non-financial)	Non-metros – up to 5 per month Metros – up to 6 per month	Ceiling of □20 per transaction (for all transactions)	Financial transactions: □15 Non-financial transactions: □5
On-Us transactions	5 per month (all centres) {over and above the non-financial transactions}		

20.27 With increase in transaction cost at ATMs, and the limits on the amounts that can be charged from customers, banks are of the view that ATM operations have become a loss-making activity for them. Even though

there is still an unmet demand for ATMs in India, more so in the semi-urban and rural (SURU) areas, the total number of ATMs deployed has remained stagnant over the last two years. On the other hand, customers complain that banks levy charges on any service offered by them through ATMs.

20.28 A committee was constituted in July 2019 under the Chairmanship of the Chief Executive, IBA to review the entire gamut of ATM charges and fees with focus on the interchange fee structure. The committee included representatives NPCI, SBI, HDFC Bank Ltd., Confederation of ATM Industry and Tata Communications Payment Solutions Ltd. The committee submitted its report in December 2019 and its recommendations are being examined by RBI for implementation.

Digital Ombudsman

20.29 The grievance redressal mechanism of a system is a measure of its efficiency and effectiveness as it provides important feedback on the working of that system. The grievances relating to digital mode of financial transactions accounted for 19 per cent of total complaints during 2016-17 which went up to 28 per cent till end June 2018, mostly due to inclusion of deficiencies in mobile banking service as a ground of complaint under the scheme with effect from July 1, 2017. Considering the growing trend and increasing complexity of such complaints along with the emergence of non-bank service providers in the digital payment space, RBI introduced the Ombudsman Scheme for Digital Transactions on January 31, 2019 in order to have a dedicated scheme for redressal of such grievances.

20.30 The Ombudsman Scheme for Digital Transactions facilitates the redressal of complaints regarding digital transactions undertaken by customers of a Payment System Participant viz., any person other than a bank participating in a payment system (banks are covered under the Banking Ombudsman Scheme). It is an expeditious and cost-free apex level mechanism for resolution of complaints regarding digital transactions.

20.31 For redressal of grievance, the complainant must first approach the system participant concerned. If the system participant does not reply within a period of one month after receipt of the complaint, or rejects the complaint, or if the complainant is not satisfied with the reply given, the complainant can file the complaint with the Ombudsman for Digital

Transactions within whose jurisdiction the branch or office of the System Participant complained against, is located. For complaints arising out of services with centralised operations, the same should be filed before the Ombudsman for Digital Transactions within whose territorial jurisdiction the billing / declared address of the customer is located.

Internal Ombudsman

20.32 The advent of non-bank entities in the payment landscape has helped further advance the rate of adoption of digital payments in the country. To build customer confidence in the system and safeguard the interest of the consumers, RBI mandated that large non-bank PPI issuers (with more than one crore outstanding PPIs) should put in place an Internal Ombudsman Scheme. The scheme was intended to ensure that complaints of customers are redressed at the level of the PSO itself by an authority placed at the highest level of the PSOs grievance redressal mechanism. The eligible PSPs were required to make the scheme operational by January 20, 2020. The Internal Ombudsman Scheme for non-bank System Participants was put in place under section 18 of the PSS Act.

Online Dispute Resolution (ODR)

20.33 Increase in number of complaints and disputes is an expected outcome of the exponential increase in number of digital transactions. The most efficient option to handle such instances, however low in proportion they may be, is to have recourse to technology-driven dispute redressal mechanisms that are rule-based, transparent, customer-friendly and involve minimum (or no) manual intervention. Given the complexity in implementing such an ODR System across various payment systems, a phased approach by way of implementing an ODR System for failed transactions for all authorised Payment Systems was announced in August 2020 with PSOs required to implement the same by January 01, 2021. Based on the experience gained ODR arrangement would later be extended to cover disputes and grievances other than those related to failed transactions.

Chapter 21

Encouraging Innovation

21.1 The modes of making payments is changing fast and evolving continuously. The payments options have changed faster in the past 15 years than in the previous 150 years and every innovation has resulted in a movement away from cash. Innovation is making payments increasingly convenient, instantaneous and ubiquitous. RBI's endeavour has always been to encourage innovation, especially in the payments space.[10]

FinTech

21.2 FinTech stands for financial technology and describes technologically enabled financial innovations. The technology enabled products enhance financial services by increasing efficiency, reducing cost and providing diversity in products. FinTech firms are redefining the way companies and consumers conduct transactions daily. In India, FinTech has the potential of providing workable solutions to problems like low penetration, scarce credit history and cash driven transaction economy encountered by traditional financial institutions.

21.3 RBI Inter Regulatory Working Group on FinTech and Digital Banking had categorised FinTech innovations broadly into the following areas, viz., (i) Payments, Clearing and Settlement, (ii) Deposits, Lending, Capital raising, (iii) Market provisioning, (iv) Investment Management and (v) Data Analytics and Risk Management. In India, FinTech companies are not competing with banks but are collaborating with them by putting in place Business to Business (B2B) models and thus acting as ecosystem enablers.

21.4 One of the classic examples of FinTech in the payments space is the UPI platform, an application based electronic payment system enabled through a smart phone that uses a registered virtual address to make or receive payments which has revolutionised the mobile payments arena.

[10] *"Banks have been at the forefront of adopting technology. Innovations such as faster settlement systems, internet banking and payment banks have made banking much easier for a customer. Global admiration which indigenously developed United Payment Interface has drawn is a tribute to leadership provided by Reserve Bank of India and all Indians can be proud of this. I am certain that banks are keenly looking at new emerging technologies to maintain high standards. I trust Reserve Bank of India is also providing necessary guidance, as well as addressing the issue of proper safeguards in adoption of technology."* ***(Hon'ble President of India, February 2020)***

UPI platform allows non-bank FinTech players to on-board bank customers and offer payment services. There are currently over 40 non-bank third party applications of various merchants live on the UPI platform. UPI was launched in August 2016, and with over 207 banks live, it has witnessed over 200 crore transactions per month since October 2020.

Regulatory Sandbox

21.5 RBI announced the opening of first cohort under the Regulatory Sandbox (RS) on November 4, 2019 with 'Retail Payments', as its theme. This is expected to spur innovation in digital payments space and help in offering payment services to the unserved and underserved segment of the population. Migration to digital modes of making payments can obviate some of the costs associated with a cash economy and can give customers a friction-free experience.

