

BANKING IN DIGITAL ECONOMY: AN INDIAN PERSPECTIVE

A B Debasis Rout⁴⁸

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ABSTRACT: *Today, every nation wants to be fully digitalized and this programme strives to provide equal benefit to the user and service provider. Hence, an attempt has been made in this paper to understand Banking in Digital age – as a campaign where technologies and connectivity will come together to provide impetus to public policy governance and improvisation of living standards of citizens by mobilizing the capability of information technology in ensuring a cashless economy as in the case of Digital India drive the Indian Government aimed at remodeling India into a knowledgeable economy.*

In this regard, Migration from cash to electronic payments as envisioned in the Payment Systems Vision Document of the Reserve bank of India paves way for a digital revolution wherein traditional economy denominated by cash transactions is subsequently being substituted by electronic payment channels like Prepaid Payment Instruments (PPI) which includes mobile wallets, Cheque Truncation System (CTS), Retail electronic clearing, credit and debit card usages, Immediate Payment Service (IMPS) etc.

Hence an attempt has been made in this manuscript, to analyse the growth in trends of digital transactions in both urban and semi-urban areas with consequent focus on the determinants and challenges guiding the transformational impact of technological innovation in banking ecosystem. For this purpose, secondary data analysis, involving the review of research reports, statistical databases concerning digital payment instruments etc shall be used to address the potential developments, significant challenges in the era of cyber landscape and suggestive measures concerning cyber security as a panacea to counter increasing instances of cybercrimes (cyber frauds) that inevitably influences the behaviour pattern of customers in adopting the digital payments gateway.

This paper also seeks to examine the readiness of Indian economy in terms of infrastructure sustaining framework for the evolving banking system with substantial comparisons with its peer economies. In this regard, this paper mentions the glaring digital divide in India and how it is imperative for a balance between digital literacy and financial inclusion to deal with disruptive shocks like demonetisation in the economy.

This manuscript seeks to draw the attention of the readers towards the dynamics of digital financial transactions during the demonetisation and remonetisation phase in Indian context and how the tabulated data is not conclusive of the popular belief that digital economy would do away with illicit facets of the economy and ensure renewed commitment towards provision of safe, efficient, accessible, inclusive, interoperable and authorised payment and settlement systems in the country.

Key words: *Disruptive shocks; Financial Inclusion; Cyber Security; Remonetisation; Electronic Payment Channels.*

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INTRODUCTION

In the neo-liberal era projecting increasing trends in consumerism, and where customer is adjudged as the king, the need for digitization in the banking system in India is felt to improve customer service. A step in this direction earnestly started in India in 1988 by Reserve Bank of India (RBI) setting up a committee on computerization of banks headed by C. Rangarajan. Since then, the country has made rapid strides in the technological innovations ranging from core banking system to digital customer services which not only improved banking services but also in turn had benefited banks immensely by reducing operational costs and improved services. Though the experience is not entirely smooth, but it had benefited both ways and contributed a great deal to India's economic achievements. Not to forget that the banking network in India is one of the largest in terms of global comparisons and post the new economic reforms era, it had witnessed a series of banking cum financial sector reforms. Also India is currently the second fastest growing economy and poised to overtake China as the fastest growing economy. To sustain the momentum in technological innovations, India needs a robust banking system which is able to deliver fast, secure and quality service to its customers. Therefore, it is imperative to further improve the extent of digitisation.

India is basically a cash based economy to the extent that 78% of retail payments are cash based and compared to its peer economies like China, Mexico and Brazil, India ranks very low. Recently Indian Government's aggressive push for more digitisation by disruptive activities like demonetisation had brought the focus back on digitisation. It has also brought back the focus on debates like to what should be the priorities for moving towards digitisation, whether disruption activities like demonetisation are necessary to force the behavioural changes and whether it will yield desired result.

In this light, the present paper attempts to study the various modes of digitisation in India, challenges and opportunities of it and suggestions to achieve the desired results as envisioned in the Digital India Initiative .

