

**Technology Banking in Kerala: Socio-Economic  
Disparities and Implications in Acceptance**

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for the award of the degree of*

**Doctor of Philosophy in Economics**

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## **Certificate**

This is to certify that this thesis entitled, “**Technology Banking in Kerala: Socio-Economic Disparities and Implications in Acceptance**” being submitted by **VISHNU LAXMAN** for the award of the degree of **Doctor of Philosophy**, to the Department of Economics, University of Calicut, Dr. John Matthai Centre, Aranattukara, is a record of bonafide research work carried out by her under my guidance and supervision. The contents of this thesis, in full or in part, have not been submitted and will not be submitted to any other institute or University for the award of any degree or diploma. Plagiarism is checked and found within the permitted limits.

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I, Vishnu Laxman, do hereby affirm that this written account titled **“Technology Banking in Kerala: Socio-Economic Disparities and Implications in Acceptance”** is a bonafide record of research done by me under the guidance of Dr. M VIMALA, Assistant Professor in Economics, Vimala College , Thrissur. I also declare that this thesis has not been submitted by me earlier for the award of any degree, diploma, fellowship or any other similar title. Further, plagiarism is checked and is within the permitted limits.

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## CONTENTS

<b>Chapter No:</b>	<b>Title</b>	<b>Page No:</b>
I	Design of the Study	1 – 25
II	Evolution of Indian Banking System	26 -63
III	Technology Banking in India	64 -109
IV	Banking Perceptions and Internet Usage	110 -143
V	Pattern and Determinants of Technology Banking Acceptance	144 -210
VI	Summary, Findings and Conclusion	211 -222
	Select Bibliography	
	Appendix I	i- xix
	Appendix II	i

## LIST OF TABLES

<b>Table No:</b>	<b>Title</b>	<b>Page No:</b>
2.3.1	Number of banks and deposit amount (1870 -1947)	34
2.3.2	Number of banks and deposits (1947 -1968)	36
2.3.3	Growth of deposit of scheduled commercial banks in India (1969 -1991)	39
2.3.4	Growth of credit of scheduled commercial banks in India (1969 -1991)	40
2.3.5	Progress of scheduled commercial banks in India (1969-1991)	41
2.3.6	Population group-wise number of branches of Scheduled commercial banks (1975 -1991)	42
2.3.7	Growth of deposits of scheduled commercial banks in India (1992 -2008)	46
2.3.8	Growth of credit of scheduled commercial banks in India (1992 -2008)	47
2.3.9	Progress of scheduled commercial banks (1992 -2008)	48
2.3.10	Population wise number of branches (1992 -2008)	52
2.3.11	Growth of Deposits of scheduled commercial banks in India (2008 -2015)	58
2.3.12	Growth of credit of scheduled commercial banks in India (2008 -2015)	59
2.3.13	Progress of commercial banks (2008 -2015)	61
2.3.14	Population wise number of branches (2008 -2015)	62

3.5.1	ATMs of Scheduled Commercial Banks	89
3.5.2	Growth of credit cards in India	92
3.5.3	Growth of debit cards in India	94
3.5.4	Transactions through Mobile banking	96
3.5.5	Transactions through Mobile wallet	97
3.5.6	Growth of NEFT in India	99
3.5.7	Growth of ECS credit in India	101
3.5.8	Growth of ECS debit in India	102
3.5.9	Growth of RTGS debit in India	102
4.2.1	Background information of the Sample respondent	111
4.3.1	Factors determining choice of bank	113
4.4.1	Preference for best bank	114
4.5.1	Source of information about banking products	116
4.6.1	Frequency of visiting bank branch in a month	117
4.7.1	Purpose of visiting bank branch	119
4.8.1	Bank branch distance	120

4.9.1	Preference to Know Account Details	121
4.10.1	Means to communicate about new banking services	122
4.11.1	Frequency of using banking services in a month	123
4.12.1	Number of years of internet usage	125
4.13.1	Number of years of internet usage across gender	126
4.14.1	Number of years of internet usage across education groups	127
4.15.1	Number of years of internet usage across activity group	129
4.16.1	Number of years of internet usage across age group	130
4.17.1	Number of years of internet usage across income group	131
4.18.1	Time spent on internet in a week	132
4.19.1	Frequency of using internet in a week	134
4.20.1	Place of accessing internet	135
4.20.1	Level of satisfaction of the speed of internet	137
4.21.1	Activities performed regularly by online	138
4.22.1	Regular usage of online communication services	139
4.23.1	Problems faced while using computer	141
5.4.1	Source of information on technology banking	149
5.5.1	Familiarity with major technology banking instruments	151
5.5.2	Familiarity with technological advancements in banking across gender	152
5.5.3	Familiarity with technological advancements in banking across education groups	153



5.5.4	Familiarity with technological advancements in banking across Income groups	154
5.5.5	Familiarity with technological advancements in banking across age group	155
5.5.6	Familiarity with technological advancements in banking across activity group	157
5.6.1	Technology banking Acceptance of the Respondents	159
5.6.2	Technology banking Acceptance across gender	160
5.6.3	Technology banking acceptance across Education groups	161
5.6.4	Technology banking Acceptance across area of residence	162
5.6.5	Technology acceptance across activity groups	163
5.6.6	Technology banking acceptance across Age groups	164
5.6.7	Technology banking acceptance across income groups	165
5.7.1	Usefulness of technology banking for the respondents	167
5.7.2	Usefulness of technology banking across gender	168
5.7.3	Usefulness of technology banking across area	168
5.7.4	Usefulness of Technology banking across education groups	169
5.7.5	Usefulness of Technology banking across activity groups	170
5.7.6	Usefulness of technology banking across age group	171
5.7.7	Usefulness of technology banking across income group	172
5.8.1	Technology banking easiness among sample respondents	174

5.8.2	Ease of use of technology banking across gender	175
5.8.3	Ease of use of technology banking across area	176
5.8.4	Ease of use of technology banking across education groups	177
5.8.5	Ease of use of technology banking across activity groups	178
5.8.6	Ease of use of technology banking across age groups	179
5.8.7	Ease of use of technology banking across income groups	180
5.9.1	Technology banking acceptance and Usefulness	181
5.9.2	Technology banking Acceptance and easiness	182
5.10.1	Frequency of using ATM in a month	183
5.10.2	Frequency of using internet banking in a month	184
5.10.3	Frequency of using mobile banking in a month	185
5.10.4	Frequency of using other services in a month	186
5.11.1	Purpose of using ATMs	188
5.11.2	Purpose of using internet banking	189
5.11.3	Purpose of using mobile banking	190
5.12.1	Reduction in bank visit across gender	192
5.12.2	Reduction in bank visit across education groups	193
5.12.3	Reduction in bank visit across activity groups	194
5.12.4	Reduction in bank visit across Age groups	195
5.12.5	Reduction in bank visit across Income groups	196
5.13.1	Reduction in liquidity across gender	197
5.13.2	Reduction in liquidity across education groups	198
5.13.3	Reduction in liquidity across activity groups	199

5.13.4	Reduction in liquidity across age groups	200
5.13.5	Reduction in liquidity across income groups	201
5.15.1	Problems related to ATMs	204
5.15.2	Problems related to mobile banking and internet banking	205
5.15.3	Reliability Statistics	206
5.15.4	KMO and Bartlett's Test	206
5.15.5	Rotated component matrix	207
5.15.6	Factors and variance explained	208
5.16.1	Reasons for not using technology banking	209

## LIST OF FIGURES

<b>Figure No:</b>	<b>Title</b>	<b>Page No:</b>
1.1	Sampling Framework	21
2.2.1	Structure of Indian Banking Industry	30
3.1	Nine pillars of digital India	68
3.2	Key distribution technologies for financial inclusion	74
3.5.3	Growth of credit cards in India	93
3.5.4	Growth of debit cards in India	95
3.5.5	Growth of NEFT in India	100
3.5.6	Growth of ECS credit in India	102
3.5.7	Growth of ECS debit in India	103
3.5.8	Growth of RTGS debit in India	105
4.4.1	Preference for best bank	115
4.6.1	Frequency of visiting bank branch in a month	118
4.8.1	Bank branch distance	121
4.11.1	Frequency of using banking services in a month	124
4.12.1	Number of years of internet usage	125
4.18.1	Time spent on internet in a week	133
4.19.1	Frequency of using internet in a week	135
4.20.1	Place of accessing internet	136
4.20.1	Level of satisfaction of the speed of internet	137
4.21.1	Activities performed regularly by online	139

4.22.1	Regular usage of online communication services	140
4.23.1	Problems faced while using computer	142
5.2.1	Technology Acceptance Model	145
5.3.1	Analytical frame work	147
5.6.1	Technology banking Acceptance of the Respondents	159
5.7.1	Usefulness of technology banking for the respondents	167
5.8.1	Technology banking easiness among sample respondents	175
5.10.1	Frequency of using ATM in a month	184
5.10.2	Frequency of using internet banking in a month	185
5.10.3	Frequency of using mobile banking in a month	186
5.10.4	Frequency of using other services in a month	187

*Chapter I*  
*Design of the Study*

# CHAPTER I

## Design of the study

### 1.1 Introduction

The largest democracy in the world with the largest segments of illiteracy, thirst and hunger. The cultural and political diversity is also beyond compare. The polity becomes more complex due to economic diversity. The economic disparity within the Indian states is among the largest in the world. Automation, by virtue of technological advancement has helped to a very large extent to cater to the needs of the people in the farthest nook and corner of this vast stretch of land. Ever since the first phase of nationalization in 1969, the banking sector in India has come to play a major role in the economic arena by advancing loans to the agricultural and industrial sectors. The era of liberalization since the 1990s has once again reinforced the crucial role of banking in developing the talents of the nation by advancing loans to the needy in the education sector too. The financial sector reforms introduced during the period has changed the very face of Indian banking sector. It has led to the emergence of digital banking in India by allowing the entry of new private sector banks and foreign banks.

Compared to other developing nations, the Indian regulators have done a better job in ensuring safety and security in electronic transactions. Many steps are afoot to encourage electronic payments such as providing RuPay debit cards and enhancing merchant and consumer awareness. And there are also steps to educate people about disadvantages of cash and benefits of electronic payments. Merchants prefer cash dealings as they can keep the transactions off the books leading to black money. But the growing generation understands the importance of electronic payments in international trade and transactions.

We, in India are trying to borrow the best practices employed abroad, so as to attain the financial inclusion. At present, the penetration of electronic transactions in India is only a meager five percent most of which is ATM withdrawals. Under the flagship Digital India program, 55000 village in the

remote regions are to be provided with mobile access, funded by Universal Service Obligation Fund (USOF), a government of India initiative. Of the 597608 villages in India 541939 villages are covered with mobile services leaving 55669 villages i.e., 9.31 percent without coverage. The Bharat Net Project further aims to connect all of India's households, particularly in rural areas, through Broad Band by 2017. It forms a part of the steps afoot to boost rural economy. Were it not for the present stage of the outreach and technological advancements in the banking sector, the difficulties faced by the people in the wake of the Demonetization would have been harsher. The Digitization that was slowly picking up on the present stage of the technological advancement in banking, culminating in the adoption of Big Data Management Policy has now become the focus of the system, thanks to the Demonetization per se a banking and money supply issue, of 8<sup>th</sup> November 2016. Greater digitization, reducing the dependence on cash transactions will accelerate the pace of financial and social inclusion, along with formalization of the informal economy.

## **1.2. Review of literature**

Digitalization is the new buzz word which has embraced almost all sectors. Digital technologies provide opportunities for the financial institutions to withstand the challenging market environment. By digitalization, banks can have a more vibrant customer relation through multiple channels, services and products. It makes banking environment more competitive and efficient. Both customers and banks benefit out of technology banking. It enhances economic growth and modernizes the economy. Policy makers have discovered a strong relation between technology adoption in financial sector and economic growth. It is also a means to achieve financial inclusion. A plethora of literature is available in the area of digitalization. It is important to review them to state the research problem. Thus, those works related to technology banking and related aspects are summarized in to following heads:

- (I) Financial sector and economic growth
- (II) Indian banking sector after New Economic Reforms



- (III) Studies on Automated Teller Machines
- (IV) Studies on mobile banking.
- (V) Studies on internet banking
- (VI) Technology banking and financial inclusion.
- (VII) Application of Technology Acceptance Model (TAM) in technology banking.

### **(I) Financial sector and economic growth**

There exist a strong relation between financial sector and economic growth because financial sector and real sectors are closely related (Schumpeter). The relationship has been established in a cross country study of 77 nations (king et.al, 1993). They specified that long run rate of economic growth; productivity and capital accumulation can be predicted by using the level of financial intermediation. This has been an area of interest for many researchers. There exists a counter argument for the relation between economic growth and financial sectors. It is said that during the initial stages of economic growth, financial markets are accessible for the richer section in the society. And only with higher growth, more people join the financial system leading to much higher growth (Jovanovics, 1990; Zilibotti, 1994). Later on it was found that together with developments in banking sector stock markets too determine the rate of capital accumulation, productivity and economic growth (Leoine et.al, 1996). The relationship between financial development and economic growth has been said as ‘virtuous’ where the development of financial system has been supported by increasing levels of income. The situation where development of financial system is impossible due to low income level can be termed as ‘under development trap’ (Berthelemy et.al, 1996). Further, based on this relation by adding the role of legal and accounting systems, the difference in financial development, thereby in economic growth was explained (Levine et.al, 1999). The long run causal relationship between economic growth and financial development for South Asian countries such as India, Pakistan and Bangladesh has been established for the period 1975-2005. The relation was established

using error correction models and was proved that financial development leads to economic growth (Wadud, 2009). There exists an opinion that it is economic growth that leads to financial development (Guryay, 2007; Olvitan, 2012). The studies conducted in Northern Cyprus and Nigeria establishes the same. The studies conducted in India have also established the relation between economic growth and the growth of banking industry. A study which has taken human capital besides income level concluded that low human capital development leads to low savings thereby weakens financial sector (Acharya et.al, 2009). Another study states in short run per capita income leads to the development of financial markets whereas in the long run improvement in financial markets leads to increase in economic growth (Aggarwal et.al, 2013).

## **(II) Over view of Indian banking sector after New Economic Reforms**

The Indian banking sector has been evolving step by step over decades. It is after nationalization of 14 major banks in India in 1969, the sector experienced a tremendous change. A new era started in Indian banking industry with the introduction of Financial Reforms as a part of New Economic Reforms in 1991. The Indian banking sector has attracted the world's attention during the time of global financial meltdown. This section deals with the studies on different aspects of Indian banking sector.

The financial sector reforms aimed at making Indian banking sector competitive at international level to improve efficiency, productivity, profitability and technologically advanced. A number of liberalization measures were introduced in this regard.

The reform measures have resulted in positive impact over scheduled commercial banks in India. Undoubtedly, the overall bank profitability has improved. But the major portion of benefits out of reforms has been reaped by private sector banks and foreign banks as the period was more or less encouraging privatization. The public sector banks were lagging behind the private and foreign banks in various aspects (Koudal, 2012). One of the studies

used Porter's five forces model and focused on developments, opportunities and challenges faced by Indian banks and was found that the need of the hour is to establish an enabling environment in banking sector rather than a limiting one (Samreen,2014). Another study focusing on the operational efficiency of commercial banks in India concluded that employee efficiency and internal management is better in foreign banks than public sector banks and private sector banks. The conclusion was based on various parameters such as branch expansion, profitability and productivity (Mohapatra.et.al, 2015). Another work examined the impact of reforms on public sector banks, private sector banks and foreign banks on the basis of their investment in government securities, credit to GDP ratio, credit-deposit ratio, proportion of various types of loans and share of business. The variation in the working of public sector banks, private sector banks and foreign banks were once again established. Foreign banks seem to be more efficient than public sector and private sector banks (Walia, 2012). Another work has found out that various regulatory measures introduced in Indian banking industry has led to change in the focus of public sector dominating banking system from social banking to a more profitable and efficient banking sector. The infusion of private equity capital was one of the reasons. Also it could result in shifting banking operations from traditional mode to technology oriented mode (Dwivedi, et.al, 2011). Attempts were made to look in to the productivity performance and technical efficiency of scheduled commercial banks in India by creating a multiple output or multiple input technology production frontier using semi-parametric estimation methods (Rajan, et.al, 2011). But studies which concentrated on time period, prior to reforms, opine that public sector banks were the most efficient ones comparing to private sector and foreign banks (Bhattacharya et.al, 1997; Sathye, 2003). But the study conducted for measuring efficiency of all the bank groups in the post reform period, i.e, 1999 to 2006, have concluded that efficiency is high for foreign banks even though the financial position of public sector banks improved (Uppal,2011). The performance of Indian banking sector has been analyzed using DEA and TOBIT model for the period 1999 to 2003 found out that in

terms of efficiency State Bank of India has been followed by private banks and other nationalized banks. The efficiency has been measured in terms of capital adequacy (Gupta et.al, 2007). The study based on profitability index for 2001 to 2006, reveals, in the selected period profitability position was better for Indian banks comparing to previous periods (Singla, 2008).

Now the banks are focusing on adopting an integrated approach in risk management. Indian banks are following BASEL accords to keep themselves at par with international standards. They try to maintain a healthy capital base for mitigating various forms of risks. They have a framework for management of credit risk and derivatives. The rural areas are experiencing a rise in income which increases demand for banking services. Thus the banking sector will be positively influenced by growth in rural income. The branch licensing policy has been liberalized by the government to reach the unbanked regions (Indian Brand Equity Foundation, 2015).

### **(III) Studies on Automated Teller Machines**

ATMs are the most popular one among the technology banking instruments. Many studies (Pandian et.al, 2012) are available that states consumer prefer ATM over other forms of technology banking instruments. Technology banking instruments are introduced by international banks and private banks in India to overcome their limitation regarding number of branches. But later on public sector banks also started investing in technology banking to withstand competition. In today's world, money is a necessity for survival and ATMs provide the customers with money whenever needed without visiting a bank branch.

The customers of ATM have a positive attitude towards using ATMs as it is easy to use , conveniently located and can access any time (Brownlie,1989; Malcom,2008). It helps in effective service delivery (Musiime et.al, 2010). Customers use variety of services provided by banks and will assess each service and their satisfaction is a result of how each service will contribute to the whole

service delivery mechanism. Here the usage of technology is inevitable to offer better services to customers (Patricio et.al, 2003).ATMs are well established in the urban area but are not so in rural regions. Thus the banks are now focused on popularizing ATMs in rural area (Musiiime et.al, 2010). A study held in Gulbarga District to know the impact of ATM on consumer satisfaction found out that, ATM is mainly used by individuals of the age group 25 to 35 years. It is more popular among the males than the females. The study tells, nearly 85 per cent of the sample respondents are aware about extra charges related to ATMs. The respondents are satisfied with the number of ATMs available to them. The study also recommends popularizing of ATMs (Kukkudi, 2006).

The factors affecting satisfaction of ATM usage includes cost of ATM usage, efficient functioning of ATMs, functions offered by ATMs, convenient locations, safety, customer friendly operations and adequacy in number of machines (Al-Hawari et.al,2006). Another study found that customer satisfaction towards ATM is determined by the year of establishment of banks, performance of the bank and size of the bank (Singh et.al, 2009).According to some researchers (Kumbhar,2011) the customers' perception on cost effectiveness of using ATMs is same as the case of both public sector banks and private sector banks. The cost effectiveness of ATM is determined by the quality of service it. Another study has looked in to ATM services, factors affecting the choice of ATM and its relation with customer satisfaction. The customer satisfaction has been analyzed at Material Customer Satisfaction (MCS) level and Abstract Customer Satisfaction (ACS) level. Material customer satisfaction is related to post-purchase behavior, fee paid by the customer and the frequency of problems they face. Abstract level satisfaction is related to the facilities provided by the banks. The study establishes that the customer satisfaction is directly related to fee charged by the banks. For the rural population, who faces difficulty in using ATM due to illiteracy, biometric ATMs are a suitable option. Thus ATMs even though a part of technology banking, suits customers from different socio-economic conditions.

#### **(IV) Studies on mobile banking.**

The innovations and advancements in the telecommunication sector have led to delivery of banking services at the door step of the consumer, via, mobile banking. It is the provision of banking services to the customers on their mobile devices (Sharma et.al,2011). Mobile banking refers to the interaction of a customer with his bank through mobile phone (Barnes et.al, 2003). Mobile banking has many advantages, just like other technology banking instruments. In India, banks promote the usage of technology banking as they can reduce the operational cost while they increase the customer base (Peterson, 2009). The transactions through mobile banking are on rise; still mobile banking is yet to achieve its full potential in India (Ashta, 2003; Wang et.al, 2003).

The most popular form of mobile banking is SMS and it was launched in India in 2002. Banks use SMS services to give alerts on account details and transactions. Today banks are using WAP – based internet websites and mobile banking applications to provide mobile banking services to the customers (Mehta, 2012). Mobile banking offers a number of banking choices to the consumers. They can easily avail their account details, transact money etc (Clark, 2008). Mobile banking has a great future in India as it is cheap comparing to desktop and can have internet connection (Vyas, 2009). The use of mobile banking by urban Indian customers are on rise as mobile banking can be used anywhere at any time ( Rugimbana, 1995 ;Karjaluoto,2002). Thus mobile banking could be the new banking channel in India (Unnithan, et.al, 2001).

Mobile banking is a powerful delivery channel not only because it provides immediate access to the customers' account but also provides a control to customer on his/her personal finances (Rao et.al, 2003; Vyas, 2009). Many other researchers (Dasgupta et.al, 2011; Gupta, 2013) also agree the bright future of mobile banking in India. In one of the study, it has been found that customers tend to avoid internet banking once they start using mobile banking (Polatoglu et.al, 2001; Burney et.al, 2001; Karjaluoto, 2002; Black et.al, 2002; Souranta, 2002). M-commerce is possible with the help of mobile banking. It enables the

customer to sell their stocks , transact money for the purchase etc (Kim et.al, 2009 ; Luo et.al,2010 ; Tiwari et.al,2007). Mobile banking has the potential to achieve financial inclusion once an efficient infrastructure and financial security is ensured (Comner, 2009). It can ensure consumer development and reduce corruption. The analysis on economic effects of mobile banking has found that it is capable of offering different services to customers so that they can manage their finances without actually handling cash (Anaysi et.al, 2009). It is also note worthy that mobile banking business itself contributes to economic development (Scornavacca et.al, 2006).\

The determinants of intentions to use mobile banking have been studied by using Technology Acceptance Model with trust as an element. It was found that information quality and structural assurance are the main factor which affects trust, thereby influencing perceived usefulness and thus the intentions to use mobile banking by the customers (Luarn et.al, 2005; Gu et.al, 2009; Zhou, 2011). Another study found that perceived ease of use, perceived usefulness, information about mobile banking and perceived credibility are important factors that determine the usage of mobile banking (Amin et.al, 2008). Together with perceived usefulness, compatibility and associated risk do influence adoption of mobile banking (Lewis et.al, 2010). Some other researchers (Riquelmae et.al, 2010) opine that it is not only usefulness but also social norms and social risk play a significant role in determining the usage of mobile banking and social norms have a stronger influence on female users compared to male users. Whereas males are more or less concerned about usefulness of mobile banking. Other factors which affect usage of mobile banking are gender, income and education (Palani et.al, 2012).

It is a big challenge for the banks to provide mobile banking services as a variety of devices are available (Mas, 2008; Lyman et.al, 2008). It is important from the part of government and banks to ensure safety and security in transactions via mobile banking. it is necessary to provide interoperability of electronic systems, protection against money laundering and to ensure Know

Your Customer practices (Hayat, 2009). Another study has come up with the opinion that, if there is security and convenience in electronic transactions, unbanked will only transact through mobile banking or internet banking (Comminos et.al, 2008). It is found that the mobile banking customers in India are very much bothered about fraudulent practices, account misuse etc. there are issues related to user friendliness of mobile banking in different types of transactions and soft ware applications (Sharma et.al, 2009). Other issues related to mobile banking are revenue sharing agreements with mobile service providers and banks which often creates some disputes (Banzal, 2010). For the customer, mobile banking is challenging as the operations have to be done through small screen and keypads were chances are there for mistakes (Kim et.al, 2009).

#### **(V) Studies on internet banking**

The internet banking was an outcome of advancements in telecommunications and technology. Internet banking differs from traditional banking in the mode in which transactions are made. The online banking services started for the first time in 1981 in Newyork. Earlier internet was mainly used by producers to sell their products and gradually it has extended. By internet banking we mean, use of internet as delivery channel for as a delivery channel for banking services. This facilitates the customer to use banking services anytime, anywhere. They can access their account details any time and can do transactions. The volume and value of transaction through internet banking is increasing with passage of time. The users of internet banking find it highly convenient and useful in nature. Internet banking also provides facilities such as bill payment, deposits, payment loans etc automatically, thus the consumer need not visit the branch. The banks also encourage the customers to use internet banking as it is cost saving for banks and can offer better service experience to the customers.

Many researchers (Jun et.al, 2001) have given their own idea on internet banking. It is the use of internet as a delivery channel for banking services which include electronic bill payment, opening of account and transferring of funds. In other words internet banking is a facility which the consumer can access with the



help of internet connection in mobile phone or personal computer (Zeithaml et.al, 2002). It is an integrated system that provides customers a convenient, flexible and inexpensive platform with integrated services through online such as saving account, loans, certificate of deposits, money market account, card accessibility, investment services, insurance, portfolio management etc (Battacherjee, 2001). It is the best example for the application of information technology in service industry (Sui et.al, 2005). Researchers (Daniel, 1999) have pointed out that the delivery of internet banking can be through different devices such as mobile phone, personal computer etc.

It not only provides consumers with a chance to access their personal accounts but also electronic markets (Zeithaml et.al, 2002). This has led to the increase in internet users and internet banking. By using internet banking, the efficiency of the banks has substantially increased which encourages the banks to invest further in internet banking (Mosocha et.al, 2011). The internet based services provided by the banks can be divided in to informational, communicative and transactional. Informational services include information on products and services, communicative services include interaction between banks' system and the customers and transactional services include facilities for the customers to make transactions with the banks. Transactional services are risky comparing to other services. Thus there is no doubt that internet banking offers the banks with a number of opportunities and threats (srinivasan, 2012).

In one of the studies, which has compared banks who are providers of internet banking services and non-providers of internet banking services found that there is no statistical correlation between profitability of the banks and internet banking. The study has used univariate statistical analysis and has taken in to account variables such as cost efficiency, profitability etc (Singh et.al, 2014). One of the greatest advantage of internet banking is that it provides customer satisfaction since customers have access to their accounts at any time from any where they want to ( Chavan et.al,2010).

Researchers (Janal et.al, 2013) have looked in to the reasons behind security breaches. Flaws in security settings can cause loss on money and confidence in bank for the customers and credibility loss for the banks. Security issues are not only because of inadequacies in banks policies but also due to lack of awareness by the customers. Thus in order to ensure security in internet banking transactions, it is important to create adequate awareness to the customers. Banks need to take adequate awareness to the customers regarding safe transactions. For this banks need to take appropriate measures to enhance awareness of the customers on internet banking.

A study which has measured the progress of internet banking through various parameters such as number of ATMs, computerization of branches, transactions through retail modes concludes that , in the future, internet banking will be the preferred mode of banking and not acceptable mode of banking (Roshanlal, et.al, 2012). One of the customer centric studies in Kerala points out that internet banking is popular among urban keralites who are young, well qualified and are earning high ( Raju,2015). The idea of internet banking is gradually gaining acceptance as government and banking sector are taking much efforts to popularize internet banking (Chauhan, 2015).

#### **(VI) Technology banking and financial inclusion**

Financial inclusion is one of the major objectives of technology banking. It is widely believed that by way of using technology banking instruments, it is possible to bank the unbaked in a cost effective and efficient manner. The importance of financial inclusion lies in the fact that it helps the poor to improve their standard of living by way of increase in income, once they are in to a formal intermediation system. The suppliers of financial services are benefitted out of low cost savings. It helps the government to channelize and allocate fund in an efficient way, thus can reduce poverty. Thus financial inclusion positively affects the economy as a whole (Subbaroa, 2013).

According to theories of growth, investment is crucial for enhancing economic growth for which financial intermediation is essential. The relation between economic growth and financial sector is already established in many studies (Harrison et.al, 1999). Financial inclusion will help every section of the society to access financial services and thereby to capital (Harrison et.al, 1999). Thus by financial inclusion no section in the society is excluded of capital. It also helps in mobilizing more resources for investment. In under developed and developing nations where informal financial system is prominent people tend to loss their hard earned money and a major proportion of savings lies outside the formal financial system without contributing to the development of the nation.

The basic necessity to provide financial inclusion is infrastructure both physical and financial infrastructure. To make credit available to all, there is a need to create an efficient financial infrastructure. Studies (Pal et.al, 2012) have found that to increase the level of financial inclusion, the availability of banking services should also be increased. So that it can be utilized especially by low income earning groups. A well developed and accessible financial infrastructure helps the poor to identify the assets from financial instruments (Chandra et.al, 2000). Developing countries like India lacks a well developed financial infrastructure due to many constraints. The commercial banks are not willing to set up rural branches due to lack of profitability and higher cost. Some of the empirical studies (Sarma et.al, 2008) point out that presence of physical infrastructure in terms of internet facilities, telephone etc helps in increasing the level of financial inclusion. A study conducted in rural West Bengal found that telecommunication, electricity facilities etc can build a better supply chain management which will enhance productivity in rural area leading to greater demand for financial services (Chattopadyaya, 2011). Another study (Rather et.al, 2012) conducted in India points out lack of infrastructural facilities leads to poor linkage with markets. This in turn results in inaccessibility to financial services in low-income states such as Madhya Pradesh.

The lack of financial infrastructure can be compensated with the help of technology adoption in banking. Technology adoption is important in banking sector due to several reasons. It keeps the banking activities efficient and cost effective. To maintain a competitive edge, technology in banking is inevitable. It also helps the banks in maintaining customer data, easy online financial services, anytime anywhere service delivery, dissemination of information about new banking products, customized products and financial products in local language (Prabha et.al, 2013). By using forms of technology such as mobile banking, cards, net banking etc, it is easy to record the transactions electronically and to identify the customers (Handoo, 2010). Since technology banking can make retail transactions easier, faster and cheaper for both banks and small customers, it helps in further financial inclusion (Thorat, 2008; Gupta, 2011). Technology banking instruments such as mobile banking have made the transactions cheaper and electronically transferrable (Raghuram Rajan Committee Report, 2008). It is revealed in a study on factors that influence the introduction of mobile banking in South Africa, that, perceived ease of use, perceived usefulness, perceived cost and customer trust are the influential factors (Ismaile et.al, 2011). One of the ground breaking technological innovations in banking was the introduction of core banking solutions. It helps in branch networking, while other technology banking instruments such as ATMs connects people to bank (Gupta, 2011).

‘Bank on wheels’ is another approach which is found to be successful in Kenya. In this approach, a bank in vehicle travels in areas without a bank branch so that people can make transactions without visiting a physical bank branch (Dupas et.al, 2012). The Reserve Bank of India has introduced Business Correspondence Model (BCs) to enhance financial inclusion. This has revolutionized the Indian banking sector (Thorat, 2010). The BC model was launched in 2006, to enable branchless banking and realize the goal of financial inclusion. This could take banking services to the door step of customers in far reaching areas (Sarath et.al, 2010). Banks can indulge in tie-up with post offices, super markets etc to be the agents of banks. By using BC model, initiatives can be taken for opening of

accounts for customers making sure that bank directly heads the responsibility for fulfilling KYC norms. BCs can also be used for creating awareness regarding savings, bank products, advice on money management and debt management in rural area (Oxford Policy Management Ltd, 2011). Even though BC model has been considered as a feasible option, there are many problems associated with the same. It lacks commercial viability and affects direct customer relations with the banks. The BCs are selected through a bidding system and they might lack financial literacy and banking knowledge (Prabha et.al, 2013).

To solve the problems certain measures can be taken. The selection process of BCs can be made stricter by including a review, investments for promoting financial literacy among BCs and mean while alternate channels such as mobile banking, ATMs have to be developed. Initially, BC model doesn't include any service charge has been imposed on customers by BCs and banks, so that more will come to serve as Business Correspondents. Studies conducted in Brazil, Kenya and Peru established that BC model improves accessibility, provide appropriate financial products and is cheaper respectively. Banks can also take steps to collect feedback from customers regarding the services rendered by BCs (Oxford Policy Management, 2011).

## **(VII) Application of Technology Acceptance Model (TAM) in technology banking**

One of the most popular models used for explaining acceptance of technology is Technology Acceptance Model propounded by Fred Davis (1989). Many studies have emerged out suggesting modifications to the original Technology Acceptance Model. According to the model perceived usefulness and perceived ease of use are the two attributes that determine an individual's attitude towards the use of technology (Davis et.al, 1989). The model has been applied in numerous studies on online consumer behavior (Venkitesh et.al, 2000; Bruner et.al, 2005). Researchers (Venkatesh, 2000; Brown, 2001) have also identified that the two belief variables, that is, perceived usefulness and perceived ease of

use are influenced by external variables. Other factors which affect the acceptance of technology are complexity and relative advantage (Rogers, 1995).

The demographic variables such as age, income, education, gender etc also plays an important role in technology acceptance by individuals. Older persons experience a reduction in their own cognitive capabilities to understand and learn, thus finding it difficult to use latest technology such as internet (Heetzog et.al, 2000). The amount of knowledge possessed by a person often influences his/her usage of technology. Those with higher levels of education easily understand and use complex technologies like internet compared to less qualified ones (Rogers, 1995). Empirical studies (Agarwal et.al, 1999) are available indicating the positive relation between educational qualification and perceived ease of use. Also the members of higher socio-economic status due to lack of cross-group communication (Kelley, 1952). It is seen that individuals belonging to lower socio-economic strata uses each other's information sources to know the usefulness of the technological innovations.

It was found that access barriers such as cost could influence the use of technology (Mathieson, 1991; Venkitesh et.al, 2001; Hoffman et.al, 2000). Perceptions about the financial investment required in using technology such as interest charges, devices etc can hinder the individuals from using them. This serves as a disincentive for lower income groups to use technology (Taglang, 2000). They also have less exposure to technologies and may confuse about the desirability of technologies (Stanley, 2003). The older persons also find less usefulness with technology such as internet as the person grows older, they would like to satisfy their emotional needs rather than informational needs (Carstensen, 1995). There is also a tendency for older individuals to decrease their social network and may confine to their close circles, leading to less information on technology (Charles et.al, 1999). A study conducted to know the influence of age, income, education and race on internet usage states that perceptions on the usefulness and easiness of internet vary across these groups and it determines the consumer attitude towards using internet. The influence of

perceived usefulness and perceived ease of use determines the attitude towards usage of internet (Porter et.al, 2006).