21.6 The innovative products / services which, were considered for inclusion under RS are:

a) Mobile payments including feature phone-based payment services: General innovation in mobile payment services has focused on or supported app-based access, limited to smartphones and similar devices. There is a need to innovate payment services for feature phones to provide the necessary thrust towards enhanced adoption of digital payments by various strata of society.

b) Offline payment solutions: Consumer behaviour has been driving growth of digital payment systems as more and more consumers are embracing mobile technology. Though mobile internet speed has risen, connectivity issues remain unresolved in large areas. Therefore, providing an option of off-line payments through mobile devices for furthering the adoption of digital payments is required.

c) Contactless payments: Contactless payments, while decreasing the time taken for payment checkout, also ease payments for small ticket transactions. Tokenisation technologies often form the basis of facilitating seamless e-commerce experiences fueled by mobile and other connected devices. The rapid growth in devices provides a significant opportunity for payments through any form factor and anywhere.

21.7 Out of the 32 applications received under the first cohort, 6 were selected for the "test phase". 2 of the entities commenced testing from November 16, 2020 with the other entities entering the test phase by December 21, 2020.

21.8 RBI subsequently announced the opening of the second cohort under RS on December 16, 2020 with the objective to spur innovations capable of recasting the cross-border payments landscape by leveraging new technologies to meet the needs of a low cost, secure, convenient and transparent system in a faster manner. The window to submit applications under the second cohort is open till February 15, 2021.

PSS Innovation Contest

21.9 RBI conducted a PSS Innovation Contest in collaboration with IDRBT. The objective of the contest was to provide a platform to encourage, recognise and promote innovations and ideas in the PSS arena as well as foster new developments by entrepreneurs, start-ups and similar entities in the payments space. The themes covered as part of the contest were (i) offline payments, (ii) automated online dispute redressal systems, (iii) safety and security in payment systems, (iv) payment options for feature phone users, (v) simple and easy KYC, (vi) payment systems data analytics, (vii) cross-border remittances, (viii) next-gen payment modes, (ix) instrument-less payment systems, (x) innovative confirmation and settlement modes for payment transactions, and (xi) automated payment processing. The shortlisted applications were invited to present their innovations to an eminent jury. The outstanding innovators were awarded prizes and all shortlisted applicants were provided certificates of appreciation.

Innovation Hub for the Financial Sector

21.10 PSS do not work in isolation. They have forward and backward linkages with the whole economy and act as catalysts for the financial sector. It is, therefore, incomplete to consider innovations for the payment systems alone without having a view for the financial sector as a whole. Payment systems are not an end in itself but a means to achieve wider financial inclusion, betterment of the society, efficient banking services, business continuity at times of emergency, etc.

21.11 RBI has set up an innovation hub (Reserve Bank Innovation Hub - RBIH) that would create internal capabilities by building applied research oriented, project specific teams with expertise on latest technology. This will facilitate setting up an innovation ecosystem for exchange of innovative ideas and providing an environment where the ideas can be prototyped, tested and certified for wider usage. Such a hub will be on the lines of the innovation hubs developed by various organisations across the world. The Hub will be guided by a Governing Council under a Chairman; Mr. Senapathy (Kris) Gopalakrishnan is the first Chairman of RBIH.

Chapter 22

Domestic, Regional and International Coordination

Domestic Co-ordination

22.1 PSS Vision 2019-2021 envisages better co-ordination among various inter-regulatory bodies to remove frictions in regulation and ease system operator / customer comfort. The endeavour is to have a co-ordinated approach to regulation and supervision within RBI and also with various other regulators. RBI, therefore, has set up two separate committees, (i) Inter-regulatory coordination committee comprising sectoral regulatory authorities, viz., Securities and Exchange Board of India (SEBI), Insurance Regulatory and Development Authority (IRDA), Telecom Regulatory Authority of India (TRAI), Ministry of Electronics and Information Technology (MeITY) and Department of Telecommunications (DOT); and (ii) Inter departmental coordination committee comprising the various regulatory and supervisory departments of RBI.

22.2 The Committees are expected to meet once every quarter to discuss the ways to augment digital payments and other related developments / issues. Apart from co-ordinating on regulation and supervision related matters of payment system, the committees will also look into improving the payment system security and implementation of the recommendations of the CDDP and co-ordinate as and when needed to enhance regulatory co-operation and sort out variances in guidelines / instructions issued by respective regulators.

Global Outreach of Payment Systems

22.3 There is scope for enhancing global outreach[11] of the payment systems, including remittance services, through active participation and co-operation in international and regional fora by collaborating and contributing to standard setting.

22.4 UPI has been a huge success in India. In a little over 4 years since its launch in 2016, its growth, in terms of volume has eclipsed all other

[11] *"There is considerable interest at International fora to understand and learn from our experience in furthering digital payments and we are very glad to share and collaborate."*
(Shri Shaktikanta Das, Governor RBI, February 2020)

payment modes. The UPI model has unique features like open and interoperable platform, two factor authentication, facility for PSPs to build on top of existing infrastructure, multiple bank accounts in a single application, e-mandate feature, compatibility with bank accounts and wallets, etc., that have made it appealing to other nations also. The growth of domestic card network, RuPay, also provides an opportunity for its global expansion.

22.5 RBI's PSS Vision 2019-21 envisaged enhancing global outreach of its payment systems, including remittance services, through active participation and co-operation in international and regional fora by collaborating and contributing to standard setting. RBI, in close collaboration with the Government and NPCI, is working in the direction of expanding the reach of UPI and RuPay globally. To bestow undivided attention towards this goal, NPCI has incorporated a wholly owned subsidiary for international business (styled NPCI International Payments Limited). While RuPay cards are being accepted the world over, the issuance of RuPay cards in Bhutan has been facilitated. A soft launch of UPI was done in Singapore, while its roll-out is in advanced stages in South Korea and UAE.

22.6 Globally there has been lot of interest in UPI. BIS has expressed interest in working with RBI towards building a prototype of the system that could be replicated and scaled up in other countries to realise the potential of UPI as a public good.