LITERATURE SURVEY

According to Katz and Koutroumpis (2012), digitization of the economy envelopes a number of innovations that helps in taking a leap from older technology and contributes to advancement in economic development and creation of jobs by a multiplier effect, in comparison to the traditional technologies. They attempted to measure the paradigm shift in digitization by taking a sample that spanned across 150 countries from the period 2004 to 2010, by developing an Index of Digitization based upon six indicators measuring Affordability, Ubiquity, Usability, and Reliability, Skill and Speed and 23 sub-indicators that dealt with the tangible parameters of perceived digitization metrics. Singh and Irving (2013), also conducted a study as to how the electronic payments had an impact on economic growth and concluded that increased card usage makes the economy productive, boosted consumption and GDP growth by assuring consumer confidence on the payment system through proper policy interventions. Further Mukhopadhyay (2016), specifically analysed India's transition towards a cashless economy and suggested policy interventions to incentivise cash inflows into bank accounts that would enable digitized payments. Instruments such as Mobile banking and Usage of cards at PoS machines were considered for the study. However the path towards a cash-lite economy is bounded by a lot of challenges as well , apart from the economic benefits. A study conducted in Ghana by Kumaga (2010) examines the challenges in the way of implementation and usage of electronic payments. The identified challenges are digital divide, people's resistance to new payment

mechanism, security, unavailability of payment infrastructure base, regulatory and legal issues, sociocultural hindrances, low level of internet penetration, under developed banking system, political and economical stabilities of neighbouring countries, high rates of illiteracy, high cost of internet charges, frequent power interruption etc. Amongst the challenges, it is the security and privacy of data issues which poses significant threat as investigated by Ackerman and Davis (2003). Incidentally, the importance of cyber security became essentially highlighted during the demonetisation drive taken by the Indian Government. In this regard Economic Survey (2017) has stated the essential need of cyber security mechanism that would inspire confidence among the customers to aid them in making informed decisions as and when they opted for digital payments.

OBJECTIVES:

1. To study the modes of digitized transactions prevalent in India.
2. To study the opportunities and obstacles in the way of the Indian banking system in the era of digital revolution.
3. To analyze the effect of forced behavioral changes like demonetization to digitize Indian economy.

METHODOLOGY:

Time period:

The time period of the study is 18 months. Pre-demonetisation period is taken as seven months starting from April'2016 to October'2016, Demonetisation period is taken as four months starting from November'2016 to February'2017 and Post-demonetisation period is taken as seven months starting from March'2017 to September'2017.

Variables:

The paper focuses on nine of the commonly used modes of digitised transactions like Credit and debit card usage at POS (Point of sale) machines excluding usage at the ATMs, Mwallets, PPI cards, Paper vouchers, RTGS (Real Time gross settlement), Mobile Banking, IMPS (Immediate payment excluding usage at Service), and NEFT (National Electronic Fund Transfers).

Tools:

Secondary data is collected from official websites of RBI and NCPI. Different websites, journals, books, and newspapers have been referred for the study to be purposive, meaningful and analytical. Simple statistical tools like Measures of Central Tendency, Percentage method and graphical methods are used for data analysis in this paper.

Modes of digitized transactions prevalent in India

Meaning of Digital Payment

A digital payment occurs when various electronic mediums are used to purchase goods and services excluding the usage of cash. For a digital transaction to occur, there are three necessary components: A Payer, Payee and a Channel of banking transaction.

Digital payment methods as considered to be an alternative to traditional mode of payments are easy and economical modes of transaction which provides the customers the flexibility to make payments as per their convenience. In other words, digital payment method is a costeffective delivery channel for the modernised financial institutions. Electronic payments are used to pay utility bills, pay for purchasing goods and services online and offline, pay for cell phone services and internet access, and offers the option to immediately transfer money with ease which might range from a big amount to a small amount.

The Government of India under the “Cashless Movement” has come with different types of digital payment instruments like Debit/Credit Cards, Internet Banking, UPI, Mobile Wallet, Point of Sale (PoS), Bank Pre-Paid cards, Mobile Banking etc.

The official ‘Cashless India’ website provides definitions for ten modes of digital payments.⁵⁰

- 1. Banking cards:** These cards enable the customers to store card information in different ewallets and payment apps, which helps in making online transactions. Due to their security features and benefits, cards are widely preferred by the customers.
- 2. USSD:** Unstructured Supplementary Service Data*99#, does not require any kind of mobile data facility to make transactions and is also available in Hindi language apart from English. Through this service customers can make balance enquiries, can initiate fund transfers and it can effectively aid in both social and economic inclusion of neglected sections of the society.
- 3. UPI:** This payment system is interoperable using which any customer having a bank account and UPI based app can send and receive money, without incurring any kind of transaction charges. This service works via Virtual Payment Address and does not require a bank account or IFSC code to initiate fund transfers.
- 4. Mobile Wallets:** It is basically based on mobile app and used for making secured payments by storing details of bank account and cards in an encoded format. Customers using mobile wallets are not required to remember PIN. Many banks and private players in India have developed mobile apps and have started providing services like payment app, mobikwik etc.