Researchers (Suh et.al, 2002) have come up with modifications for Technology Acceptance Model. One such added element to the Technology Acceptance Model is 'trust'. Another model was developed on the basis of TAM known as Online Shopping Acceptance Model (OSAM) which has been used for analyzing shopping behavior of the customers (Zhou et.al, 2007). To the study the acceptance of e-commerce both trust and perceived risk were added to already existing Technology Acceptance Model (Pavlou, 2003). The study on the acceptance of online banking in Finland, revealed that together with perceived usefulness, information related to online banking is significant for customers to accept it (Pikkarainen et.al, 2004). A study on adoption of electronic services explains, acceptance pattern of internet self efficacy determines its adoption (Hsu et.al, 2001). Another study on mobile banking acceptance points out that perceived usefulness is the strongest factor that determines its acceptance (Ervasthi et.al, 2010). Also, we can find modifications of Technology Acceptance Model with security concern as a factor (Muller, 2009). Another model which combines Technology Acceptance Model and Theory of Planned Action is also available (Taylor et.al, 1995). The element of compatibility has been added to TAM in certain studies (Agarwal et.al, 1998). In a study regarding World Wide Web, a new factor called 'playfulness' was used (Moon et.al, 2001). Voluntariness is another factor which was added to Technology Acceptance Model as a factor influencing the intention to use technology (Sun et.al, 2003). Technology Acceptance model is widely used in studying information technology and its acceptance. Undeniably, it helps in providing insights in to the customer behavior towards information technology based services, especially technology banking.

Thus undoubtedly, technology helps in the invention of more flexible and user friendly services (Dixit et.al, 2010). Also branchless banking has a great

potential to reach poor people who cannot be reached by way of traditional bank branch system (Vatuary et.al, 2008).

### **1.3 Research gap**

The review of literature gives insights in to the previous studies conducted in this area. The emergence of information technology in to the banking sector has benefitted both banks and the customers. Banks can offer better services to the customers in a cost effective way. Customers find it comfortable as it is convenient to use any time anywhere. It also gives better control over ones personal finance. The government as well as the banks is trying all means to popularize technology banking as its potential is high. The studies points out that, customers do face the security threats out of technology banking and also it is used by a section of the community, probably the young, rich, educated urban males. Thus the possibility of socio-economic differences in the acceptance and usage of technology banking has been discussed in various studies. But Kerala is a state which is known to have a high level of socio-economic indicators. Bu the studies on technology banking in Kerala have focused on the urban customers. Whether there exists a urban-rural difference in acceptance of technology banking and its usage and what are its implication on financial inclusion as in Kerala also banks and government aims at achieving financial inclusion through technology banking has to be studied and discussed.

### **1.4 statement of the problem**

Technology revolution has picked up its pace in India after the introduction of globalization, privatization and liberalization. Technology adoption was experienced in every walk of life and banking sector was not an exception. It has reengineered business process and made banking services branchless by paving way for E-banking. A thorough study of the banking literature gives insights on technology adoption by banks and technology acceptance by customers. We can find that information technology adoption is still continuing in Indian banks but most of the studies points out customer reluctance towards technology banking



towards due to socio economic constructs and the perception of the customers. This stands as a hindrance to exploring the full potential and benefits of technology banking, especially in achieving one of the important aims of financial inclusion. There is a need for reassessing the extend of technological innovations in banking and how far technology banking has been adopted and accepted by banking sector customers belonging to various socio-economic groups, its determinants and possible implication on financial inclusion. Today a lot of efforts are taking place to spread digitalization in all the sectors. Comparing to other states, Kerala has a higher profile of socio-economic factors. Many studies have conducted regarding the acceptance and adoption of technology banking in urban Kerala. It is imperative to look in to technology banking adoption and acceptance among various socio-economic groups as the existing literature gives the possibility of having disparities across socio-economic groups in terms of gender, age, education, activity, income and area of residence.

### **1.5 Objectives**

The objectives of the study are the following:

1. To assess the extent of technological innovations in banking.
2. To examine the acceptance and usage of technology banking among the sample respondents.
3. To analyze the socio-economic disparities in the acceptance and adoption of technology banking.
4. To examine the implications of acceptance of technology banking on financial inclusion.

### **1.6 Hypothesis**

The technology adoption in Indian banking sector is still in its infancy stage. Due to continuous efforts, the penetration of technology banking might have increased to meet the growing demands of the urban customers. The instruments of E-banking might have changed the very nature of banking activities of the

customers but with socio-economic disparities. These socio-economic disparities may cause a digital divide due to differences in adoption and acceptance of technology banking among socio-economic groups. Thus the very idea of financial inclusion through technology banking is challenged here. Thus, this socio-economic disparity may in turn hinder achieving financial inclusion via technology banking.

Thus the study hypothesizes that, there is no significant relation between technology banking acceptance and socio-economic variables.

### **1.7 Data Source and Methods**

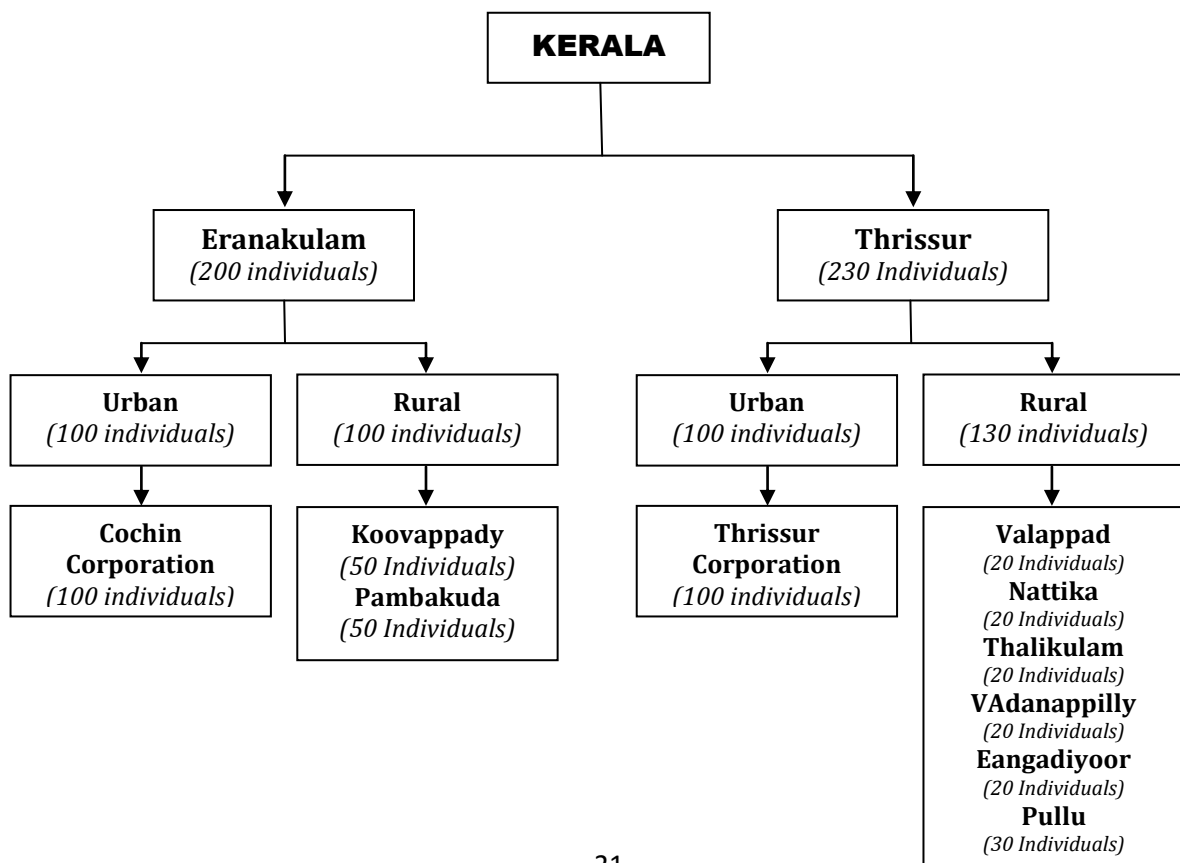
The study attempts to examine the technology banking adoption pattern in Kerala where the socio-economic parameters are high, thereby to bring out the disparities in adoption of technology banking among various socio-economic groups. It is also examined whether the mentioned socio-economic disparities in technology banking adoption hinders financial inclusion.

The study is based on both primary and secondary data. The secondary data has been collected from the Reserve Bank of India publications such as Trend and Progress of Banking, Financial Stability Reports, Hand book on Indian Economy and Payment and Settlement systems Reports of various years. The secondary data pertaining to technology banking variables such as RTGS, ECS debit and credit, NEFT, debit cards and credit cards and mobile banking has been taken for the period 2005 to 2015. Data has also been collected from Economic Survey and Economic Review.

The first objective is to analyze the trend and pattern of technological innovations in banking based on secondary data collected from Payment and Settlement Systems Report published by RBI. The data have been taken from 2005 to 2015. The objective has been satisfied by fitting the trend line. The other two objectives, to examine the acceptance and usage of technology banking among the sample respondents and the socio-economic disparities in the acceptance of technology banking has been studied on the basis of primary data.

The primary data have been collected from both rural and urban areas of Ernakulum and Thrissur. According to RBI data for second quarter in 2015, Ernakulum had the highest number of branches followed by Thrissur. The rural and urban blocks surveyed were selected from the list of blocks provided by the lead bank, that is, Canara bank. As urban area, Thrissur Corporation and Cochin Corporation area has been surveyed. As rural area, Valappad, Nattika, Vadanappilly, Engandiyoor, Talikulam and pullu (chazhoor Panchayat) from Thrissur District and Pambakuda and Koovapady from Ernakulum District were chosen. To select the sample individuals, purposive sampling method has been used. The sample size is 430 account holders that is, 200 collected from urban area and 230 collected from rural area. A well structured schedule together with likert scale has been used to capture customer perceptions. As per the requirement of the study 5 point likert scale and comapritive scale has been used. The 5 point likert scale ranges from very high to very low and strongly agree to strongly disagree.

**Figure 1.1**  
**Sampling Framework**



To analyze the technology adoption pattern, a technology adoption index has been constructed by taking technology banking instruments adopted by the customers. The variables include debit card, credit card, RTGS, NEFT, mobile banking, internet banking, tele banking, cash deposit machines and point of sales. The score values were given in such a manner that, 1 for positive response and 0 for negative response. Indices were constructed by normalizing the value and the value of index ranges from 0 to 1. For those individuals whose value lies in the range of 0 to 0.33 has been categorized as low technology banking acceptance, from 0.34 to 0.64 as moderate technology banking acceptance and from 0.65 to 1 as high technology banking acceptance. Bivariate and multivariate tables were formed and chi-square was used to test the hypothesis. Using the given method, easiness to use technology banking index and usefulness of technology banking index were constructed and the hypothesis has been tested. The problems in using technology banking have been analyzed using factor analysis. The Cronbach's reliability test has been done and the suitability of performing factor analysis has been checked with the help of KMO and Bartlett's test. The rotated component matrix has been derived to convert the factors in to groups. Other tools used include bivariate, multivariate tables and simple growth rate.

### **1.8 Significance of the Study**

Digitalization is embracing all spheres of the economy. In banking sector, the technology adoption has begun with the introduction of New Economic reforms in 1999. As a part of liberalization, new private sector banks and foreign banks entered Indian banking industry with the state-of-the-art technology and public sector banks in India was forced to adopt technology to keep competitive edge. But comparing to other nations, technology banking in India is still in its infancy stage. It is not only because of infrastructural constraints, but also due to customers' attitude towards technology banking which is determined by socio-economic constructs. The technology banking is still continuing in Indian banking sector. Hence a reassessment of its growth and trend has been made in

this study. Kerala has the highest level of social indicators comparing to other states. The existing studies which have been mentioned in the review of literature section, have established that literacy, nature of activity, income and age influences the usage of technology banking. The studies have been conducted in urban area and concluded that the literate, high income earning young males are using technology banking for most of their banking transactions. We can also see the government and the banks are taking a number of measures to propagate the usage of technology banking with special focus on lower strata of the economy. It is because, technology banking is said to be the best means for financial inclusion. The present study looks in to customer acceptance of technology banking both in urban and rural area and tries to find out whether there exists any difference in acceptance of technology banking across socio-economic groups. The study also looks in to usage pattern of technology banking across socio-economic groups to have a clear idea on the acceptance of technology banking. Unlike other studies, the present study establishes that even though socio-economic indicators are high in Kerala, there exist socio-economic differences in the acceptance and usage of technology banking. And technology banking itself has got some inbuilt nature which reinforces the reluctance in customers who are illiterate, old with less income and are residents of rural area to use technology banking. Thus the study questions the present efforts to achieve financial inclusion through technology banking through the inferences made from primary survey results and highlights the need for checking the feasibility of technology based programmes before implementation.

### **1.9 Scope of the Study**

Technology banking has been a recent phenomenon in Indian banking sector. It fastened its pace only after the introduction of New Economic Reforms. By realizing its potential to cater economic growth, government and banks are trying to popularize technology banking and also to reap its maximum benefits. But realization of the potential of technology banking is possible only with the

acceptance of customers. Being a recent phenomenon, the availability of secondary data are limited. The Reserve Bank of India has started publishing secondary data on transaction through technology banking instruments only from 2005 onwards. The trend has been analyzed out of it, but not for a large number of variables as for some of the variables the data are available only from 2011 onwards. The data are available for India as a whole and not at state level. To check the acceptance of technology banking, primary data collected from the bank customers using an interview schedule has been used. The primary data collection has been done in Kerala – the state with highest socio-economic indicators in India. The primary data has been collected only from two districts in Kerala- Ernakulum and Thrissur. According to data published by RBI in 2015 (second quarter), Ernakulum has the highest number of branches followed by Thrissur. The primary data have been collected from 430 individuals. Samples have been collected from both the urban and rural areas of these two districts. The places to be surveyed were selected on the basis of details on blocks given by Canara bank. The samples have been collected by using purposive sampling method, as the customer details are not available from banks. The primary analysis has been done on the basis of Technology Acceptance Model, propounded by David in 1989. The study makes use of the variables in basis TAM such as perceived easiness and perceived usefulness rather than using modified versions of TAM with added variables. The study tries to accommodate all other variables in to two basic variables of TAM –perceived usefulness and perceived ease of use. The study can be extended to more number of places with a larger sample size. The other versions of TAM with additional variables can be used to capture their individual influence on technology banking acceptance behavior of customers.

### **1.10 Chapter scheme**

The chapter scheme of the study is as follows:

## **Chapter 1**

Introduction- review of literature- research gap – statement of the problem – objectives – hypothesis – data source and methods – significance of the study – scope of the study – chapter scheme- limitations of the study.

## **Chapter 2**

Introduction- structure of Indian banking industry – evolution of Indian banking sector – conclusion.

## **Chapter 3**

Introduction – history of technology banking- technology banking in digital economy – technology banking in India – committees on technology banking – instruments of technology banking – conclusion.

## **Chapter 4**

Introduction –internet usage – years of internet usage – place of accessing internet –frequency of using internet - activities done online – problems faced while using internet - distance from bank branch –preference for banks- factors affecting preference - conclusion.

## **Chapter 5**

Introduction – technology banking acceptance across socio-economic variables – familiarity of technology banking instruments- purpose of using ATM, mobile banking and internet banking- reduction in liquidity and bank visits after using technology banking – problems faced while using technology banking – reasons for not using technology banking – conclusion.

## **Chapter 6**

Summary- findings – conclusion – contribution of the researcher – areas for further research.

## *Chapter II*

### *Evolution of Indian Banking System*



## CHAPTER II

### EVOLUTION OF INDIAN BANKING SYSTEM

#### 2.1 Introduction

It is undeniably said that the system of banking forms the bedrock of all development and concoction of the present day world. It paves way for faster growth rate of the economy by way of promoting greater investment. The multi dimensional nature of banking system makes it indispensable for a modern economy. Former Governor of Reserve Bank of India, D Subharoa stated, our growth should be in such a way that the poor contributes to the growth as well as the poor benefits out of growth. For this the economy needs a well defined banking system. The banking system is no more immured to its traditional role of financial intermediation by accepting deposits and lending to the needy. A healthy banking sector denotes a sound economy. Banking has abetted in developing the integral sectors of the economy and has revamped the hopes and endeavors of millions of people into reality. The growth of banking sector is imperative for the growth of crucial sectors such as agriculture, industry, and trade. It directly contributes to the surge of infrastructural facilities, cater the development of business environment and provides base for employment generation. It is the banking system that passes the monetary policy impulses in the economy. The banking system also helps in achieving equity and growth with social justice. The clear linkage between growth and social justice can be explored only with the help of banking system in the current capitalist world. Thus banking system itself has transformed from a mere financial intermediary to a catalyst of change.

This chapter makes an overview of the emergence of banking system in India. A detailed account on pre independence banking, banking in the nationalization, liberalization and post recession periods are given. The structure of Indian banking industry is also explained.

## **2.2 Structure of Indian banking industry**

Bank is a financial institution whose main activities are borrowing and lending money. Banks borrow by accepting deposits from the general public or other financial institutions. The term 'bank' was originated in Middle English from Middle French 'banque', from Old Italian 'banca' and from Old German 'banc', which means bench counter. . The section 5(1) of Indian Banking regulation Act, defines bank as "any company which transacts the business of banking in India. In section 5(2), banking is defined "as accepting, for the purpose of lending or investment, deposits of money from the public, repayable on demand or otherwise and withdraw able by cheque, draft, order or otherwise. According to Professor Croucher, bank is "a financial institution which can accept the surplus savings from the individuals in the form of deposits and when the depositor demands the money, the institution can immediately pay the amount invested."According to section 5(1) of Indian Banking Regulation Act, 1949, a bank is "any company which transacts the business of banking in India". In section 5(2), banking is defined as accepting for the purpose of lending or investment, deposits of money from the public, repayable on demand or otherwise and withdrawal by cheque, draft, and order or otherwise.

Banks play a prominent role in the functioning of the economy by providing security to the savings of the customers and channelize these savings to the proper stream. It helps in rapid increase in savings and encourages public confidence in the working of the financial system. Banks are also the controllers of money supply. The micro and macroeconomic trends are affected by the quantity of money circulating in an economy. From the micro point of view, a large supply of money implies more personal spending, that is individuals can easily avail loans such as personal loans, home mortgages, or car loans. On the other hand, at the macroeconomic level, the amount of money circulating in an economy affects variables like Gross Domestic Product, growth rate, interest rates, and unemployment rates. To achieve economic objectives the central banks attempt to control the quantity of money in circulation via monetary

policy. They can do this by setting reserve requirements, opting open market operations tactics and influencing interest rates. To ensure a healthy and sustainable economy it is imperative to have the right quantity of money in circulation. The primary function of the bank is to accept deposits and lend money. Bank deposits can be classified in to time deposits, savings deposits and demand deposits. By lending money, banks act as manufacturers of credit in the economy. Banks perform a number of agency functions such as collection of cheques, collection of dividends, payment of insurance premium, rent, electricity bill, execution of wills, purchase and sale of shares and government securities on behalf of customers and other banks. Banks also provide general utility functions such as locker facilities, issue of letter of credit, purchase and sale of foreign currencies, transfer of funds, underwriting of shares and debentures, issue of travelers cheque, collection and supply of information, issue of credit cards and debit cards etc.

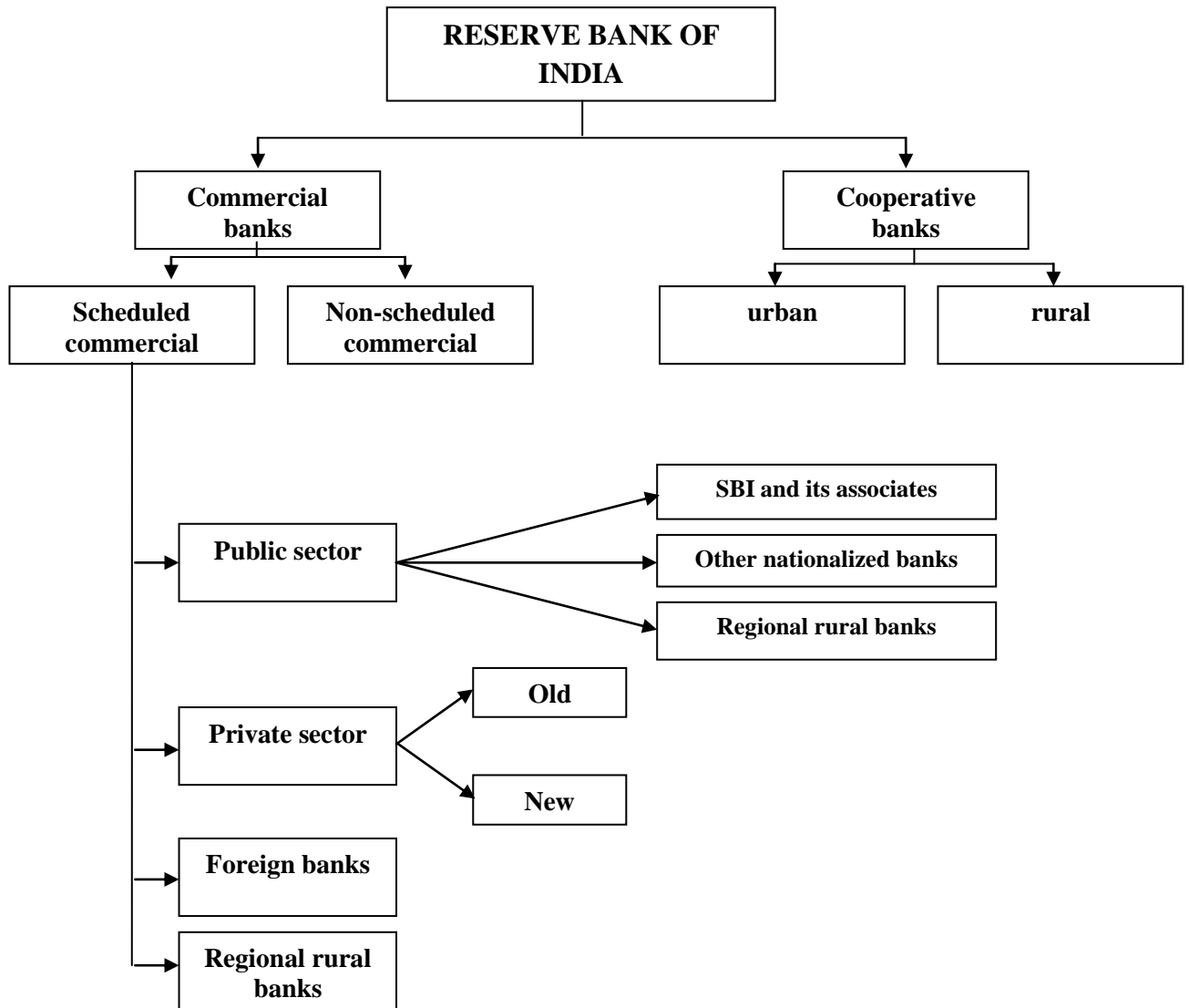
The major types of banking include the following:

Branch banking refers to doing banking activities at a location that is separate from banks, central business location. This helps to reach banking services to different locations and is easier for customers as it has the features of large banks. The bank exists even if the other branches fail. Unit banking refers to bank that is single, independent and does not have any connecting banks. Such banking units easily fail when an economic turmoil happens. Unit banking possesses the advantages of time saving in decision making and cost saving in supervision. The profit need not be shared among the branches, thus can be used for own development. But being a single unit, specialization is not possible and there possess high risk due to lack of diversification of assets and deposits. It is a situation in which three or more banks that are independently chartered are controlled by a small group of people. Group banking is a system in which a plan is offered by banks designed to be used by groups rather than individuals.

There exists an opinion that the nature of financial structure matters for the economic growth. Whereas others opine that rather than the nature of financial structure, it is the overall development of financial structure that contributes to growth. According to Jaffe and Levonian (2001), the demand for banking services varies across the nations and is dependent on the geographic, demographic and economic features of the nation. Dimaggio and Powell (1983), discussed an institutional theory which throws light on factors that influences organizations to change their performance and responses as per changing demands. Lin, Sun and Jhang (2009) emphasized on 'factor endowment' in an economy at each stage of its development which in turn determines the optimal industrial structure in the real sector. Reid (2010), argues that the suitability of financial structure depends on the circumstances. However the three thinking mentioned above reveals that the banking structure and the changes in the economy and the macroeconomic environment.

**Figure 2.2.1**

**Structure of Indian Banking Industry**



The Indian banking system includes both commercial and cooperative banks. Commercial banks include scheduled banks and non-scheduled banks. The banking activities in our nation have been dominated by scheduled commercial banks and they are the direct regulation of Reserve Bank of India. Scheduled commercial banks are classified on the basis of their ownership in to public sector banks and private sector banks. Public sector banks are owned by the government of India and comprises of nationalized banks, State Bank of India and its associated banks and regional rural banks. Private Banks includes old and newly owned banks. The Indian banking system currently includes 26 public sector banks, 25 private banks, 43 foreign banks and 56 Regional Rural Banks, 1589 Urban Cooperative Banks and 93550 Rural Cooperative Banks (2015).

### **2:3 Evolution of Indian Banking Sector**

A dive into the history of banking gives insights on political and cultural aspects of civilized human kind. Perhaps the earlier form of banking could be the practicing of depositing personal valuables at religious places which were also treasuries of that time, against a receipt, in ancient Babylon. In India, The Central Banking Enquiry Committee(1931) have traced money lending activity back to Vedic period, i.e., 2000 to 1400 B.C. Banking regulation has also evolved along with banking activities in India, exhibiting a rich tradition. The foundations of Indian banking industry can be traced in the 18th century, and has had a diverse evolutionary experience since then. In the initial stage banks in India were primarily traders' banks engrossed only in financing activities. With the enlargement of trade the idea of banking gained greater ground. The management of banking activities switched from individuals to groups to companies. The pre-independence era witnessed the development of Presidency Banks, which were later transformed into the Imperial Bank of India and in the aftermath into the State Bank of India. The infant stages of the banking industry were characterized by private ownership and a highly erratic work environment. The nationalization in 1969 and 1980 transformed the face of banking in India by instilling public ownership and accountability. To accommodate them to the

global competitive scenario the industry has moved towards greater liberalization by encouraging the entry of private and foreign players.

To discern the historical progress and the present structural framework of banking sector in India, the overall development period has been classified into several phases. The global banking scenario witnessed a fatal change during past four decades and particularly the last two decades. In complimentary to the global banking system Indian banking system has also followed the same trend. The banking system in India has passed through the following phases;

- (1) Phase I – Pre independence period (prior to 1947)
- (2) Phase II – Pre nationalization period (1947 to 1968)
- (3) Phase III – Post nationalization period (1969 to 1990)
- (4) Phase IV – Liberalization period (1991 to 2008)
- (5) Phase V- Recession period (2008 to Present)

### **2.3.1 Phase I- pre independence period (prior to 1947)**

In India, the western kind of banking activities started in 18<sup>th</sup> century, with the establishment of Calcutta and Bombay Agency Houses. The commercial banking activities began with the establishment of Bank of Hindustan in 1770, which is the first joint stock company in India. But this was liquidated in 1832. In 1806, the Bank of Bengal was established followed by the establishment of Bank of Bombay and Bank of Madras in 1840 and 1843 respectively. These three banks together known as Presidency banks and was given right to issue notes in the region. During this time, many banks emerged but failed due to speculation, mismanagement and fraudulent practices. In between 1865 and 1870, only one bank emerged out, that is, Allahabad Bank Ltd. In 1881, The Oudh Commercial Bank was established, which is the first purely Indian bank. By the beginning of 1900, due to influence of Swadeshi movement, the number

of banks increased. There were only 8 banks during 1870 with total deposit of Rs 1263 lakhs, but this has increased to 20 in 1900 with a deposit amount of Rs 3427 lakhs. India witnessed the emergence of a number of joint stock banks during 1906 to 1913. By 1920, there were 76 banks with a total deposit of Rs 23458 lakh. The major banks include the people's bank of India Ltd, The Bank of India Ltd, The Central Bank of India Ltd, the Bank of Baroda etc. in 1947, the number has hiked to 656 with Rs. 117768 lakhs of deposit amount (table 2.1). If the branch distribution is examined, during 1930, Bengal Province had the highest number of banks registered under the Indian Companies Act, 1913. It had 919 banks followed by Madras province with 167 banks. The North West Province had the least number with only one bank. By the end of 1947 Madras had 200 commercial banks which were the highest followed by west Bengal with 106.

The year 1921 was marked with a significant happening in Indian banking history. The three banks, Bank of Bengal, Bank of Bombay and Bank of Madras were amalgamated to form Imperial Bank of India which can hold government balances, manage public debt and clearing houses but had no power to issue notes. Another keystone in the history of banking is the establishment of Reserve Bank of India, under the Reserve Bank of India Act, 1934 as a shareholders bank with paid up capital of Rs. 5 crore. The establishment of Reserve Bank of India was based on the recommendation made by The Royal Commission on Indian Currency and Finance, 1926. It was established for the organization of currency and credit.



**Table 2.3.1**

**Number of banks and deposit amount (1870 -1947)**

<b>Years</b>	<b>Number of commercial banks</b>	<b>Growth rate (%)</b>
1870	8	
1880	10	25
1890	13	30
1900	20	53.85
1910	30	50
1920	76	153.33
1930	107	40.79
1940	654	511.21
1947	656	0.31

*Source: Evolution of Banking in India, RBI Publication, Mumbai*

The table provides the trend in number of commercial banks during 1870 to 1947. The number of commercial banks was exhibiting an increasing trend till 1900. During 1880, the increase was 25 per cent but during 1900, the number of commercial banks increased by 53.85 per cent by 1930, the growth rate declined to 40.79 per cent from 153.33 per cent in 1920. By 1947, the loss making banks were closed and hence the growth rate in number of commercial banks was as small as 0.31 per cent.

The description of the plight of banking sector is incomplete without mentioning the instances of numerous bank failures. Forty two banks failed in 1914, the number rose to 107 in 1930. The reasons of bank failures includes both international as well as domestic. International reasons include the occurrence of two world wars and the Great Depression of 1930s. The domestic reasons were insufficiency of liquid assets, low capital base and inter connected lending. The Second World War had a slight positive effect on Indian banking sector. As India became a supply base for allied armies in the Middle East and south East Asia, the government's defense expenditure has resulted in rapid expansion of money supply. This has contributed to the development of Indian banking sector.

### **2.3.2 PHASE II – PRE NATIONALISATION PERIOD (1947 to 1968)**

On the eve of independence, banking sector in India was underdeveloped, characterized by bank failures, concentration of banks in urban and metropolitan areas and catered the needs of industrial sector alone neglecting the agriculture sector. In the post independence period, India opted for a socialistic pattern of society through planned development. The first five year plan has emphasized on the role of monetary and credit policy in resource mobilization to the fullest and their optimum allocation. It also gives the basic objectives of banking policy to bring a much better balance between aggregate demand and supply through effective control of credit expansion. The post independent India witnessed many changes in the banking sector, so that it can cater to economic growth and development. One of the major changes that Indian banking sector witnessed, right after independence was nationalization of Reserve Bank of India in 1949. By nationalization, the Reserve Bank of India was given the powers as the central bank and started efforts to develop Indian banking sector in modern lines. It is the apex monetary authority that formulates , implements and monitors the monetary policy. By this RBI maintains price stability and ensure adequate flow of credit to productive sectors. It acts as a regulator and supervisor of the financial system by prescribing parameters of banking operations, maintaining public confidence, protecting depositor's interest and takes measures to provide cost-effective banking services to the public. RBI also facilitates external trade, payment and promotes development and maintenance of foreign exchange market in India. The issue of currency and to maintain adequate money supply is also the obligation of RBI. RBI also acts as the banker to the government by performing all banking functions of the government and also banker to the bank by maintaining the accounts of all scheduled commercial banks. Today RBI has 19 regional offices and 9 sub offices.

In the same year, the Banking Companies Act, 1949 was passed which was renamed as Banking Regulation Act, 1949 in 1966. During the time of independence, extending the banking facilities to the rural areas was one of the

main objectives. In this regard three major steps were taken. Firstly, the Imperial Bank of India was nationalized in 1955 and was renamed as “State Bank of India”, under State Bank of India act, 1955. Further in 1959 seven subsidiary banks of State Bank of India was also nationalized. Secondly, All India Rural Credit Survey Committee (AIRCS) was set up in 1951 to examine the rural credit system and the report indicated the nationalization of Imperial Bank of India. Thirdly, the committee also recommended the setting up of Agricultural Refinance Corporation (ARC) to refinance Central Land Mortgage Banks and Scheduled Commercial banks.

**Table 2.3.2**

**Number of banks and deposits (1947 -1968)**

<b>Year</b>	<b>Number of Commercial Banks</b>	<b>Growth rate (%)</b>	<b>Total Deposits (in billions)</b>	<b>Growth rate (%)</b>	<b>Total credit (in billions)</b>	<b>Growth rate (%)</b>
1947	656		-		-	
1950	600	-8.53	8.82		5.47	
1951	561	-6.5	8.52	-3.40	5.22	-4.57
1952	529	-5.7	8.32	-2.35	5.29	1.34
1960	344	-34.97	19.02	128.61	11.28	113.23
1967	91	-73.55	34.25	80.07	26.92	138.65
1968	85	-6.59	43.38	26.66	33.96	26.15

*Source: Trend and Progress of Banking in India, RBI Reports, Various issues, Mumbai.*

During the time of independence, Indian banking sector was fully under private domination. The bank failure was also a common phenomenon. In 1948, out of more than 637 banks, 45 banks were closed down as a result of opening more branches they could sustain on the strength of their resources and by making

large loans against property or inadequate security. As a solution bank amalgamation was recommended under section 45 of Banking Companies Act 1961. Thus between 1954 and 1966 several banks were amalgamated. As a result, the number of banks reduced to 85 in 1968 from 600 in 1950. To increase confidence of the depositors in banking system, by way of passing the Deposit Insurance Corporation Act, 1961, insurance cover was extended to deposits of small depositors in banks in India. India was one of the few countries to introduce insurance cover to deposits. Due to bank failure and amalgamations, the number of commercial banks decreased. During 1951, there were 561 banks in India which declined to 85 banks in 1968. The growth of bank deposit and credit during 1951 was -3.40 per cent and -4.57 per cent respectively. This has improved to 128.61 per cent for deposits and 113.23 per cent for credit in 1960 due to reduction in number of scheduled commercial banks and government efforts to rejuvenate the sector. But by 1968 both deposit and credit growth rate declined. Gradually, there developed a thought that banks can play a more active role in India's growth efforts by mobilizing resources. Thus in 1967 a policy of social control was imposed on Indian banking sector which changed the management and distribution of credit by the banks. To supplement the process, National credit Council was set up in 1968 to estimate the credit demands and resource allocation. All these policy measures brought tremendous changes in banking sector and paved way for further changes.

