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An evaluation of the prospects of private firms entering in payment systems in India

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Abstract: Financial transactions are made easier in today's fast moving world. Conventional payment methods lost its importance. Majority is depending on online methods for financial transactions. Now people use mobiles and other electronic gadgets to buy and sell goods and services. Every transaction done is controlled by a payment system. In every country there is a payment system to control all the payments and settlements. National Payments Corporation of India (NPCI) manages the payment systems in India. NPCI is an institution which provides many financial services like payments, transfers, providing 24*7 services, easy access to banking services etc. It helps all the financial institutions, government sector, banks and corporate sector to get easy access to financial services. This institution helps in promoting financial inclusion in Indian economy by bringing innovations in technology. The concept of private sector payment systems emerged just recently in Indian economy. It's been used in many other countries. This paper will assess the impact of private sector payment systems in India.

Evaluation was done on the basis of secondary data collected from newspapers, journals, articles etc. The data analysis is done by reviewing several documents of the respective organizations which are in control of different payment systems in different parts of the world.

Keywords: Private Payment Systems, NPCI, RBI, Digital Payments, Electronic Payments

INTRODUCTION

Before the concept of money there was barter system. The exchange of goods and services takes place in barter system. In Barter system we cannot estimate the correct value of the goods and services. In order to avoid such problems the concept of money came in. The introduction of money in the market helped in making the transactions easier. After so many decades money was the only mode of payment. There were many problems in settlement of cash transactions. Some cash transactions do not involve any valid document. It is very difficult to account such transactions. Auditing becomes difficult if there is no valid voucher and there are more chances of illegal transactions. After the cash era, negotiable instruments were introduced into the market. The major negotiable instruments that are used in traditional payment systems are drafts, letter of credit etc. Traditional payment systems involves more time, burden of carrying cash, counterfeit currencies, black money, transaction errors, hawala transactions etc. Drastic changes in the mechanism of payment systems in India came after the new economic policy of 1991. Globalization was introduced in Indian market after the introduction of New Economic Policy. More FDI was pumped into our market. The role of private sector increased. The number of transactions increased. Burden of cash transaction increased. In 1999, National Payments Council (NPCI) was formed. It's an apex body which makes policy directions and also makes reforms in payments and settlements. NPCI made emphasis

on implementation of the Real Time Gross Settlement System (RTGS). RBI formed a Board for Payment and Settlement Systems (BPSS) as per RBI regulations 2005. This board was formed for 2 years. Its aim is to strengthen the institutional framework of payment systems. In their Vision Document 2005-08 for Payment Systems, RBI pointed out that the main goal of any payment system is to allow free flow of money. The main aim of BPSS was digitalization of payment systems and establishing an infrastructure for technological, legal and procedural development. In 2007, a Department of Payments & Settlement Systems (DPSS) which is a functional department of RBI was formed. In order to supervise and regulate the Payment Systems RBI passed an act in parliament which is known as Payment and Settlement Act 2007. (1.), (2.), (3.), (10)

PAYMENT SYSTEMS

Payment Systems are utilised for performing financial transactions. Different processes and technologies are involved in payment systems. Payment system helps in improving the flow of money into the economy. A developed economy should include a cheap, efficient, reliable, faster payment system. An efficient payment system helps in taking risks. The people should get access to all transactions without any time constraints. They can do financial transactions anywhere and at anytime. A payment system is better when it is reasonable, reliable and faster. Central bank of a country helps in overall development of this system. RBI is the apex bank of our whole nation. RBI has put forward many initiatives for providing a safe, secured, efficient, accessible and authorised payment system in India. The major aspects put forward by RBI before making payment systems are:

1. Paper Based Payments

In India, almost 60 percentages of non cash transactions are paper based instruments. Paper based instruments include cheques, drafts and other negotiable instruments. RBI has introduced Magnetic Ink Character Recognition in order to increase the efficiency in clearing of cheques.

2. Electronic Payments

There were many initiatives by RBI in order to digitalise the payments and settlement systems. The major initiatives that were introduced in 1980 and 1990 are:

1. Electronic Clearing Service(ECS) Credit

It was introduced in 1990 to handle bulk a repetitive transactions like salary, dividend payment, interest, pension etc.

2. Regional ECS (RECS)

It has debit and credit variants. It covers all the core-banking-enabled branches in a State or gathering of States and can be utilised by organizations envious of achieving recipients inside the State/gathering of states.