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COURSES TAUGHT:

- *Principles of Accounting*
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He is a qualified Chartered Accountant with considerable industry experience and also some teaching background. Presently, his career goals are fully focussed on academic, and he seeks to harness his expertise to conduct meaningful research and train future managers.

One specific area he seeks to specialise in is the rural sector, where much of his work experience lies. He feels this is not only an emerging area in its own right from a commercial point of view, but also carries with it considerable socio-economic implications. Given his formal training as also his work experience, he stand in an advantageous position to contribute significantly to it in terms of both research and teaching.

RESEARCH INTEREST: *Finance; Rural Banking, Direct Taxes; Taxation Policy; Social Aspects of Taxation*

⁵⁰ Cashless India < http://cashlessindia.gov.in/digital_payment_methods.html>

5. **Bank pre-paid cards:** This mode allows the customers to make payments by just loading on money to it.
6. **POS terminals:** The customers can make purchases using credit or debit cards via this device which is installed at all retail stores and is also used by small time business owners who do not want to invest in expensive electronic registers. Virtual PoS systems use web based applications to process payments.
7. **Internet Banking:** Basically it refers to banking transactions carried out online using Internet banking. Fund transfer through NEFT, RTGS, opening of accounts and making deposits are major internet banking transactions done in India. Customer needs to log in to the internet and authenticate by using his ID & Password to carry out transactions.
8. **Mobile Banking:** This mode aims at making a large population of Mobile users to do the banking through their smart phones. Its scope in India is ever growing through various mobile apps Like BHIM, E-wallet, PAYTM etc.

Opportunity and challenges faced by Indian banking system in the era of digital revolutions

OPPORTUNITIES OF DIGITAL BANKING:

With the radical change in customer behaviour and increase in mobile phone users and internet penetration across the globe, the option of digital banking is phenomenally opted as a preferred option for making both high value and low value transactions and this shift to digital technology has created a window of opportunities which are as follows:

- It is an economical and convenient mode of payment and the system offers varied digital services of high value suiting to changing customer requirements.
- There are lot of costs involved in printing of new currency notes and in replacement of the soiled cum mutilated notes. Switching to digital banking results in reduced costs apart from saving time in financial transactions.
- Digital banking aids in checking tax evasion and generating revenue collections by ensuring transparency and accountability .This could lead the way in curbing black money in the economy by keeping track of every financial transaction.
- There would also be a decline in crime rate involving illegal activities like drug trafficking, prostitution, etc as it happened in case of Sweden economy when it shifted to cashless transactions.
- Engaging in digital transactions would reduce the preference for cash holdings and leave more cash with the banks which would enable more savings and investment opportunities.

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Qualification:

1. *Pursuing PhD from Utkal University, Bhubaneswar.*
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3. *Qualified Net & JRF.*

Achievements

1. *State Topper in Plus Two Exams, CHSE, Odisha(6 th rank).*
2. *Graduation Topper in Eastern Zone, Odisha.*
3. *First Rank Holder in Junior Lectureship Examination conducted by OPSC*

Interest Areas in Research: Energy Sector and Finance Sector

- Carrying cash has always raked in the safety issue in comparison to digital banking where security issues can be reduced by proper cyber security measures.
- Digital banking is coming up with new technologies (cloud and mobile technologies, biometrics) to drive new innovations in the market and pose stiff competition to nonbank entities and retain customer loyalty.