### **2.3.3 PHASE III – Post nationalization period (1969 to 1991)**

During the post nationalization period, the public sector banks have grown over the years to dominate banking sector operations. The oligopolistic dominance of public sector banks with respect to deposit mobilized and loans deployed has been due to the expansion of these banks through extension of branch net work. Even though the banking system made some progress during 1950s and 1960s the social goals remained untouched. Thus a structural transformation in banking system became a necessity by way of nationalization. The major contribution to GDP was from agriculture and allied sectors. But these sectors were devoid of

credit. Since most of the banks were controlled by corporate families and private business houses it was imperative to control these monopolies in order to ensure a steady supply of credit to priority sectors. In proportion to the population and geographic location, the number of banks was inadequate and many regions remained unbanked especially in the rural areas creating urban-rural divide. It was also necessary to create savings habit especially among rural households to augment more investments to meet our development needs. Thus with an aim of rapid economic growth with social justice, in 1969, fourteen major private banks were nationalized and also in 1980 another six banks were also nationalized and by that the Government of India could control over 90 percent of the banking business in the nation. This period witnessed much social controls over the banking sector. The Lead Bank Scheme was introduced to mobilize deposits on large scale and also to lend to the needy sections in the society. The scheme has also paved way for branch expansion. The idea of priority sector was formulated and specific lending targets were given to public sector banks in 1974 and private sector banks by 1978. Except for priority sector, a minimum lending rate was fixed on all other loans. A Differential ratio of interest scheme was also introduced for the upliftment of vulnerable sections in the society in 1972. By 1973, district credit plans were formed. In 1975, banks were required to keep all borrowers with aggregate credit limit from the banking system in excess of Rs 10 lakh on the first method of lending, where by 25 per cent of the working capital gap, i.e., the difference between current assets and current liabilities, excluding bank finance, was required to be funded from long term sources. Another important step taken by the government to fulfill rural credit needs is the establishment of Regional Rural Banks under the Regional Rural Banks Act of 1976, as per the recommendations made by working group appointed in 1973. The Working Group identified that cooperative credit agencies and commercial banks are not enough to meet rural credit needs due to their uncertainty of repayment and low profitability. Together with the minimum lending rates, a maximum rate for bank loans was also fixed in 1976. During 1980, as a second method of lending, the contribution from borrowers towards working capital out

of their long term sources was placed, which means, not less than 25 per cent of current assets required for the estimated level of production, which would give a minimum current ratio of 1.33:1. In 1988, the lead Bank Scheme was modified in to Service Area Scheme. The CRR and SLR was increased to 15 per cent from 5 per cent and 26 per cent from 12.5 percent in 1989 and 1990 respectively. The effects of bank nationalization are explained through the following tables.

**Table 2.3.3**  
**Growth of deposit of scheduled commercial banks in India (1969 -1991)**

Year	Aggregate deposits (in billions)	Growth rate (%)	Demand deposits (in billions)	Growth rate (%)	Time deposits (in billions)	Growth rate (%)
1969	43.38	-	19.34	-	24.04	-
1981	379.88	20	77.98	12	301.90	123
1986	854.04	18	156.12	15	697.32	18
1991	1925.41	18	331.92	16	1593.49	18

*Source: Trend and Progress of Banking in India, RBI Reports, Various issues, Mumbai.*

The trend in deposits from the period of nationalization to the period of economic reforms is given in the table. The growth rate of aggregate deposit from the time of first nationalization (1969) to the period of second nationalization (1980) is 20 per cent. The major contribution is from time deposit which grew 123 per cent whereas demand deposits grew only by 12 per cent during the period. From the 1981 to 1986, the deposits were growing with fluctuations. Aggregate deposit growth was 18 per cent. The growth of demand deposits has improved by growing 15 per cent whereas time deposit grew only by 18 per cent. During the eve of New Economic Reforms, the growth of aggregate demand was almost stagnant at 18 per cent itself.

**Table 2.3.4****Growth of credit of scheduled commercial banks in India (1969 -1991)**

Year	Aggregate credit (in billions)	Growth rate (%)	Non-food credit (in billions)	Growth rate (%)
1969	33.96	-	33.96	-
1981	253.71	18	253.71	18
1986	560.67	17	560.67	17
1991	1163	16	1163	16

*Source: Trend and Progress of Banking in India, RBI Report, Various issues, Mumbai.*

The table gives light on the pattern of credit growth from 1969 to 1991. The credit has increased by 18 per cent from the period of first nationalization to second nationalization. The purpose of nationalization was to increase and channelize credit for rural development. This has been achieved to a great extend. But after the second nationalization the credit growth decelerated to 17 per cent during 1981 to 1986 and further to 16 per cent during 1986 to 1991.

**Table 2.3.5**  
**Progress of scheduled commercial banks in India (1969-1991)**

INDICATORS	1969	1981	1986	1991
No. of Commercial Banks	689	187	276	276
	-	(12)	(8)	(0)
Scheduled Commercial Banks	73	183	272	272
	-	(8)	(8)	(0)
of which: Regional Rural Banks	-	102	193	196
	-	-	(14)	(0)
Non-Scheduled Commercial Banks	16	4	4	4
	-	(-11)	(0)	(0)
Population per office (in thousands)	64	19	14	14
	-	(-10)	(-6)	(0)
Deposits of Scheduled Commercial banks per office (Rs.Lakh)	56	11	172	334
	-	(6)	(9)	(14)
Credit of Scheduled Commercial banks per office (Rs in lakhs)	44	74	107	202
	-	(4)	(8)	(14)
Per Capita Deposits of Scheduled Commercial Banks (Rs.)	88	587	1198	2368
		(17)	(15)	(15)
Per Capita Credit of Scheduled Commercial Banks (Rs.)	68	385	747	1434
	-	(16)	(14)	(14)
Deposits of Scheduled Commercial Banks as percentage of National Income (at current prices)	15.5	34.4	41.5	48.1
	-	(7)	(4)	(3)
Scheduled Commercial Banks' Advances to Priority Sector (Rs.Crore)	504	9444	22844	44572
		(28)	(19)	(14)
Share of Priority Sector Advances in total credit of Scheduled Commercial Banks (per cent)	14	35.6	41	37.7
	-	(8)	(3)	(-2)
Credit Deposit Ratio	77.5	65.5	62.3	60.6
Investment Deposit Ratio	(29.3)	(35.1)	(36)	(37.7)

*Source: A profile of Banks, RBI Report, Various issues, Mumbai.*

*(Figures inside the parentheses represent percentage of growth.)*



The table explains the trend in the movement of variables related to banking. Due to increase in number of bank branches, the population per office has declined. During 1969 to 1981, population per office declined from 64000 per office to 19000 per office. There was a further decline to 14000 per office during 1981 to 1986 and remained stagnant till 1991. Both deposits per office and credit per office improved. The deposit per office has improved by 6 per cent during 1969 to 1981 and further by 9 per cent and 14 per cent during 1981 to 1986 and 1986 to 1991 respectively. The increase in credit per office was 4 per cent during 1969 to 1981 and further increased by 8 per cent and 14 per cent during 1981 to 1986 and 1986 to 1991 respectively.

**Table 2.3.6**

**Population group-wise number of branches of  
Scheduled commercial banks (1975 -1991)**

Year	Rural	Growth rate (%)	Semi urban	Growth rate (%)	Urban	Growth rate (%)	Metropolitan	Growth rate (%)	Total	Growth rate (%)
1975	6807		5598		3489		2836		18730	
1981	17656	17	8471	7	5454	8	4126	6	35707	11
1986	29703	11	10585	5	7209	6	5790	7	53287	8
1991	35206	3	11344	1	8046	2	5624	-1	60220	2

*Source: Trend and Progress of Banking in India, RBI Report, Various issues, Mumbai.*

The main objective of nationalization was to increase the spread of banks and thereby to cater the credit needs of the rural poor too. After the first nationalization in 1969, there was an increase in number of bank branches. The total increase in bank branches during 1975 to 1981 was 11 per cent and the increase was visible in the case of rural bank branches. During 1975 to 1981, the rural bank branches have increased by 17 per cent. Later on the increase decelerated to 11 per cent and further to 3 percent during 1981 to 1986 and 1986 to 1991 respectively.

Thus the period 1969 to 1990 witnessed a drastic change in banking sector by way of implementing a number of social controls over banking sector. It is obvious that the number of bank branches have increased which provided access to banking services even in rural regions. This has led to decline in population per bank office. A serious effort was taken towards fulfilling the credit needs of the vulnerable section by defining priority sector and imposing lending targets for both nationalized and private banks. But these developments were achieved in a controlled atmosphere. We couldn't move ahead with these measures as many regions of the country are unbanked, especially the backward states such as the Madhya Pradesh, Chhattisgarh, Uttar Pradesh and north-eastern states of India. The resource mobilization was also not to the expected level and there was reduction in profitability and efficiency of the banks. By increasing the number of branches, administrative expenses also increased. Thus sluggish working, lack of responsibility, political interference, and lack of profit motive became the features of Indian banking system. Hence, to discover new avenues of development it is imperative to have a liberalized economy which we realized from 1991 onwards.

#### **2.3.4 Phase IV- Liberalization period**

It is evident from the global experience that nations with well developed, market oriented financial system grow at a faster and consistent pace than those with fragile and stringently regulated system. In India, after nationalization, banking sector could expand their geographic coverage, mobilize savings and

could provide funds to priority sectors within a highly regulated environment. The interest rate credit allocations, entry into the banking industry were highly controlled. By 1991, these public sector banks were characterized by less profitability, poor quality of customer service and lacked adequate capital base. They lagged much behind the international standards in introducing technology banking and product innovations. Due to poor financial condition of the banks the interest rates were hiked, causing an adverse effect on the investment climate in the nation. Thus financial sector reforms were introduced as a part of New Economic Reforms in India. The government also appointed Committee on Financial system under the chairmanship of M.Narasimham to examine all aspects of financial system and to provide necessary recommendations to rejuvenate and make banking sector efficient and profitable.

The reforms in financial sector were provided on the basis of five principles or 'panch sutra'. The reforms were cautious and were sequenced well. They were mutually reinforcing so that the confidence in system is not lost out of reform measures. The changes in banking sector were in line with the existing monetary policy, fiscal policy and external policies. The committee also focused on developing a full-fledged financial infrastructure such as a well defined legal frame work, technology, audit and supervisory standards etc. It has also taken in to account the debt, money and forex market so that a holistic development is possible.

As per recommendations of Narasimham committee 1(1992), the entry of new private sector banks, including both domestic and foreign banks have been deregulated. This measure has led to emergence 15 new private banks, 9 domestic and 6 foreign banks. The number of commercial banks has increased from 276 during 1992 to 300 by 1998. The population per office has almost been stable at 15000 from the period 1992 to 2001. The population per office has been almost constant at 15000 during the period 1994 to 2001 and has slightly increased in 2002 at 16000. The number registered a decline from 2007 onwards.

The branch licensing policy also liberated. The interest rate structure has been simplified by deregulating the lending rates for loans above 2 lakhs. Also fixing of bank deposit rates according to account types and maturities got deregulated. The RBI was trying to rationalize the term deposit rate structure and boost the mobilization of both short term and long run deposits. These measures were meant to prevent a liquidity crunch and to push nominal lending rates upward. Since 1994 the markets determined prime lending rates were showing an upward trend. The RBI has reduced the lowest maturity limit on term deposits from 46 days to 30 days and encouraged medium to long term deposits by progressively deregulating the rates on term deposits of longer than one year maturity. The continuous increase in rates since deregulation raised concerns especially since the increase in nominal interest rates have been coupled with persistently high real rates of interest rates as inflation was declining during 1995-1996. This was curbed by RBI by reduction in CRR.

The preemption of large proportion of bank reserves has been reduced by lowering Cash Reserve Ratio and Statutory Liquidity Ratio. The high monetization of government debt has also been reduced. The reduction of SLR from 38.5 per cent to 25 per cent has made the government bonds subjected to market pressure as the government bond market got integrated in to the main stream capital market. The investors were comparing the yields on government bonds with yields available on comparable financial instruments elsewhere.

Earlier 40 per cent of bank credit was channeled to priority sector at concessional rates. During the post reform period number of directed credit categories and interest rate subsidy element were reduced and the weaker section in priority sector was redefined. The share of priority sector lending in total credit was 37.1 per cent during 1991 which has declined to 34.6 during 1998 as the attention was fully on improving profitability and efficiency of the banks. It has improved to 36.7 during 2005 but again declined to 34.9 during 2008. It was due to deliberate avoidance of banks to provide funds to doubtful sectors. The regulation on asset classification income recognition and capital adequacy has

also been strengthened. The capital adequacy norm of 8 per cent as set by Bank for International Settlements were introduced in Indian banking system and recapitalization of banks were undertaken. To strengthen the bank supervision, Board for Financial Supervision was set up. A number of measures were introduced to strengthen customer service. To solve customer complaints regarding deficiency in banking services in a fast and cost effective manner Banking Ombudsman Scheme was introduced in 1995. The Banking Companies Act was amended to permit public sector banks to raise capital up to 49 per cent from the public. The banks were also permitted to trade shares in the secondary market. To bring greater discipline in credit utilization and control in credit flows, a 'loan system' for delivery of bank credit for working capital was also introduced. During the post reform period the scope of private sector banks has widened. The number of scheduled private sector banks has increased from 46 to 63 between 1991-1992 and 1995-1996.

**Table 2.3.7**

**Growth of deposits of scheduled commercial banks in India (1992 -2008)**

Year	Demand deposits (in billions)	Growth rate (%)	Time deposits (in billions)	Growth rate (%)	Aggregate deposits (in billions)	Growth rate (%)
1992	450.88		1856.70		2307.58	
1996	806.14	16	3532.05	17	4338.19	17
2000	1273.66	12	6859.78	18	8133.45	17
2004	2250.22	15	12793.94	17	15044.16	17
2008	5230.85	23	26726.30	20	31969.39	21

*Source: Trend and Progress of Banking in India, RBI Report, Various issues, Mumbai*

**Table 2.3.8****Growth of credit of scheduled commercial banks in India (1992 -2008)**

<b>YEAR</b>	<b>Food credit(in billions)</b>	<b>Growth rate (%)</b>	<b>Non food credit(in billions)</b>	<b>Growth rate (%)</b>	<b>Aggregate bank credit (in billions)</b>	<b>Growth rate (%)</b>
1992	-	-	1255.92	-	1255.92	-
1996	97.91	-	2442.24	18	2540.15	19
2000	256.91	27	4102.67	14	4359.58	14
2004	359.61	9	8048.24	18	8407.85	18
2008	443.99	5	23175.15	30	23619.14	29

*Source: Trend and Progress of Banking in India, RBI Report, Various issues, Mumbai*

**Table 2.3.9**  
**Progress of scheduled commercial banks (1992 -2008)**

Indicators	1992	1996	2000	2004	2008
No. of Commercial Banks	276 -	293 (2)	297 (0)	291 (-1)	175 (-12)
Scheduled Commercial Banks	272	291 (2)	297 (1)	286 (-1)	171 (-12)
of which: Regional Rural Banks	196 -	196 (0)	196 (0)	196 (0)	91 (-17)
Non-Scheduled Commercial Banks	4 -	(2) (-16)	(2) (0)	(5) (26)	(4) (-5)
Population per office (in thousands)	14 -	15 (2)	15 (0)	16 (2)	15.0 (-2)
Deposits of Scheduled Commercial banks per office (Rs. Lakh)	392 -	688 (15)	1302 (17)	2295 (15)	4204 (16)
Credit of Scheduled Commercial banks per office (Rs in lakhs)	217 -	403 (17)	694 (15)	1288 (17)	3106 (25)
Per Capita Deposits of Scheduled Commercial Banks (Rs.)	2738 -	4644 14	8498 16	14550 14	28327 18
Per Capita Credit of Scheduled Commercial Banks (Rs.)	1516 -	2719 (16)	4531 (14)	8166 (16)	20928 (27)
percentage of National Income (at current prices)	49.5 -	50.6 (1)	53.5 (1)	68.5 (6)	84 (5)
Scheduled Commercial Banks' Advances to Priority Sector (Rs.Crore)	47318 -	80831 (14)	155779 (18)	311335 (19)	824773 (28)
Share of Priority Sector Advances in total credit of Scheduled Commercial Banks (per cent)	37.1 -	32.8 (-3)	35.4 (2)	37.1 (1)	34.9 (-2)
Credit Deposit Ratio	(55.4)	(58.6)	(53.3)	(56.1)	(73.9)
Investment Deposit Ratio	38	38	36.6	43.8	30.4
Cash Deposit Ratio	(18.2)	(12.4)	(9.8)	(5.6)	(8.6)

*Source: A profile of Banks, RBI Report, Various issues, Mumbai*  
*(Figures inside the parentheses represent percentage of growth.)*

From 1992 to 1996, 1996 to 2000 and 2000 to 2004, the aggregate deposit rate has been remained stagnant at 17 per cent (table 2.3.7). Regarding bank deposits and advances for public sector banks the growth rate is slightly lower in the post reform period than that of pre-reform period. The deposit growth rate in the post reform period, for foreign banks has registered a declining tendency from 28.47 percent in 1985 to 1992 to 16.48 per cent in 1992 to 1996. Whereas for domestic private sector banks the deposit growth rate increased from 14.73 per cent during 1985 to 1992 to 24.67 per cent during 1992 to 1996. From 1992 to 1996, 1996 to 2000 and 2000 to 2004, the compound growth rate of aggregate deposit has remained constant at 17 per cent (Table 2.3.7)

During 1997-1998, deposits and credits of all scheduled commercial banks increased comparing to the previous years and also banks had sufficient liquidity. Among the components of aggregate deposits there has been significant growth in time deposits by 17 per cent during the period. But credit to sick industries fell down. The banks could increase their efficiency by reducing the level of NPAs. But during the period the spread of banks declined and credit deposit ratio too declined to 51.7. This was mainly due to interest rate deregulation and consequent collapse of rates on term deposits. In 2000, the aggregate deposits of scheduled commercial banks registered a growth at 15 per cent compared to 13 per cent in 1998. The time deposits grew over 20 per cent. Due to fluctuations in industrial activities and decline in exports, there was only a smaller increase in credit allocation to non-food sector also decreased, whereas more credit was allocated to weak industries. The credit-deposit ratio was comparatively higher at 53.5. By 2000, both demand and time deposits registered a lower growth rate but irrespective of this, the credit expanded. Thus the credit-deposit ratio also moved upwards. During 1996 to 2000, the aggregate deposits grew by 17 per cent (table 2.3.7) and aggregate credit by 14 per cent (table 2.3.8). Even though in 2000, the credit expanded at 13.81 in 1999, for the whole period 1996 to 2000, 14 per cent of compound annual growth rate was low comparing to 19 per cent during 1992 to 1996 period (table 2.3.8).



During 2001, the aggregate deposits registered a higher growth rate at 12 per cent as a result of inflow of deposits under the Millennium Deposits Scheme. But the credit growth slowed down to 17.31 per cent. The year 2002 witnessed an improvement in the performance of scheduled commercial banks in terms of operating as well as net profits. The deposits have improved mainly due to increase in time deposits. The bank credit has also improved but at a decreasing rate due to decline in both food and non food credit. There was an effort to keep the prudential norms at par with the international best practices to address the issues in financial stability.

During 2003, due to revival in industrial activities there was an improvement in non food credit at 26.88 per cent. But deposit expansion remained subdued due to deceleration in time deposits. This happened out of lower accrual of interest and a shift to current account due to industrial activities.

In 2004, both deposits and credits recorded a better growth. Increase in demand deposits was higher at 32 per cent due to increased activities in capital market including disinvestment and Foreign Institutional investments and development in mutual fund segment. Among the bank group, the expansion of deposits was highest for the private banks with 29.6 per cent followed by public sector banks with 15.4 per cent and foreign banks with 15.1 per cent. Regarding the credit growth, the food credit contracted due to lower procurement but non food credit increased. Credit flow to priority sectors increased due to inclusion of investments made by banks in the mortgage backed securities under direct lending to housing within the priority sector. The total growth in advances to priority sector was 19 per cent (table 2.3.9). During 2000 to 2004, the deposit grew by 17 per cent and credit by 18 per cent. Thus the credit – deposit ratio was improved to a level of 56.1 per cent (table 2.3.9).

This credit growth continued and reached 30.88 per cent by 2005. During this period, to meet the increased credit demand, banks increased recourse to non deposit resources and restricted fresh investments in government securities. The

profitability of public sector banks and new private sector banks improved. But the deposits grew at a slower pace at 13 per cent compared to previous year due to slow down in demand deposits and savings deposits. The demand deposits decelerated as a result of base effect. The term deposits grew because of hike in NRI deposits and certificate of deposits, but other deposits registered a less growth due to substitution in favor of postal deposits and other investment products as the save taxation and have a higher amount of returns in comparison to time deposits. The credit-deposit ratio witnessed a sharp rise at 64.9 per cent and it was the highest for new private sector banks. The investment - deposit ratio witnessed a decline due to high credit demand, so that the banks restrict further investments in government securities. In 2006-2007, the aggregate deposits of scheduled commercial banks registered a spurt due to increase in time deposits whereas both demand and time deposits slowed down. The spurt in time deposits was mainly due to three reasons. There was a shift from postal savings to term deposits of banks due to favorable interest rate differentials and extension of tax benefits to long term bank deposits. Also both public sector and private sector companies preferred to deposit their surplus funds with the banks and nonresident deposits too grew at a higher pace compared to previous years. The overall growth in deposit during 2004 to 2008 was 21 per cent (Table 2.3.7). The loans and advances of scheduled commercial banks increased in a robust way especially the term loans. But overall deployment of credit in major sectors such as agriculture, industry, services and personal loans decelerated whereas credit to SSI sector increased sharply. Credit flow to priority sectors has also improved. The credit growth for the period 2004 to 2008 was 29 per cent (table 2.3.8) and advances to priority sector grew by 28 per cent (table 2.3.9).

**Table 2.3.10****Population wise number of branches (1992 -2008)**

YEAR	RURAL	Growth rate (%)	SEMI URBAN	Growth rate (%)	URBAN	Growth rate (%)	METRO POLITAN	Growth rate (%)	TOTAL	Growth rate (%)
1992	35269		11356		8279		5666		60570	
1996	32995	-2	13561	5	9086	2	7384	7	63026	1
2000	32734	0	14407	2	10052	3	8219	3	65412	1
2004	32121	0	15091	1	11000	2	8976	2	67188	1
2008	30712	-1	17777	4	14245	7	13191	10	75925	3

*Source: Trend and Progress of Banking in India, RBI Report, Various issues, Mumbai*

Table 2.3.10 explains the growth in number of branches of scheduled commercial bank during 1992 to 2008 in rural, semi urban, urban and metropolitan areas. The trends in compound growth rate shows that the growth rate has been declining in the case of rural branches whereas it exhibited an increasing trend for other areas. The compound annual growth rate for urban and metropolitan areas for the period 1992 to 1996 was 2 per cent and 7 per cent respectively.

The main reason behind sluggish growth rate in bank deposits during reform period was the growth of non bank financial intermediaries including finance companies, mutual funds and stock market. It could be also because the public sector banks have reached with saturation point through branch expansion. In the advances market too, the growth rates of the public sector banks have declined where as the private sector banks including foreign banks performed well.

During the initial years of reforms, there has been an improvement in the profitability of private sector banks due to infusion of capital by the government but after 1995-1996 they suffered a setback. It was mainly due to imposition of stricter disclosure norms by RBI, higher capital losses on bank's investments in government securities due to the rising interest rates, the increased cost of borrowed funds as banks had increased their dependence on call money market

funds and certificate of deposits for meeting liquidity requirements arising out of asset liability mismatches amidst high demand for credit and higher provisioning requirements.

The availability of credit as a proportion of total deposits of the banking system is indicated by credit - deposit ratio. After the reforms the credit - deposit ratio declined for the commercial banks due to recession over this period and also the banks were trying to adjust themselves to the new lending norms. Gradually the rates improved. Together with the decrease in cash-deposit ratio, there witnessed a corresponding increase in the proportion of risk free government securities in banks major earning assets. This is also a reflection of risk averse nature of banks. By investing in government securities, the bank gets an opportunity to keep aside a lower amount of capital to fulfill the bank's capital adequacy norms and do not carry any provisioning requirements. The economic reforms were mainly meant to infuse competition and efficiency in the banking sector. During the initial years of reforms, there were signs of competition and efficiency but at marginal level.

The increase in competition is evident from changes in market shares of public and private sector banks, m-bank concentration ratio and the quality and range of services offered. The market share of public sector banks in both the advances and deposit market have fallen during 1991-1992 to 1995-1996. During 1991-1992, the share of public sector banks has fallen by around 2 per cent where as during the post reform period, it has declined around 5 per cent. The m-bank concentration ratio also reveals a slower growth of public sector banks due to increased competition from private sector banks. Another indication of competition is the improved customer services. This has been the reflection of increased use of technology by the public sector banks to keep up with the private banks that have emerged out with technology banking technology banking. Also banks have diversified their activities by entering into merchant banking, custodial services, mutual fund management, credit cards, leasing, hire purchase finance etc.. The increased competition has not led to any

improvements in efficiency of public sector banks. The trends in operating cost as a proportion to working funds reveals that comparing to private and foreign banks, public sector banks were inefficient. The reason behind increasing operating cost was adoption of technology by public sector banks.

The New Economic Reform led to structural changes in almost all sectors of Indian economy, especially the financial sector. The banking sector prior to reforms was facing serious challenges such as low profitability, inadequacy in capital and lack of financial soundness. The reform measures mainly aims at making the banking sector profitable by imposing supervisory measures and strengthening capital adequacy norms. It also instilled competition in to the banking industry by permitting the entry of new private sector banks and foreign banks with the state –of –the-art technology. During the first phase of reforms, i.e., from 1991 to 1998, profitability of the banks improved. By the end of second phase of reform period, the sector became fair and transparent and banks were provided with greater autonomy, flexibility and soundness.

### **2.3.5 Phase V- Recession period (2008 to 2015)**

During 2007-08, the financial sector across the world has been moved by the global financial crisis which has been originated in United States of America. But the Reserve Bank of India could shield Indian banks against the financial meltdown and could register reasonable profit in the year 2008-09. The Reserve Bank of India used its monetary policy well during the time of inflation by strengthening its hold over the markets and by increasing interest rates. The payment and money transfer were smoothly conducted as the inter bank transactions were not affected.

The Indian banks stays away from foreign portfolio investment and their investments in share market are under check by the Reserve Bank of India. Banks are also regulated in such a way that they depend less on foreign capital. The conservative mode under which the Indian banks were operating and the

efficiency of monetary policy adopted by the RBI during the time of financial crisis was appreciated by the world.

The public sector banks in India registered a reasonable growth during the time of global financial meltdown, irrespective of the fact that assets and liabilities of both foreign and private sector banks fell down. Because of this the inflow of bank credit to various sectors remained unaffected. The banking sector could register a profit as investment banks could fetch income out of underwriting, increase in trading revenue and increase in retail banking. Irrespective of expansion in credit extension by banks, the credit growth in 2008, decelerated due to reduction in fund flow from non-bank sources such as NBFCs and other sources from capital markets, external commercial borrowings and FDI and there experienced a hike in NPAs.

The Indian banking industry is expected to remain robust in the coming years. The 'India Vision 2020' predicts that there could be additional reserves for strong capital base of the banks. After the introduction of new economic reforms, following WTO agreement, India has encouraged the entry of foreign and private banks. It is the new private sector banks and foreign banks that attempted to rewrite conventional banking business model via, their innovative practices and technology oriented methods. But the private banking sector reach nowhere near public sector banks in terms of their size, low cost deposit and reach and thus mergers and acquisitions were their only means to combat the public sector banks. Apart from providing banking services, now banks are indulged in providing insurance services too, which is popularly called as banc assurance.

During the post recession period, two major developments have taken place in Indian banking sector – introduction of Bank Board Bureau as recommended by P.J.Nayak Committee and BASEL III norms. The Indian banking industry has evolved through various committee recommendations. Among them, the recent P.J.Nayak committee report is worth mentioning. In the context of deteriorating asset quality of banks, the Reserve Bank of India appointed P.J.Nayak

committee for giving recommendations for improving public sector banks and to augment capital attracting capacity of private banks. To overcome the problem of NPAs and low productivity, the committee recommended a change in governance structure of public sector banks by constituting a bank investment company and thereby reducing government holding in public sector banks to less than 50 per cent. The BIC will be responsible for the appointment of directors, CEOs etc. This also calls for the abolition of the Bank Nationalization Act and SBI Act and BIC will be governed by the companies Act, 2013. The report was criticized as it increases the element of privatization which may ultimately hit the vulnerable section. Also the report is based on a study conducted from 2005 to 2013, which is a short period and has excluded non-economic causes for increasing inefficiency in banking sector. But it is also notable that government has given nod for the creation of Bank Board Bureau.

The formation of BASEL committee and the implementation of its norms was a ground breaking measure in the history of banking. The committee was constituted with an aim of standardizing banking regulation across the nations.

BASEL 1 was formed in 1988 with a focus of solving the credit risk problem of banks. It defined the constituents of banking capital as tier1 and tier2 and set the ratio of capital to weighted risk assets at 8 per cent. The greatest advantage of BASEL 1 is that, it could provide a discipline in managing credit with in a simple frame work. It has transformed the very structure of capital requirements and could provide infrastructural support to banks. But BASEL 1 failed in focusing on risks other than credit risk.

BASEL 2 came to limelight in 2004, with an emphasis on prudential regulations. BASEL 2 lays that minimum capital requirement should be line with technological advancements. BASEL 2 norms are more flexible and has more risk sensitivity compared to BASEL 1. It lays down the relevance of having own internal methodology and supervisory review for banks. It tries to bring more market discipline.

BASEL 3 released in 2010 is the latest one in the series of BASEL accords. It includes a set of reform measures on strengthening regulation, banking supervision and risk management. The new BASEL accord tries to improve bank's ability to withstand financial and economic stress and bank's transparency by taking lessons from the financial meltdown of 2008. This can create a more efficient and stable banking sector. The pillars of BASEL 3 includes minimum regulatory capital requirements based on risk weighted assets, that is capital will be maintained by taking in to consideration market, operational risk and credit. The second pillar is to have a supervisory review process to handle the risk faced by banks and enhancing market discipline through making the banks transparent. This will be done by increasing the disclosures by banks.

The major features of BASEL 3 include the requirement of better quality of capital that is higher loss absorbing capacity. This will help the banks to withstand the financially stressed periods. It advocates the banks to maintain a cushion of capital conservation buffer at 2.5 per cent to counter the effects of financial stress. A counter cyclical buffer consisting of fully loss absorbing capital or of common equity, ranging from 0 per cent to 2.5 per cent has been introduced. This will help in enhancing lending during stressful period and limits banking activities in good times by decreasing and increasing capital requirements respectively. A leverage ratio for providing a safety net, liquidity coverage ratio and net stable funding ratio will be introduced under BASEL 3 norms. The systematically important banks need to have a loss absorbing capability beyond the BASEL 3 norms as a part of macro prudential regulations. It can be in the form of capital surcharges, contingent capital and bail in debt.

The implementation of BASEL 3 norms in Indian banking sector will definitely enhance its capacity to withstand economic downturn as it raises minimum capital requirement and introduces counter cyclical measures. By adopting the liquidity requirements, India will be at par with other nations and overall risk probability will be reduced. But reorganization in the institutional set up, trying



to maintain the liquidity ratio and supervisory measures may lead to slow down in the banking activities. Also the weaker banks may be at risk due to high capital requirements. The expansion of capital is a heavy task not only for the banks but for the government of India itself. But overall implementation of BASEL 3 norms will make Indian banks more healthy and sound.

The period 2008 witnessed a major change in the Indian macroeconomic scenario and the businesses as well as financial performance of the scheduled commercial banks were in line with these changes. The trend of major banking variables are explained in the tables.

**Table 2.3.11**

**Growth of Deposits of scheduled commercial banks in India (2008 -2015)**

<b>Year</b>	<b>Demand Deposits(in billions)</b>	<b>Growth rate (%)</b>	<b>Time Deposits(in billions)</b>	<b>Growth rate (%)</b>	<b>Aggregate deposits(in billions)</b>	<b>Growth rate (%)</b>
2009	5243.1		33110		38341	
2011	6417.1	11	45663	17	52080	17
2013	6623	2	60882	15	67505	14
2015	7940.3	9	77393	13	85333	12

*Source: Trend and Progress of Banking in India, RBI Report, Various issues, Mumbai*

**Table 2.3.12****Growth of credit of scheduled commercial banks in India (2008 -2015)**

<b>YEAR</b>	<b>FOOD CREDIT (in billions)</b>	<b>Growth rate (%)</b>	<b>NONFOOD CREDIT (in billions)</b>	<b>Growth rate (%)</b>	<b>BANK CREDIT(in billions)</b>	<b>Growth rate (%)</b>
2009	462.11		27293		27755	
2011	642.82	18	38778	19	39421	19
2013	964.22	22	51640	15	52605	16
2015	944.18	-1	64420	12	65364	11

*Source: Trend and Progress of Banking in India, RBI Report, Various issues, Mumbai*

The growth rate in term deposits slowed down also the aggregate loans and advances too decelerated due to reduction in term loans. But the Reserve Bank of India could shield Indian banks against the financial meltdown and could register reasonable profit in the year 2008-09 despite of the deceleration. The Reserve Bank of India used its monetary policy well during the time of inflation by strengthening its hold over the markets and by increasing interest rates. The payment and money transfer were smoothly conducted as the inter bank transactions were not affected. The Indian banks stays away from foreign portfolio investment and their investments in share market are under check by the Reserve Bank of India. Banks are also regulated in such a way that they depend less on foreign capital. The conservative mode under which the Indian banks were operating and the efficiency of monetary policy adopted by the RBI during the time of financial crisis was appreciated by the world.

Even though the definition for priority sector was modified but due to overall reduction in credit, it couldn't attract many loans. The sluggishness in banking sector continued in 2009 and 2010. Both deposits and credits were low. During 2010, the deposit growth was 17 per cent and credit growth was 16.91 per cent. But in 2011, despite the challenging operational environment, the banking sector

witnessed a growth. The deposits grew and reached 16 percent and credit at 21.49 per cent. The credit-deposit ratio was 75.7 per cent but investment deposit ratio declined to 28.8 per cent. Among the bank groups the new private sector banks recorded the highest credit-deposit ratio. The increase in deposits was mainly due to increase in term deposits and the nonperforming assets declined. The aggregate deposit growth rate during 2009 to 2011 was 17 per cent and it is the time deposit which contributed more to aggregate deposit growth by 17 per cent whereas demand deposit grew by 11 per cent (table 2.3.11). The aggregate credit grew by 19 percent during 2009 to 2011, with 18 per cent growth in food credit and 19 per cent growth in non-food credit (table 2.3.12).

During 2012, the deposits grew at a subdued pace as a continuation of recession and could grow only by 13 per cent. The economy was performing poor due to cyclical and structural factors and it led to the slowdown in the growth of credit to industries, services, infrastructure and personal loans. The domestic banks also failed to meet priority sector lending targets and it improved in 2013 despite the drop in overall credit but still was below the target level and it continued in 2015 too. The growth of advances to priority sector during the period 2013 to 2015 was 14 per cent (table 2.3.13). Another feature of 2013 was the deterioration in asset quality due to rising NPAs. The slow down continued in 2015 too. The moderate growth of scheduled commercial banks was mainly attributed to slow growth in loans and advances. It reflected the poor industrial growth and also risk aversion from the part of banks in the context of rising bad loans and governance related issues. The credit – deposit ratio has declined to 73 per cent during 2015 from 77.8 per cent during 2013.