International Coordination

Committee on Payments and Market Infrastructures (CPMI)

22.7 CPMI is a committee formed under the BIS with the objective to promote safety and efficiency of payment, clearing, settlement and related arrangements, thereby supporting financial stability and the wider economy. CPMI is a global standard setting body that aims at strengthening regulation, policy and practices through central bank cooperation. The CPMI also monitors and analyses developments in these areas, both within and across jurisdictions.

22.8 RBI is a member of CPMI and actively participates in various task forces and working groups formed by the CPMI in the area of PSS as well

as FMIs. RBI contributes in undertaking assessments of other member jurisdictions and also participates in surveys by providing inputs on the features of systems operating in India. RBI is also involved in drafting and reviewing consultation and discussion papers drafted by CPMI. Further, the statistics on PSS operating in India are also shared with CPMI for publication in the Red Book statistics which contains PSS statistics of member countries.

22.9 The guidance released by CPMI on FMIs and payment systems is adopted by RBI and the measures are implemented to ensure adherence to the same. The progress of implementation of the measures in India is monitored through participation in surveys for progress monitoring and implementation circulated by the CPMI.

22.10 As a member of CPMI, RBI attends the periodic CPMI meetings where apart from discussing the progress of various work streams of the CPMI, the developments in member countries are also presented to other members. RBI also is a member of various working groups constituted by CPMI and actively contributes to the papers published by CPMI.

BRICS

22.11 A Special Task Force on Payment Issues has been constituted by BRICS to work out a common approach to developing a payment infrastructure that would be independent from traditional methods of financial messaging exchange. RBI has nominated two officers to the Task Force.

SAARC Payments Council (SPC)

22.12 India is currently in the chair of SPC. Payment Systems statistics and developments of all the countries are collated and hosted on SPC website, which is maintained by RBI. The idea of a Single Harmonised Payments Mechanism for SAARC is being actively discussed. Since the various SAARC countries are at different levels of development, it was decided that member countries will first assess the standards in their country to see if they have reached a critical level of maturity before taking a call on integration.

SWIFT Oversight Forum (SOF)

22.13 SWIFT is a cooperative society registered under Belgian law and is owned and controlled by its shareholders. The National Bank of Belgium (NBB) is the lead overseer of SWIFT, and is supported by the G-10 central banks. In SOF, the G10 central banks are joined by other central banks from major economies, viz., Bank of Korea, Bank of Russia, Central Bank of the Republic of Turkey, Hong Kong Monetary Authority, Monetary Authority of Singapore, People's Bank of China, Reserve Bank of Australia, Reserve Bank of India, Saudi Arabian Monetary Agency and the South African Reserve Bank.

22.14 SOF provides a forum for the G-10 central banks to share information on SWIFT oversight activities with a wider group of central banks. The oversight primarily focuses on ensuring that SWIFT has effective controls and processes to avoid posing a risk to the financial stability and the soundness of financial infrastructures. RBI as a member of the SOF actively monitors the developments and security controls put in place by SWIFT. RBI also ensures that all SWIFT users in India adhere to and comply with SWIFT's Customer Security Program. Any issues faced by banks / entities using SWIFT in India are taken up in the SOF for discussion and resolution.

LEI Regulatory Oversight Committee

22.15 LEI-Regulatory Oversight Committee (LEI-ROC), established in 2013, is the body responsible for regulatory oversight of the Global LEI System, involving a group of 71 public authorities and 19 observers from more than 50 countries, LEI-ROC is comprised of Plenary, Executive Committee, Committee on Evaluation of Standards and other working groups. Global LEI Foundation (GLEIF) is tasked to support the implementation and use of LEI through Local Operating Units (LOUs), which are authorised by GLEIF to issue LEIs. Currently, RBI is one of the Vice-Chairs of LEI-ROC.

22.16 ROC has been tasked to coordinate and oversee the Global LEI System since 2012. In 2019, the FSB identified ROC to become the International Governance Body (IGB), with an expanded mandate for

governance of the globally harmonised Unique Transaction Identifier (UTI), Unique Product Identifier (UPId) and Critical Data Elements (CDEs). After taking note of the appropriate adjustments in ROC's existing governance, the FSB transferred all governance and oversight responsibilities of the UTI, UPId and CDEs to the ROC, with effect from October 1, 2020. Further, as IGB of the UTI, UPId and CDE, the ROC became the overseer of the designated UPId service provider, The Derivatives Service Bureau.

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Chapter 23

Benchmarking India's Payment Systems

23.1 The past decade has witnessed several innovations in retail payments across the globe including India. Benchmarking is necessary to gauge India's progress vis-à-vis payment systems and instruments in major countries which would give further impetus to the planned efforts for deepening the digitisation of payments.

23.2 A comprehensive exercise for benchmarking India's Payment Systems was undertaken by selecting a mix of 21 countries [including advanced economy countries, Asian economies and BRICS (Brazil, Russia, India, China and South Africa)] nations spread across all the continents where payment systems are considered robust, diverse and efficient. The countries included Australia, Brazil, Canada, China, France, Germany, Hong Kong, India, Indonesia, Italy, Japan, Mexico, Russia, Saudi Arabia, Singapore, South Africa, South Korea, Sweden, Turkey, United Kingdom and the United States of America.

23.3 Payment Systems were rated on the basis of categories: (i) "Leader": ranked 1st or 2nd or 3rd; (ii) "Strong": in the top rungs of the countries other than the leaders (4th to 9th); (iii) "Moderate": ranked in the middle (10th to 15th); and (iv) "Weak": in the lowest rungs (16th to 21st).

23.4 The objective of the benchmarking exercise was to provide an understanding of the payment systems in place in India and how their usage preferences compare with other countries. It was also a starting point for a meaningful analysis of the efficiency levels of India's payment systems.