3. Electronic Clearing Service (ECS) Debit

It is used by institutions for making debits to a huge number of accounts for paying water bills, electricity charges, telephone bills etc.

4. Electronic Funds Transfer (EFT)

It is a method introduced in 1990 where we can transfer money from one bank account to another instantly using electronic mode with any other participating bank. Now it is not available for general public.

5. National Electronic Funds Transfer (NEFT) System

It was introduced in 2005 as a one to one transfer system that is available for individuals and corporate.

6. Real Time Gross Settlement (RTGS) System

Here the transfer takes place on the spot and it is irrevocable.

7. Clearing Corporation of India Limited (CCIL)

It functions as an organization which links with an exchange to handle confirmation, delivery and settlement of transactions.

OTHER PAYMENT SYSTEMS IN INDIA

1. Pre-paid Payment Systems

These instruments can be furnished in the form of smart cards, wallets etc. which make easier to purchase goods and services.

2. Mobile Banking System

It was introduced in 2008 as a mobile banking service.

3. Automated Teller Machine / Point of Sale Terminals / Digital Transactions

Automated Teller Machine is a service provided by financial institutions using debit Card, credit card etc. These cards can be used for buying and selling goods and services in point of sale (POS) terminals. (4.)

NEED FOR NPCI

In 2008, RBI along with Indian Banking Association founded National Payments Corporation of India under the Payments and Settlements Systems Act 2007. It was formed "under section 25 of Companies Act 1956(now it is under section 8 of Companies Act 2013), NPCI was incorporated as a not for profit company." It has 10 promoter banks. Its main goal is to provide infrastructure to integrate the whole banking system in India and also make India a less cash society. (4.)

FACTORS LED TO ESTABLISHMENT

Indian economy is highly advanced in information technology. The technological advancement should be used in payment systems also. The NPCI was formed in order to increase the usage of electronic payments and reduce the burden of cash in Indian economy. Consumers are expecting faster payments. For increasing gross domestic product (GDP) of our nation the buying and selling of goods should be increased.

Now everything is done online. Today's mode of payments includes card payments digital funds transfers, internet banking etc. In order to do faster payments and settlement the payment systems should be technologically advanced. The importance of NPCI increases when there is less use of cash transactions. NPCI provides unrestricted access to digital payment services, helps in financial inclusion, helps in providing various banking functions like transfer of money, electronic payments, checking bank account balance, generation of mini statement, changing account pin etc., integrate various financial institutions in a uniform platform, helps in easy transfer and payments, reduce the cost of different transactions, USSD code *99# can be used without internet. (4.)

Now Cashless Society is promoted in order to reduce burden of cash in the economy. Cashless Society is a recent phenomenon in India. Everything is done digital or electronic means. Cashless transactions help in avoiding parallel economy. It saves our time and money, speedier transactions, increase accountability and transparency, helps in avoiding red tapism etc. The major products of NPCI are:

1. Rupay Card

Rupay card is a domestic card introduced by NPCI in order to fulfill RBI vision to make participation of all banks and financial institutions in India. This card helps in providing customers with low cost and affordability, customised product offering, secured data, provide electronic options to people who have lower awareness level, provides interoperability between various payment channels and products.

2. National Financial Switch(NFS)

The Institute for Development and Research in Banking Technology designed NFS. NFS is the biggest network of apportioned ATMS in India.

3. Unified Payment Interface(UPI)

UPI is a unique pin given for online transactions in India. It has two versions. UPI 2.0 is the latest version. This unique pin can be used for transferring money.

4. *99#

It is a 4 digit USSD code that is used in any mobile. First that mobile number should be registered for such transactions. We can use this for knowing account balance, transferring money etc.

5. BHIM(Bharat Interface for Money)

It is an app which is easier to use in smart phones and payment of transactions is done through UPI for transferring money, checking account balance etc.

6. Immediate Payment Service(IMPS)

It provides 24 *7 money transfer. The problem of NEFT and RTGS is that it can be used in banking hours only.

7. National Electronic Toll Collection(NETC)

It helps in collecting tolls electronically.

8. NACH (National Automated Clearing House)

It is a centralised system to consolidate multiple Electronic clearing systems.

9. Aadhaar Enabled Payment System(AePS)

It is a payment service which is done by using Aadhaar Card.