**Table 2.3.13**  
**Progress of commercial banks (2008 -2015)**

INDICATORS	2009	2011	2013	2015
No. of Commercial Banks	170	169	155	152
	-	(0)	(-4)	(-1)
Scheduled Commercial Banks	166	165	151	148
	-	0	(-4)	(-1)
of which: Regional Rural Banks	86	82	64	56
	-	(-2)	(-12)	(-6)
Non-Scheduled Commercial Banks	4	4	4	4
	-	0	0	0
Population per office (in thousands)	14.5	13.4	11.9	10.3
	-	(-4)	(-6)	(-7)
Deposits of Scheduled Commercial banks per office (Rs.Lakh)	476.0	577.0	657.7	708.1
	-	(21)	(14)	(8)
Credit of Scheduled Commercial banks per office (Rs in lakhs)	344.6	436.7	511.5	517.2
	-	(13)	(8)	(1)
Per Capita Deposits of Scheduled Commercial Banks (Rs.)	33471	43034	55445	68576
	-	(13)	(14)	(11)
Per Capita Credit of Scheduled Commercial Banks (Rs.)	24230	32574	43123	50089
	-	(16)	(15)	(8)
Deposits of Scheduled Commercial Banks as percentage of National Income (at current prices)	88	82	84	80
	-	(-3)	(1)	(-2)
Scheduled Commercial Banks' Advances to Priority Sector (Rs.Crore)	9674.14	13373.33	18179.70	23781.71
	-	(18)	(17)	(14)
Share of Priority Sector Advances in total credit of Scheduled Commercial Banks (per cent)	34.8	33.9	33.7	36.6
	-	(-1)	0	(4)
Share of Priority Sector Advances in Total Non Food Credit of Scheduled Commercial Banks (per cent)	35.4	34.5	34.3	37.2
	-	(-1)	0	(4)
Credit Deposit Ratio	72.4	75.7	77.8	73.0
Investment Deposit Ratio	30.4	28.8	28.8	29.2
Cash Deposit Ratio	6.7	6.7	5.6	5.6

*Source: A profile of Banks, RBI Report, Various issues, Mumbai*

*(Figures inside the parentheses represent percentage of growth.)*

**Table 2.3.14****Population wise number of branches (2008 -2015)**

<b>YEAR</b>	<b>RURAL</b>	<b>Growth rate (%)</b>	<b>SEMIURBAN</b>	<b>Growth rate (%)</b>	<b>URBAN</b>	<b>Growth rate (%)</b>	<b>METROPOLITAN</b>	<b>Growth rate (%)</b>	<b>TOTAL</b>	<b>Growth rate (%)</b>
2009	31395		19065		15273		14131		79864	
2011	33923	4	23089	10	17629	7	16255	7	90896	7
2013	39816	8	28546	11	19935	6	18092	5	106389	8
2015	48557	10	33766	9	23036	7	20498	6	125857	9

*Source: Trend and Progress of Banking in India, RBI Report, Various issues, Mumbai*

The table explains the growth in number of branches in different areas. The number of branches has grown for rural semi urban, urban and metropolitan areas during the period 2009 to 2015. The total number of branches has grown 7 per cent during 2009 to 2011, 8 percent during 2011 to 2013 and 9 per cent during 2013 to 2015. The number of rural branches has grown during 2013 to 2015 period by 10 per cent from 4 per cent during 2009 to 2011. The growth of semi urban area was 9 percent, urban area was 7 per cent and metropolitan area was 6 per cent during 2013 to 2015.

The public sector banks in India registered a reasonable growth during the time of global financial meltdown, irrespective of the fact that assets and liabilities of both foreign and private sector banks fell down. Because of this the inflow of bank credit to various sectors remained unaffected. The banking sector could register a profit as investment banks could fetch income out of underwriting, increase in trading revenue and increase in retail banking. Irrespective of expansion in credit extension by banks, the credit growth in 2008, decelerated due to reduction in fund flow from non-bank sources such as NBFCs and other

sources from capital markets, external commercial borrowings and FDI and there experienced a hike in NPAs.

## **Conclusion**

The banking sector in India has evolved as a result of many policy measures government has taken during various time periods. Undoubtedly, the path breaking measure was the financial sector reforms taken as a part of new economic policy. It could modernize, strengthen and bring international practices in to Indian banking system.. Even though India is prone to international shocks, the strong hold of Reserve Bank of India on the scheduled commercial banks have shielded Indian financial sector from global melt down of 2007-'08. In order to improve asset quality and profitability through privatization, the recommendations of P.J.Nayak committee was taken by the government for the establishment of Bank Board Bureau. To keep Indian banking system sound and at par with international standards, BASEL norms has been introduced. The other aspect which Indian banking system needs to be concerned about is regarding technology adoption. The technology adoption also started in the period of new economic reforms and has changed the very banking scenario in India. Technology has helped India to survive in the competitive sphere, to maintain its global relevance, to retain the existing market share and to explore new avenues. But Indian banking system still lags behind in technology adoption and acceptance by the customers. The acceptance of technology by the customers required some pre requisites such as information super highway to ensure uninterrupted and fast internet connection, digital literacy and security etc. The coming chapters' deals with internet usage and acceptance pattern of technology banking instruments by customers in Kerala.

*Chapter III*  
*Technology Banking in India*

## CHAPTER III

### TECHNOLOGY BANKING IN INDIA

#### 3.1 Introduction

The advent of technology has changed all walks of human life. The role of technology is to enhance growth. It has the potential to cater to their needs, and hence, policy makers have identified strong inter-linkage between technology and economic development. In fact, human development, in combination with technology, yields economic growth, which in turn, is necessary to generate further advance in human development (Gustav 2011). Different models in economic theory, from Harrod-Domar model to Solow's model recognized the role of technology in growth. In India the introduction of economic reforms in 1991, paved the way for technology break through by way of implementing the recommendation given in Narasimham committee reports of 1993 and 1998 and Basel reports. It was adopted in banking sector with an aim to promote flexibility, operational autonomy and competition and also to keep Indian banking standards at par with that of international banking standards.

The entire sphere of technology initiatives that have taken place in the banking industry can be termed as e-banking. Electronic banking can be defined as the process in which a customer could perform banking transactions technologically, without visiting a brick-and - mortar institution. The adoption of technology banking in transactions, settlement of accounts, book keeping and other related functions have transformed and redefined banking activities by instilling greater speed, accuracy, convenience and transparency, benefitting both banks and customers. The adoption of technology has changed the very dynamics of commercial banking by bringing virtually, the whole banking set up at the doorstep of the common man. Today, information technology is not only an enabler of business improvement but is emerging as a driver and key differentiator of business performance and helps in keeping competitive advantages.



While implementing technology, certain requirements have to be fulfilled. There is a need for standardization across hardware, system software, operating systems and application software, so that there is interconnectivity of systems across branches. A high level of security has to be ensured as the banking environment requires confidentiality. To facilitate centralized data bases and distributed processing, an advanced level of communication and networking with the adoption of technology banking, the whole business process has to be reengineered so that full benefits of computerization can be reaped. There should be a fully fledged mechanism to monitor the bank's technology plan and also to upgrade the technology on time. The bank should also initiate special efforts to solve the issues in human relations that arise in a computerized environment.

The requirements of the banks are different according to the nature and volume of business. The technology deployed should be capable enough to meet the internal requirements of the firm. It should support the banks in creation of new products as it is inevitable to withstand competition. The adoption of information technology in banking sector has led to certain trends. One such much discussed trend is outsourcing. The gaps in IT expectation and reality trend towards focusing on core areas of banking, increasing legitimacy of outsourcing and intention of getting out of the responsibility of up gradation of software's and hardware's give scope for outsourcing. Another trend is the movement from hierarchy to team approach. Such integration will help to address the new issues out of technology adoption at a faster pace and develop further capabilities. With the emergence of electronic banking the number of employees as a percentage of total staff is witnessing a down turn, as the expenditure on IT goes up. In the embryonic stage of adoption of technology, it was a means to get rid of high processing cost, but later technology was seen as a means to reap profit. Information technology, once believed to be a panacea, transformed itself to an enabler that supports business process re-engineering, human resource initiatives, organizational set up and even physical infrastructure. Another trend caused by technology adoption is downsizing which refers to transferring computing power from mainframe to the work station and personal computers.

From these observations, it is evident that the adoption and implementation of technology has changed the whole industrial frame work.

### **3.2 History of technology banking**

In this modern era, technology is no more an extravaganza, but necessity, itself. Economic growth has been a result of scientific knowledge and innovation. The growth experienced by the industrialized nations has been of course, the result of technological progress achieved by nations in different spheres. Thus technological progress is in imperative for a long term economic growth and development. At the global level, the technological innovations started with the advancement in communication technology. This has increased co-ordination between head office and branches and bridged inter market price differentials during the period 1864 to 1945. Between 1945 and 1965 the advancement in technology has led to growth of cross border payments and automation of branch accounting. Automated Teller Machines were introduced during this period. The diffusion of technology has taken place during 1980 to 1995. During this period, banks started to supply nonpayment products like pension, insurance and mortgages. The banking sector also witnessed the development of alternative distribution channels such as EFTPOS, phone banking etc. Today the banking system is no more confined to its traditional role. It is wider in its scope and activities. Obviously, it is technology adoption that plays an inevitable role in meeting the demands and expectations vested in the banking system.

### **3.3 Technology banking in digital economy**

Digitalization is the new buzzword in the third world nations and is as regarded the third industrial revolution as it is the new productivity platform. A digital economy is also referred to as an internet economy. It is the worldwide network of economic activities enabled by information and communication technologies. In other words, it is an economy based on digital technologies. Digital technology is expected to generate massive wealth by exploring new markets and growth opportunities and new jobs. It is also expected to be the greatest business opportunity of the future generations. It provides such an opportunity that a person equipped with a mobile can now be a producer creating services,

earning money. Thus it leads to a fundamental transformation in economic systems as the traditional market place is changed to a virtual market place.

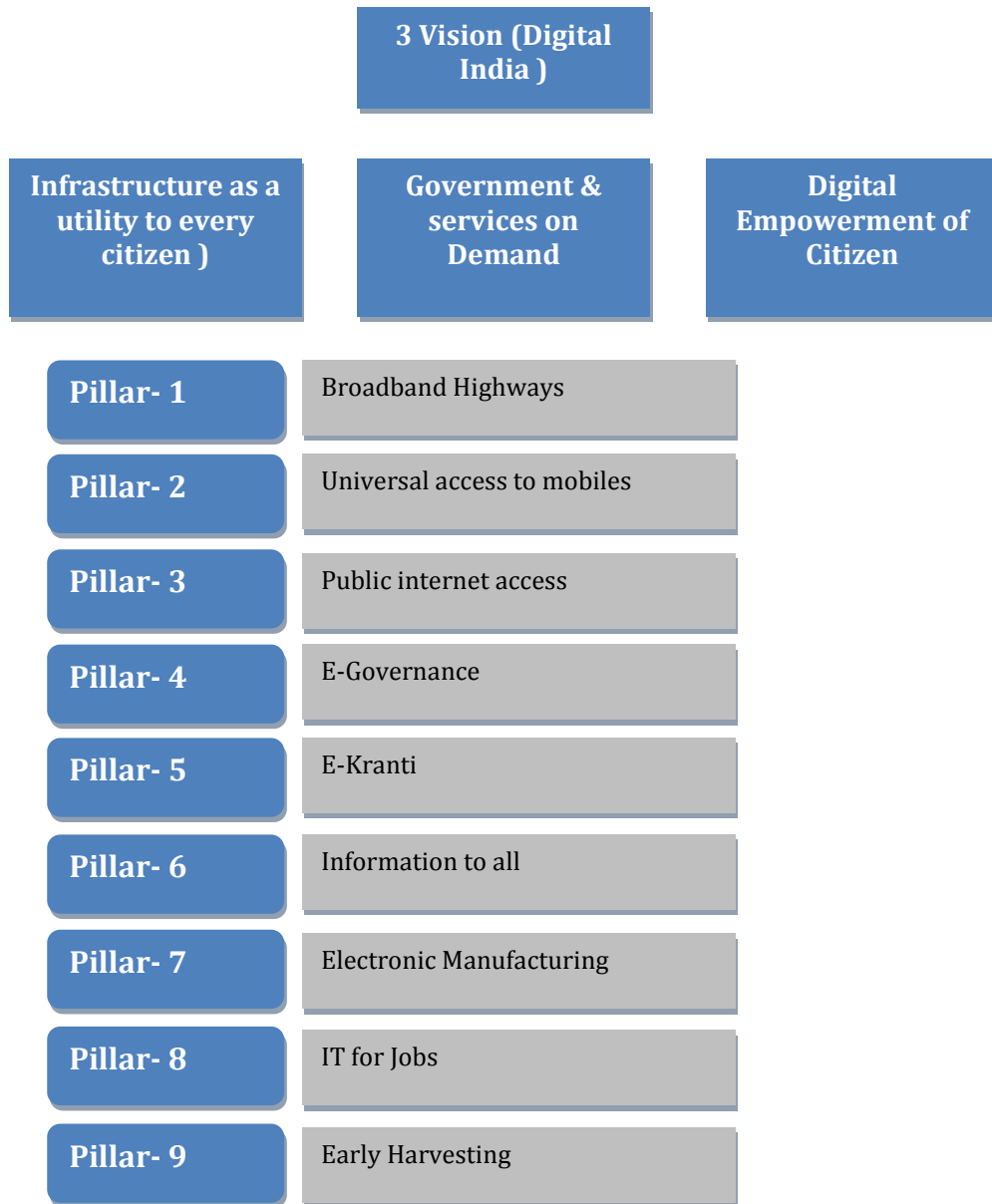
The usage of technology leads to optimization by making the marginal cost zero. Digitalization is also regarded as the second machine revolution. The technology can become embodied in human or physical capital and can create more output with less input (Mayinka et-al 2013). It can also provide solutions to scientific controversies.

The digitalization initiatives began in India, after the introduction of New Economic Reforms in 1991. Our policy makers have realized the potential of technology to enhance growth and development by generating job opportunities and new investment avenues. Presently the government aims at “transforming India in to digitally empowered society and knowledge economy”.

Digitalization also helps in improving governance in an effective way, so that to tackle the issues of poverty and inequality. The government of India started many projects to enhance digitalization in India. The national e-governance plan is one such mission. But it is the digital India, which gave momentum to digitalization, as it aims to promote inclusive growth through digitalization and to make the economy transparent and speedy.

Digital India, introduced in 2014 aims at improving inter connectivity, so that the government services are made available to all citizens online to achieve inclusive growth in the areas of job opportunities, manufacturing products and services. Digital India is based on three key areas – Digital infrastructure as a utility to every citizen, governance and services on demand and digital empowerment of the citizens.

**Figure 3. 5.1  
Nine pillars of digital India**



It has been centered on nine pillars. These pillars cover major products like National e-governance plan, national optical fiber network, national knowledge network, digital cities etc. The first and foremost important pillar is the internet connection for all. Both rural and urban areas and the government departments have to be connected with internet. This is possible only with the construction of high speed broad band highways and it should be accessible to all.

The best instrument to provide connectivity among all sections of the masses is mobile phone. Universal access to mobile phones is another major objective of the government. It is imperative to have mobile phones to have internet connection and is the second major pillar of “Digital India”. Together with building broad band highways, Public Internet Access Mission has been started with special focus on providing internet connections in rural areas. Under National Rural Internet Mission about 250000 villages and 150000 post offices are to be connected. The fourth pillar is E-governance. Both central as well as state governments are taking initiatives for delivering government services electronically. A national e-governance plan has been formulated by the Department of Electronics and Informatics Technology. (DEITY) and Department of Administrative Reforms and Public Grievances (DARPG). Thus under e-governance plan, it is easy for the information seekers to avail online payment gateways, certificates, government data bases and government schemes. This makes the governance system more transparent and reachable to citizens. To deliver the government services electronically, government has started a project E-Kranti, which is the fifth pillar of digital India. The project focuses on E-education, E-health, and technology for farmers, technology for planning, technology for financial inclusion, technology for justice and technology for security. Under E-education, all schools should be provided with broad band connection, digital literacy initiatives and opening of online open courses. E-Health initiative is to provide online medical consultancy, patient information and online record keeping. By adopting technology in agriculture, farmers can avail real time price information, loan and relief payments via mobile banking and online ordering of inputs. By adopting technology in planning, decision making can be made on the basis of GIS. For ensuring security, mobile emergency services can be implanted at larger level with the help of technology. Technology also helps in achieving the goal of financial inclusion by way of mobile banking and micro – ATM programme. To ensure better justice E-courts, E-police, E-Jails and E-prosecution can be established using technology.

Another major pillar of Digital India is “information for all”. It is important to provide information to all the citizens for an efficient and affective planning and decision making. Electronic manufacturing is another area which got thrust in “Digital India”. This is to completely eliminate the import of electronic good by 2020. For this, a national policy on Electronics has been framed with adequate measures. IT for jobs is the other pillar in Digital India, which has emphasis on providing training to youth to avail employment in IT sector. Under this programme, both rural and urban youth are considered and also creation of BPO in every North –East state. Early harvesting programme is the ninth pillar in Digital India, which encompasses areas such as biometric attendance, Wi-Fi connection in all universities in India, public Wi-Fi hotspots, IT platform for managers etc, national portal for lost and found children, weather information and disaster alerts and e-books in schools etc.

‘Digital India is believed to make drastic changes in the field of education, health, banking etc., which will lead to improvement in socio-economic condition of the poor and vulnerable. By 2025 it is expected to increase employment opportunities and thereby GDP to 1 trillion. It also helps in enhancing entrepreneurial opportunities and labor productivity. Digital India is connecting far reaching rural areas, so that better health care and banking facilities can be provided. The unbanked villages of India can be banked, realizing our biggest goal of financial inclusion, i.e. the proportion of individuals using financial services. Opening bank accounts merely does not contribute to financial inclusion in all aspects, but should put to regular use to meet their regular financial requirements. It should also be supported by an appropriate regulatory and legal frame work to maintain the information environment. Technology banking is believed to be the most suitable way to achieve financial inclusion as it reduces cost in providing financial services and increases accessibility too.

The draft of Internet of things (IOT) published by the Department of Electronics and Information Technology of India asserts the positive role technology could

play in the Indian economy. Internet provides a wide range of possibilities in the public sector, such as smart grid, gas monitoring, connected learning, travel avoidance etc, which lead to increased revenue and improves service delivery of the government. In the private sector too Internet of Everything (IOE) ensures maximum asset utilization and improved supply chain through capability improvement. Internet of Everything (IOE) offers better solutions for water scarcity monitoring in India. It helps in sewage treatment, ground water recharge and monitoring building green homes. It also contributes to food security as by solving inefficiencies in supply chain management. Technology is also inevitable in developing smart cities/buildings. It provides all necessary facilities such as traffic management, security, video surveillance, connected commercial vehicles, monitoring air quality, road quality, pollution, citizen – to - government interactions and also provides local and central government with new revenue streams.

Technology helps in improving the overall health care system as it facilitates exchange of health information, chronic disease management and decreases individual errors. This makes health care systems more safe and responsive and improves delivery of health care. Today, it is impossible to compete and succeed in business without technology. Technology is the enabler of business ventures. It transforms the very organizational structure and redefines organization. Direct marketing is more efficient with the help of technology. It provides flexibility, also reduces barriers to entry and exit.

As a measure to achieve financial inclusion, the government has begun 'Jan Dhan Yojana', Aadhar, mobile banking, which is popularly known as JAM. The Unique Identification Authority of India started Aadhar as an initial attempt in this regard. The customers are linked to their accounts via the ID number, given in the Aadhar card, facilitating transaction through biometric identification. This improves service delivery at a reduced cost. Pradhan Manthri Jan-Dhan-Yojana is another attempt for financial inclusion, under which bank accounts can be opened with zero balance. This is to promote opening of bank accounts and

cultivate a habit of banking activity. In developing nations like India, mobile banking is a huge potential to create banking culture among the rural population. The number of mobile phones and mobile connection are fairly growing in India. Thus, by using bank accounts opened under Jan-Dhan-Yojana, Aadhar number and mobile phones, one can perform banking activities at reduced physical barrier and cost.

Digital economy promises a bright future but is not devoid of challenges. Digital goods have their own peculiarities. Like any other good, they contain information, but digital goods themselves are information. It is difficult to track the real impact of digital goods on the economy. Technology has changed the way in which goods are created, produced, distributed, exchanged and consumed.

Digital goods appear to be public goods due to certain qualities they possess. The greatest challenges posed by digital goods are that it disturbs the existing, balance between public goods and private goods. Unlike public goods, the nature of digital goods may seem to be rival in nature. But rivalness is only in terms of medium used for distributing the digital good. Digital goods can be replicated without loss of information or quality thus can be considered as non-rival. With regard to the principle of exclusion, only the first unit of digital good is excludable. Also, digital goods are expensive goods, as the actual value can be realized only after the usage of goods. Due to this, consumers may not be willing to pay the price of digital goods. Digital goods are also durable in character which results in loss of market power. Because of these characteristics of digital goods, to produce digital goods, the firm may require more market power. Another major threat by digital goods is consumer piracy, and data in security. Thus, because of the peculiar features of digital goods, the prices of digital goods are at an unsustainable level, leading to market failure. Even through digital economy offers a huge number of job opportunities, it also has some in – built problems. Working in a digital environment leads to non-standardization of work, and job in security is high. The workers receive less of employer



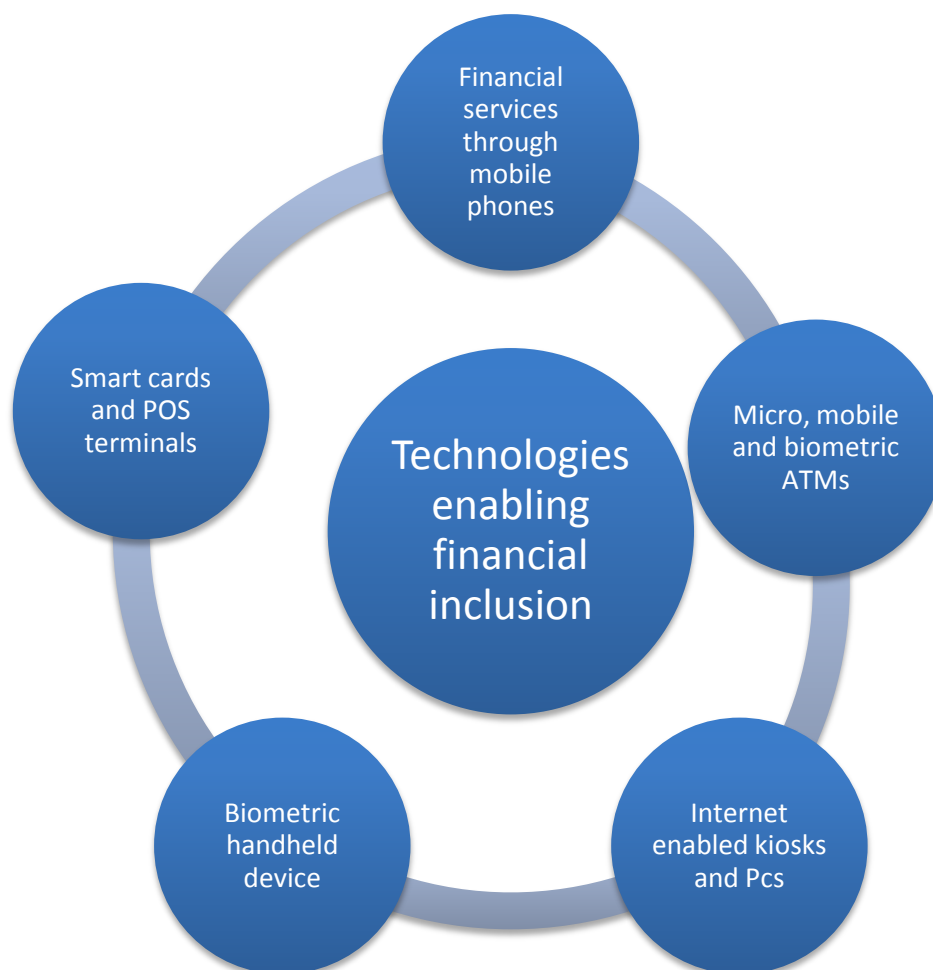
sponsored training programmes. This may result in higher level of unemployment, social isolation and stress of self management.

### **Technology banking and financial inclusion**

With the help of technology, the servicing banks can improve their efficiency, and can also work together as an interconnected system through multiple channels. Development of technology and communication helps in establishing a rural information infrastructure in India. A number of technology based applications are available to increase financial inclusion in India. It includes Unstructured Supplementary Services Delivery (USSD), Short Message Services (SMS) Wireless Application Protocol (WAP), phone based applications such as Java 2 Micro Edition/Binary Runtime Environment for wireless, General Packet Radio Service (GPRS) Subscriber Identity Module (SIM) based applications Near Field communication (NFC) etc.

**Figure 3. 5. 2**

**Key distribution technologies for financial inclusion**



POS: Point of Sales, PC: Personal Computer, ATM: Automated teller machines

*Source: Workshop on Role of ICT in Financial Inclusion by UNDP*

**Key distribution Technologies for financial inclusion**

The most commonly used distribution technologies in India are IT enabled Kiosks, mobile phones and ATM's. IT enabled kiosks are one of the most widely used methods to increase financial inclusion. They are self-operated; IT enabled centers which provide banking facilities to customers. Another method for financial inclusion is mobile phone services. The number of mobile phones and mobile connections are increasing in India. Thus it can be used to reach unbanked population in remote areas. With the help of an intermediary, mobile

phones can be used to perform banking transactions. ATMs are a computerized telecommunication device that provides financial transaction facilities in public place. The greatest advantage of ATM is that it does not require a human interference. In order to cater to the needs of the rural masses, several innovations in ATM's have come up. Biometric ATM is one such innovation which suits the illiterate customers. Mobile ATM is ATM services on van, so that ATM services can be provided to the interior regions. Biometric card holders can also make use of mobile ATM facility. Micro ATMs are alternative to ATMs which possess all the basic features of an ATM, but requires less cost to establish and maintain. They can be established in accessible points frequently visited by rural people. Biometric hand held devices are used by business correspondents, which has the facility for thumb impression, retina detection to identify the user; it is also capable of providing audio confirmation of the transactions done and issue receipts. Smart card is another method used to save all consumer information's that includes finger prints and photographs. In Point of Service (POS) terminal, smart cards can be used to do transactions or withdrawals. The transaction information are secured, which will be later uploaded on bank's main server.

### **3.3 Towards technology banking in India**

In India the efforts for the adoption of technology in banking system started with the implementation of recommendations given by the C.Rangarajan committee in 1984. But the real breakthrough has happened when India opened itself to the world by way of economic reforms in 1991. Since then, the banking sector has been opened to foreign banks and private sector banks who own the state-of-the-art technology. Thus Indian banks were forced to adopt technology banking to with stand competition.

At the initial stage, the departments and main functions in principal branches were computerized with the adoption of advanced ledger posting machines. This was to deal the accounts section. Next, branch automation was introduced with a focus on customers. This could enable single window service. After that emerged the network based operations to provide interbank connectivity. Next,

the Indian banking system witnessed the deployment of Automated Teller Machines and introduction of core banking solutions. With the establishment of the Institute for Development and Research in Banking Technology (IDRBT) in 1996, technological infrastructures such as structured financial managing system (SFMS) INFINET and PKI based electronic data transfer has been developed to facilitate a secured payment system in India. Gradually, other electronic banking services such as cards, mobile banking, internet banking etc emerged. Today, technology banking is gaining much popularity and the Reserve bank of India has taken many measures in this regard.

The process of technology adoption is still continuing in Indian banking sector, and we are not yet in an advanced stage compared to developed nations. As per the information given by Global Findex (2011) developed by world bank, the percentage of population who are 15 years and above, using technology banking is merely 2 percentage in India. The percentage of population using credit –card, debit cards and mobile banking is only 1.8, 8.4 and 2.2 percentages respectively. These data make it clear that India is yet to move a long way in the path of technology adoption in banking sector, which also requires a consensus between government, banks and customers.

Technology is undoubtedly the key driver for development in all the sectors. It can expand opportunities, improve service delivery and boost growth. Adoption of technology in banking, paving way for digital banking was a transformational measure, due to its potential to benefit government, banks and customers. The greatest advantage of technology banking is that, it facilitates the customers to perform anytime, anywhere banking. The customers need not visit a brick-and – mortar institution to get their banking activities done. Customers can indulge in self operation, which ensures privacy. This is possible as the customers can access their online account anytime. Thus time and distance are no more barriers to perform banking activities. Technology banking is also said to be cost effective. Data management and data availability becomes easier and cheaper with the establishment of data warehouses. The decision makers could take

timely action at reduced cost. With the use of digital banking, costs of cross-border transactions as well as transactions between banks, between branches and its subsidiaries has been reduced. It also makes transactions easy, accurate, and transparent at an increased speed. The Indian Diaspora is thus economically benefitted due to sharp reduction in their costs and increased transparency in remittances.

In a knowledge based society, customers are more informed, hence, more demanding. Thus, by digitalizing banking activities, banks could satisfy the increasing consumer demands by offering better products and wide choices to them. With the help of information technology, banks have an improved customer relationship management system. Banks can have a close examination about the needs of the different classes and can offer suitable products for them. Banks are also in a position to handle large volume of transactions with reduced cost, time and employees, so that they can very well focus on strategically important functions. This in turn results in better customer services and profitability for the banks.

Information technology adoption is the most accepted method for banks to keep a distinctive edge over competitions. The costs of luring new customers to the banks are much higher than retaining the old customers. The customers are often tempted to leave the bank due to poor services. By using technology, banks can retain old customers and can also attract new ones. Thus, digitalization helps the banks to withstand competition and to retain and acquire market share. With the help of informatics communication technology, banks can formulate advanced risk management systems. After the global recession of 2007-'08, risk management has been a matter of concern. Banks can also have a credit appraisal system with which they could assess the credibility of the customers, which will result in reduction of nonperforming assets. Green banking is another possibility, which Indian banks are yet to explore in depth, using information technology. This helps banks to finance ecofriendly projects with less negative

externality on both environment and society. Thus banking sector can directly contribute to sustainable development.

Banks can also develop an advanced fraud monitoring and preventive system with the help of information technology. Customers should be provided with safe banking experience to enhance their satisfaction. Safe banking experience to the customers will help the bank to prevent huge financial loss out of it and also help to withstand competition. By digitalizing payments, the government could achieve significant cost savings in the case of social transfer that is payments made by government to public. An analysis made by Mckinsey and company estimated that by resorting to digital mode of payments, Indian government can save \$ 22.4 billion per year. This cost reduction is out of reduction in transaction cost, overhead costs and fraudulent practices. (Lochann Et el 2010). Because of liquidity and transactional anonymity of cash, there are chances for leakage. By digitalizing, government can trace out the payment process as digitalization consists of stringent identification measures and every record is tamper proof. A study based on India village shows that by making pensions card based, bribery demands have been reduced by 1.8 percent and evidence of 'ghost' recipient by 1.1 percent (Muraleedharan et.al, 2014),

To achieve technology banking is also said to be a means of financial inclusion. Financial inclusion is necessary for all social as well as economic progress. By technology banking banks can extend the banking activities without a physical infrastructure. Thus geographical coverage and banking penetration are enhanced. In India business correspondence model is widely used in this regard. This helps banks in exploring new markets, banking the unbanked, thereby bringing them to the main stream financial activities.

Thus technology banking plays an important role in increasing economic growth. It deepens financial inter mediation and increased efficiency in accessing credit, payment services, insurance etc. By digitally connecting, central bank can keep a check on scheduled commercial banks via extranet, and can facilitate management of cash reserves, clearing of checks, discounting of bills open

market operations etc. A digital platform offers an opportunity to easily access financial services to meet the challenges of economic growth and to ensure financial stability. Technology, when effectively used can create a multiplier effect on growth and development.

### **3.4 Committees on technology banking**

The digitalization in Indian banking sector is based on recommendations given by various committees appointed by the Reserve Bank of India. By looking into these recommendations one can easily trace out the milestones Indian banking sector has undergone during the time of technology adoption.

#### **3.4.1 Working Group to Consider Feasibility of Introducing MICR/OCR Technology for Cheque Processing.**

The committee appointed in 1982 was chaired by Y.B. Damle. The committee recommended for the introduction of MICR/OCR in three phases so that large volume of processing is possible. It means sorting and listing of cheques with the help of computers and there by easing of work load. The committee was also responsible to give details on standardization of cheque form with regard to quality of paper, printing specification, size etc. In the first phase, item processing was introduced in four metro Politan cities i.e. Mumbai, New Delhi, Chennai and Calcutta with the help of MICR technology. In the second phase, attempt was made to introduce it in all state capitals and important commercial centers. In the third phase, national clearing was introduced by dividing the nation into four regional grids i.e. Delhi, Mumbai, Calcutta and Chennai. Each regional centre should function as a clearing house for intra – grid instruments and also should participate in national clearing on behalf of the grid for extra – grid outstation cheques. Even though MICR technology was adopted in Indian banks, it had less coverage especially in rural areas where 70 per cent of bank branches were located. The National Clearing system also would have been extended to remote area, so that early clearing of funds in an efficient manner would have been possible.

### **3.4.2 Committee on Mechanization in the Banking Industry**

The nationalization of 14 major commercial banks in 1969 has transformed the Indian banking system. It has grown in terms of size of operations and number of bank branches. It was thus essential to accommodate these changes through mechanization and the committee on mechanization in banking industry was appointed in 1984 under the chairmanship of C. Rangarajan. The committee needs to identify the areas where mechanization is needed and its required extent in bank branches and head offices. An efficient mechanization should have a standardized procedure in different areas of work and different tiers of bank offices, appropriate equipments for processing and adequate infrastructure which the committee needs to recommend. An apt security arrangement in data flow and their processing should also be specified. The committee recommended for setting up of service branches at centers having more than ten branches. Such service branches are meant to perform clearing operations of the bank at that centre. The committee envisaged that the banks should be ready for the introduction of MICR technology at the four metropolitan cities after assessing their requirements for encoding, adoption of standardized cheque forms and to recognize their work procedures accordingly. The banks will also be asked to train their staffs to the required level. But computerization should have been at a larger scale with more coverage of regional offices, zonal offices and central offices and also with interbank offices. A complete computerization would have helped in easing the blockage of communication between offices of RBI, ministry of finance and other financial institutions. The recommended standard format for exchange of information and smooth data flow was not in consultation with IT experts, making it less efficient.

### **3.4.3 Committee on Communication Network for Banks and Society for World Wide Interbank Financial Telecommunication (SWIFT) implementation.**

In 1987, the committee on communication network for banks and SWIFT implementation was constituted under the chairmanship of T.N.A Iyer. The



committee recommended setting up of BANKNET which is to be owned jointly by Reserve Bank of India and the public sector banks. BANKNET can make use of the four IBM main frames which are installed at four meters for cheque processing for data communication. BANKNET is to be implemented in two phases. In the first phase, the IBM mainframe services will be connected with the computer systems available in the head offices of the public sector banks in Mumbai, Delhi, Chennai and Calcutta. In the second phase, the connection will be extended to eight to ten major banking centers and within three years connection shall be given to hundred centers. This can be used to perform inter-bank fund transfers on bank's own account and on customer's account, government transactions and currency chest transactions. There can be an improvement in payment system by facilitating automated clearing services, branch banking etc. To transmit and receive international financial messages, India should join the Society for World Wide Interbank Financial Telecommunication (SWIFT) Network. Also, the committee recommended that, BANK NET should take after SWIFT in matters of encryption message standards authentication and data security which are of International standards.