23.5 The benchmarking was done over a range of 21 areas and 41 indicators as indicated below. A snapshot of India's position is as follows:

Rating	Indicator	Area
Leader	Regulation of costs of payment systems	*Regulation*
	Features available in Cheque instruments	*Cheques*
	Number of debit cards issued	*Debit and Credit Cards*
	Number of ATMs deployed across the country. Per capita cash withdrawal at ATMs	*Cash & ATM*
	Share of Credit Transfers in payment systems	*Credit transfers*
	Availability of alternate payment systems; Share of e-Money in payment systems	*e-Money*
	Citizen to Government (C2G) e-payments; Business to Government (B2G) e-payments; Government to Business (G2B) e-payments	*Government e-payments*
	Oversight by the Central Bank	*Oversight*
	Cross-border personal remittance flows	*Cross-border Personal Remittances*
Strong	Laws in place and scope of regulation	*Regulation*
	Cash in Circulation per capita	*Cash*
	Number of Point of Sale (PoS) terminals deployed across the country	*Debit and Credit Cards*
	Volume and growth of Credit Transfers	*Credit transfers*
	Real Time Gross Settlement System (RTGS)	*Large Value Payment Systems*
	Fast payment systems available in the country	*Fast payments*
	Volume and growth of e-Money	*e-Money*
	Mobile and Broadband subscriptions	*Digital Infrastructure*
	Customer safety and Authentication Standards; Ombudsman scheme for Complaints Redress	*Customer Protection & Complaint Redress*
	Central Counterparty operational in the country	*Securities Settlement & Clearing System*
Moderate	Cash in Circulation as percentage of GDP	*Cash*
	Overall Payment Systems transactions volume and growth; Value of payment systems transactions to cash in circulation	*Payment Systems Transactions*
	Number of credit cards issued	*Debit and Credit Cards*
	Debit and Credit Card usage at PoS terminals and online	*Debit and Credit Cards*
	Presence of domestic Card Network and its share	*Domestic Card Network*
	Government e-payments in the country; Government to Citizen (G2C) e-payments	*Government e-payments*
	Regulation of Payment Aggregators	*Aggregators*
	Costs of cross-border personal remittances	*Cross-border Personal Remittances*
Weak	Rate of decline of cheques; Ratio of Cheque volume vs payment systems volume	*Cheques*
	Share of debit and credit card payments in payment systems; Number of people per PoS terminal	*Debit and Credit Cards*
	Value of debit and credit card payments to cash in circulation	*Cash vs Debit and Credit Cards*
	Number of people per ATM; Ratio of ATM Withdrawal vs cash in circulation	*Cash & ATM*
	Volume and year on year growth of direct debits; Share of direct debits in payment systems	*Direct Debits*
	Digital payment of utility bills; Public Mass Transportation systems in the country	*Digital Utility Payments*
	Availability of channels and operators for cross-border personal remittances	*Cross-border Personal Remittances*

Chapter 24

Challenges

Weaning away from cash

24.1 Cash is all pervasive as it is perceived to provide anonymity, flexibility, convenience and swiftness of making payment; finality of payment, without any default risk; and high level of liquidity and acceptability.

24.2 Notwithstanding the above advantages of cash payments, a recently published report by RBI, titled, "Assessment of the progress of digitisation from cash to electronic", (ref:https://www.rbi.org.in/Scripts/PublicationsView.aspx?id=19417) stated that India is progressively shifting to electronic payments at a rapid pace. It is on account of factors like trust (aided by measures like AFA), consumer confidence (no default risks and settlement in central bank books of accounts), low cost of access and convenience (easy to use mobile based payment system products), that have been brought in the digital payments by the efforts of the regulator and participants over a period of time. But still there is a long road ahead for migration of the country from predominantly a cash-based economy to a predominantly digital economy which is a work in progress.

Digital Financial Awareness and Digital Financial Literacy (DFA and DFL)

24.3 While there has been growth in adoption of digital payments across the geographies and cross-sections of the society, there is differential rate of adoption, owing to lack of DFA and DFL across the spectrum. A lot of efforts have been put on this front by the regulator and various PSOs through awareness campaigns like 'RBI Kehta Hai' and e-BAAT, among others.

24.4 Considering the diversity of users in the payment ecosystem, there is still a long road to be travelled, especially across the geographies (Tier III-VI centres) and societal cross-sections (say senior citizens and migrant workers). A targeted approach in DFA and DFL is, therefore, required to cater to these potential areas and probable user segments which will augment the efforts to attain the desired level of digital payment adoption.

Digital payment Products for users across the spectrum

24.5 While there are options in digital payment products for a smartphone user (mobile banking, internet banking, UPI, IMPS, digital wallets, etc.), there is a gap area in terms of digital payment products for the non-smartphone user. Even though USSD caters to this segment, it is only in a limited way as only certain transaction with low limits are allowed on this platform due to safety issues. There is scope for innovation which will offer digital payment products for the non-smartphone users who though declining, would still number around 50 crore by 2022 (according to ASSOCHAM-PwC study- December, 2018).

Customer Protection and Security of Digital Payments

24.6 While adequate measures are prescribed and adopted by PSOs as they provide digital payment platforms and products, there are instances of frauds, mostly due to customer vulnerability or sometimes on account of system breaches. This leads to apprehension in new users to move towards the digital payments as also makes it difficult to retain those customers who had a bad experience. Steps such as zero customer liability, switch-on / switch-off of digital transactions and digital ombudsman have been taken as customer protection measures to restore customer confidence and limit the liability of the customer. The high cost of implementation of cyber security measures leads to a tendency of an adhoc approach which become points of vulnerability leading to instances of system breaches. While such vulnerabilities are addressed through frequent advisories and instructions to the system participants, it brings the issue of cost to the forefront.

Cost and Connectivity

24.7 The cost of digital payments is sometimes a deterrence for users to adopt digital payments as against cash which is perceived to be free by such users. In addition, the cost of installation of acceptance infrastructure like PoS dissuades certain small merchants to adopt them. Low cost digital acceptance solutions like QR codes have helped in addressing this gap to a certain extent (there are over 7 crore QR codes deployed across the country), but there is scope for more innovative products and further

expansion of QR code deployment. Effecting payment through the QR code still requires internet connectivity at the user's end and offline payment solutions can help plug this gap. As per the TRAI data, as on October 2020 there are 73.4 crore internet subscribers in India as against 117.1 crore telephone subscribers which implies that there is still scope for expansion of internet coverage.

Chapter 25

The Road-map

25.1 The factors inhibiting the digital push are connectivity issues, inadequate acceptance infrastructure, lack of familiarity with newer, alternative payment methods, delay in getting complaints resolved and security and privacy concerns. RBI has acknowledged the same and to address these issues has put in place systems like, consumer awareness programmes, ombudsman schemes, etc.