10. Bharat Bill Payment System(BBPS)

BBPS is an integrated payment service used for paying bills for electricity, water, telephone etc.

11. Cheque Truncation System(CTS)

It is used for faster clearing of cheques.

12. Bharat QR

QR code is a unique code used for paying money in shops by using mobile apps. (4.)

THE CHANGING PARADIGMS OF PAYMENT SYSTEMS

In order to understand the major revolutions in payment systems, we need to analyze the existing payment systems in different parts of the world. Here only the developed countries like U.S.A., U.K. and Japan are analyzed. Private participation in payment systems is common in these countries. We will get a clear cut idea about the impact of private payment participation in these countries.

Payment Systems in selected countries

1. Payment Systems in U.S.A

In U.S.A, many financial intermediaries are involved in providing payment, settlement and clearing services. Some types of payment service were offered by deposit taking institutions. In U.S.A, there are many privately owned and operated payment systems. Federal Reserve System is known to be the central bank of U.S.A. It provides payment processing services. The main functions performed by the central bank are making monetary policy, promoting consumer protection and maintaining financial institution etc. In U.S.A, private payment systems starts from localised interbank associations which do clearance of cheques or ATMs or POS terminals, debit and credit card networks and a large value electronic funds transfer system. Here legal framework of payment systems is very complex because financial institutions work either at the state or federal level, and it is directed by 1 or more organizations at the state or federal level or both. Numerous varieties of clearance mechanism are involved in dispensing the obligations of payment among customers and financial institutions. These payment instruments may vary in their features like cost, technological differences, ease of access, availability of funds etc. Here the large value electronic funds transfer systems help to dispense the cash in United States. Payments involved in retail transactions are settled through paper based instruments like cash, cheques etc. Here the usage of ATM cards, POS transactions, Automated Clearing House transactions are increasing day by day.

In U.S.A, payment systems are classified into two:

- 1. Wholesale payment systems
- 2. Retail Payment Systems.
 - 1. Wholesale payments Systems

Wholesale payments Systems are classified into:

1. Fedwire

Fed wire was started in 1918 and is formerly known as the Federal Reserve Wire Network. Fed wire transfers can be done online using telephone based services called FEDNET. It is administered by Federal Reserve System which is a real time gross settlement system. This enables establishments to exchange reserves electronically.

2. Society for Worldwide Interbank Financial Telecommunications (S.W.I.F.T.)

S.W.I.F.T. is owned by 2800 banks in the world (Around 150 are from U.S.) and was incorporated in Belgium. It is a system that transmits and makes money related messages among members and system of clients connected round the world.

3. Clearing House Interbank Payments System (CHIPS)

CHIPS were begun in 1970 as a private payment clearing system worked by Clearing House Interbank Payments Company L.L.C. (CHIP Co). CHIP Co is governed by a 10 member board which consists of 4 elected participants and other 6 members are appointed by the clearing house. Investment in CHIPS is

open to banking institutions or Edge Act organizations that meet the requirements point by point in Rule 19 of CHIPS Rules.

4. National Settlement Service (NSS).

National Settlement Service (NSS) is carried out by Federal Reserve System that is utilised for settling clearing houses, money related trades and other clearing and repayment courses of action.

2. Retail payment Systems

Retail Payment Systems are classified into Cheques, Credit Cards, Electronic Payments Network (EPN) and Automated Clearing House. Cheques are paper based instruments used for payment instead of cash. This type of payment instrument is largely used for non cash payment in U.S.A. Credit card is issued to a person for obtaining products and ventures. National Automated Clearing House Association (NACHA) which controls Automated Clearing House (ACH) network is an electronic batch processing system where payment requests can be exchanged among associations which are utilizing cash as a mechanism of exchange. Electronic Payments Network (EPN) handles electronic transfers. (6.),(7.),(11.)