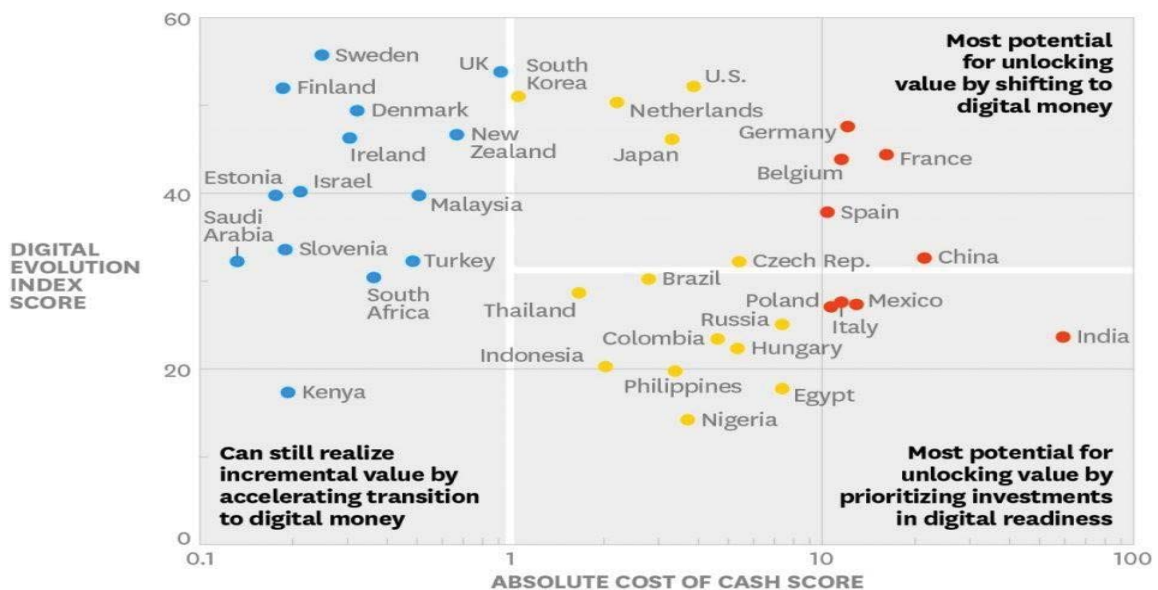
Challenges to Digital Banking

In a recent Report unveiled under the Digital Evolution Index 2017, India's rank (53) is the lowest among BRICS (Brazil – 46, Russia – 39, India – 53, China – 36, and South Africa – 43) nations, amongst 60 countries. The core parameters of the comprehensive research pertaining to the Index that tracks the progress of countries include supply, consumer demand, institutional environment, and innovation. India has shown rapid strides in digital payments ecosystem with the demonetisation phase acting as a catalyst. However, there are certain evident barriers which the economy needs to address to unblock the hidden potential of switching to digital payment ecosystem.

Nonetheless, the digital evolution index score, hints at the Indian economy's potential to unravel the digital dividend by shifting from cash-rich economy to cash-lite economy. (Refer to Image 1)

Which Countries Are Best Positioned to Go Cashless?

Looking at digital readiness paired with absolute costs of cash highlights potential cashless sweet spots.



SOURCE DIGITAL EVOLUTION INDEX, THE FLETCHER SCHOOL AT TUFTS UNIVERSITY

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The digital drive in India's banking system faces the following challenges:

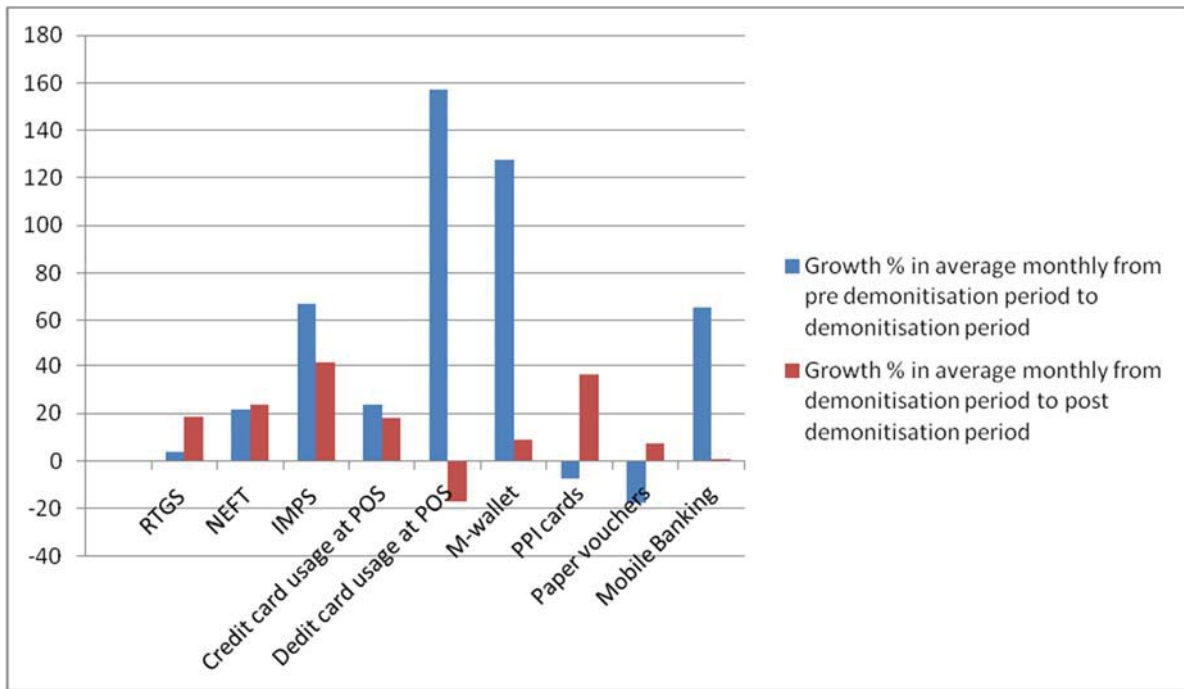
- (1) There is the risk of digital divide between the rural and the urban areas, where the accessibility of internet (ICT) and financial services, to the poor and vulnerable sections of the population are yet to be addressed in totality. One major fallout is the uneven development of infrastructure facilities leading to delay in implementation of infrastructure projects. Hence, the need of the hour, is mitigating this rural-urban divide by addressing the needs of the remote rural areas.