#### **3.4.4 Committee on Computerization in Banks**

Committee on computerization in Banks has been chaired by C.Rangarajan, the then deputy governor of RBI in 1988. The committee looked in to the diversification and expansion of the banking industry after mechanization. The committee made a series of recommendations which laid the foundation for digitalization in banking sector. It made plans for computerization in zonal offices, head offices and branches for five years, which is from 1990 to 1994. The committee recommended for computerization of clearing houses at Thiruvananthapuram, Jaipur, Patna and Guvati, which are managed by the Reserve Bank of India. National clearing of intercity cheques and MICR technology will be introduced at four metropolitan cities and cheques drawn on the four metros received from Hyderabad, Bangalore, Nagpur and Ahmadabad all collected by way of one way collection. The branches were computerized and

established connection between branches. The committee envisaged uniform rules and regulations for all clearing houses. There was an improvement in customer service due to introduction of online banking and a network of Automated Teller machines in Mumbai. A plan to introduce ATM's at strategically important spots such as railways, airports, hospitals, commercial centers etc. has been charted out, so that the consumer can perform basic banking activities without visiting a brick- and – mortar institution. But the introduced number was not enough to meet the growing demands. A single “All Bank Credit Card was introduced to reduce customers” dependence on cash and cheques. Also, in order to ensure risk free and efficient electronic transfer of funds, standardization and improved security features were incorporated. Attempts were made to assess requirements for trained staffs for popularizing computerization. But many computers were making use of Advanced Ledger posting Machines which is only partial computerization. Thus recommendations would have made for LAN networking and to connect the entire system through LAN. Steps to promote computer based communication methods such as emails were absent in the recommendations. Anyway there were efforts from the part of committee to promote card culture and necessary training regarding the same.

#### **3.4.5 Committee on Technology Issues Related to Payments Systems Cheque Clearing and Securities Settlement in the Banking Industry.**

The committee was appointed in 1994 under the headship of W.S. Saraf. The committee was appointed to examine the managerial issues regarding technology and financial transactions in the banking industry, also to review MICR cheque clearing procedures and SWIFT operations. The Saraf committee recommendations paved the way for the establishment of Electronic Fund Transfer, with the BANKNET communication network as the carrier. Also suitable legislation in the Electronic Funds Transfer Act 1978, USA, and data protection Act 1984 UK, was formulated. The committee also decided to introduce MICR clearing in centers with more than hundred branches. Centres such as Hyderabad, Bangalore, Pune, Surat and Ahmadabad were to be given

priority due to large volumes of transactions, and the size of the MICR instruments was made uniform. An Electronic credit clearing service for low volume recurring transactions and Electronic Debit clearing service for payments to utility companies was also introduced. A Delivery Versus Payment (DVP) was introduced for Constituent Subsidiary General Hedge Account (SAH). There was a switch over to online, interbank clearing and the concept of clearing Bank was introduced for decentralized cheque processing. It was also decided to expand BANKNET Network with nodes in all major branches and transaction of cheque was allowed up to the value of Rs. 5000. To enable dial up connectivity, encryption and file transfer facility, modifications were recommended for COMET software. To repeat currency chest transactions, NICNET is to be used by the chest branches. The committee also emphasized on large scale induction of communication technology and computers in service branches and also optimal use of SWIFT. The committee also planned for a reporting system between banks and RBI and training programs for the staffs but both the plans did not come to reality.

#### **3.4.6 Committee for Preparing Legislation on Electronic Fund Transfer and other Electronic Payments.**

Electronic Fund Transfer being a major revolution, it was inevitable to define its scope. In 1995, the Reserve Bank of India constituted a committee under K.S.Shere to prepare legislation on electronic Fund Transfer and other electronic payments. The committee was also required to look the extent to which paper documents are mandatory. The committee recommended a set of regulations under Reserve Bank of India Act, 1934 and also to make necessary amendments to Banker's Books Evidence Act, 1881, as a short term measure. As a long term measure, the committee envisaged the creation of Electronic Fund Transfer Act, the Computer misuse and Data Protection Act. To deal with electronic contracts the committee proposed information technology Bill, 1999 and Electronic commerce Bill 1999; Despite these measures, still there is a need for a separate act for EFT to efficiently deal with the issues such as rights and obligation of the

party, payment finality etc. A model Bank – Customer contract agreement has to be framed for EFT's. There is also a need to amend the Reserve Bank of India Act, 1934, in tune with the new payment and settlement systems so that the Reserve Bank of India has the desired regulatory and supervisory powers. Also the committee was focusing on methods to induct information technology rather than going deep in to cyber laws and related legal issues since cyber law was at infant stage.

#### **3.4.7 Committee on Banking Sector Reforms.**

The committee on banking sector reforms (1998) under the chairmanship of Narasimham stated that information technology and Electronic fund Transfer are the pillars of modern banking development. The committee opined that India was lagging behind in terms of technology banking due to lack of data warehousing, inadequate telecom infrastructures, inadequate bank automation and commercially oriented infra-bank platforms, lack of marketing efforts and lack of planned standardized electronic systems. The committee specified in terms of developing a state – of – the – art IT infrastructure for the banking sector. We are of the view that the issue needs to be considered in terms of serving the two major sector in India, that have slightly different priorities viz. rural and urban. In fact, the ultimate infrastructural needs for both the sectors are the same, but their priorities and needs differ.

#### **3.4.8 Committee on Technology upgradation in Banking Sector**

The focus of the committee under the chairmanship of A. Vasudevan was to provide terms of references and practical solution to the problems related to technology up gradation in banks, to implement the recommendation of Narasimham committee II. The committee called for making legislative changes at the earliest, keeping in view the recommendation made by the Shere Committee. The committee emphasized to solve issued related to encryption on public switching Telephone network lines, record keeping , admission of

electronic files as evidence and treatment of electronic funds transfer on a par with crossed cheques or drafts for purpose of income tax.

The government should take lead role in adopting technology and IDRBT together with RBI should initiate the process of designing the payment system and establishing standards. The Reserve bank of India should take steps for establishing a network of regional data warehouse, so that together with the availability of comprehensive statistical data, risk assessment can be made easier. The process of automation should be coupled with the process of recognizing too and the scope of outsourcing in this regard can also be explored. The committee submitted its report in 1999 with all essential solutions for the problems in technology up gradation in banks.

#### **3.4.9 Working group on Information Security, Electronic Banking, Technology Risk Management and Cyber Frauds.**

The working group was formed under the chairmanship of G. Gopalakrishna in 2010 to suggest measures to the Reserve bank of India to mitigate the risk of use of information technology in banking operations. As per the recommendation given by the working group the Reserve Bank of India issued guide lines regarding the same in 2011. The committee vests the IT risks management accountability with that of the Board of Directors and executive management of the bank, and the organizational structure and process should be modified in such a way to ensure that there is sustainability for Bank's IT security and it is in line with the business strategies and objectives. The banks are required to form a separate information security function from that of information technology department to exclusively focus on information security and risk management. The bank should take effort to enhance organizational capabilities to provide value additional facilities to the customers. This can be achieves by managing IT services, infrastructure and IT operations risks. In case of out sourcing, the ultimate responsibility lies with the Board and the senior management of the bank. In such cases services provider should be efficiently chosen and there should be continuous monitoring and control of outsourced activities, risk

evaluation and management. The committee also spelled out the role and responsibilities of Information Security Audit stakeholders, planning and execution of the audit and also on the need for creating an industry wide frame work to deal with fraudulent practices. With relation to fraud issues, a customer awareness programme and frame work should be formed. Adequate steps should be taken to mitigate the legal risk from cyber laws.

#### **3.4.10 Committee on Comprehensive Financial Services for Small Business and Low Income Households.**

The committee was appointed by the revenue Reserve Bank of India under the chairmanship of Nachiket Mor in 2011 to propose measures to increase access to financial services, there by achieving financial inclusion. The committee stated that each low - income household should be given access to the formal financial system; so that they can avail suitable invest products, credit products, deposit products and insurance. They can also manage risk at reasonable price level. For this the committee recommended to provide all Indians above eighteen years with an electronic bank account, and also to establish a widely distributed electronic payment access points, offering different banking facilities such as deposits, withdrawals etc., at reasonable price. But the committee was silent on the level of digital literacy of the users and the infrastructural requirements for the same.

### **3.5 Instruments of technology banking**

#### **3.5.1. Automated Teller Machines**

The committee on Computerization in Banks (1988) chaired by Dr. C. Rangarajan recommended for setting up of a network of Automated Teller Machines in Mumbai which is a major breakthrough in the development of ATMs. The committee also recommended for setting up of ATMs at strategic locations such as airports, railway stations, hospitals, important commercial centers and bank branches. In 1997, the IBRT started National Financial Switch to facilitate inter-operability between clusters of ATMs. In 2009, RBI introduced

one of the key measures for expanding ATM network in India. It made all transactions of third party ATM free, but later on imposed restrictions.

An ATM is a computerized telecommunication device that allows a financial institution's customers a secure method of financial transaction in a public space without the need for a human bank teller or clerk. The customer is given a plastic card with a magnetic strip or a plastic smart card with a chip that contains the account number. A personal identification number (PIN) is also given, on the entry of which the customer is identified. ATMs are of two types. In mono – function devices, only one type of mechanism for financial transaction is present whereas in multi-function devices, multiple mechanisms to perform multiple services within a single foot print are present. An ATM perform various functions such as cash dispensing, generating statement of account, account balance enquiry, request for a cheque book, deposit of cash or cheque, issue of gift cheque and traveler cheque and make utility payments like telephone bills, electricity bills etc. With the help of ATMs efficient transactions are possible at anytime. They are also a boon for the banks as it saves cost of setting a physical branch. ATMs are not free from disadvantages. It can perform only limited function and the cash withdrawals are restricted to certain amounts as fixed by the bank. At times it also raises security issues.

Several ATM models are available in India. They include online model, offline model, stand alone model, networked model, dip card model and motorized model. In online model, the ATM is connected to the bank's data base, so that there is online real time access to the customers' accounts. Usually banks set a daily limit for withdrawal which will be monitored by the ATM switch center. In offline model, the ATM is not connected to bank's data base and the withdrawals are permitted up to a prefixed limit, irrespective of the balance available in customer's account. When an ATM is not connected to any ATM network, it is called stand alone ATM. Here transactions are restricted to the customers of the ATM branch and its link branches. When ATMs are connected to an ATM network, they are said to be networked. The card holders can use

their ATM cards at any of the networked ATMs. In dip card model, the customer is supposed to dip the card and take it back to do the transaction. In motorized model, the customer inserts the card and takes it back only after the transaction is done.

The important types of ATMs are brown label ATMs, white label ATMs, biometric ATMs and micro ATMs. Brown label ATMs are those ATMs where hardware and lease of the ATMs are owned by service provider but cash management and connectivity is provided by sponsor banks whose brand is used on the ATM. Reserve Bank of India is not directly involved as outsourcing companies have contractual obligation with their respective banks. White label ATMs are owned and operated by non-bank entities without bearing an outsourcing contract from a particular bank. It is the sponsor bank that provides cash but they do not carry the logo of even the sponsor bank. Reserve Bank is directly involved as white label companies had to obtain license to conduct operations. The first non-banking entity to obtain permission from RBI is Tata Communications Payment. Bio-metrics ATM is the ATM which uses biometric technology for identification instead of PIN codes. It provides strong authentication and costs incurred on card personalization, delivery management; re-issuance, PIN generation etc can be avoided. It suits countries with rural illiterate masses. Micro ATMs are point of sale devices, connected to a central banking service through GPRS. It works with minimal power and also helps in reducing operational costs. Micro ATMs are used by banking correspondents to bank the unbanked.



**Table 3.5.1****ATMs of Scheduled Commercial Banks (in number)**

Banks	2006	2008	2010	2012	2014
Scheduled Commercial Banks	NA	34789	60153	95686	160055
Public Sector Banks	NA	21788	40680	58193	110424
Nationalized Banks	7165	13355	19702	31050	56995
State Bank Group	5443	8433	20978	27143	51128
Private Sector Banks	7659	11967	18447	36079	48467
Old Private Sector Banks	1547	2100	3390	5771	9384
New Private Sector Banks	6112	9867	15057	30308	39083
Foreign Banks	880	1034	1026	1414	1164

*Source: Trend and Progress of Banking in India, RBI Report, Various issues, Mumbai.*

The data on number of ATMs is showing an increasing trend. The total number of ATMs of scheduled commercial banks in India has increased from 95686 in 2012 to 160055 on March 2014. The entire group shows an increase in the number of ATMs. The annual growth rate of number of ATMs of all the scheduled commercial banks shows an increase from 28.43 percent in 2012 to 40.38 percent in 2014. The regional deployment of ATMs has also increased. In 2014, the number of ATMs were 4880, 47641, 43200 and 23334 for metro, urban, semi-urban and rural areas respectively. But there is a decreasing trend in the average number of transactions per ATM as the number of ATMs increases. This shows there is a need to reduce cost of setting up of ATMs. During 2014-2015, there were 181398 ATMs in India.

ATM poses various challenges which includes transaction failure, maintenance issues and mainly security issues. ATM fraud is not a phenomenon of a

particular region. Since the time of its introduction, there have been fraudulent practices too. ATM does not require human involvement all the time and its location may also pose threats of attacks. Thus ATM fraud is a global problem and authorities must view from a global perspective to find a solution. ATM frauds include card and currency fraud, logical or data attacks and physical attacks. Card and currency fraud involves direct attempts to steal cash as well as indirect attempts to steal customer identity to create counterfeit cards. Logical or data attacks include skimming, card trapping or phishing and currency trapping or phishing. Card skimming refers to usage of a small sophisticated device installed inside or over top of an ATMs factory installed card reader to fetch personal data of the customer including their PIN number. External card skimming refers to keeping a device over the card reader slot; so that consumer data is captured from the magnetic strip during the transaction gets done. In internal card skimming the top hat of the ATM is accessed to modify or replace the original card reader so that consumer data is obtained during the transaction. When there is an attempt to steal customers' cards as they are inserted into card reader during a transaction, it is called card trapping or phishing. When there is an attempt to steal the currency dispensed by the ATM during the transaction, it is called currency trapping. It includes attack on software, operating system and communication system. Today, ATMs, branch systems, communication systems etc are connected through internet. This increases the threat of logical or data attacks. Physical attack involves any attempt to physically damage the ATM as a whole or its components to obtain cash.

In India, if we take the incidents of ATM frauds, theft and burglary, in 2010 there reported 160 cases and total amount involved was Rs 2101.42 lakhs. It increased to 631 cases in 2011 and the amount involved was Rs. 1814.71 lakhs. But in 2012 it reduced drastically to 199 cases with Rs. 497.4 lakhs involved. If we take the incidents of robbery alone, in 2013-14, there reported 78 cases in India, with Punjab as the state with 26 such cases.

### **3.5.2. Core banking solution**

Core banking is a centralized system that provides accounting, customer's information management and transaction processing functions. Core banking applications provide anywhere, anytime banking and also provide automation across multiple delivery channels. It provides the complete front – end and back end automation of banks, also provides inter-connectivity of branches with the centralized data centre. The core banking system has enabled banks to launch and target new products and services at specific customer segment, after understanding their banking and investment requirement. It performs various functions such as customer information files management, deposit management, reserve for bad debts and financial accounting.

### **3.5.3. Charge cards**

In charge cards, transactions are accumulated over a period of time, generally a month and then the total is debited to the accounts. The card holder is given 25 to 50 days to pay. The amount on a charge card is payable in full and no credit is given.

### **3.5.4. Credit card**

In credit card, at the end of a month details of all amounts purchased are sent to the card holder who is required to pay a minimum amount, if the card holder does not wish to pay the entire amount. She/he is then given credit for the balance not paid and interest is charged on the balance which varies between 2 to 3 percent.

**Table 3.5.2**  
**Growth of credit cards in India**

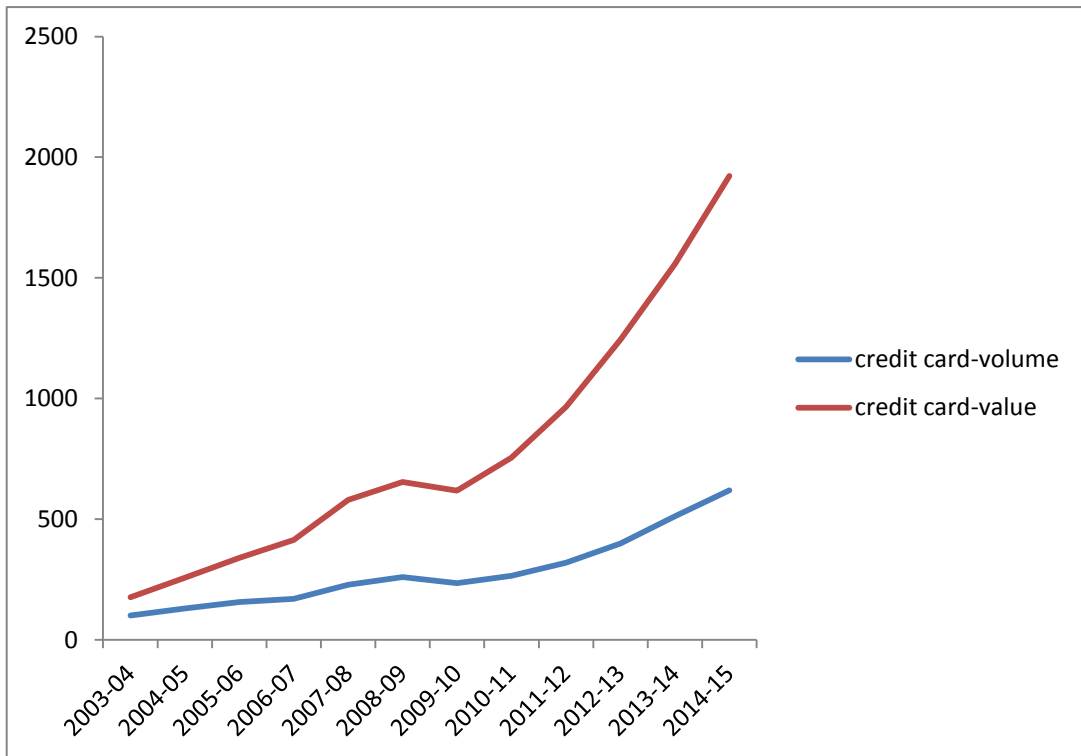
year	credit card- volume (in millions)	growth rate	credit card- value (in billions)	growth rate
2003-04	100.18		176.63	
2004-05	129.47	29.24	256.86	45.42
2005-06	156.09	20.56	338.86	31.92
2006-07	169.54	8.62	413.61	22.06
2007-08	228.2	34.60	579.85	40.19
2008-09	259.56	13.74	653.56	12.71
2009-10	234.24	-9.75	618.24	-5.40
2010-11	265.14	13.19	755.16	22.15
2011-12	319.96	20.68	966.13	27.94
2012-13	399.13	24.74	1243.93	28.75
2013-14	512.03	28.29	1556.72	25.15
2014-15	619.41	20.97	1922.63	23.51

*Source: payment and settlement system, RBI Report, Various issues, Mumbai*

The table explains the trend of credit cards in India. During 2004-2005, the volume of credit cards grew by 29.24 per cent and value by 45.42 per cent. This has increased to 34.60 per cent in terms of volume but value reduced to 40.19 per cent in 2007-2008. In 2009-2010, both volume and value of credit cards have recorded a low rate of growth at -9.75 per cent and -5.40 respectively due to the effect of global financial recession. It has improved from 2010-2011 onwards. During 2010-11, volume of credit card grew by 13.9 per cent and value by 22.15 per cent.

**Figure 3.5.3**

**Growth of credit cards in India**



**3.5.5 Debit card**

Unlike credit card, the holder of the debit card does not receive any credit. As soon as the transaction is undertaken, the customer's account is debited with the amount of the purchase and if the amount is not sufficient in the account, the transaction is rejected. Debit card have a unique number for customer identification. The greatest advantage of debit card is that, it does not create any outstanding amount.

**Table 3.5.3****Growth of debit cards in India**

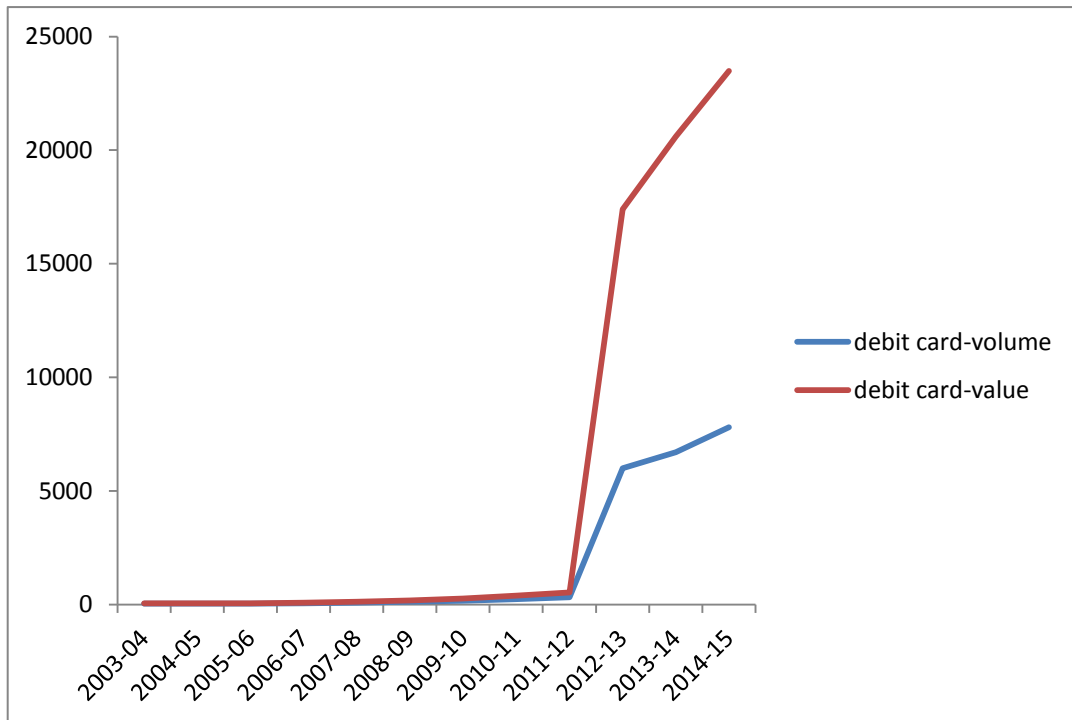
<b>year</b>	<b>debit card- volume (in millions)</b>	<b>growth rate</b>	<b>debit card- value (in billions)</b>	<b>growth rate</b>
2003-04	37.76		48.74	
2004-05	41.53	9.98	53.61	9.99
2005-06	45.69	10.02	58.97	10.00
2006-07	60.18	31.71	81.72	38.58
2007-08	88.31	46.74	125.21	53.22
2008-09	127.65	44.55	185.47	48.13
2009-10	170.17	33.31	264.18	42.44
2010-11	237.06	39.31	386.91	46.46
2011-12	327.54	38.17	534.32	38.10
2012-13	5999.21	1731.60	17393.44	3155.25
2013-14	6707.1	11.80	20602.86	18.45
2014-15	7804.57	16.36	23492.65	14.03

*Source: payment and settlement system, RBI Report, Various issues, Mumbai*

Comparing to credit card, people prefer to use debit cards. Thus people are aware of the interest payments and other risks associated with the credit cards. Similar to credit card, debit card transaction also experienced a decline as a result of global melt down in 2007. During 2007-08, the growth of debit cards in terms of volume and value was 46.74 per cent and 53.22 per cent respectively. This has decreased to 33.31 per cent and 42.44 per cent in terms of volume and value respectively during 2009-2010.

**Figure 3. 5.4**

**Growth of debit cards in India**



**3.5.6 Smart card**

A smart card is similar to a credit card. It has an integrated circuit (IC) chip installed in it. The chip contains memory and processor and communicates through contacts on the surface of the card.

**3.5.7 Electronic purse**

An electronic purse is a kind of smart card that has transferred into it an amount of money. Every time a transaction is entered into, the purse is depleted by the money taken out, this is replenished automatically.

**3.5.8 Mobile banking**

It is the method of using one's mobile phone to conduct banking transactions by sending a message which saves money and time. The various functions offered through mobile banking are account balance enquiry, account statement enquiries, cheque status enquiry, cheque book request fund transfer between

accounts, credit or debit alerts, minimum balance alerts, bill payment alerts and bill payment. Mobile banking services can be classified on the basis of originator of service and on the basis of the nature of the service. On the basis of originator of services, it can be classified to push and pull. Push is when the bank sends out information based upon an agreed set of rules, whereas pull is when the customer requests a service or information from the bank. On the basis of nature of services, there are two types of mobile banking transaction based and enquiry based. When a customer request for the bank statement, it is an enquiry based service and a request for the fund transfer to some other account is a transaction based services. Mobile banking is being deployed using mobile applications developed on channels such as Interactive Voice Response (IVR) Short Message Service (SMS) wireless access protocol (WAP) banking through a mobile van and fast net mobile.

**Table 3. 5.4**

**Transactions through Mobile banking**

<b>Year</b>	<b>Volume (in millions)</b>	<b>Value (in billions)</b>
2012-2013	53.30	59.90
2013-2014	94.71	224.18
2014-2015	171.92	1035.30

*Source: payment and settlement system, RBI Report, Various issues, Mumbai*

The table depicts the trend in mobile banking. The use of mobile banking is increasing both in terms of volume and value. During 2012-13 it was 53.30 million in terms of volume and 59.90 billion in terms of value which has increased to 171.92 million and 1035.30 billion respectively.



### 3.5.9 Mobile wallet

Mobile wallet is a virtual wallet that stores payment card information in mobile phone. It gives the user an opportunity to conveniently make in store payments and can be used with merchants listed with the mobile wallet service provider.

**Table 3. 5.5**

#### **Transactions through Mobile wallet**

<b>Year</b>	<b>Volume (in millions)</b>	<b>Value (in billions)</b>
2012-2013	32.70	8.14
2013-2014	107.51	29.05
2014-2015	255.00	81.84

*Source: payment and settlement system, RBI Report, Various issues, Mumbai*

From the table, the increasing popularity of mobile wallets is visible. The volume of mobile wallet transaction in 2012-2013 was 32.70 million which rose to 255 million in 2014-15. Similarly, the value of mobile banking transaction has also increased from 8.14 billion in 2012-2013 to 81.84 billion in 2014-2015.

### 3.5.10 Tele banking

Tele banking is a service which allows its customer to perform transaction ones the telephone with automated attendance or when requested with telephone operator. It is a system based can the application of interactive voice response (IVR) Tele-banking can be of two types-public enquiry and private enquiry. It can be used to check account balance, enquire on the status of cheque, transfer funds between accounts open time deposit accounts, change maturity instruction for time deposits, request for cheque book or statement, pay credit card bills,

make enquiries on credit card statement and check credit card account balance, It is easy to use, cost effective and provides round the clock availability of information. It also helps in improving the efficiency level of information release and use of human resources. This helps in bridging the gap between digital data and human modality.

### **3.5.11 Internet banking**

In internet banking, customers with the help of internet connected to their computers can avail the services such as checking account balance, reconciling bank transaction, transferring money between accounts, tracking recent account activities, authorizing electronic bill payments, requesting copies of past statements and processed cheques, ordering travelers, cashiers and regular cheques and applying for loans. Internet banking helps in cross-account fund transfer, cheque history withdrawals and stop payments, online loan payments, online loan application, PIN changes, credit card and statement imaging. The present stage of internet banking provides wireless access of banking services to the customers.

Electronic Funds Transfer is a system of transferring money from one bank account directly to another without any paper money changing hands. It is used for both credit transfers and debit transfers. The transactions are processed by the bank through the Automated Clearing House (ACH) network. One of the most widely used EFT programme is direct deposit in which payroll is deposited straight into an employee's bank account, although EFT refers to any transfer of funds initiated through an electronic terminal, including credit card, ATM and point of sale (POS) transaction. The benefits of EFT are reduced administration cost, increased efficiency, simplified book keeping and greater security.

The National Electronic Fund Transfer (NEFT) and the National Electronic Clearing Service (NECS) enables quick, safe and efficient electronic fund movement from virtually any part of the country to any other locations.

**Table 3. 5.6****Growth of NEFT in India**

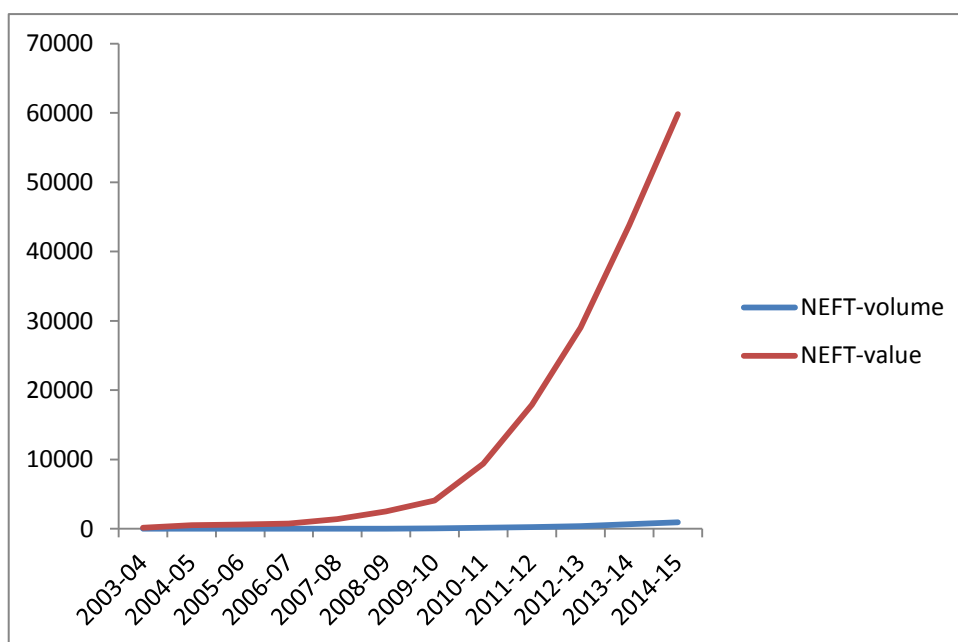
<b>year</b>	<b>NEFT- volume (in millions)</b>	<b>growth rate</b>	<b>NEFT-value (in billions_)</b>	<b>growth rate</b>
2003-04	0.82		171.25	
2004-05	2.55	210.98	546.01	218.84
2005-06	3.07	20.39	612.88	12.25
2006-07	4.78	55.70	774.46	26.36
2007-08	13.32	178.66	1403.26	81.19
2008-09	32.16	141.44	2519.56	79.55
2009-10	66.34	106.28	4095.07	62.53
2010-11	132.34	99.49	9391.49	129.34
2011-12	226.11	70.86	17903.5	90.64
2012-13	394.13	74.31	29022.42	62.10
2013-14	661.01	67.71	43785.52	50.87
2014-15	927.55	40.32	59803.83	36.58

*Source: payment and settlement system, RBI Report, Various issues, Mumbai*

The volume and value of NEFT is also showing an increasing trend except during the time of recession, reflecting the growing demand for electronic transactions from the customers. During 2007-2008, the growth rate of volume of NEFT was 178.66 per cent which reduced to 141.44 per cent in 2008-2009. The value of transactions through NEFT was 81.19 per cent in 2007-2008, declined to 79.55 per cent. And also customers do have security issues and knowledge problem while transacting money via electronic channels, which affects its further growth.

**Figure 3.5.5**

**Growth of NEFT in India**



**3.5.12 Video Banking**

It is a term used for performing banking transaction on professional banking via a remote video and audio connection. Video banking can be performed via purpose built banking transaction machines or via a video conference enabled bank branch clarification.

**3.5.13 Electronic Clearance System (ECS)**

Electronic clearance systems are of two types – ECS credit and ECS debit. ECS credit is a method of payment which provides customers an option to collect their monthly/quarterly/half yearly /yearly interest/ dividend/ salary/ pension directly through their bank accounts. In this system payment instruction would be issued by the bank electronically through the banker to the clearing authority, and the clearing authority would supply credit reports to the bank with which customer maintains the specific account.

ECS debit was introduced in India after it was approved by the Committee on Technology Issues in Banking Industry headed by W.S.Saraf. This system

allows the customers to pay their monthly/quarterly/half yearly/yearly utility bills like telephone, electricity, loan installments, insurance premium etc. directly through their bank accounts. Here also clearing authority plays an important role by giving the payment instructions. The trend and pattern of ECS debit and credit is shown below.

**Table 3.5.7**

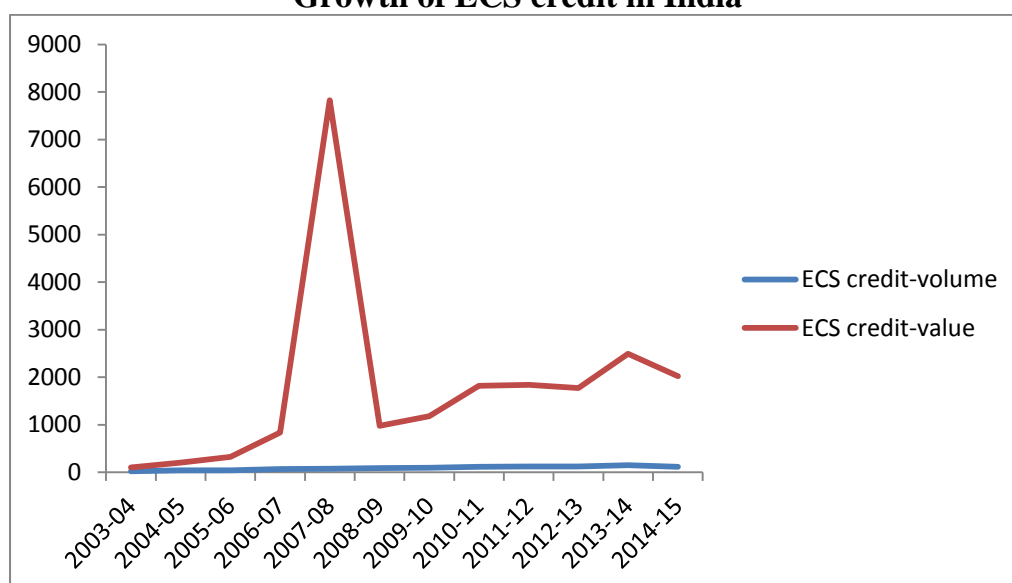
**Growth of ECS credit in India**

<b>year</b>	<b>ECS credit- volume (in millions)</b>	<b>growth rate</b>	<b>ECS credit- value(in billions)</b>	<b>growth rate</b>
2003-04	20.32		102.28	
2004-05	40.05	97.10	201.8	97.30
2005-06	44.22	10.41	323.24	60.18
2006-07	69.02	56.08	832.73	157.62
2007-08	78.37	13.55	7822.22	839.35
2008-09	88.39	12.79	974.87	-87.54
2009-10	98.13	11.02	1176.13	20.64
2010-11	117.3	19.54	1816.86	54.48
2011-12	121.5	3.58	1837.84	1.15
2012-13	122.18	0.56	1771.28	-3.62
2013-14	152.54	24.85	2492.19	40.70
2014-15	115.35	-24.38	2019.14	-18.98

*Source: payment and settlement system, RBI Report, Various issues, Mumbai*

The volume of ECS credit growth has registered 97.10 per cent growth and ECS credit value growth at 97.30 per cent in 2004-2005. Both declined to 11.02 per cent and 20.64 per cent respectively during 2009-2010. But immediately after the recovery of India after global recession in 2010-2011, the volume of ECS credit grew at 19.54 per cent and value at 54.48 per cent. Again in 2014-15, ECS credit growth has experienced a decline.