Self-Regulatory Organisation (SRO)

25.2 RBI has been following the approach of placing discussion papers in public domain and inviting feedback before bringing in structural changes in the payment systems and also changes in regulation of payment systems. There are a variety of ways in which industry participation can be facilitated in the regulatory and supervisory process, and self-regulation is one such process. Self-regulation would involve prescribing standards, setting good governance practices and moderating deviant behaviour through voluntary agreements, peer pressure, ear-to-the-ground and other methods. Most of these activities can be institutionalised through a SRO which can engage with the regulator / supervisor and also be responsible for setting and enforcing rules for PSOs. SRO can collaborate with various stakeholders and facilitate their participation in the self-regulatory processes including helping to frame rules and monitoring compliance. SRO is expected to address concerns beyond the narrow self-interest of the industry, such as to protect customers, participants and other stakeholders in the ecosystem. A framework for recognition of SROs, as announced in the Monetary Policy Statement dated February 6, 2020, was released in October 2020 and RBI is awaiting applications for authorisation of SROs.

Offline Payments

25.3 There has been considerable growth in digital payments using mobile phones, cards, etc. Lack of internet connectivity or low speed of internet, especially in remote areas, is a major impediment for adoption of digital payments. Against this backdrop, providing an option of off-line payments

through mobile devices and stored value component on cards is expected to further adoption of digital payments. Entities are being encouraged to develop offline payment solutions and a pilot scheme in this regard was rolled out in August 2020. The pilot scheme is being undertaken till March 31, 2021 and based on experience gained, a decision will be taken on roll out of the scheme.

Surveys for Digital Payments Awareness

25.4 As digital payments are a back-up and an important part of all contingency plans at the time of an emergency or a natural disaster, it is important to understand the factors inhibiting digital payments. A survey will therefore be conducted to understand the digital penetration in the country. This will help to orient policies and operations to ensure that digital footprints reach the remotest area and strata of the country. The survey will also support the efforts towards, (a) operationalising the PIDF, (b) contributing to the one-district-in-a-state to be fully digital enabled initiative, (c) understanding overall digital penetration by merchants, service providers, users, etc.

Digital Payments Index (DPI)

25.5 In the Sixth Bi-monthly Monetary Policy Statement for 2019-20 dated February 06, 2020, the Statement on Developmental and Regulatory Policies announced that RBI would construct and periodically publish a composite "Digital Payments Index" (DPI). The DPI is envisaged to effectively capture the extent of digitisation of payments in the country and would be based on multiple parameters to accurately portray the penetration and deepening of various digital payment modes. The RBI-DPI has since been constructed with March 2018 as the base period, i.e. DPI score for March 2018 is set at 100. RBI-DPI was published on January 01, 2021 and the DPI score for March 2019 and March 2020 were 153.47 and 207.84, respectively.

Legal Entity Identifier (LEI)

25.6 LEI envisages identification of unique parties to financial transactions across the globe and is designed as an important component for improvement in financial data across the globe. Cross-border retail payments are

generally less transparent and more expensive than domestic transactions. Given the nature of cross-border transactions, there is a case for exploring the option of using LEI to identify the payment system participants, agents and distributors, in respect of cross-border services, particularly for large value payments, including expanding the implementation across all the identified segments.

Central Bank Digital Currencies (CBDC)

25.7 CBDC is a legal tender and a central bank liability in digital form denominated in a sovereign currency and appearing on the central bank's balance sheet. It is in the form of electronic currency which can be converted or exchanged at par with similarly denominated cash and traditional central bank deposits. Innovations are changing the payments space rapidly. This has made central banks around the world to examine whether they could leverage on technology and issue fiat money in digital form.

25.8 Private digital currencies (PDCs) / virtual currencies (VCs) / crypto currencies (CCs) have gained popularity in recent years. In India, the regulators and governments have been sceptical about these currencies and are apprehensive about the associated risks. Nevertheless, RBI is exploring the possibility as to whether there is a need for a digital version of fiat currency and in case there is, then how to operationalise it.

Geo-tagging

25.9 In order to measure the adoption of digital payments, it is essential to have geographical location of the payment system touch points [bank branches, ATMs, PoS terminals, BCs, etc.] across the country. The Reserve Bank has already established a framework to capture the location and business details of commercial bank branches, ATMs and BCs across the country. It is envisaged to extend a similar framework to capture and maintain information about PoS terminals and other payment system touch points.

Increased Coordination

25.10 The Payment Systems Vision 2021 envisaged that in order to have a co-ordinated approach towards regulation, the Reserve Bank shall

engage with the other sectoral regulators - SEBI, IRDA, TRAI, etc., to remove frictions in regulation and ease system operator / customer comfort. Accordingly, the Reserve Bank has set-up an inter-regulatory committee on Digital Payments with officials from other financial sector regulators and the inaugural meeting was held on July 31, 2020. The committee is expected to work towards overcoming frictions in digital payments arising out of connectivity issues, exchange inputs / references between / amongst regulators, enhance awareness about digital payments, facilitate digital financial inclusion, etc. The endeavour is also to have a co-ordinated approach to regulation and supervision within Reserve Bank across the different related departments - Department of Regulation, Department of Supervision, Financial Markets Regulation Department, Financial Markets Operations Department, Foreign Exchange Department, Customer Education and Protection Department, Department of Information Technology, Department of Economic and Policy Research, Department of Statistics and Information Management, Department of Government and Bank Accounts, etc. The intra-regulatory committee is expected to address issues related to intra-regulatory coordination, problems in TReDS, etc. The inaugural meeting of the intra-regulatory committee was held on November 24, 2020.

Chapter 26

Conclusion

26.1 The journey of PSS in the country started with the mission of establishing safe, secure, sound and efficient PSS in the country. Over the years, new challenges were encountered, and RBI has been dynamically addressing them through its Payment Systems Vision with new strategies and planned efforts to address these issues and ensure development of the payment ecosystem in the country. The payment landscape has evolved from the paper-based payment instruments and progressed to a situation where a plethora of payment systems facilitate digital payments.

26.2 India has witnessed significant growth in payments over the past decade with the introduction of numerous payment systems. The challenge now is to sustain the growth in payments and ensure a shift in customer behaviour from cash to digital payments. Efforts such as introduction of AFA, limiting customer liability, digital ombudsman and switch-on / switch-off cards for online and international use are few milestones in the domain of customer protection. RBI has worked diligently towards creation of a payment landscape where banks and non-banks coexist and thrive together which augurs well for further growth and development of digital payments in the country.