- (2) According to the findings of a survey, the major deterrents towards digitization among the consumers are: security concerns, lack of awareness, lack of strong ecosystem for cashless payments, additional costs of digitization, non-availability of point of sale system, instability of mobile network, strong preference on cash due to convenience, low regulations of the Indian banking system, and lack of effective complaints and redressed mechanisms.(Statista 2018).
- (3) There are challenges pertaining to policy formulations which make the Indian banking system low on its regulatory framework.
- (4) Data Security is one such area over which even the Economic Survey has made a mere mention but is absolutely silent over its importance and implementation. Recent incidence of compromise of personal details of 3.2 million debit cards on cloud based services like Digi Locker can't be ignored.
- (5) In India, where digital literacy is a big concern even for the Bureaucrats, it becomes essential to highlight the importance of spreading literacy in vernacular languages, which is a vulnerable area.
- (6) India's rank is very low in the Digital Evolution Index score due to poor adoption of information technology systems to provide customized web-based citizen services, catering to daily recurring needs of the customers and business professionals.
- (7) There is no separate entity for customer grievance redressals.
- (8) Banks must enhance their IT security system, to ward off cyber attacks and combat financial fraud and all forms of money laundering.

Analysis of effect of forced behavioural changes like demonitisation to digitise economy

(Table 1: Authors' calculation, Data Source: RBI)

| | | | | | | | (Rs in Billion) | |
|-------------------------------|--|--|---|-------------------------------------|---|---|---|--|
| Types of Digital Transactions | Predemonitisation Period (April'16 - Oct'16) | Avg Monthly (Predemonitisation Period) | Demonitisation period (Nov'16 - Feb'17) | Avg Monthly (Demonitisation period) | Postdemonitisation Period (Mar'17 - Sep'17) | Avg Monthly (Postdemonitisation Period) | Growth % in average monthly from pre demonitisation period to demonitisation period | Growth % in average monthly from demonitisation period to post demonitisation period |
| | A | B = A/7 | C | D = C/4 | E | F = E/7 | $G = (D - B) \times 100 / B$ | $H = (F - D) \times 100 / D$ |
| RTGS | 690812 | 98687.43 | 408744 | 102186 | 847474 | 121067.71 | 3.55 | 18.48 |
| NEFT | 61167 | 8738.14 | 42579 | 10644.75 | 92250 | 13178.57 | 21.82 | 23.80 |
| IMPS | 1815 | 259.29 | 1730 | 432.5 | 4283 | 611.86 | 66.80 | 41.47 |
| Credit card usage at POS | 1688 | 241.14 | 1191 | 297.75 | 2458 | 351.14 | 23.47 | 17.93 |
| Debit card usage at POS | 1191 | 170.14 | 1750 | 437.5 | 2545 | 363.57 | 157.14 | -16.90 |
| M-wallet | 200 | 28.57 | 260 | 65 | 496 | 70.86 | 127.50 | 9.01 |
| PPI cards | 161 | 23.00 | 85 | 21.25 | 203 | 29.00 | -7.61 | 36.47 |
| Paper voucher | 17 | 2.43 | 8 | 2 | 15 | 2.14 | -17.65 | 7.14 |
| Mobile Banking | 5846 | 835.14 | 5527 | 1381.75 | 9765 | 1395.00 | 65.45 | 0.96 |
| Total | 762897 | 108985.29 | 461874 | 115468.50 | 959489 | 137069.86 | 5.95 | 18.71 |