T9: Value of transactions processed by selected payment systems Source (USD trillions; total for the year)							
« United States »	Year						
< 2017 > >	2013	2014	2015	2016	2017		
Level: 1 2 3 4 5 6 Filter: D Select to chart	2013	2014	2015	2010	2011		
□ Large-value payment systems							
□CHIPS							
■Total gross value ¹	380	391	376	364	393		
■ Breakdown of 'total gross value' by instrument type							
☐ Fedwire Funds Service							
■Total gross value ²	713	885	835	767	740		
■ Breakdown of 'total gross value' by instrument type							
■NSS							
■ Total gross value ³	17	18	18	18	19		
■ Breakdown of 'total gross value' by instrument type							
Concentration ratio in terms of value (%) 4	nav	nav	nav	nav	52.00		
☐ Retail payment systems							
☐ Cheque clearing: Federal Reserve ☐							
■Total gross value ⁵	8	8	8	8	9		
■ Breakdown of 'total gross value' by instrument type							
☐ Cheque clearing: Private							
■Total gross value ⁶	10	10	10	10	10		
■ Breakdown of 'total gross value' by instrument type							
™ EPN							
■ Total gross value 7	19	20	21	22	23		
☐ Breakdown of 'total gross value' by instrument type							
⊡FedACH							
Total gross value ⁸	20	20	21	22	23		
■ Breakdown of 'total gross value' by instrument type							

Source: CPSS Red Book Statistical Update, 27 September 2018.

2. Payment Systems in United Kingdom (UK)

"In United Kingdom, guidelines of money related issues are finished by the Bank of England alongside Financial Services Authority and U.K Supervisory agency The major duties of central bank are done as per the Bank of England Act 1988 and the Banking Act 2009 and the duties of Financial Services Authority (FSA) are done as per Financial Services and Markets Act 2000. The Financial Services and Markets Act 2000 came into force on Dec 1 2001 and it changed the previous regulatory authority to FSA. Now there are mainly 4 interbank payment systems operated and managed by independent

companies. Previously this was under the control of Association for Payment Clearing Services". The four main interbank systems are:

1. CHAPS(Clearing House Automated Payment System)

Now the CHAPS system is operated by Bank of England. It provides risk free settlement. CHAPS have a place in the largest high-value payment systems in the globe. It provides well organised, secure and payments cannot be reversed. Now almost 30 participants which are direct and around 5000 financial institutions make payments through chaps. It is a real time gross settlement system that is being operated by CHAPS clearing Company.

2. BACS(Bankers' Automated Clearing Services)

In BACS, payment transactions are done electronically at a date in and it is managed by BACS Payment Schemes Ltd (BPSL). This digital system is utilised to make legitimately starting with one bank account holder to next bank account holder.

3. Faster Payments Service (FPS)

In 2008, FPS was founded as a system where payment transactions are done electronically at a date in future and it is owned and managed by Faster Payments Schemes Limited.

4. Cheque & Credit Clearings (C&CC)

Here the paper based clearing system for cheques is used. It is owned and operated by Cheque and Credit Clearing Company Limited (C&CCC). It was launched in October 2017. This company also manages image clearing system.

Other payment systems in UK

1. LINK

LINK is a payment system managed by linked merchandise banks and is utilised for withdrawal of cash through any ATM in U.K. It sets the tenets and is in charge of the administration of everyday administration of ATMs.

2. CREST

CREST is a private security settlement framework which bolsters a delivery-versus-payment (DVP) for transactions in Irish language, Manx language and U.K and Channel Islands securities.

3. LCH Clearnet Ltd

LCH Clearnet Ltd is a where private is administered and it serves major international exchanges. This company clears assets like foreign exchange assets, swaps transactions involving interest rate, exchange traded derivatives', products, derivatives involving freights, securities, swaps which avoid the risk of buyers by eliminating loss of credit by defaulting, energy contracts and Euro and Sterling denominated bonds like bulldog bonds and repurchase agreements' (8.), (11.)

T8: Volume of transactions processed by selected payment systems

(millions, unless otherwise stated; total for the year)

« United Kingdom »	Year				
Level: 1 2 3 4 5 6 Filter: D Select to chart	2013	2014	2015	2016	2017
■ Large-value payment systems					4.5
☐ CHAPS Sterling					
Total gross volume	35	37	38	39	42
■ Breakdown of 'total gross volume' by instrument type					
Concentration ratio in terms of volume (%)	73.00	72.00	71.00	75.30	72.30
■ Retail payment systems					
■BACS					
■Total gross volume	5,695	5,841	6,080	6,219	6,347
■ Breakdown of 'total gross volume' by instrument type					
Number of netting cycles	1	1	1	1	1
□ Cheque/credit					
■ Total gross volume	587	518	445	378	310
■ Breakdown of 'total gross volume' by instrument type					
Number of netting cycles	1	1	1	1	1
■LINK					
■Total gross volume	nav	nav	nav	3,171	3,105
■ Breakdown of 'total gross volume' by instrument type					
Number of netting cycles	nap	nap	nap	1	1
■ Fast payment systems					
■ Faster Payments Service					
Total gross volume	968	1,101	1,247	1,426	1,656
■ Breakdown of 'total gross volume' by instrument type					
Number of netting cycles	3	3	3	3	3

Source: CPSS Red Book Statistical Update, 27 September 2018.