26.3 Fuel to the growth of retail payments has been provided by the central bank operated payment system viz., NEFT and creation of an umbrella entity (NPCI) by RBI. The approach has yielded results with many innovative products like UPI, IMPS, AEPS, BBPS, Bharat QR among others, ushering the country into the era of innovative and fast digital payments space and nurturing growth of retail payments. With interoperability as the cornerstone of the regulatory approach of RBI, it has been ensured that there is option of usage of a payment system product across the system participants. The advent of FinTech firms in the payments space has provided further fillip to the expansion of the payment ecosystem. By offering API based integration, these FinTech firms have leveraged the utility of the existing platforms to offer a bouquet of innovative payment solutions to widen the reach, enrich user experience and simultaneously enhance retail payments.

26.4 Even though ample options already exist for digital payments in the country, regulatory efforts will continue to encourage innovation to include hitherto excluded geographies and societal cross-sections, promote healthy competition among system participants, enhance customer literacy and awareness in payment systems, ameliorate acceptance infrastructure across the country and enhance cross-border payments through bilateral and multilateral arrangements with other countries. All the above will be implemented based on learnings from experiences, as well as knowledge and insights gained from information sharing with other countries, and from viewpoints of stakeholders through consultations and discussions.

26.5 Such is the development of digital payment in the country that it has started expanding beyond boundaries. Implementation of successful Indian practices in developed countries of Europe and United States is testimony of India being perceived as the leader in payment systems now.

26.6 As new dimensions are added to the payment ecosystem, it is accompanied by new challenges and opportunities to overcome these challenges. RBI has meticulously met these challenges and utilised the opportunities to smoothen the journey towards the vision of a less-cash society by creating a framework of robust, convenient, accessible, low cost and secure digital PSS in the country which is adapting and evolving with time, customer and market landscape. As indicated in the opening sentence, the journey of PSS in the country started with the mission of establishing safe, secure, sound and efficient PSS in the country and the journey continues with all the path breaking innovations and initiatives.

Appendix 1

Chronology of Major Milestones

Date	Announcements
05.02.2010	Enhancement of features of NEFT - increase in operating hours, hourly settlements, positive confirmation to remitter and tightening of return window.
22.02.2010	CTS-2010 standard - provision of mandatory minimum-security features on cheque forms like quality of paper, watermark, bank's logo in invisible ink, void pantograph, etc., and standardisation of field placements on cheques.
24.09.2010	Authorised Payment System Providers to put in place a Dispute Resolution Mechanism.
27.12.2010	Authorised entities to furnish their respective system audit reports from a qualified Certified Information Systems Auditor on an annual basis.
04.01.2011	Scope of Speed Clearing extended to cover all transaction codes, other than those relating to government cheques.
22.03.2011	Banks to submit a quarterly review of ATM transactions (failed and complaints).
29.03.2011	Put in place a system of online alerts for all types of card transactions at various channels, irrespective of the amount.
04.05.2011	Limit of Mobile Banking transactions without insisting on end-to-end encryption revised to ₹ 5000.
04.08.2011	Banks to put in place additional factor of authentication for all Card Not Present transactions.
21.09.2011	Revised access criteria for centralised payment systems and decentralised payment systems.
22.09.2011	Risk mitigation measures related to Card Present transactions.
29.09.2011	Measures to enhance usage of Indo-Nepal Remittance System.
27.12.2011	Cut-off date for implementing the CTS-2010 standard across the country.
05.01.2012	Payment of Penal Interest for delayed credit / refunds of NEFT transactions and efficient functioning of Customer Facilitation Centres.

Date	Announcements
09.04.2012	Expanded the sub-membership route to enable all licenced banks to participate in NEFT and RTGS systems.
13.04.2012	Banks to allow the customers to choose NEFT also as one of the electronic modes of making payment towards loan EMIs / repayments, etc.
20.06.2012	Permitting non-banks to set-up and operate White Label ATMs in India.
28.06.2012	Cap on Merchant Discount Rate for debit card transactions.
10.08.2012	CBS enabled banks to issue only "payable at par" / "multi-city" CTS-2010 Standard cheques.
24.06.2013	Security and Risk Mitigation Measures for Card Present and Electronic Payment Transactions.
11.10.2013	Launch of new Next Generation RTGS (NG-RTGS) System.
20.12.2013	Adoption of ISO 20022 messaging standard in NG-RTGS System.
07.05.2015	Banks to issue only EMV chip and pin-based cards.
09.07.2015	Introduction of new category of PPI for Mass Transit Systems.
27.08.2015	Enhanced limits for cash withdrawal at Point-of-Sale Terminals at Tier-3 to Tier-6 Centres to ₹ 2000/-.
26.05.2016	Banks to put in place a Board approved policy on merchant acquisition.
29.09.2016	Banks to ensure that all new card acceptance infrastructure deployed with effect from January 1, 2017 are enabled for processing payment transactions using Aadhaar-based biometric authentication also.
08.05.2017	NEFT system - Settlement of batches at half-hourly intervals.
06.04.2018	All system providers to ensure that the entire data relating to payment systems operated by them are stored in a system only in India.
15.10.2018	Capital requirements and governance framework of Central Counterparties (CCPs) as also providing a framework for recognition of foreign CCPs.

Date	Announcements
16.10.2018	Road map on interoperability (i) of PPIs issued in the form of wallets through UPI, (ii) between wallets and bank accounts through UPI, and (iii) for PPIs issued in the form of cards through card networks.
15.11.2018	Positive confirmation to the remitter of the funds regarding completion of the fund transfer in RTGS system.
04.01.2019	Criteria for determining customers' liability with the objective of strengthening customer protection in unauthorised electronic payment transactions in PPIs issued by authorised non-banks.
08.01.2019	Authorised card payment networks to offer card tokenisation services to any token requestor through mobile phones / tablets.
08.01.2019	Committee on Deepening of Digital Payments constituted; report submitted in May 2019.
28.05.2019	Customer transactions cut-off time in RTGS extended from 4:30 pm to 6:00 pm, with effect from June 1, 2019.
04.06.2019	Report on Benchmarking India's Payment Systems against 20 other jurisdictions released.
11.06.2019	Waiver of (i) processing and time varying charges levied by RBI on banks for outward transactions undertaken using the RTGS system and (ii) the processing charges levied by RBI for transactions processed in the NEFT system with effect from July 1, 2019.
11.06.2019	Committee to Review the ATM Interchange Fee Structure constituted; report submitted in December 2019.
21.08.2019	Processing of e-mandate on cards for recurring transactions (merchant payments) with AFA during e-mandate registration, modification and revocation, and the first transaction.
16.09.2019	Scope and coverage of Bharat Bill Payment System enhanced to include all categories of billers who raise recurring bills (except prepaid recharges) as eligible participants, on a voluntary basis.