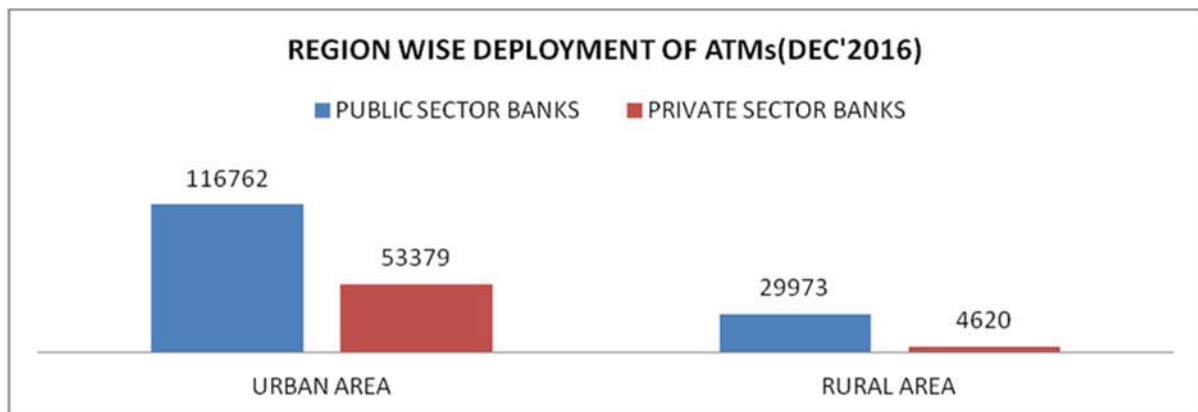


To examine the effect of forced behavioural changes through disruption activities like demonetisation, value of digitisation transactions in pre-demonetisation period, demonetisation period and post demonetisation period is taken into account. Predemonetisation period is taken as seven months starting from April'2016 to October'2016, demonetisation period is taken as four months starting from November'2016 to February'2017 and Post-demonetisation period is taken as seven months starting from March'2017 to September'2017. Demonetisation period is taken as four months only considering the fact that during these four months cash was not sufficiently available and lots of restrictions was in place for cash withdrawals. To make comparisons possible, average monthly transactions for each period with respect to major types of digitised transactions are taken into account. As the calculations can be seen from the Table 1, RTGS transactions grew at around 3.5 % from pre-demonetisation period to demonetisation period and it grew at around 18.5 % thereafter. The increase was mainly due to the fact that RBI issued a circular banning payment above Rs 10 lakhs through cheque and forcing high value payments through RTGS. It cannot be concluded that behavioural change had happened leading to increase in growth of payments through RTGS. Growth rate of NEFT transactions saw only marginal increase from 21.82 % to 23.8 %. It is not significant considering the rate at which economy of the country grew. Growth rate of payment through IMPS decreased from 66.8% to 41.47%. Growth rate of payment through credit card usage at POS also decreased post demonetisation from 23.47% to 17.93%. The most significant change was observed in the digitised transactions through debit cards at POS. Once the cash was available in the economy, growth rate of these type of transactions saw significant decline from 157.14% to a negative -16.9 %. Mobile banking transactions which were sort of forced on people also saw a significant decline once the cash was available in the economy. Growth rate of this type digitised payments was reduced from 65.45% to 0.96%. Though the growth rate of payments through PPI & Paper vouchers increased, the total transactions through these methods are insignificant compared to other modes of digitised payments. Another most important reason for the substantial jump in digital payments can be cited as the increase in digital inclusion of the poor and less affluent through the Jan Dhan Accounts and Rupay cards. So it can be concluded that forced disruptions

like demonetisation did not bring the desired results in changing the behaviour of the people towards digitisations. Journey towards cashless and digital economy depends on lots of other factors like infrastructure issues, incentives available, security issues, financial literacy etc. We tried to examine one factor relating to infrastructure i.e availability of ATM network in rural and urban area in this regard to see how it is a hindrance in case of India, considering the fact that India lives in its villages.