3. Payment Systems in Japan

There are mainly 4 payment systems in Japan.

- 1. The BOJ-NET Funds Transfer System (BOJ-NET FTS)
- 2. The Zengin Data Telecommunication System
- 3. The Foreign Exchange Yen Clearing System (FXYCS)
- 4. The bill and cheque clearing systems (BCCS)
- 1. The BOJ-NET Funds Transfer System (BOJ-NET FTS)

The Bank of Japan manages this payment system and is utilised to settle interbank commitments. It also includes net obligations of participants in the private sector clearing systems.

2. The Zengin Data Telecommunication System(Zengin System)

It started its operations in 1980. It is managed in private sector which is used to clear retail credit exchanges.

3. The Foreign Exchange Yen Clearing System (FXYCS)

FXYCS is a payment system established in 1980. It is operated in the private sector which is used to clear cross border transactions using YEN currency.

4. The bill and cheque clearing systems (BCCS)

BCCS is a private payment system which is used to clear cheques and bills produced before at regional clearing houses. (9.), (11.)

T8: Volume of transactions processed by selected payment systems Source (millions, unless otherwise stated; total for the year)

« Japan »	Year				
Level: 1 2 3 4 5 6 7 Filter: D Select to chart	2013	2014	2015	2016	2017
■Large-value payment systems					
■ BOJ-NET					
	16	17	17	16	17
☐ Partial breakdown of 'total gross volume'					
Of which: volume of settlement in the PS in question for other PSs	nav	nav	nav	nav	nav
Breakdown of 'volume of settlement in the PS in question for other PSs' by PS whose transactions are settled					
'FXYCS' net volume settled in 'BOJ-NET' 1	7	6	7	7	7
'Zengin System' net volume settled in 'BOJ-NET' ²	2	3	3	2	3
Concentration ratio in terms of volume (%)	45.80	49.36	47.95	49.10	49.57
₽FXYCS					
■Total gross volume	7	6	7	7	7
■Breakdown of 'total gross volume' by instrument type					
Credit transfers	7	6	7	7	7
Concentration ratio in terms of volume (%)	80.67	80.41	76.32	76.82	77.29
■Retail payment systems					
■Tokyo Clearing House					
■Total gross volume ³	23	22	21	19	18
Number of netting cycles	1	1	1	1	1
■Zengin System					
■Total gross volume ⁴	1,481	1,515	1,548	1,576	1,594
Number of netting cycles	1	1	1	1	1

Source: CPSS Red Book Statistical Update, 27 September 2018.

The analysis of private sector payment systems in these three countries has shown that they have made a good performance in the payment systems scenario. India is a country who is new to this type of innovation. This is an experiment for India. Only competition will help to improve the system. If a monopoly exists then there will be many problems. Those can be avoided by creating competition.

Present position of NPCI in India

NPCI is now the payment system which is a monopoly in payment scenario. It processed half of the digital payments across the country. On Jan 21 2019, Reserve bank of India released a policy paper on Authorization of new retail payment systems. In RBI's point of view, the concentration risk of payment systems should be reduced. They are trying to solve this problem by opening new private payment systems.

The main advantages of monopoly of payment systems according to RBI are:

1. Standardization:

There will a standardised way to make easier systems and procedures.

2. Economies of Scale:

Monopoly can promote economies of scale.

3. Oversight and governance:

There is unity of approach towards directing and regulating a single entity or a small group of institutions.

The main disadvantages of monopoly of payment systems according to RBI are:

1. Systemic and Operational risk:

There is a chance of single point of miscarriage and furthermore it makes the entity too big to fizzle.

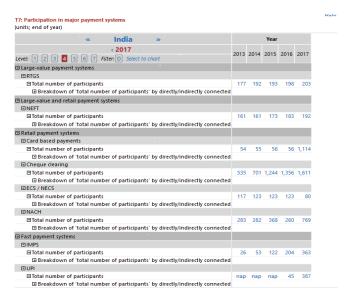
2. Lack of innovation and upgradation:

There is no competition among payment systems. So there is no chance of making innovations.