**Figure 3.5.6  
Growth of ECS credit in India**



**Table 3.5.8**

**Growth of ECS debit in India**

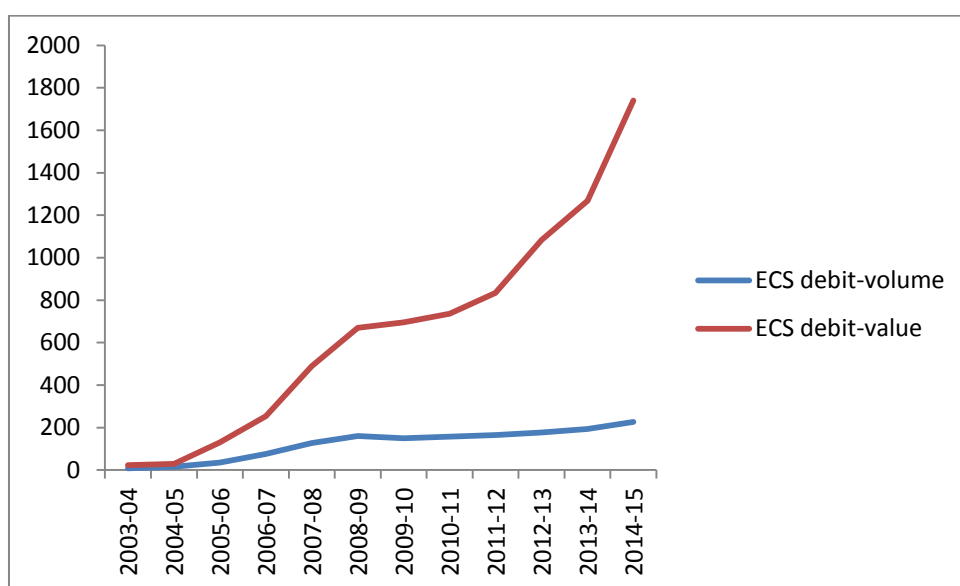
	ECS debit – volume (in millions)	growth rate	ECS debit – value (in billions)	growth rate
2003-04	7.87		22.54	
2004-05	15.3	94.41	29.21	29.59
2005-06	35.95	134.97	129.86	344.57
2006-07	75.2	109.18	254.41	95.91
2007-08	127.12	69.04	489.37	92.35
2008-09	160.05	25.90	669.76	36.86
2009-10	149.28	-6.73	695.24	3.80
2010-11	156.74	5.00	736.46	5.93
2011-12	164.74	5.10	833.55	13.18
2012-13	176.53	7.16	1083.1	29.94
2013-14	192.91	9.28	1267.96	17.07
2014-15	226.01	17.16	1739.78	37.21

*Source: payment and settlement system, RBI Report, Various issues, Mumbai*

The table explains the trend in growth of ECS debit. The volume of ECS debit has increased at 109.18 per cent in 2006-2007, but fell to -6.73 per cent during 2009-2010. Similarly the growth of value of ECS debit has also experienced a fall during 2009-2010 to 3.80 per cent. From 2010-2011 onwards, the volume and value of ECS debit has been witnessing a growth. In 2014-15, the volume of ECS debit grew by 17.16 per cent and value by 32.21 per cent.

**Figure 3.5.7**

**Growth of ECS debit in India**



**3.5.14 PC Banking**

PC Banking means personal computer based home banking services to other banks. In this case, customers can contact their banks from their home by using their personal computer. It is a very flexible system and can transfer funds, make loan payments, request withdrawal cheques, view current balances, view account history, view cleared cheques, add a product or service to their existing account, read alert messages on the account, update password, apply for loan, and report a lost or stolen ATM, debit or credit card.

### 3.5.15 Real Time Gross System (RTGS)

The introduction of Real Time Gross Settlement system was a major milestone in the Indian banking history. This has resulted in compliance with the Bank's core principles for systematically important payment systems of the bank for international settlements. It is an interbank fund transfer or settlement system where funds are settled on a transaction by transaction basis. The system has been providing the means for risk free and credit push-based fund transfer settled on a real time basis.

**Table 3.5.9**

#### **Growth of RTGS debit in India**

year	RTGS- volume (in millions)	growth rate	RTGS- value (in billions)	growth rate
2003-04	na		19.65	
2004-05	0.46		40661.84	206830.48
2005-06	1.77	284.78	115408.36	183.82
2006-07	3.88	119.21	246191.8	113.32
2007-08	5.85	50.77	482945.59	96.17
2008-09	13.38	128.72	6113999.12	1165.98
2009-10	33.25	148.51	1011699.31	-83.45
2010-11	49.27	48.18	941039.34	-6.98
2011-12	55.04	11.71	1079790.59	14.74
2012-13	68.52	24.49	1026350.05	-4.95
2013-14	81.11	18.37	904968.04	-11.83
2014-15	92.78	14.39	929332.89	2.69

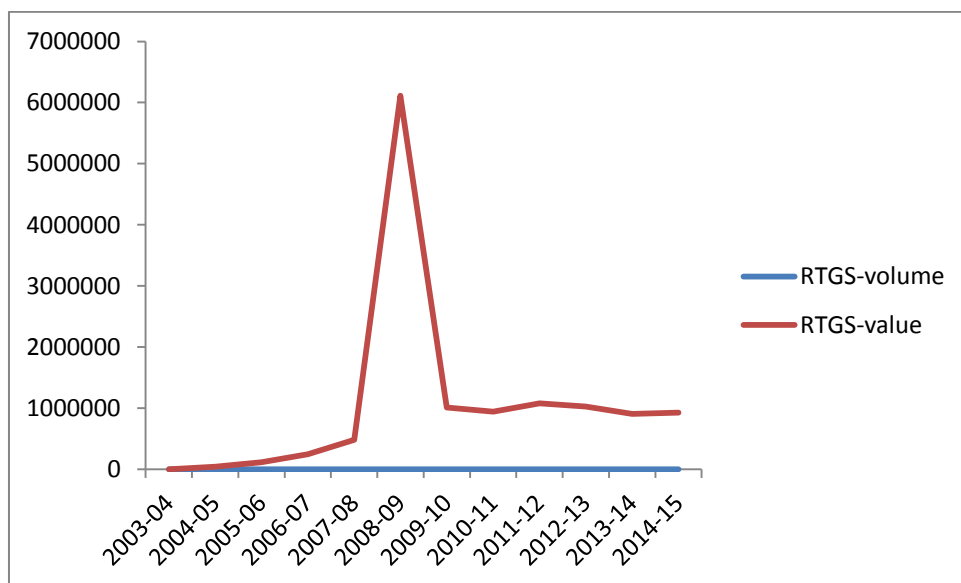
*Source: payment and settlement system, RBI Report, Various issues, Mumbai*



RTGS is meant transaction of large amount. It is evident from the table; the growth of RTGS has been influenced by the recession as the value of RTGS grew at -83.45 per cent during 2009-2010. Once after its recovery in 2011-2012 by growing at 14.74 per cent, the growth rate again went down and again in 2014-2015, it experienced a positive growth.

**Figure 3.5.8**

**Growth of RTGS debit in India**



### 3.5.16 Data ware housing

The Data Ware House is an informational environment that provides an integrated and total view of the bank, makes the banks current and historical information easily available for decision making, which make decision – support transaction possible without hindering operation systems. Finding out the number of branches maintaining data warehouse of customers and industrial enterprises is called the Know Your Customer (KYC) policy.

### **3.5.17 Knowledge Management System (KMS)**

Knowledge management is a systematic process for capturing, integrating, organizing and communicating knowledge accumulated by the banks. It is a vehicle to share corporate knowledge so that the employees may be more effective and productive in their work. As a part of KMS banks set up their own internet and extranet which is a boon to both employees and customers spread over wide geographic locations.

### **3.6 Challenges of technology banking in India**

Undoubtedly, technology banking is beneficial in several ways for banks, customers and government. But they are not from challenges. The challenges faced by technology banking in a developing country like India, having disparities and infrastructural constraints are high. To reap the full benefits of technology banking, these challenges must be addresses first.

Digital banking possesses various types of risks such as operational risks, security risks, legal risks, and cross border risks. The operational risk is out of technological failure. This leads to in accurate transaction processing, inefficient data integrity and data privacy, failure in enforcing contracts, unauthorized access to banking systems and transactions etc. Thus the security risk also is increased here. Outsourcing of digital banking services also increases security threats. The legal risk involves inadequacies in laws regarding validity of agreement formed via electronic media using digital signature, consumer privacy and disclosure in formation. There is also the risk associated with the person's identity, when processing the request for transactions over internet. Since the rules and regulations related to privacy, consumer protection and record keeping varies across nations, chances are high for cross border risks. The possibility of security breaches and cyber crimes can affect the trust of consumers. The system should reliable and safe only if there is adequate safeguard measures. Otherwise, the system could even bring advance effects. Banks should opt for good information technology governance systems, so that data quality and data

standards can be maintained. This can also facilitate smooth and efficient data flow. It is also important to keep banking strategies and information technology development align, which is possible with information technology governance systems.

To deliver banking services digitally, adequate infrastructure should be developed which involves huge investment. In developing nations such an infrastructure is confined to certain areas only. Building a digital eco system is imperative to encourage customers to keep their funds in digital form. Another important hindrance in popularizing digital banking is the customer perception. In developing nations, people residing remote areas may not be used to or be comfortable with technology banking. The literacy level of the customers may be low and specifically they may not have adequate financial as well as digital literacy. The customers may not realize the scope and usefulness of digital banking. In such cases it is necessary to educate customers on new and advanced technology banking products. This helps the banks to maintain customer loyalty too.

A study conducted in Bangladesh on government cash transfer to low income women found and that by taking effort for educating women how to use digital payment products has led to increase in understanding and use of that product – (West and Lehee, 2014). The designing of product also should be in such a way that it is easy, secured and affordable for ordinary customers to use. To increase awareness and understanding on digital products, banks should employ skilled staff to assist customers in understanding the programme, payment process and resource mechanism. A high level of government intervention is required as it is impossible to adopt global technology at low cost and those hi-fi banks may not be willing to establish themselves in rural areas as the customer profile itself shows chances of low profit. Thus, in a rural area physical access to financial services and maintaining adequate liquidity together with technology adoption remains as a core challenge. Also, to make digital payments cost-effective and sustainable, it should be ensured that digital payment can be made accessible to

any member of parties, which involves huge investment. Thus, inter operability between bank and non-bank financial service providers is another major challenge.

Technology banking also raises some macroeconomic challenges. E – Banking system may delink the financial activities of firms and households from that of the central bank policies. In such a context, monetary policy may become ineffective. Also digital banking makes cross border transactions, cheaper, encouraging capital inflows, which also makes monetary policy, weak.

Digital banking thus has to be adopted with caution in order to overcome its challenges. A proper digital ecosystem and infrastructure is imperative. Before introducing new technology, customer acceptance should be checked and adequate facilities to help customers in overcoming their digital fear, illiteracy and language barrier should be provided. The compatibility of banking strategies and central bank policies should be checked. In a developing nation like India, government has a very significant role to play, together with the banks. It is only then the full potential and benefits of technology banking can be reaped in a secured way.

### **3.7 Conclusion**

The trend in analyzing various components of electronic banking shows that the demand for electronic banking is increasing. The government together with Reserve Bank of India has been taking measures in order to popularize technology banking. Also measures were taken to financially include all by way of technology banking. But the present day technology banking methods existing in our nation requires knowledge in handling computers. The real experience so far reveals that technology banking is popular only among a section of the society who are educated and felt need for technology banking to save their time and money. Thus the internet accessibility, usage of internet and socio-economic variables plays a significant role in determining the usage of technology banking and variations can be seen across various socio-economic groups regarding the

use of technology banking. The analysis of secondary data also reveals that international factors do influence technology banking usage which calls for apt policy measures for safeguarding the customers' interest, thereby the financial sector too.

## *Chapter IV*

### *Banking Perceptions and Internet Usage*

## **Chapter IV**

### **Banking Perceptions and Internet usage**

#### **4.1 Introduction**

This chapter contains the demographic features of the sample respondents and their general perceptions on banks. The responses from 430 individuals were collected by using a well structured schedule from both rural and urban areas. The responses from all the 430 individuals were taken for analysis, none were omitted. It gives a summary of the demographic profile of the sample respondents, their general banking perceptions and also their digital literacy and internet accessibility. To adopt digital banking, computer skill and knowledge and access to internet are basic requisites. One should have internet facility, computer system and internet connectivity to access their bank accounts electronically and to carry out the transactions. This section deals with the internet accessibility, its usage pattern, computer skills and problems experienced by respondents while using computer. These are very essential to know the technology adoption and acceptance by the customers. The banking perceptions, computer skills and knowledge and internet usage are very much important to adopt digital banking.

#### **4.2. Demographic profile of the sample respondents**

The table reveals the demographic profiles of the sample respondents.

**Table 4.2.1**

**Background information of the Sample respondent**

<b>Selected Variable</b>	<b>Attributes</b>	<b>Urban</b>	<b>Percentage</b>	<b>Rural</b>	<b>Percentage</b>	<b>Total Number of respondent</b>	<b>Percentage</b>	<b>Total Percentage</b>
Gender	Male	95	42.0	131	58.0	226	52.6	100
	Female	105	51.5	99	48.5	204	47.4	
Age Group	Below 35 years	66	41.0	95	59.0	161	37.4	100
	35-59 years	102	51.0	98	49.0	200	45.5	
	60 years and above	32	46.4	37	53.6	69	16.6	
Educational Qualification	Below Matriculation	41	33.6	81	66.4	122	28.4	100
	Matriculation	18	34.6	34	65.4	52	12.1	
	Technical Diploma	20	50.0	20	50.0	40	9.3	
	Graduation	42	40.4	62	59.6	104	24.2	
	Post Graduation & Above	35	63.6	20	36.4	55	12.8	
Activity group	Government	39	78.0	11	22.0	50	11.6	100
	Private	77	51.0	74	49.0	151	35.1	
	Business	5	71.4	2	28.6	7	1.6	
	Casual	9	22.0	32	78.0	41	9.5	
	Retired	15	50.0	50	50.0	30	7.0	
	Unearned group	55	36.4	96	63.6	151	35.1	
Monthly income Group	Less than or equal to 5000	14	32.6	29	67.4	43	10.0	100
	5001- 10000	38	38.8	60	61.2	98	22.8	
	10001-25000	47	36.4	82	63.6	129	30.0	
	25001-50000	82	60.3	54	39.7	136	31.6	
	50001 and above	19	79.2	5	20.8	24	5.6	

*Source: Primary Survey*



The sample units have been collected from both urban and rural areas of Kerala. The number of sample from urban area is 200 and rural area is 230. The sample population consists of 52.6 per cent of males and 47.4 per cent of females. The age-wise classification shows, majority of the sample respondents belongs to the age category 35 to 59 years (46.5) followed by people less than 35 years old (37.4 per cent). Of the respondents, 71.2 per cent were married. Education wise, 28.4 per cent had qualification below matriculation, 24.2 per cent were graduates and 13.3 per cent were professionally qualified. Regarding the activity status, majority of them that is 35.1 percent belongs to private sector and again unearned group representation in total sample size is 35.1. As per income group, majority of the sample respondents fall in the category of Rs25001 to 50000 followed by the income category Rs10001 to 25000. Of the respondents, 53.5 per cent were from rural area and 46.5 per cent from urban area. The demographic features always play an important role in determining the digital banking usage. The existing literature points out that technology banking usage is more in the urban areas comparing to rural area. Also it is popular among youngsters who are highly qualified and has computer skills. Many studies reveal that those who belong to regular, private and business class use it often than those who are indulged in casual work.

#### **4.3 Factors of choice of bank**

The decisions of the customers are influenced by various factors such as time, their physical environment, perceptions, motivations, attitude, age group, culture, social class etc.

**Table 4.3.1****Factors determining choice of bank**

<b>Factors</b>	<b>Urban</b>	<b>Percentage</b>	<b>Rural</b>	<b>Percentage</b>	<b>Total</b>
security	165	48.8	173	51.2	338
Location	167	52.2	153	47.8	320
Trust	124	54.1	105	45.9	229
Employees attitude	92	53.8	79	46.2	171
Number of ATMs	27	43.5	35	56.5	62
Internet banking facilities	40	71.4	16	28.6	56
Mobile banking facilities	40	71.4	16	28.6	56
Salary	48	81.4	11	18.6	59
Reputation	109	58.6	77	41.4	186
Others (subsidy)	40	75.5	13	24.5	53

*Source: Primary Survey*

While choosing a bank, the main factors turn out to be safety and security. Out of 430 individuals, 78.6 per cent of the customers opined that, they should feel safe in their transactions and they expect banks to be a safe destination for their hard earned money. In rural area, security is the most important factor (51.2 per cent) to consider while choosing bank, whereas for the urban folk, their salary account determines their bank. Among those who have selected their bank on the basis of salary account, 81.4 per cent are from urban area. Most of the respondents were also

bothered about the convenient location of the banks. Trust is another major determinant. Other important determinants are loan facilities, employees attitude etc. a proportion of 14 per cent always looks for the number of that particular banks ATMs where as 13 per cent prefers a bank by looking in to the mobile banking and internet banking facilities. In rural area, number of ATM is more relevant to the respondents (56.5 per cent) compared to internet banking and mobile banking facilities. But in urban areas, 71.4 per cent looks in to both internet banking and mobile banking facilities.

#### 4.4 Preference for best bank

The table depicts the respondents best preferred bank among nationalized banks, private banks, foreign banks, cooperative banks and others.

**Table 4.4.1**  
**Preference for best bank**

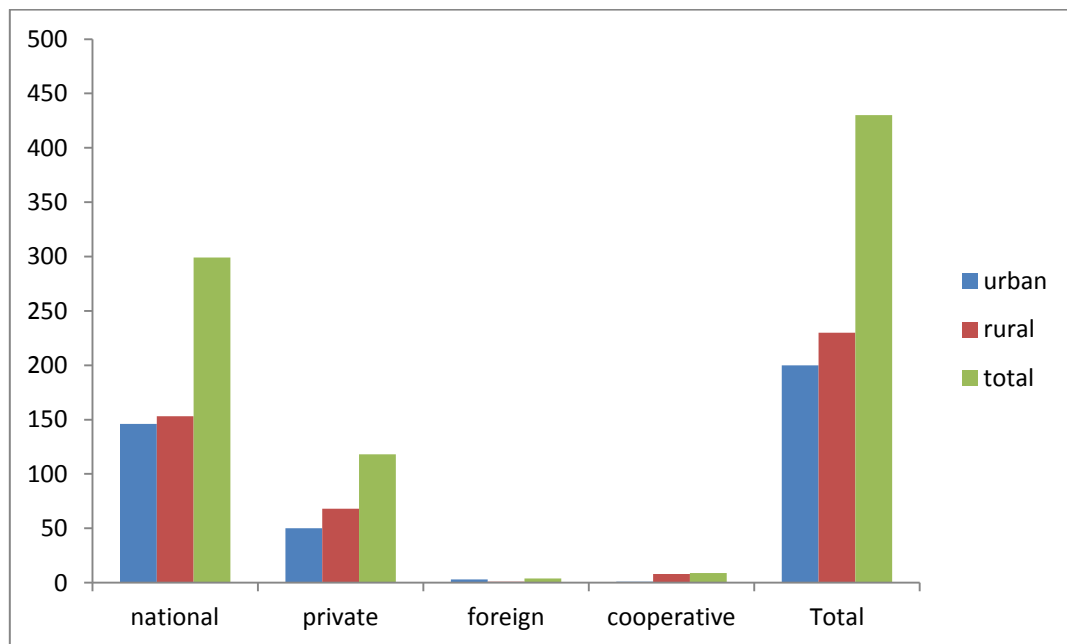
Area	national	private	foreign	cooperative	Total
urban	146 (73.0)	50 (25.0)	3 (1.5)	1 (0.5)	200 (100.0)
rural	153 (66.5)	68 (29.6)	1 (0.4)	8 (3.5)	230 (100.0)
Total	299 (69.5)	118 (27.4)	4 (0.9)	9 (2.1)	430 (100.0)

*Source: Primary Survey*

*(Figures inside the parenthesis represent percentage)*

It is clear from the table that majority of the respondents prefer nationalized banks. 69.5 per cent of the people preferred nationalized banks followed by private banks (27.4 per cent). The main reasons for choosing nationalized banks are safety and location. Also, nationalized banks have more number of branches comparing to any other bank group. Those who preferred private sector banks were attracted by the customer facilities offered by them. Another major determinant for choosing best bank is the salary account (12.6 per cent). Other reasons include popularity of the bank, loan facilities and NRI account facilities. The foreign banks are less popular mainly because they are urban centered and people hold a view that they are reachable only for rich. Majority of them do not consider digital banking facilities while choosing the bank. Only 14.4 per cent looks in to ATM facilities and 13 per cent considers internet banking and mobile banking facilities while choosing their bank.

**Figure 4.4.1**  
**Preference for best bank**



#### 4.5 Source of information about banking products

In the table, the first hand source of information on banking products and services are given.

**Table 4.5.1**  
**Source of information about banking products**

Source	Urban	Percentage	Rural	Percentage	Total
Bank employees	118	47.0	133	53.0	251
Friends and relatives	62	33.3	124	66.7	186
SMS	37	64.9	20	35.1	57
Advertisement	15	42.9	20	57.1	35
Website	32	59.3	22	40.7	54
E-mail	10	45.5	12	54.5	22
Training and demo	3	33.3	6	66.7	9
Brochure and books	6	37.5	10	62.5	16

*Source: Primary Survey*

It is obvious from the table that, the more than half of the proportion (58.4) receives information on new banking products and services from the bank employees itself. In rural areas 53 percent of the respondents are informed by bank employees compared to 47 per cent in urban area. The second important source of information on banking product is friends and relatives (43.3) of the respondents, out of which 66.7 per cent are from rural area and urban respondents are only 33.3 per cent. Sources such as training and demo can be availed only by employed persons either in public sector or in private sector. Regarding technology based sources; SMS is comparatively popular with 13.3 per cent respondents considering SMS as a first hand source. As a whole, only 5.1 per cent of the respondents opined email as a first hand source of information and out of that, 54.5 per cent belongs to

rural area. Sources such as websites and emails are only popular among those who are not only literate but with digital literacy too and the major proportion are from urban area.

#### 4.6 Frequency of visiting bank branch

The customers need to visit bank branch for various purposes. The frequency of customer visit to bank branches in both rural area and urban area has been summarized in the table.

**Table 4.6.1**  
**Frequency of visiting bank branch in a month**

Area	less than 2 times	Above 2 times	Total
Urban	200 (100.0)	0 (0.0)	200 (100.0)
Rural	227 (98.7)	3 (1.3)	230 (100.0)
Total	427 (99.3)	3 (0.7)	430 (100.0)

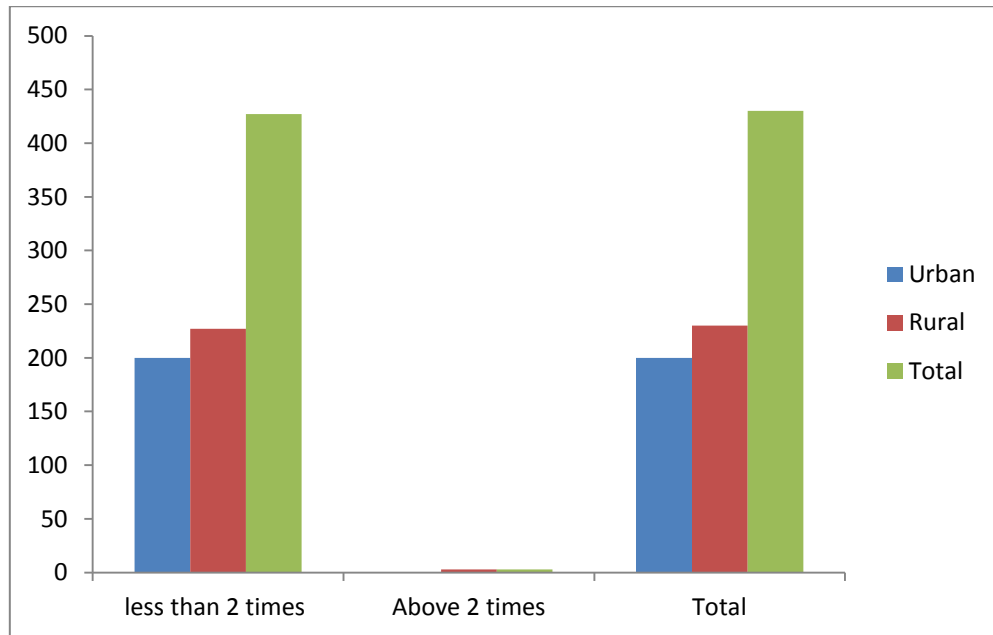
*Source: Primary Survey*

*(Figures inside the parenthesis represent percentage)*

All the customers in urban area visit the bank branch less than 2 times a month. It is noteworthy that 49.2 per cent of urban people do not visit bank branch every month as majority of them have access to digital banking. In rural area also majority visits bank branch less than 2 times a month but a small proportion (1.3 per cent) was visiting bank branch more than 2 times a month.

**Figure 4.6.1**

**Frequency of visiting bank branch in a month**



#### **4.7 Purpose of visiting bank branch**

The table represents the purpose for which the customers has been visiting bank branch. After the advent of technology banking, there has been a significant decline in bank visit among those who use it. So it is imperative to look in to the purposes for which people prefer to visit bank branch.

**Table 4.7.1**  
**Purpose of visiting bank branch**

Purpose	Urban	Percent	Rural	Percent	Total
Withdrawal	130	47.1	146	52.9	276
Balance enquiry	0	0.0	1	100	1
Interest payment	0	0.0	3	100	3
Loan	2	9.5	19	90.5	21
Deposits	0	0.0	2	100	2
Collection of financial assistance	20	22.2	70	77.8	90
Locker facility	22	84.6	4	15.4	26
Friendly visit	2	66.7	1	33.3	3
New service	18	26.9	49	73.1	67

*Source: Primary Survey*

The most important purpose of bank visit is withdrawal of cash from bank. 64.2 per cent of the sample respondents always go to banks for withdrawal purpose. Among the respondents who depend on branch for withdrawal of money, 52.9 per cent belongs to rural area. The next important need for which they visit bank is to collect financial assistance from government or other agencies (20.9 per cent) followed by availing of new services (15.6 per cent). Among those who use locker facility, 84.6 per cent are from urban area. It is clear that rural people visits more of bank branch comparing to the urban people.



#### 4.8 Bank branch distance

Table 4.7 gives idea on the distance between the house and home branch of the customers.

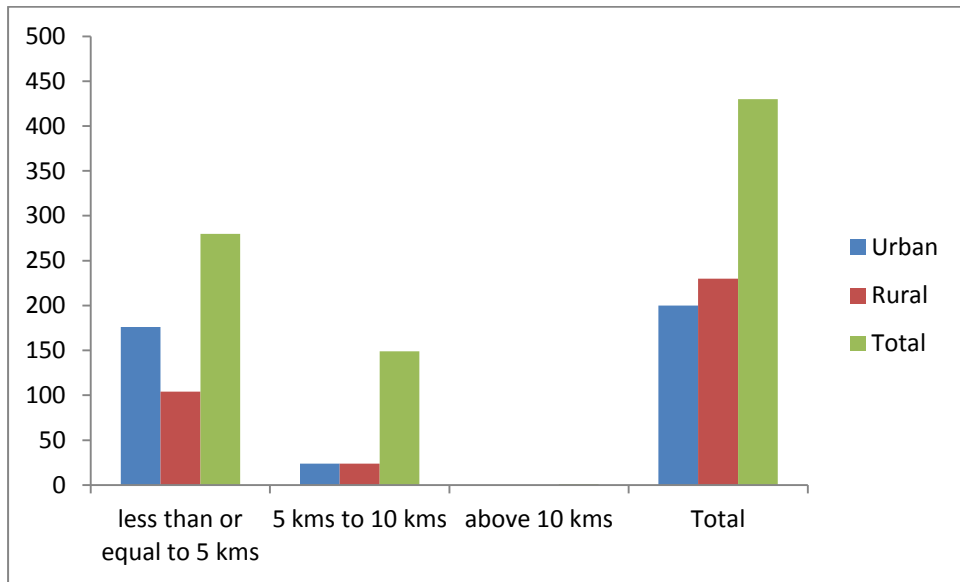
**Table 4.8.1**  
**Bank branch distance**

Distance	area		Total
	urban	rural	
less than or equal to 5 kms	176 (62.9)	104 (37.1)	280 (100.0)
5 kms to 10 kms	24 (16.1)	125 (83.9)	149 (100.0)
above 10 kms	0 (0.0)	1 (100.0)	1 (100.0)
Total	200 (46.5)	230 (53.5)	430 (100.0)

*Source: Primary Survey*  
*(Figures inside the parenthesis represent percentage)*

Majority of the urban people (62.9 per cent) have access to banks in less than a kilometer from their home, whereas in rural area only 37.1 per cent have banks with in a kilometer. In rural area, 83.9 per cent of the people have banks less than 10 kilometers of their residence.

**Figure 4.8.1  
Bank branch distance**



#### 4.9 Preference of means to know account details

The table clearly shows the preference of the bank customers to know their account details both in rural and urban areas.

**Table 4.9.1  
Preference to Know Account Details**

Instruments	Urban	percent	Rural	percent	Total	percent
ATM	88	44	86	37.4	174	40.5
Memory recall	50	25	83	36.1	133	30.9
Pass book	47	23.5	84	36.5	131	30.5
Mobile banking	21	10.5	10	4.3	31	9.31
Internet banking	12	6	5	2.2	17	4

*Source: Primary Survey*

It is seen from the table that, in urban as well as rural area, ATM is the most preferred method to know account details. In rural areas, for some, ATMs are not self operable. A large section of people recalls the account balance from memory. 23.5 per cent in urban and 36.5 per cent in rural depends on passbook. Any way only a small section of population is depending on mobile banking and internet banking to know account details.

#### 4.10 Means to communicate about new banking services

The table presents the customers first preference for means to communicate them about new banking products and services.

**Table 4.10.1**  
**Means to communicate about new banking services**

Means	Urban		Rural		Total frequency
	frequency	Per cent	frequency	Per cent	
Person to person	141	70.5	207	90	348
SMS	30	15	34	14.8	64
E-MAIL	40	20	21	9.1	61
Telephone	0	0	3	1.3	3
TV advertisement	0	0	3	1.3	3

*Source: Primary Survey*

The customers should be provided information about new banking services to understand the process and use them. It is seen from the table that both in urban and rural areas 80.9 per cent people prefer personal communication method to educate them about new services. More than 14 percent people prefer to know about new services via email and SMS. Other communication modes include telephone

calls, radio, TV and print advertisements, sending mail and through community members.

#### 4.11 Frequency of using banking services in a month

The rural urban difference in the frequency of using bank services is explained in the table.

**Table 4.11.1**  
**Frequency of using banking services in a month**

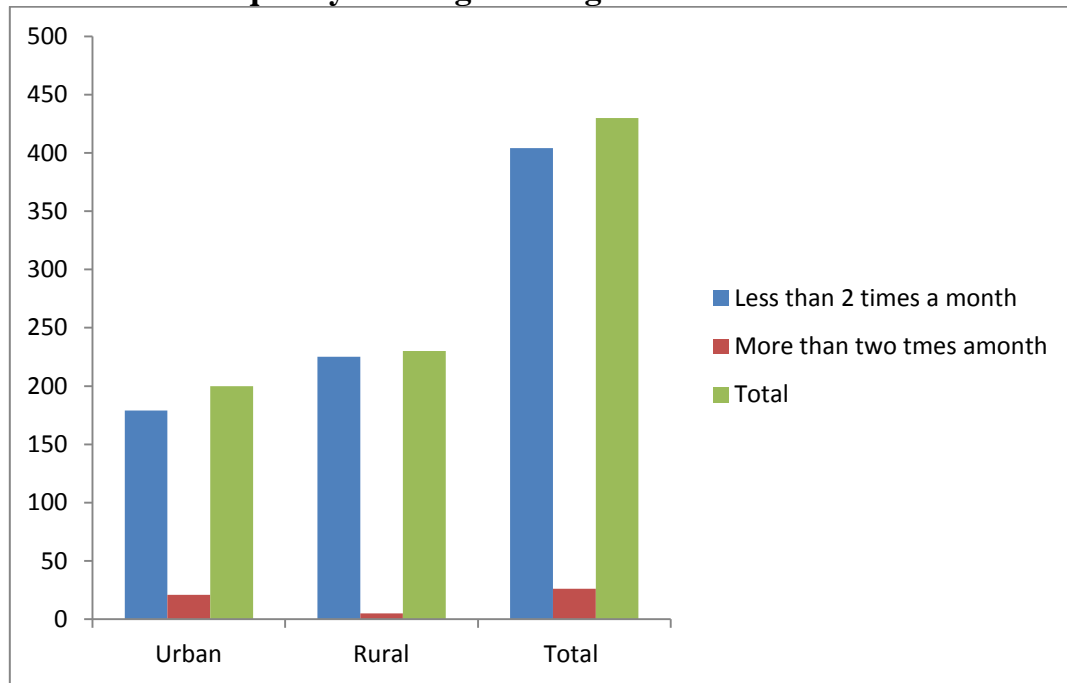
Frequency	Area		Total
	Urban	Rural	
Less than 2 times a month	179 (44.3)	225 (55.7)	404 (100.0)
More than 2 times a month	21 (80.8)	5 (19.2)	26 (100.0)
Total	200 (46.5)	230 (53.5)	430 (100.0)

*Source: Primary Survey*

*(Figures inside the parenthesis represent percentage)*

It is obvious from the table that urban people are more using banking services than rural people. In urban area, 80.8 per cent people are using banking services more than twice a month where as in rural area it is only 19.2 per cent. Thus urban people have found more usefulness to banking services.

**Figure 4.11.1**  
**Frequency of using banking services in a month**



#### 4.12 Usage of internet

The usage of internet ofcourse determines the adoption of digital banking by the sample respondents. The survey on internet users in Asia, 2014 reveals that the penetration of internet in India is only 19.4 per cent and the users' accounts only for 17.5 per cent. In china the 46.3 per cent of the population uses internet and in the case of USA it is 100 per cent.

Here to explain the association between the selected variables, Pearson's chi – square test is used. It has been widely used in the present study in various contexts.