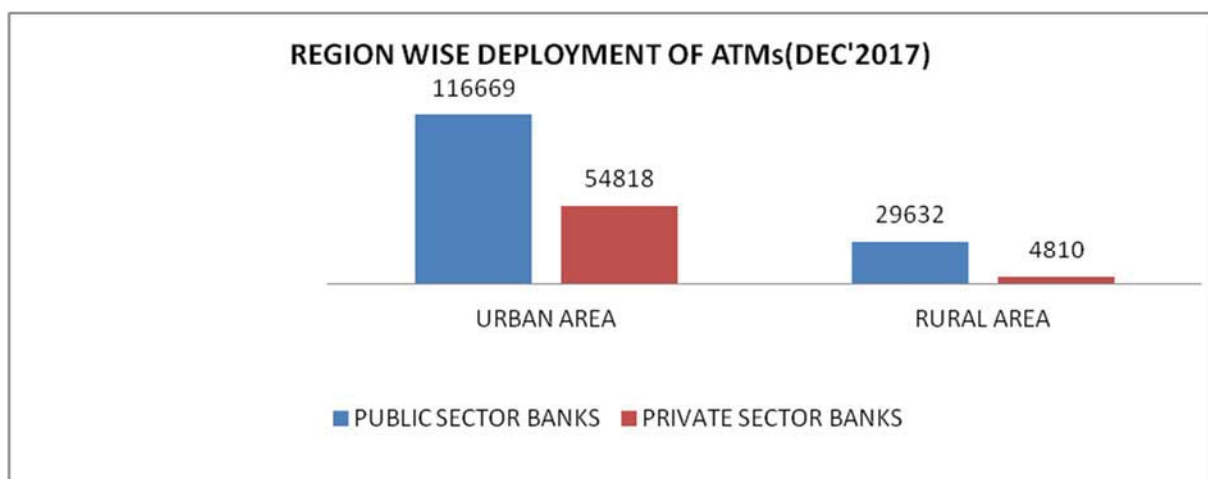
(Table 2: Authors' calculation, Data Source: RBI Website)

| BANKS (2016) | URBAN AREA | RURAL AREA | TOTAL | %URBAN | %RURAL |
|----------------------|------------|------------|--------|--------|--------|
| PUBLIC SECTOR BANKS | 116762 | 29973 | 146735 | 79.57 | 20.42 |
| PRIVATE SECTOR BANKS | 53379 | 4620 | 57999 | 92.03 | 7.96 |



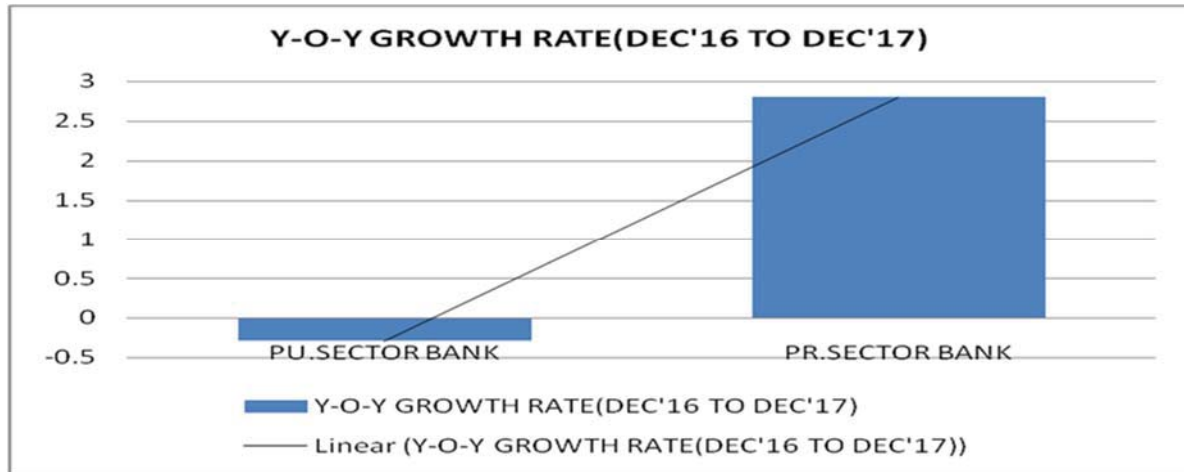
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(Table 4: Authors' calculation, Data Source: RBI Website)

| BANK | Y-O-Y GROWTH RATE(DEC'16 TO DEC'17) |
|----------------|-------------------------------------|
| PU.SECTOR BANK | -0.29 |
| PR.SECTOR BANK | 2.8 |