Date	Announcements
20.09.2019	Framework for TAT and customer compensation for failed transactions using authorised payment systems.
30.09.2019	Payment and Settlement Systems Innovation Contest and Payment and Settlement Systems Innovative Ideas Competition announced.
04.11.2019	Regulatory Sandbox (RS) - Retail Payments as its First Cohort.
16.12.2019	NEFT started operating 24x7.
16.12.2019	Member banks to waive charges for NEFT transactions initiated online by savings bank account holders.
23.12.2019	Committee for Analysis of QR Code constituted; report submitted in July 2020.
24.12.2019	New type of semi-closed PPI introduced with loading only from a bank account and usage restricted to purchase of goods and services.
30.12.2019	All authorised payment systems and instruments to link with FASTags under the NETC system.
10.01.2020	Processing of e-mandate on UPI for recurring transactions (merchant payments) with AFA during e-mandate registration, modification and revocation, as also for the first transaction.
10.01.2020	Revised framework for imposing monetary penalty on authorised payment system operators / banks.
15.01.2020	Guidelines on improved user convenience and increased security of card transactions.
17.03.2020	Guidelines covering regulation of payment aggregators and payment gateways covering authorisation, capital requirements, governance, merchant on-boarding, settlement and escrow account management, dispute management framework, etc.
23.03.2020	Payments fraud reporting by bank and non-bank PPI issuers commenced in CPFIR.
05.06.2020	PIDF created to encourage acquirers to deploy Points of Sale infrastructure (both physical and digital modes) in tier-3 to tier-6 centres and north eastern states.

Date	Announcements
13.06.2020	Release of Oversight Framework for Financial Market Infrastructures and Retail Payment Systems.
22.06.2020	Authorised PSOs and participants to undertake targeted multi-lingual campaigns to educate their users on safe and secure use of digital payments.
06.08.2020	PSOs to introduce Online Dispute Resolution (ODR) systems in a phased manner. To begin with, authorised PSOs to implement ODR systems for failed transactions in their respective payment systems by January 01, 2021.
06.08.2020	A pilot scheme announced for authorised PSOs - banks and non-banks - to provide offline payment solutions using cards, wallets or mobile devices for remote or proximity payments, for a limited period.
18.08.2020	Released framework for authorisation of pan-India Umbrella Entity for Retail Payments.
25.09.2020	Mechanism of Positive Pay for all cheques of value ₹ 50,000 and above to be introduced from January 1, 2021.
22.10.2020	Framework for recognition of a Self-Regulatory Organisation for PSOs.
22.10.2020	Streamlining QR codes to reinforce the acceptance infrastructure, provide better user convenience, promote interoperability and enhance system efficiency.
17.11.2020	Reserve Bank Innovation Hub set up to promote innovation across the financial sector by leveraging on technology and creating an environment which would facilitate and foster innovation.
04.12.2020	RTGS round the clock on all days of the year with effect from December 14, 2020.

Appendix 2

Payment System Data-2010, 2015 and 2020

Item	Volume (Lakh)			Value (₹ '000 Crore)		
	2010-11	2015-16	2019-20	2010-11	2015-16	2019-20
Payment Systems						
1. Large Value Credit Transfers – RTGS	493	983	1507	48487	82457	131156
Retail Segment						
2. Credit & Debit Transfers	4064	31415	215619	1194	9140	29398
2.1 NEFT	1323	12529	27445	939	8327	22946
2.2 IMPS		2208	25792		162	2338
2.3 UPI			125186			2132
2.4 NACH		14041	36979		380	1976
2.5 ECS	2741	2638	19	255	271	5
2.6 Others			198			1
3. Card Payments	5022	19593	73013	114	399	1535
3.1 Credit Cards	2652	7857	21773	75	241	731
3.2 Debit Cards	2371	11736	51240	39	158	804
4. Prepaid Payment Instruments		7480	53317		48	215
5. Paper-based Instruments	13873	10964	10414	10134	8186	7824
Total Retail Payments (2+3+4+5)	**22959**	**69452**	**352363**	**11442**	**17775**	**38974**
Total Payments (1+2+3+4+5)	**23452**	**70435**	**353870**	**59930**	**100233**	**170130**
Total Digital Payments (1+2+3+4)	**9579**	**59472**	**343456**	**49795**	**92046**	**162305**

Appendix 3

Acronyms Used

Sl No	Acronym	Expansion
1	AePS	Aadhaar-enabled Payment System
2	AFA	Additional Factor of Authentication
3	APBS	Aadhaar Payments Bridge System
4	ATM	Automated Teller Machine
5	BBPCU	Bharat Bill Payment Central Unit
6	BBPOU	Bharat Bill Payment Operating Unit
7	BBPS	Bharat Bill Payment System
8	BC	Business Correspondent
9	BCP	Business Continuity Plan
10	BHIM	Bharat Interface for Money
11	BIS	Bank for International Settlements
12	BPSS	Board for Regulation and Supervision of Payment and Settlement Systems
13	CAGR	Compounded Annual Growth Rate
14	CBDC	Central Bank Digital Currency
15	CBS	Core Banking System
16	CC	Crypto Currency
17	CCIL	Clearing Corporation of India Limited
18	CCP	Central Counter Party
19	CDE	Critical Data Elements
20	CDDP	Committee on Deepening of Digital Payments
21	CDSL	Clearcorp Dealing Systems (India) Limited
22	CFC	Customer Facilitation Centre
23	CNP	Card Not Present
24	CP	Card Present
25	CPMI	Committee on Payments and Market Infrastructures
26	CPMI-IOSCO	Committee on Payments and Market Infrastructures - International Organisation of Securities Commissions
27	CPPS	Central Positive Pay System
28	CPS	Centralised Payment System
29	CROMS	Clearcorp Repo Order Matching System
30	CTS	Cheque Truncation System