The test statistic is

$$\chi^2 = \sum \frac{(O - E)^2}{E}$$

$\chi^2$  = the test statistic       $\sum$  = the sum of

O = Observed frequencies    E = Expected frequencies

**Table 4.12.1**  
**Number of years of internet usage**

Area	years of usage				Total
	below 2 years	3 to 5 years	6 to 9 years	Not applicable	
Urban	47 (23.5)	46 (23.0)	33 (16.5)	74 (37.0)	200 (100.0)
Rural	38 (16.5)	47 (20.4)	24 (10.4)	121 (52.6)	230 (100.0)
Total	85 (19.8)	93 (21.6)	57 (13.3)	195 (45.3)	430 (100.0)

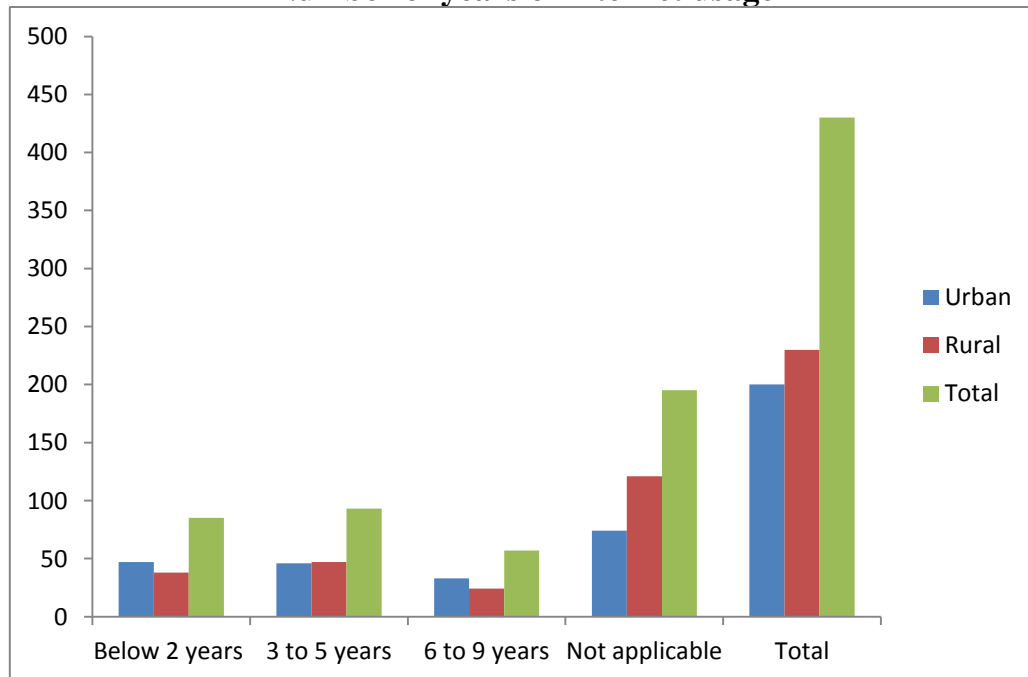
Source: primary survey

( $\chi^2=11.68$ )

(Figures inside the parenthesis represent percentage)

From the table, it is evident that 37 per cent of urban bank customers and 52.6 per cent of rural bank customers are not using internet..16.5 per cent of urban customers has been using for more than 6 years whereas in rural area it is only 10.4 per cent. This means urban customers had more accessibility and experience in using internet comparing to the rural counter parts.

**Figure 4.12.1**  
**Number of years of internet usage**



#### 4.13 Number of years of internet usage across gender

The experience of sample respondents in using internet across gender is explained in the table.

**Table 4.13.1**  
**Number of years of internet usage across gender**

Area	Gender	years of usage				Total
		below 2 years	3 to 5 years	6 to 9 years	Not applicable	
urban	male	30 (31.6)	29 (30.5)	16 (16.8)	20 (21.1)	95 (100.0)
	female	17 (16.2)	17 (16.2)	17 (16.2)	54 (51.4)	105 (100.0)
	Total	47 (23.5)	46 (23.0)	33 (16.5)	74 (37.0)	200 (100.0)
rural	male	20 (15.3)	34 (26.0)	18 (13.7)	59 (45.0)	131 (100.0)
	female	18 (18.2)	13 (13.1)	6 (6.1)	62 (62.6)	99 (100.0)
	Total	38 (16.5)	47 (20.4)	24 (10.4)	121 (52.6)	230 (100.0)

Source: Primary Survey  $(\chi^2_u = 21.93, \chi^2_r = 11.33, \chi^2 = 22.43)$

(Figures inside the parenthesis represent percentage)

It is very evident from the table that there exists a difference between males and females across area in the case of number of years of internet usage. In urban area, 37 per cent of the population are not using internet whereas in rural area, it is 52.6 per cent. The proportion of respondents having a long term experience in using internet, that is, 6 to 9 years is only 16.5 percent in urban area, out of which 16.8 percent are men and only 16.2 percent is women. This indicates, there is no gender disparity in urban area regarding the long term users. In rural area, among those who uses internet for more than 6 years, there exists a gender disparity as 13.7 per cent are men whereas only 6.1 per cent are women. In rural area, majority of the

users (20.4 per cent) have started using internet for less than 5 years comparing to urban area and this is high among males. This shows internet penetration is a recent phenomenon in rural area.

#### 4.14 Number of years of internet usage across education groups

**Table 4.14.1**  
**Number of years of internet usage across education groups**

Area	Education groups	years of usage				Total
		below 2 years	3 to 5 years	6 to 9 years	Not applicable	
Urban	below matriculation	1 (2.4)	0 (0.0)	0 (0.0)	40 (97.6)	41 (100.0)
	matriculation	6 (33.3)	3 (16.7)	1 (5.6)	8 (44.4)	18 (100.0)
	technical diploma	5 (25.0)	6 (30.0)	4 (20.0)	5 (25.0)	20 (100.0)
	graduation	8 (19.0)	11 (26.2)	11 (26.2)	12 (28.6)	42 (100.0)
	post graduation and above	15 (42.9)	9 (25.7)	5 (14.3)	6 (17.1)	35 (100.0)
	professional degree	12 (27.3)	17 (38.6)	12 (27.3)	3 (6.8)	44 (100.0)
	Total	47 (23.5)	46 (23.0)	33 (16.5)	74 (37.0)	200 (100.0)
Rural	below matriculation	1 (1.2)	7 (8.6)	0 (0.0)	73 (90.1)	81 (100.0)
	matriculation	11 (32.4)	3 (8.8)	5 (14.7)	15 (44.1)	34 (100.0)
	technical diploma	4 (20.0)	7 (35.0)	1 (5.0)	8 (40.0)	20 (100.0)
	graduation	13 (21.0)	21 (33.9)	10 (16.1)	18 (29.0)	62 (100.0)
	post graduation and above	4 (20.0)	5 (25.0)	5 (25.0)	6 (30.0)	20 (100.0)
	professional degree	5 (38.5)	4 (30.8)	3 (23.1)	1 (7.7)	13 (100.0)
	Total	38 (16.5)	47 (20.4)	24 (10.4)	121 (52.6)	230 (100.0)

Source: Primary Survey ( $\chi^2_u = 100.71$ ,  $\chi^2_r = 91.45$ ,  $\chi^2 = 184.64$ )

(Figures inside the parenthesis represent percentage)



The table gives the idea that, professionals in urban area are more experienced in using internet. 27.3 per cent of the professionals have been using internet for more than 6 years followed by graduates with 26.2 per cent. In rural area, post graduates stood first in long term usage of internet with 25 per cent followed by professionals with 23.1 per cent. Thus people with high qualification has started using internet long before and has more experience with them. Majority of the less qualified people are not at all using internet.

#### 4.15 Number of years of internet usage across activity groups

The table gives insights in to the experience with internet usage among various activity groups.

**Table 4.15.1**  
**Number of years of internet usage across activity group**

Area	Activity groups	years of usage				Total
		below 2 years	3 to 5 years	6 to 9 years	Not applicable	
urban	Regular	13 (33.3)	5 (12.8)	17 (43.6)	4 (10.3)	39 (100.0)
	Private	21 (27.3)	35 (45.5)	7 (9.1)	14 (18.2)	77 (100.0)
	Business	0 (0.0)	1 (20.0)	1 (20.0)	3 (60.0)	5 (100.0)
	Casual	0 (0.0)	1 (11.1)	4 (44.4)	4 (44.4)	9 (100.0)
	Retired	5 (33.3)	3 (20.0)	3 (20.0)	4 (26.7)	15 (100.0)
	Unearned group	8 (14.5)	1 (1.8)	1 (1.8)	45 (81.8)	55 (100.0)
	Total	47 (23.5)	46 (23.0)	33 (16.5)	74 (37.0)	200 (100.0)
rural	Regular	1 (9.1)	4 (36.4)	5 (45.5)	1 (9.1)	11 (100.0)
	Private	19 (25.7)	24 (32.4)	10 (13.5)	21 (28.4)	74 (100.0)

	Business	0 (0.0)	1 (50.0)	1 (50.0)	0 (0.0)	2 (100.0)
	Casual	2 (6.3)	2 (6.3)	2 (6.3)	26 (81.3)	32 (100.0)
	Retired	3 (20.0)	4 (26.7)	3 (20.0)	5 (33.3)	15 (100.0)
	Unearned group	13 (13.5)	12 (12.5)	3 (3.1)	68 (70.8)	96 (100.0)
Total	Total	38 (16.5)	47 (20.4)	24 (10.4)	121 (52.6)	230 (100.0)

Source: Primary Survey ( $\chi^2_u = 115.40, \chi^2_r = 69.69, \chi^2 = 170.87$ )

(Figures inside the parenthesis represent percentage)

It is revealed from the table that internet adoption is taking place at a higher pace in urban area comparing to that of rural area. In urban area casual workers (44.4 percent) have a long term experience of using internet followed by persons engaged in regular work (43.6 percent) and business class (20 per cent). In urban area, majority of the persons engaged in regular, private and business class has been using internet for less than 5 years of time period. In rural area, a long term usage of internet has been found among those who are engaged in business (9.1 per cent) followed by regular workers (45.5 per cent).

#### **4.16 Number of years of internet usage across age groups**

It is important to look in to the difference in using internet across age groups.

**Table 4.16.1****Number of years of internet usage across age group**

Area	Age groups	years of usage				Total
		below 2 years	3 to 5 years	6 to 9 years	Not applicable	
<b>urban</b>	Below 35 years	26 (39.4)	34 (51.5)	6 (9.1)	0 (0.0)	66 (100.0)
	35 - 59 years	18 (17.6)	9 (8.8)	24 (23.5)	51 (50.0)	102 (100.0)
	60 years and above	3 (9.4)	3 (9.4)	3 (9.4)	23 (71.9)	32 (100.0)
	Total	47 (23.5)	46 (23.0)	33 (16.5)	74 (37.0)	200 (100.0)
<b>rural</b>	Below 35 years	26 (27.4)	30 (31.6)	10 (10.5)	29 (30.5)	95 (100.0)
	35 - 59 years	10 (10.2)	16 (16.3)	13 (13.3)	59 (60.2)	98 (100.0)
	60 years and above	2 (5.4)	1 (2.7)	1 (2.7)	33 (89.2)	37 (100.0)
	Total	38 (16.5)	47 (20.4)	24 (10.4)	121 (52.6)	230 (100.0)

Source: Primary survey

( $\chi^2_u = 91.96$ ,  $\chi^2_r = 46.34$ ,  $\chi^2 = 120.31$ )

(Figures inside the parenthesis represent percentage)

Here first group consist of youngsters, that is people below the age of 35 years and second group consist of people between the age of 35 to 59 years and the third group consist of people above 60 years. Both in urban as well as rural area, respondents between the age of 35 to 59 years are having more than 6 years of experience in using internet. Regarding the youth, both in urban and rural area, majority of them were using internet for a period of less than 5 years. 51.5 per cent of urban youth and 31.6 per cent of rural youth has been using it for less than 5

years. With respect to respondents who are above 60 years, 9.4 per cent in urban area and 2.7 per cent in rural area has an experience of using internet for more than 6 years.

#### 4.17 Number of years of internet usage across income groups

**Table 4.17.1**

**Number of years of internet usage across income group**

area	Income groups	years of usage				Total
		below 2 years	3 to 5 years	6 to 9 years	Not applicable	
urban	less than or equal to 5000	0 (0.0)	0 (0.0)	0 (0.0)	14 (100.0)	14 (100.0)
	5001 to 10000	10 (26.3)	12 (31.6)	0 (0.0)	16 (42.1)	38 (100.0)
	10001 to 25000	8 (17.0)	5 (10.6)	3 (6.4)	31 (66.0)	47 (100.0)
	25001 to 50000	24 (29.3)	23 (28.0)	22 (26.8)	13 (15.9)	82 (100.0)
	50001 and above	5 (26.3)	6 (31.6)	8 (42.1)	0 (0.0)	19 (100.0)
	Total	47 (23.5)	46 (23.0)	33 (16.5)	74 (37.0)	200 (100.0)
rural	less than or equal to 5000	0 (0.0)	0 (0.0)	0 (0.0)	29 (100.0)	29 (100.0)
	5001 to 10000	10 (16.7)	12 (20.0)	2 (3.3)	36 (60.0)	60 (100.0)
	10001 to 25000	19 (23.2)	21 (25.6)	8 (9.8)	34 (41.5)	82 (100.0)
	25001 to 50000	9 (16.7)	14 (25.9)	11 (20.4)	20 (37.0)	54 (100.0)
	50001 and above	0 (0.0)	0 (0.0)	3 (60.0)	2 (40.0)	5 (100.0)
	Total	38 (16.5)	47 (20.4)	24 (10.4)	121 (52.6)	230 (100.0)

Source: Primary Survey ( $\chi^2_u = 81.78, \chi^2_r = 57.06, \chi^2 = 121.63$ )  
 (Figures inside the parenthesis represent percentage)

The table explains the relation between income and years of internet usage. High income people have been using internet for long period as they can afford it than other income groups. Also once internet was considered as a matter of status rather than a necessity. 42.1 percent in urban area and 60 per cent in rural area, earning

above Rs 50000 per month has been using internet for more than 6 years. In urban as well as rural area, those who earn less than Rs 5000 a month are not at all using internet.

#### 4.18 Time spend on internet in a week

The number of hours spends on using internet shows the accessibility of internet. More hours reveals the tech savvy nature of the respondents and the level of comfort they have with internet using.

**Table 4.18.1**  
**Time spent on internet in a week**

Hours	Area		Total
	Urban	Rural	
0 to 2 hours	23 (35.9)	41 (64.1)	64 (100.0)
2 to 9 hours	24 (47.1)	27 (52.9)	51 (100.0)
9 to 18 hours	7 (53.8)	6 (46.2)	13 (100.0)
18 to 30 hours	72 (67.3)	35 (32.7)	107 (100.0)
not applicable	74 (37.9)	121 (62.1)	195 (100.0)
<b>Total</b>	200 (46.5)	230 (53.5)	430 (100.0)

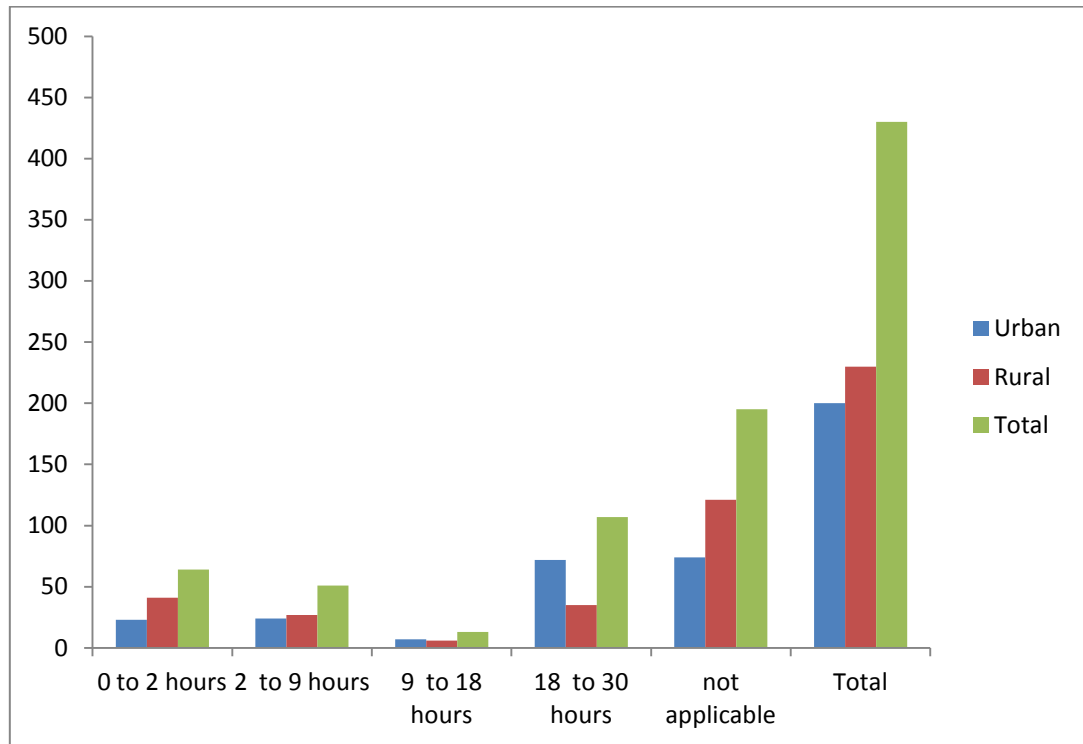
*Source: Primary Survey*

*(Figures inside the parenthesis represent percentage)*

It is found that urban residents spent more hours using internet than the rural counter parts. 67.3 per cent of urban respondents spend more than 18 hours per week using internet, whereas in rural area it is only 32.7 per cent. Also in rural area, a large proportion of respondents (64.1) uses internet only less than two hours in a week.

**Figure 4.18.1**

**Time spent on internet in a week**



#### **4.19 Frequency of using internet in a week**

Frequency of using internet in a week is another indicator for assessing accessibility of internet and also to know how comfortable the respondents are in using internet.

**Table 4.19.1**  
**Frequency of using internet in a week**

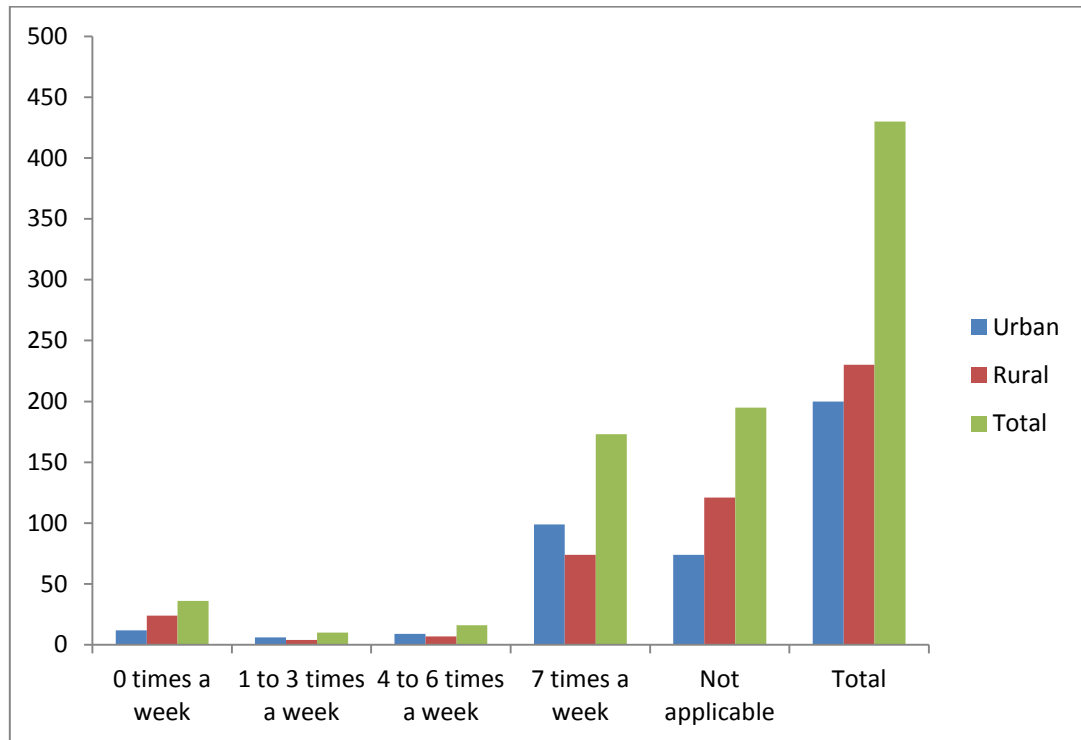
Frequency	Area		Total
	Urban	Rural	
0 times a week	12 (33.3)	24 (66.7)	36 (100.0)
1 to 3 times a week	6 (60.0)	4 (40.0)	10 (100.0)
4 to 6 times a week	9 (56.3)	7 (43.8)	16 (100.0)
7 times a week	99 (57.2)	74 (42.8)	173 (100.0)
Not applicable	74 (37.9)	121 (62.1)	195 (100.0)
Total	200 (46.5)	230 (53.5)	430 (100.0)

*Source: primary survey*

*(Figures inside the parenthesis represent percentage)*

The table explains the difference in frequency of using internet in a week by rural and urban residents. In rural area, 66.7 per cent, that is majority are not at all using internet even once in a week where as in urban area, 60 per cent of the masses are using internet 1 to 3 times a week. 57.2 per cent urban residents are daily users of internet whereas in rural area it is only 42.8 per cent.

**Figure 4.19.1**  
**Frequency of using internet in a week**



**4.20 Place of accessing internet**

Place of accessing internet indicates how easily the respondents are accessible to internet facilities.

**Table 4.20.1**  
**Place of accessing internet**

Place of access	Urban		Rural		Total	
	frequency	percent	frequency	percent	frequency	Per cent
Home	126	53.6	109	46.4	235	100
Office	85	65.4	45	34.6	130	100
College	0	0	8	100	8	100
Not applicable	74	37.9	121	62.1	195	100

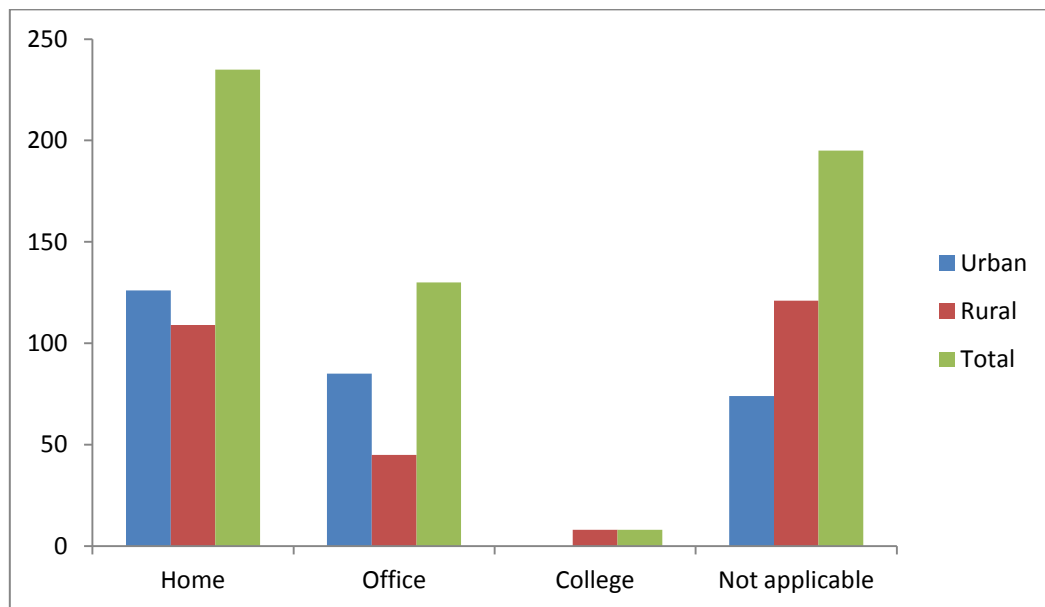
*Source: Primary Survey*



The table gives insights in to the places from which the respondents access internet facilities. In urban area, more than half of the respondents (53.6 per cent) can access internet from their home, where as in rural area, it is 46.4. The percent of population who access internet from office is higher for urban area with 65.4 per cent. In rural area, all the college students are using internet from their college. The proportion of masses that do not use internet is high in rural area (62.1 per cent) whereas in urban area, it is only 37.9. Thus it is very clear that urban respondents have more easy access to internet facilities as most of them can access it at their home itself.

**Figure. 4.20.1**

**Place of accessing internet**



#### **4.20 Level of satisfaction of the speed of internet**

In order to adopt internet banking a high speed internet without interruptions is necessary. This helps to do speedy and safe transactions.

**Table4.20.1**

**Level of satisfaction of the speed of internet**

Level of satisfaction	Urban	Rural	Total
Satisfied	24 (49.0)	25 (51.0)	49 (100.0)
Not satisfied	102 (54.8)	84 (45.2)	186 (100.0)
Not applicable	74 (37.9)	121 (62.1)	195 (100.0)
Total	200 (46.5)	230 (53.5)	430 (100.0)

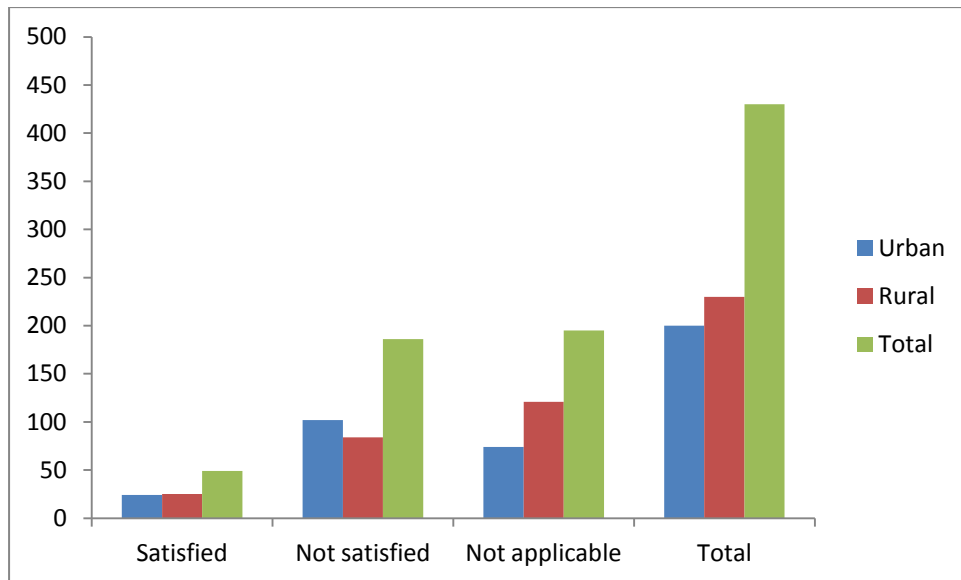
*Source: Primary Survey*

*(Figures inside the parenthesis represent percentage)*

It is inferred from the table that more than half of urban population (54.8 per cent) are not satisfied with the speed of the internet. It could be because of their growing demands and needs and also due to infrastructural constraints. And also the slow pace of internet facility can affect the productivity of workers too.

**Figure 4.20.1**

**Level of satisfaction of the speed of internet**



#### 4.21 Activities performed online

By taking in to account the online activities of the respondents their skill and knowledge in computer can be recognized. Such a skill is necessary to adopt digital banking.

**Table 4.21.1**  
**Activities performed regularly by online**

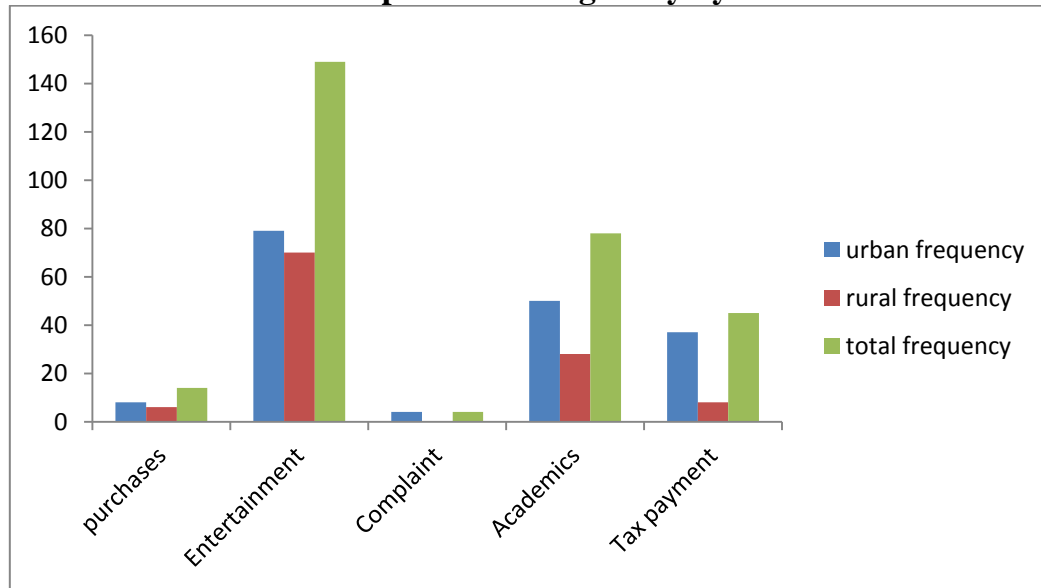
Activities	Urban		Rural		Total	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
purchases	8	51.1	6	42.9	14	100
Entertainment	79	53	70	47	149	100
Complaint	4	100	0	0	4	100
Academics	50	64.1	28	35.9	78	100
Tax payment	37	82.2	8	17.8	45	100

*Source: Primary Survey*

The table gives idea on the activities done online by the sample respondents. It is very clear that urban residents are performing many activities online on a regular basis comparing to rural residents. This shows their skill in handling computer and internet is much higher than the rural customers. Out of people who do regular online purchases, 51.1 per cent is from urban area. Tax payment in urban area by online is by 82.2 per cent but in rural it is merely 17.8 per cent. None from the sample respondents in rural area have filed a complaint online. For rural residents internet is mainly meant for entertainment activities. Also in case of rural area, those who do not use internet accounts to 62.1 per cent where as in urban it is only 37.9 per cent.

**Figure 4.21.1**

**Activities performed regularly by online**



#### 4.22 Usage of online communication services

By examining how far respondents are using online communication services, we can know how far internet has become a part of their daily life.

**Table 4.22.1**

**Regular usage of online communication services**

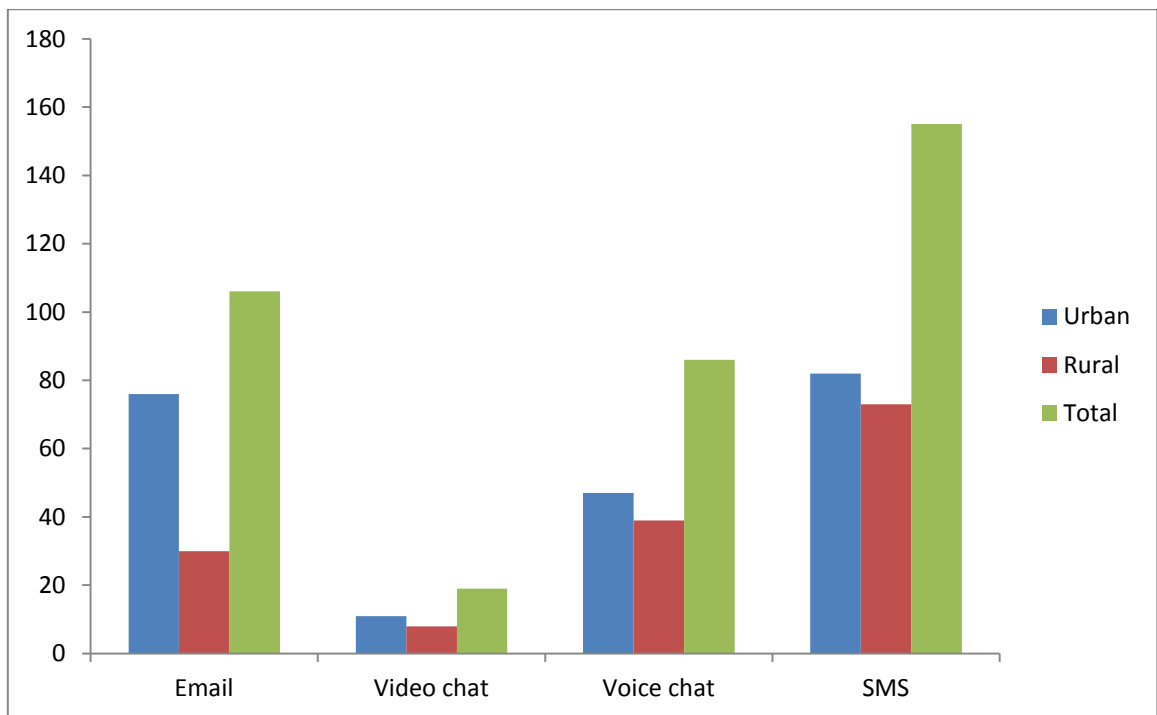
services	Urban		Rural		Total	
	Frequency	Per cent	Frequency	Per cent	Frequency	Per cent
Email	76	71.7	30	28.3	106	100
Video chat	11	57.9	8	42.1	19	100
Voice chat	47	54.7	39	45.3	86	100
SMS	82	52.9	73	47.1	155	100

*Source: Primary Survey*

Regarding communication services also, the urban people are using more compared to rural people. In urban area, 71.7 per cent are using email but only 28.3 per cent are using email in rural area. The case of video chat, voice chat and SMS is the similar. Urban people dominate the scene. SMS is popular among both rural and urban residents.

**Figure 4.22.1**

**Regular usage of online communication services**



#### **4.23 Problems faced while using computer**

Customer faces a number of problems out of usage of computer and internet. This could be due to infrastructural constrains or of the inefficiency of the customer itself. It is imperative to improve the infrastructural capacities and also the users' efficiency. Only such a measure can improve technology banking adoption and acceptance. This wins the confidence of the customers and makes their banking activities smooth and free of security concerns.