Our analysis of the data published by the RBI, clearly shows the disparity of branch banking between the Public Sector Banks and the Private Sector banks, in setting up ATM centres in urban and rural areas. In rural areas, there are only 20.25 percent of ATMs of Public Sector Banks and of the State Bank of India group) and 8.06 percent of the ATMs of private sector banks whereas in urban areas, there are 79.74 percent of ATMs of Public Sector banks and SBI group and 91.93 percent of the ATMs of private sector banks as on Dec'2017.(Refer to Table no.2 ,3 and 4). On comparison of the year-on year growth rate from Dec'16 to Dec'17, it is found that there is negative growth rate in case of Public Sector Banks (-0.29) whereas there is positive growth rate in case of Private Sector Banks (2.8). Here, it can be inferred that operational costs of installation of ATMs was perhaps high due to which there was decline in the deployment of ATMs by the Public Sector Banks in rural areas. In general, the count of Public Sector banks in the rural areas in comparison with the urban areas, is much more than the Private Sector banks and the likes of Foreign banks' concentration in the rural areas also show an insignificant number. The ATM s are so widely dispersed that it is very difficult to even find an ATM in an extremely remote rural area What is appalling is that, the Government has not been taking adequate steps in motivating Private Sector Banks in spreading their branches in the remote rural areas.

RBI data on State-wide deployment of ATMs also depicts a sorry tale of financial infrastructure with Diu (11) and Lakshadweep (16) having the lowest number in comparison to states like Maharashtra (23,845), Tamil Nadu (21,492) and Karnataka (16,688) having the highest deployment of ATMs as estimated at the end of December, 2017. This particular issue if properly addressed can go a long way in advancing case of cashless economy in the rural area.

CONCLUSION:

The present paper on the basis of examination of data pertaining to the pre vs post demonetisation phase which brought about significant disruptions in the Indian economy within the time frame of 14 months, highlighted the importance of the TIME component that inevitably influences the behavioural pattern of the people and impinges a force to deviate from their preferences of cash transactions to digital payments. Nonetheless, normalcy was restored as soon as the force factor was loosened. We further infer from the data analysis that disruptive shock like demonetisation resulted in a demand-supply mismatch of currency notes apart from leading to reduced supply of cash and increased deposits within the banking system. This is what propelled transient quantum jump in financial payments through digital modes like RTGS, NEFT, and Mobile Banking etc.

Which now leads us to confront the question, did demonetization actually bring about behavioural change as its proponents have consistently claimed? We need to appreciate this in the light of the manner in which digital transactions have grown. Admittedly, in this digital age, there has been a significant surge in the volume and value of overall digital transactions in the Indian Economy. And yet it would be a grossly misleading overstatement to suggest India could transform into a completely cash-lite economy any time soon.

The causes behind this are not hard to discern: they included factors like the nation's considerable magnitude of digital illiteracy and higher Cash-GDP ratio. In fact India lags much behind its peer economies in adopting cashless transactions as per the World Atlas data on international comparisons of countries having adopted cashless mode of transactions. There have been various endeavours taken within the banking system to match up with the technological innovation flows in the form of introducing better versions of digitised payment options to incentivise paperless transactions and simultaneously frequent efforts are being taken to sustain the momentum of such a digital push. However data security issue is a big hurdle in the path of Indian banking system and a robust secure financial and firewall network is the need of the hour ,apart from other structural and institutional barriers and constraints that brings about a glaring digital divide between the rural and the urban areas.

Limitations of the study:

One of the major limitations of this manuscript is that it is based upon secondary data analysis and survey of the literature only. All the modes of the digitised payments have not been covered rather only commonly used instruments have been considered. Also cross country comparisons (international trends in E-banking) have not been done to figure out India's performance vis-a-vis other countries. Growth figures in terms of value are only considered for the purpose of tabular data analysis.

Suggestions:

Majority of the advanced economies are already into the cash-lite mode with countries like Canada, Sweden, UK, France, USA, China, Australia, Germany, Japan and Russia which have greatly embraced the cashless culture. Digital economy has its own advantages and it certainly would lead to increase in productivity in the economy but this does not require a disruption as in case of India, rather there needs to be a holistic approach in offering digital payment solutions. This includes reducing the high service charges levied on banking transactions, ensuring server connectivity by strengthening and streamlining the ICT infrastructure, framing

stringent laws to counter data security breaches and other type of cyber banking frauds ,assuring spread of digital literacy especially in the remote rural areas and finally ,ensuring an integrated system of digital payment structure that would incentivise electronic payment transactions and discourage cash payments in the economy.

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