Sl No	Acronym	Expansion
31	DFA	Digital Financial Awareness
32	DFL	Digital Financial Literacy
33	DoT	Department of Telecommunications
34	DPI	Digital Payments Index
35	DSB	Designated Settlement Bank
36	DTH	Direct-To-Home
37	e-BAAT	Electronic-Banking Awareness and Training
38	ECCS	Express Cheque Clearing System
39	ECS	Electronic Clearing Service
40	EERC	External Expert Review Committee
41	e-KYC	Electronic-Know Your Customer
42	EMV	Europay, Mastercard, Visa
43	FBIL	Financial Benchmarks India Limited
44	FMI	Financial Market Infrastructure
45	FRA	Forward Rate Agreement
46	FSB	Financial Stability Board
47	FY	Financial Year
48	G2P	Government to Person
49	GIFT	Global Interchange for Financial Transactions
50	GLEIF	Global LEI Foundation
51	GPRS	General Packet Radio Service
52	HVC	High Value Clearing
53	IAMAI	Internet and Mobile Association of India
54	IBA	Indian Banks' Association
55	IBBC	Indian Banking Community Cloud
56	IDL	Intra-day Liquidity
57	IDRBT	Institute for Development and Research in Banking Technology
58	IFSC	Indian Financial System Code
59	IFTAS	Indian Financial Technology and Allied Services
60	IGB	International Governance Body
61	IMPS	Immediate Payment Service
62	INFINET	INdian FInancial NETwork
63	IoT	Internet of Things

Sl No	Acronym	Expansion
64	IRDA	Insurance Regulatory and Development Authority
65	IRS	Interest Rate Swap
66	IVR	Interactive Voice Response
67	KYC	Know Your Customer
68	LABs	Local Area Banks
69	LEI	Legal Entity Identifier
70	LEIL	Legal Entity Identifier India Limited
71	LEI-ROC	LEI-Regulatory Oversight Committee
72	LOU	Local Operating Unit
73	LVPS	Large Value Payment System
74	Magstripe	Magnetic Stripe
75	MDR	Merchant Discount Rate
76	MeitY	Ministry of Electronics and Information Technology
77	MIBOR	Mumbai Inter Bank Offer Rate
78	MICR	Magnetic Ink Character Recognition
79	MIOIS	Mumbai Inter Bank Overnight Indexed Swaps
80	MMBCS	Magnetic Media Based Clearing System
81	MNSB	Multi-lateral Net Settlement Batch
82	MoU	Memorandum of Understanding
83	MPoS	Mobile Point of Sale
84	MSME	Micro, Small and Medium Enterprise
85	MTSS	Money Transfer Service Scheme
86	NACH	National Automated Clearing House
87	NCD	Non-Convertible Debenture
88	NCMC	National Common Mobility Card
89	NDS-OM	Negotiated Dealing System-Order Matching
90	NECS	National Electronic Clearing Service
91	NEFT	National Electronic Funds Transfer
92	NETC	National Electronic Toll Collection
93	NFC	Near Field Communication
94	NFS	National Financial Switch
95	NG-RTGS	Next Generation-Real Time Gross Settlement
96	NPCI	National Payments Corporation of India
97	NSBL	Nepal SBI Bank Limited

Sl No	Acronym	Expansion
98	ODR	Online Dispute Resolution
99	OTC	Over The Counter
100	P2M	Person to Merchant
101	P2P	Person to Person
102	PA	Payment Aggregator
103	PAN	Primary Account Number
104	PBs	Payment Banks
105	PDC	Private Digital Currency
106	PFMIs	Principles for Financial Market Infrastructures
107	PG	Payment Gateway
108	PIDF	Payments Infrastructure Development Fund
109	PIN	Personal Identification Number
110	PKI	Public Key Infrastructure
111	PM	Performance Metrics
112	PoA	Point of Arrival
113	PoS	Point of Sale
114	PPI	Prepaid Payment Instrument
115	PRD	Panel for Resolution of Disputes
116	PSO	Payment System Operator
117	PSP	Payment System Provider
118	PSS	Payment and Settlement Systems
119	PSTN	Public Switched Telephone Network
120	PSU	Public Sector Undertaking
121	QCCP	Quantified Central Counterparty
122	QR	Quick Response
123	RBI	Reserve Bank of India
124	RDA	Rupee Drawing Arrangement
125	RECS	Regional Electronic Clearing Service
126	RRBs	Regional Rural Banks
127	RS	Regulatory Sandbox
128	RTGS	Real Time Gross Settlement
129	SAR	System Audit Report
130	SEBI	Securities and Exchange Board of India
131	SFMS	Structured Financial Messaging System

Sl No	Acronym	Expansion
132	SGL	Subsidiary General Ledger
133	SIPS	Systemically Important Payment System
134	SMS	Short Message Service
135	SOF	SWIFT Oversight Forum
136	SPC	SAARC Payments Council
137	SRO	Self Regulatory Organisation
138	SSS	Securities Settlement System
139	STP	Straight Through Processing
140	SURU	Semi-Urban and Rural
141	SWIFT	Society for Worldwide Interbank Financial Telecommunication
142	TAT	Turn-Around Time
143	TPA	Third Party Applications
144	TPAP	Third Party Application Provider
145	TR	Trade Repository
146	TRAI	Telecom Regulatory Authority of India
147	TReDS	Trade Receivables Discounting System
148	TREPS	Tri Party Repo Dealing System
149	TSP	Technology Service Provider
150	UIDAI	Unique Identification Authority of India
151	UPI	Unified Payments Interface
152	UPId	Unique Product Identifer
153	USSD	Unstructured Supplementary Services Data
154	UTI	Unique Transaction Identifier
155	VC	Virtual Currency
156	WLA	White Label ATM
157	WLAO	White Label ATM Operator

Appendix 4

References

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2) Assessment of the Progress of Digitisation from Cash to Electronic - RBI

3) CPMI Red Book

NOTES

NOTES

RESERVE BANK OF INDIA
DEPARTMENT OF PAYMENT AND SETTLEMENT SYSTEMS
CENTRAL OFFICE
MUMBAI