2. Inefficiencies:

The monopolistic behavior of the system may negatively impact customers on giving access, giving good quality of service, etc. (12.)

These are the major advantages and disadvantages according to RBI. RBI is trying to open up payment systems to private sector. RBI is analyzing the impacts before adopting this policy.



Source: CPSS Red Book Statistical Update, 27 September 2018.

LIC AND NPCI

Life Insurance Corporation of India (LIC) is an organization founded in 1956 following the life insurance act in parliament. It is the largest life insurance company in India. LIC has acquired immense development in the field of Insurance. In 2000, government planned to liberalise the life insurance sector and gave opportunity to private sector to curb the monopoly of LIC. Subsequently LIC showed tremendous performance and now private sector fails to compete with LIC. Now IDBI bank employees joined the prestigious LIC's workforce to show the synergies of both bank and insurer. This clearly shows that competition can bring improvements to technology, workforce, profitability etc.

Now RBI's plan for giving opportunity for private sector to participate in payment Scenario can make improvements to NPCI like LIC. RBI has setup a High-Level Committee for Deepening of Digital Payments on Jan 9 2019. It was

formed in order to persuade digitization the payments scenario and increase financial inclusion through digitization. The committee has 5 members which includes a chairman and 4 other members. The major problems that should be analyzed by committee according to RBI are:

- 1. To analyze the current status of digitalization of payments in the nation and recognise the current flaws in the system and suggest its measures.
- 2. To evaluate the present dimensions of digital payments in financial inclusion.
- To attempt cross country investigations so as to recognise best practices that can be embraced in our nation to quicken digitization of the economy and financial inclusion by using more digital payments.
- 4. Recommend measures to fortify the wellbeing and security of digital payments.
- 5. To give a guide to expanding client certainty and trust while using financial services through electronic modes.
- 6. To recommend a medium-term procedure for extending of digital payments.
- 7. Any other significant item of importance. (13.)

Now NPCI is handling all payment methods like Unified Payment Interface, *99#, National Financial Switch, Rupay Contactless, Rupay, BHIM, Immediate Payment Service, National Electronic Toll Collection, NACH (National Automated Clearing House), Aadhar Enabled Payment System, Bharat Bill Payment System, Cheque Truncation System, Bharat QR etc. So there is more burden for NPCI. I think by analyzing different companies in different sectors private sector participation has improved their performance. So I think if private sector is given an opportunity to participate in payment systems. NPCI will try to compete with this private sector payment systems and will show more improvement in their functioning. The concentration risks can be minimised and they can bring innovations. In many countries like U.S.A., U.K., Japan etc private sector participation in payment systems has shown tremendous performance. India is faster in making innovations in technology. Competition will help to improve the overall performance of NPCI. Improvement in new technologies will help to reduce error rate of transactions and it will help to provide accurate data. Delay in settlement of transactions can be reduced. NPCI will try to provide security of data by using data encryption methods. By upgrading technology quality of service can also be improved. So in India if RBI allows more private sector participation then they will show their best and meanwhile NPCI will also improve like LIC.

References

- (1) Speech by Shri R. Gandhi, Deputy Governor October 22, 2016 at the Banaras Hindu University, Varanasi
- (2) https://www.npci.org.in/sites/all/themes/npcl/images/PDF/Feb 13 7th Network International User Conference.pdf
- (3) https://www.rbi.org.in/scripts/PaymentSystems_UM.aspx
- (4) https://www.npci.org.in/about-us-background
- (5) https://www.npci.org.in/
- (6) Hayashi, F. (2015). Faster payments in the United States: how can private sector systems achieve public policy goals?.
- (7) https://www.bis.org/cpmi/paysys/unitedstatescomp.pdf
- (8) https://www.bis.org/cpmi/paysys/unitedkingdomcomp.pdf
- (9) https://www.boj.or.jp/en/paym/outline/pay boj/pss1212a.pdf
- (10) https://www.financialexpress.com/archive/rbi-forms-panel-on-payment-and-settlement-systems/129002/

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- (11) Ranjan, R. D. K. (2011). Management of payment and settlement systems in India critical review and challenges.
- $(12)\ https://m.rbi.org.in/scripts/PublicationReportDetails.aspx?UrlPage=\&ID=918$
- $(13) https://rbi.org.in/Scripts/BS_PressReleaseDisplay.aspx?prid=45949$