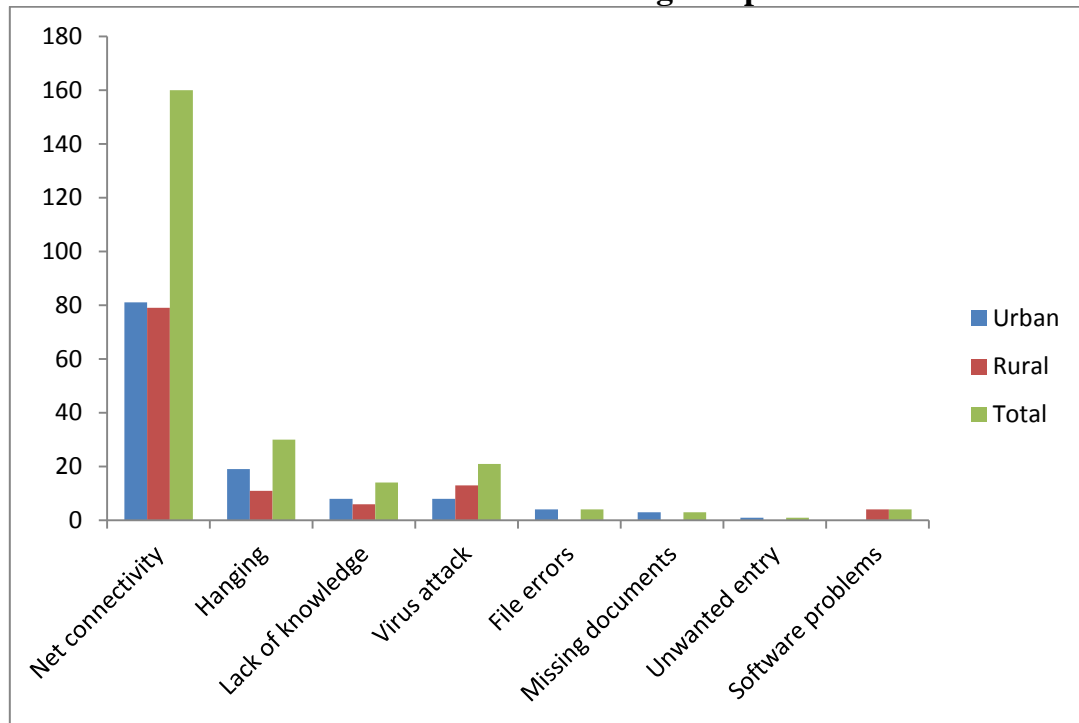
**Table4.23.1**  
**Problems faced while using computer**

Problems	Urban		Rural		Total	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Net connectivity	81	50.6	79	49.4	160	100
Hanging	19	63.3	11	36.7	30	100
Lack of knowledge	8	57.1	6	42.9	14	100
Virus attack	8	38.1	13	61.9	21	100
File errors	4	100	0	0	4	100
Missing documents	3	100	0	0	3	100
Unwanted entry	1	100	0	0	1	100
Software problems	0	0	4	100	4	100

*Source: Primary Survey*

The table depicts the problems faced by sample respondents during the time of using computer and internet. Majority of the people browse in their mobiles and lap tops rather than using desktop versions. Both urban and rural people somewhat equally suffer from internet connectivity problems. 50.6 percent and 49.4 per cent of respondents have internet connectivity problems in urban and rural areas respectively. But problems that emerge out of daily usage such as hanging, file errors, etc has been experienced more by urban respondents which indicates their frequency of usage is high. 57.1 per cent urban residents and 42.9 per cent rural residents lack adequate knowledge to handle computer and internet.

**Figure 4.23.1  
Problems faced while using computer**



### 4.23 Conclusion

In this chapter the demographic variables, banking habits and internet usage of the respondents have been discussed in detail. The demographic variables together with banking habits and internet usage are significant while analyzing the technology banking acceptance of the respondents. People prefer nationalized banks mainly because of security. Location is another factor which people consider while choosing their bank. The main purpose of visiting a bank branch is to withdraw cash. People receive information about new banking products mainly through bank employees followed by friends and their relatives. They always prefer to have person to person approach to gather new information. ATM is the preferred means to know the account details as it is more convenient and safe. In order to use technology banking products, the important pre requisites are internet accessibility and digital literacy. We can also find that digital literacy and usage is high among

urban highly educated, high income earning youth and middle aged. While using internet and computer main problems are related with internet connectivity and lack of knowledge. In the light of the findings, the technology banking acceptance and its pattern, its problems and reasons for not using technology banking across various socio-economic groups are discussed in the next chapter.



*Chapter V*  
*Pattern and Determinants of Technology*  
*Banking Acceptance*

## **Chapter V**

### **Pattern and Determinants of Technology Banking Acceptance**

#### **5.1 Introduction**

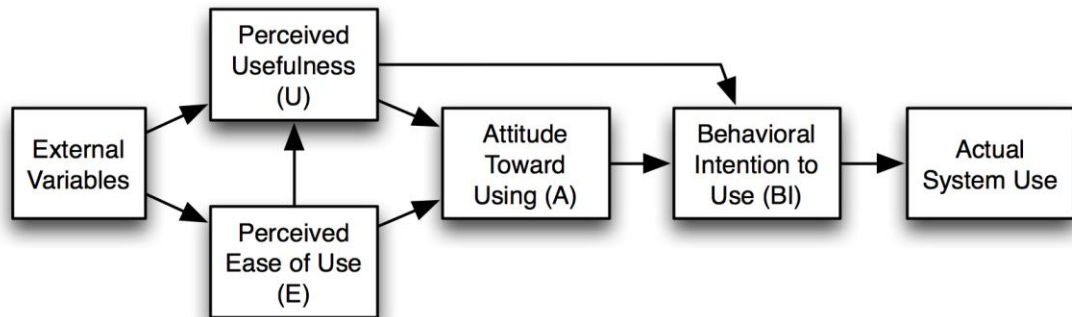
The chapter explains the technology banking acceptance by the customers across socio-economic groups and the problems related to the use of technology banking. The review of literature points out the influence of socio-economic variables on the usage of technology banking and the chance for disparities in usage across these socio-economic constructs. Thus it has been examined in Kerala context. To use technology banking it is necessary to use internet. The internet usage pattern has been examined in the previous chapter and has found that even in the case of internet usage there exist socio-economic disparities. Thus the chapter, in depth discusses on source of information on technology banking for the users, level of awareness about technology banking across socio-economic groups, usage pattern of ATMs, mobile banking and net banking and problems faced by users and also the reason for not using technology banking instruments.

#### **5.2 Technology banking acceptance**

. By technology banking acceptance we mean, usage of technology banking by customers so that their banking needs are satisfied without visiting a brick and mortar institution efficiently and effectively. The acceptance of technology by the people can be explained by using Technology Acceptance Model suggested by David in 1989.

**Figure 5.2.1**

**Technology Acceptance Model**



*Source: (Davis, Bagozzi & Warshaw 1989)*

An individual accepts any technology if he/she finds perceived usefulness and perceived ease of use in using that technology, which is determined by a number of external variables.. Perceived usefulness is defined as "the degree to which a person believes that using a particular system would enhance his or her performance". Perceived ease of use can be defined as "the degree to which a person believes that using a particular system would be free from effort". These two elements determine the individual's attitude towards using the technology and intention to use it. Due to uncertainty about new technology individual will at first try the technology and later on such an experience will lead to actual use of the technology or actual system use.

Many studies have emerged out with different models to study the information technology acceptance by the customers. Other popular models include Theory of Reasoned Action (TRA), Theory of Planned Behavior (TPB) and Unified Theory of Acceptance and Use of Technology (UTAUT). The Theory of Reasoned Action developed by Fishbein and Ajzen (1975) asserts that the behavior of a person is determined by his/her intention to perform it. And the behavioral intention is an outcome of attitude and the subjective norms, the person holds. Thus the theory explores the link between attitude, norms,

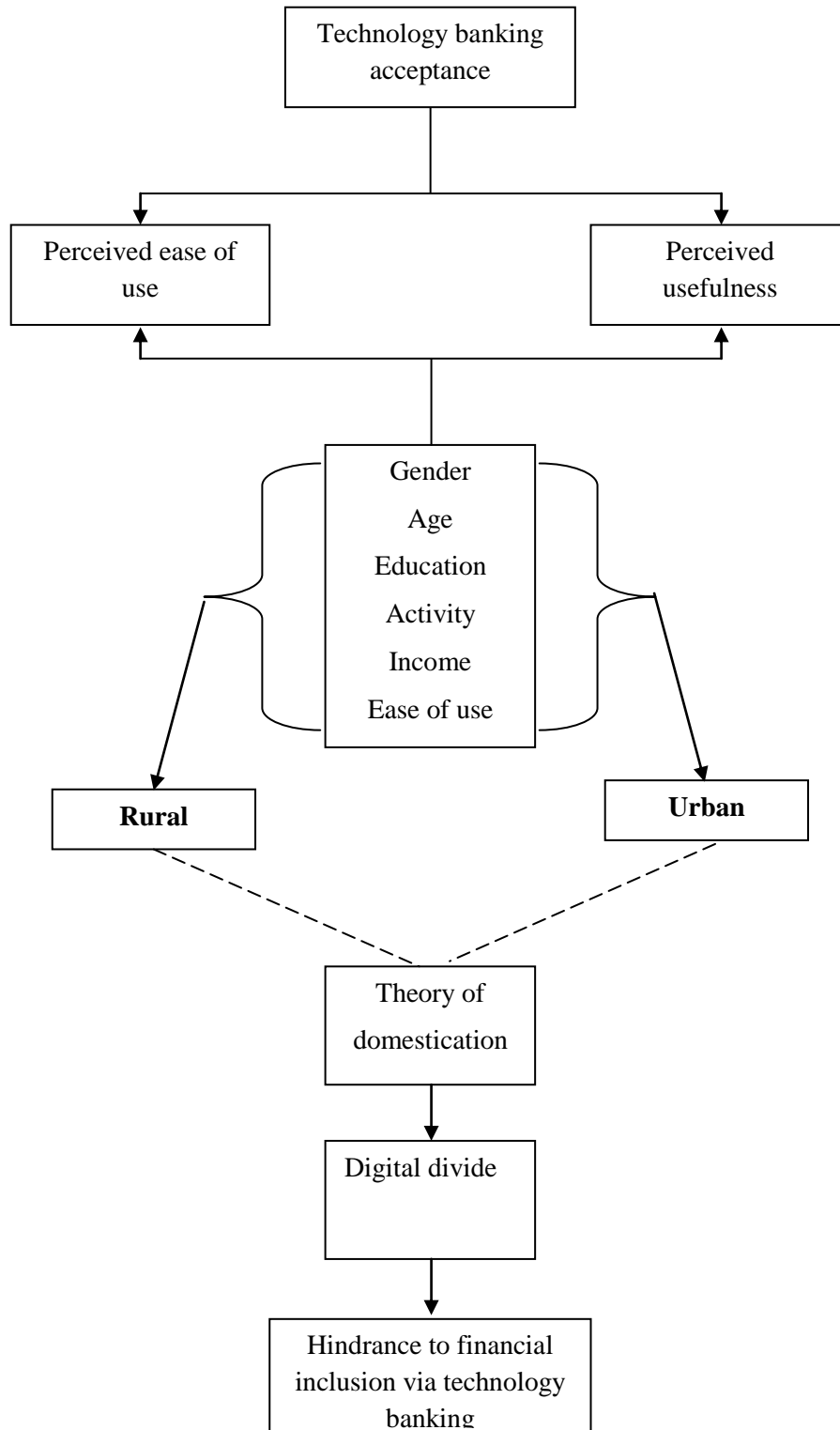
intentions, beliefs and behavior of the individuals. The theory of Planned Behavior propounded by Ajzen (1988, 1991) attempts to predict deliberate human behavior. The model actually aims at strengthening the Theory of Reasoned Action by taking in to consideration the role of perceived behavioral control. The Unified Theory of Acceptance and Use of Technology (UTAUT) formulated by Venkatesh and others to look in to the user intention to use an information system and its usage behavior. The theory makes use of four constructs such as performance expectancy, effort expectancy, social influence and facilitating conditions.

The present study makes use of an analytical framework based on Technology Acceptance Model.

### 5.3 Technology banking acceptance: analytical frame work

Figure 5.3.1

#### Analytical frame work



According to technology acceptance model, an individual accepts and adopt technology, when he/she found usefulness in that and also should feel easiness in using technology. Both usefulness and easiness to use technology is determined by certain socio-economic variables such as gender, education, age, activity status, income and area of residence. We can find differences in technology adoption across the mentioned variables with an urban bias. It may be easy for the urban customers to adopt technology banking compared to their rural counter parts. Hence the theory of domestication works. The urban customers have the capability both in terms of infrastructure and skills to use digital banking. They will also recognize the benefits of technology banking which makes their banking activities smooth functioning. They can save time and money out of using digital banking. it will also ensure them privacy, prestige and suits their tech savvy nature. Since they are aware of the boons and banes of digital banking, they can keep themselves safe and secured too. The urban customers will get used to the technology banking instruments and gradually they demands new products and services to meet their growing banking demands where as the rural people will not be in a position to use even the basic technology based banking services. This creates a digital divide among people and it arises out of usage of technology banking, leaving the vulnerable in vulnerability itself. Thus it can hinder its very aim of achieving financial inclusion. Thus financial inclusion via technology banking is possible only when we apply technology banking cautiously by taking care of the divide it may create.

#### **5.4 Source of information on technology banking**

To popularize technology banking, it is imperative to give information about technology banking to the customers. The table looks in to the major source of information about technology banking instruments.

**Table5.4.1**  
**Source of information on technology banking**

source	ATM			Internet banking			Mobile banking			others		
	urban	rural	total	urban	rural	total	urban	rural	total	urban	rural	total
Advertisement	3 (33.3)	6 (66.7)	9 (100)	12 (46.2)	14 (53.8)	26 (100)	16 (47.1)	18 (52.9)	34 (100)	11 (91.7)	1 (8.3)	12 (2.8)
Friends and relatives	7.1 (33.2)	143 (66.8)	214 (100)	58 (40.3)	86 (59.7)	144 (100)	73 (44.8)	90 (55.2)	163 (100)	15 (31.3)	33 (68.8)	48 (11.2)
Brochures and booklets	6 (60.0)	4 (40.0)	10 (100)	2 (25.0)	6 (75.0)	8 (100)	24 (38.1)	39 (61.9)	63 (100)	8 (53.3)	7 (46.7)	15 (3.5)
Bank employees	170 (48.2)	183 (51.8)	353 (100)	144 (57.4)	107 (42.6)	251 (100)	117 (57.4)	87 (42.6)	204 (100)	46 (68.7)	21 (31.3)	67 (15.6)
Training and demo	0 (0.0)	0 (0.0)	0 (00.0)	0 (00.0)	0 (00.0)	0 (00.0)	0 (00.0)	0 (00.0)	8 (100)	0 (00.0)	0 (00.0)	0 (00.0)
Bank websites	17 (65.4)	9 (34.6)	26 (100)	20 (69.0)	9 (31.0)	29 (100)	0 (00.0)	0 (00.0)	0 (00.0)	0 (00.0)	1 (100)	1 (0.2)
SMS	10 (45.5)	12 (54.5)	22 (100)	1 (20.0)	4 (80.0)	5 (100)	12 (48.0)	13 (52.0)	25 (100)	0 (00.0)	18 (100)	18 (4.2)
E mails	17 (42.5)	23 (57.5)	40 (100)	11 (55.0)	9 (45.0)	20 (100)	8 (44.4)	10 (55.6)	18 (100)	0 (00.0)	0 (0.0)	0 (0.0)

*Source: primary survey*

*(Figures inside the parenthesis represent percentage)*

The main source of information regarding ATM, internet banking, mobile banking and other services such as RTGS, NEFT and ECS is bank employees. The proportion of respondents informed by bank employees are 82.1 per cent, 58.4 per cent, 47.4 per cent and 15.6 per cent regarding ATMs, internet banking, mobile banking and others respectively. The second major source of information for ATMs (49.8 per cent), internet banking (33.5 per cent) and mobile banking (37.9 per cent) is friends and relatives. E mails and bank websites are a major source of information for educated, high earning youths especially in urban area. Also only a small proportion of the population receives information from training programs. It is necessary to choose a source carefully to popularize technology banking as all sources may not be suiting customers from different strata.

### **5.5 Familiarity with technological advancements in banking sector across socio-economic variables**

In this section an attempt is made to assess how far the respondents are aware about the instruments of technology banking. 10 mostly used technology banking instruments are taken for this purpose. Also a general assessment is made with the help of a five point likert scale across socio economic variables.



**Table 5.5.1****Familiarity with major technology banking instruments**

Instruments	Known		Unknown		Total	
	Urban	Rural	Urban	Rural	Urban	Rural
Debit card	184 (92.0)	202 (87.8)	16 (8.0)	28 (12.2)	200 (100.0)	230 (100.0) <sup>v</sup>
Credit card	141 (70.5)	111 (48.3)	59 (29.5)	119 (51.7)	200 (100.0)	230 (100.0)
RTGS	60 (30.0)	49 (21.3)	140 (70.0)	181 (78.7)	200 (100.0)	230 (100.0)
ECS	18 (9.0)	14 (6.1)	182 (91.0)	216 (93.9)	200 (100.0)	230 (100.0)
NEFT	65 (32.5)	62 (27.0)	135 (67.5)	168 (73.0)	200 (100.0)	230 (100.0)
Mobile banking	138 (69.0)	117 (50.9)	62 (31.0)	113 (49.1)	200 (100.0)	230 (100.0) <sup>v</sup>
Internet banking	150 (75.0)	124 (53.9)	50 (25.0)	106 (46.1)	200 (100.0)	230 (100.0)
Tele banking	57 (28.5)	44 (19.1)	143 (71.5)	186 (80.9)	200 (100.0)	230 (100.0)
Point Of Sales	121 (60.5)	67 (29.1)	79 (39.5)	163 (70.9)	200 (100.0)	230 (100.0)
CDM	120 (60.0)	63 (27.4)	80 (40.0)	167 (72.6)	200 (100.0)	230 (100.0)

*Source: primary survey*

*(Figures inside the parenthesis represent percentage)*

It is seen from the table that, regarding the technology banking instruments urban people are more aware comparing to rural residents. Among the technology banking instruments debit card is more popular as 92 percent urban residents and 87.8 percent rural residents knew debit card, whereas credit card is more popular among urban people. 30 per cent urban residents knew about RTGS where as only 21.3 per cent in rural area knew it. ECS is comparatively a less popular instrument it seems as only 9 per cent urban respondents and 6.1 per cent rural respondents knew it. National electronic Fund Transfer ( NEFT) is known to 32.5 per cent and 27 per cent urban and rural respondents respectively. 69 per cent urban people and 50.9 per cent rural people knew about mobile banking. Internet banking is known to 75 per cent urban respondents whereas in rural area only 53.9 per cent knew it. Regarding tele banking 28.5 per cent from

urban area and 19.1 per cent from rural area knew it. Point of sales is much known to urban residents (60.5 per cent) whereas only 29.1 per cent rural respondents are aware of such a facility. Cash Deposit Machine is also popular among urban people than rural ones as 60 percent of urban respondents are aware.

### 5.5.1 Familiarity with technological advancements in banking across gender

**Table 5.5.2**  
**Familiarity with technological advancements in banking across gender**

Area	Gender	VERY HIGH	HIGH	MODE RATE	LOW	VERY LOW	Total
Urban	Male	16 (16.8)	34 (35.8)	20 (21.1)	19 (20.0)	6 (6.3)	95 (100.0)
	Female	9 (8.6)	18 (17.1)	42 (40.0)	23 (21.9)	13 (12.4)	105 (100.0)
	Total	25 (12.5)	52 (26.0)	62 (31.0)	42 (21.0)	19 (9.5)	200 (100.0)
Rural	Male	13 (9.9)	12 (9.2)	16 (12.2)	56 (42.7)	34 (26.0)	131 (100.0)
	Female	3 (3.0)	9 (9.1)	39 (39.4)	26 (26.3)	22 (22.2)	99 (100.0)
	Total	16 (7.0)	21 (9.1)	55 (23.9)	82 (35.7)	56 (24.3)	230 (100.0)

Source: primary survey ( $\chi^2_u = 17.19, \chi^2_r = 25.89, \chi^2 = 34.05$ )

(Figures inside the parenthesis represent percentage)

It is visible from the table that both in urban and rural area, disparity in familiarity of technological advancements in banking are seen between male and female. Males are having better awareness about technology banking instruments with an urban bias. In urban area, 16.8 per cent males have very high awareness on technology banking whereas in the case of rural males, it is only 9.9 per cent. In the case of females, 8.6 per cent are aware of technology banking

in urban area, but only 3 per cent of them have awareness in rural area. Thus there is a significant association between gender and familiarity with technological advancements in banking.

### 5.5.2 Familiarity with technological advancements in banking across education groups

The table gives insights in to the relation between education and familiarity with technological advancements in banking.

**Table 5.5.3**  
**Familiarity with technological advancements in banking across education groups**

AREA	EDUCATION	VERY HIGH	HIGH	MODERATE	LOW	VERY LOW	TOTAL
urban	Below matriculation	0 (0.0)	0 (0.0)	11 (26.8)	12 (29.3)	18 (43.9)	41 (100.0)
	Matriculation	0 (0.0)	0 (0.0)	16 (88.9)	2 (11.1)	0 (0.0)	18 (100.0)
	technical diploma	2 (10.0)	5 (25.0)	8 (40.0)	5 (25.0)	0 (0.0)	20 (100.0)
	graduation	0 (0.0)	8 (19.0)	16 (38.1)	18 (42.9)	0 (0.0)	42 (100.0)
	post graduation and above	0 (0.0)	27 (77.1)	3 (8.6)	5 (14.3)	0 (0.0)	35 (100.0)
	professional degree	23 (52.3)	12 (27.3)	8 (18.2)	0 (0.0)	1 (2.3)	44 (100.0)
	Total	25 (12.5)	52 (26.0)	62 (31.0)	42 (21.0)	19 (9.5)	200 (100.0)
rural	below matriculation	0 (0.0)	0 (0.0)	5 (6.2)	33 (40.7)	43 (53.1)	81 (100.0)
	matriculation	3 (8.8)	3 (8.8)	16 (47.1)	9 (26.5)	3 (8.8)	34 (100.0)
	technical diploma	3 (15.0)	2 (10.0)	5 (25.0)	10 (50.0)	0 (0.0)	20 (100.0)
	graduation	4 (6.5)	3 (4.8)	24 (38.7)	22 (35.5)	9 (14.5)	62 (100.0)
	post graduation and above	3 (15.0)	8 (40.0)	2 (10.0)	6 (30.0)	1 (5.0)	20 (100.0)
	professional degree	3 (23.1)	5 (38.5)	3 (23.1)	2 (15.4)	0 (0.0)	13 (100.0)
	Total	16 (7.0)	21 (9.1)	55 (23.9)	82 (35.7)	56 (24.3)	230 (100.0)

Source: primary survey

( $\chi^2_u = 239.34$ ,  $\chi^2_r = 130.41$ ,  $\chi^2 = 370.74$ )

(Figures inside the parenthesis represent percentage)

It is seen that as education increase awareness about technological innovations in banking too increases. Respondents who are qualified below matriculation level have a very low level of awareness. 43.9 percent in urban area and 53.1 per cent

in rural area have a low level of awareness. A very high level of familiarity is seen among professionals, with 52.3 per cent in urban area and 23.1 per cent in rural area. Thus as education increases awareness level too increases with an urban bias.

### 5.5.3 Familiarity with technological advancements in banking across Income groups

The table explains the level of awareness regarding technology banking among different income groups.

**Table 5.5.4**  
**Familiarity with technological advancements in banking across Income groups**

Area	Income	Very High	High	Moderate	Low	Very low	Total
urban	less than or equal to 5000	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	14 (100.0)	14 (100.0)
	5001 to 10000	0 (0.0)	4 (10.5)	19 (50.0)	11 (28.9)	4 (10.5)	38 (100.0)
	10001 to 25000	0 (0.0)	2 (4.3)	30 (63.8)	14 (29.8)	1 (2.1)	47 (100.0)
	25001 to 50000	14 (17.1)	42 (51.2)	9 (11.0)	17 (20.7)	0 (0.0)	82 (100.0)
	50001 and above	11 (57.9)	4 (21.1)	4 (21.1)	0 (0.0)	0 (0.0)	19 (100.0)
	Total	25 (12.5)	52 (26.0)	62 (31.0)	42 (21.0)	19 (9.5)	200 (100.0)
rural	less than or equal to 5000	0 (0.0)	0 (0.0)	0 (0.0)	5 (17.2)	24 (82.8)	29 (100.0)
	5001 to 10000	0 (0.0)	2 (3.3)	12 (20.0)	30 (50.0)	16 (26.7)	60 (100.0)
	10001 to 25000	6 (7.3)	3 (3.7)	27 (32.9)	33 (40.2)	13 (15.9)	82 (100.0)
	25001 to 50000	9 (16.7)	15 (27.8)	15 (27.8)	12 (22.2)	3 (5.6)	54 (100.0)
	50001 and above	1 (20.0)	1 (20.0)	1 (20.0)	2 (40.0)	0 (0.0)	5 (100.0)
	Total	16 (7.0)	21 (9.1)	55 (23.9)	82 (35.7)	56 (24.3)	230 (100.0)

Source: primary survey

( $\chi^2_u = 260.14$ ,  $\chi^2_r = 115.69$ ,  $\chi^2 = 342.73$ )

(Figures inside the parenthesis represent percentage)

Both in urban as well as rural area, those who earn less than Rs 5000 a month has only low level of awareness regarding technology banking. In urban area,

those who earn more than Rs 50000 a month have high level of awareness whereas in rural area, only 20 per cent of the respondents have a high level of awareness. Thus it is clear that higher income earning urban people found it worthwhile easy an affordable to indulge in technology banking whereas the lower income people are not. Hence awareness level is also high for them.

#### 5.5.4 Familiarity with technological advancements in banking across age groups

**Table 5.5.5**

**Familiarity with technological advancements in banking across age group**

Area	Age group	Very High	High	Moderate	Low	Very low	Total
urban	Below 35 years	22 (33.3)	19 (28.8)	15 (22.7)	10 (15.2)	0 (0.0)	66 (100.0)
	35 - 59 years	2 (2.0)	22 (21.6)	45 (44.1)	32 (31.4)	1 (1.0)	102 (100.0)
	60 years and above	1 (3.1)	11 (34.4)	2 (6.3)	0 (0.0)	18 (56.3)	32 (100.0)
	Total	25 (12.5)	52 (26.0)	62 (31.0)	42 (21.0)	19 (9.5)	200 (100.0)
rural	Below 35 years	8 (8.4)	5 (5.3)	30 (31.6)	45 (47.4)	7 (7.4)	95 (100.0)
	35 - 59 years	4 (4.1)	11 (11.2)	25 (25.5)	37 (37.8)	21 (21.4)	98 (100.0)
	60 years and above	4 (10.8)	5 (13.5)	0 (0.0)	0 (0.0)	28 (75.7)	37 (100.0)
	Total	16 (7.0)	21 (9.1)	55 (23.9)	82 (35.7)	56 (24.3)	230 (100.0)

Source: primary survey

( $\chi^2_u = 150.20$ ,  $\chi^2_r = 84.93$ ,  $\chi^2 = 184.94$ )

(Figures inside the parenthesis represent percentage)

It is evident from the table that familiarity regarding technological innovations in banking is high among youths in urban area where as in rural area, it very high

among retired persons. This is because of the fact that these retired persons were once working in urban area and are used with technology banking. But 75.7 per cent of rural retired persons have very low awareness.

### 5.5.5 Familiarity with technological advancements in banking across activity groups

The table shows that there is an association between activity in which the person is engaged and the level awareness in technology banking.

**Table 5.5.6**

#### Familiarity with technological advancements in banking across activity group

Area	Activity group	very high	High	Moderate	Low	Very low	Total
urban	Regular	8 (20.5)	14 (35.9)	13 (33.3)	3 (7.7)	1 (2.6)	39 (100.0)
	Private	13 (16.9)	23 (29.9)	16 (20.8)	21 (27.3)	4 (5.2)	77 (100.0)
	Business	1 (20.0)	2 (40.0)	2 (40.0)	0 (0.0)	0 (0.0)	5 (100.0)
	Casual	0 (0.0)	0 (0.0)	2 (22.2)	5 (55.6)	2 (22.2)	9 (100.0)
	Retired	1 (6.7)	11 (73.3)	3 (20.0)	0 (0.0)	0 (0.0)	15 (100.0)
	Unearne d group	0 (0.0)	2 (3.6)	26 (47.3)	13 (23.6)	14 (25.5)	55 (100.0)
	Total	25 (12.5)	52 (26.0)	62 (31.0)	42 (21.0)	19 (9.5)	200 (100.0)
rural	Regular	2 (18.2)	1 (9.1)	2 (18.2)	3 (27.3)	3 (27.3)	11 (100.0)
	Private	5 (6.8)	2 (2.7)	16 (21.6)	40 (54.1)	11 (14.9)	74 (100.0)
	Business	2	0	0	0	0	2

		(100.0)	(0.0)	(0.0)	(0.0)	(0.0)	(100.0)
	Casual	3 (9.4)	1 (3.1)	1 (3.1)	12 (37.5)	15 (46.9)	32 (100.0)
	Retired	4 (26.7)	11 (73.3)	0 (0.0)	0 (0.0)	0 (0.0)	15 (100.0)
	Unearne d group	0 (0.0)	6 (6.3)	36 (37.5)	27 (28.1)	27 (28.1)	96 (100.0)
	Total	16 (7.0)	21 (9.1)	55 (23.9)	82 (35.7)	56 (24.3)	230 (100.0)

Source: primary survey

( $\chi^2_u=83.01$ ,  $\chi^2_r=162.17$ ,  $\chi^2=187.86$ )

(Figures inside the parenthesis represent percentage)

In urban area, those who are indulged in regular work have the highest level of familiarity with that of developments in technology banking. Among the regularly working class 20.5 per cent have very high level of awareness followed by the business class with 20 per cent. In rural area, the business group has the highest level of awareness with cent per cent. The lowest level of awareness is seen among unearned group (25.5 per cent) in urban area and among casual workers (46.9 per cent) in rural area.

### 5.6 Technology banking Acceptance Index

In order to study the extend of technology banking acceptance by the sample respondents, a technology banking acceptance index was formed by taking the positive responses of the 10 technology banking instruments accepted and adopted by the sample respondents. The variables are

1. Debit card
2. Credit card
3. RTGS
4. ECS
5. NEFT

6. Mobile banking
7. Internet banking
8. Telebanking
9. Cash deposit machine
10. Point of Sales

Technology banking acceptance index =  $\frac{X_i - \text{Minimum}(X_i)}{\text{Maximum}(X_i) - \text{Minimum}(X_i)}$

Where  $X_i$  = actual value of the  $I^{\text{th}}$  indicator.

The value of index ranges between 0 – 1. Scoring method has been used here. Scores given are 1 for positive response and 0 for negative response. Those responses that lies between 0 to 0.33 has been categorized as low technology banking acceptance, between 0.34 to 0.65 as moderate technology banking acceptance and between 0.65 to 1 as high technology banking acceptance. The relation between technology banking acceptance index and the major socio-economic variables are shown in the following tables. The association between various socio-economic variables and technology acceptance index is analyzed by testing the hypothesis that there is no association between technology banking acceptance level and different variables considered.  $X^2$  statistic has been used to test the hypothesis.



### 5.6.1 Technology banking acceptance of the sample respondents.

**Table 5.6.1**

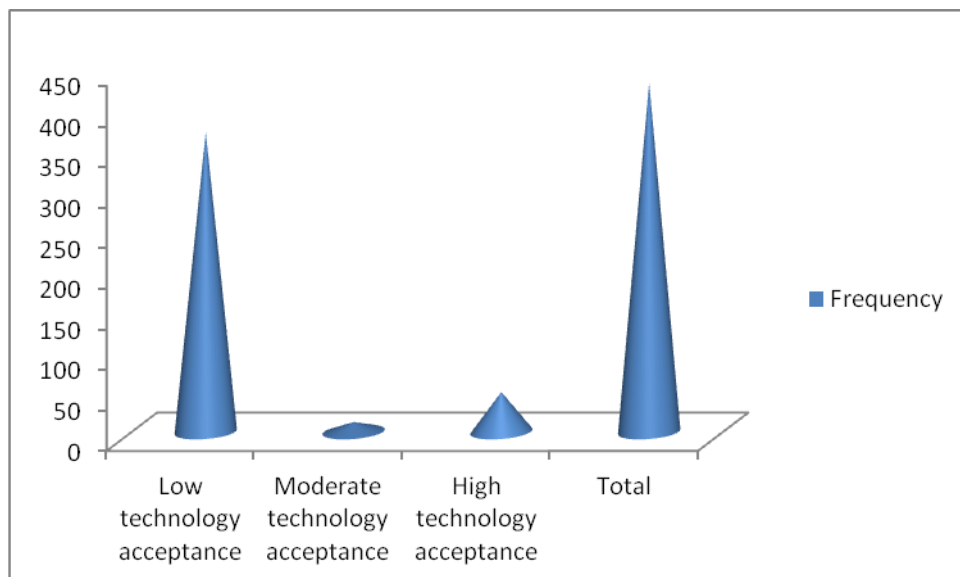
**Technology banking Acceptance of the Respondents**

<b>Level of Technology Banking Acceptance</b>	<b>Frequency</b>	<b>Percent</b>
Low technology banking acceptance	369	85.8
Moderate technology banking acceptance	12	2.8
High technology banking acceptance	49	11.4
<b>Total</b>	<b>430</b>	<b>100.0</b>

*Source: primary survey*

**Figure 5.6.1**

**Technology banking Acceptance of the Respondents**



The technology banking Acceptance Index shows that 85.8 per cent of the sample respondents have low level of technology acceptance. Only a small proportion of the respondents have a high level technology acceptance. 11.4 per

cent of the respondents have high technology acceptance where as 2.8 per cent has moderate technology acceptance.

### 5.6.2 Technology banking Acceptance across gender

**Table 5.6.2**

**Technology banking Acceptance across gender**

gender	Low technology banking acceptance			Moderate technology banking acceptance			High technology banking acceptance			total		Grand total
	Urban	rural	total	urban	rural	total	urban	rural	total	urban	rural	
male	71 (74.7)	117 (89.3)	188 (83.2)	8 (8.4)	2 (1.5)	10 (4.4)	16 (16.8)	12 (9.2)	28 (12.4)	95 (100)	131 (100)	226 (100)
female	87 (82.9)	94 (94.9)	181 (88.7)	2 (1.9)	0 (0.0)	2 (1.0)	16 (15.2)	5 (5.1)	21 (10.3)	105 (100)	99 (100)	204 (100)
total	158 (79.0)	211 (91.7)	369 (85.8)	10 (5.0)	2 (0.9)	12 (2.8)	32 (16)	17 (7.4)	49 (11.4)	200 (100)	230 (100)	430 (100)

Source: primary survey

( $\chi^2_u=4.732$ ,  $\chi^2_r=2.995$ ,  $\chi^2=5.355$ )

(Figures inside the parenthesis represent percentage)

The table describes the technology adoption pattern across gender in rural and urban areas. It is clear from the table that, in the urban area, there is not much variation between male and female in the case of high technology adoption. 16.8 percent males and 15.2 percent females have high level of technology adoption. In case of moderate and low technology acceptance, we can see a serious gender disparity, where men fall short of women. It is also notable that 83.2 per cent of men and 88.7 per cent of women has low technology adoption level. According to World Bank studies, this is mainly because of the high exposure men receive comparing to women and also due to variations in ownership of mobile phones etc. the grand total picture also depicts the same. In all the possible three cases, low moderate and high technology adoption, men outstands women.

### 5.6.3 Technology banking Acceptance across Education groups

The level of technology adoption among different education groups are clearly given in the table

**Table 5.6.3**  
**Technology banking acceptance across Education groups**

Education groups	Low technology banking acceptance			Moderate technology banking acceptance			High technology banking acceptance			Total		Grand total
	Urban	rural	total	urban	rural	total	urban	rural	total	urban	rural	
Below matriculation	41 (100)	81 (100)	122 (100)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	41 (100)	81 (100)	122 (100)
Matriculation	18 (100)	32 (94.1)	50 (96.2)	0 (0.0)	2 (5.9)	2 (3.8)	0 (0.0)	0 (0.0)	0 (0.0)	18 (100)	34 (100)	52 (100)
Technical diploma	19 (95.0)	17 (85.0)	36 (90.0)	1 (5.0)	0 (0.0)	1 (2.5)	0 (0.0)	3 (15.0)	3 (7.5)	20 (100)	20 (100)	40 (100)
Graduation	40 (95.2)	54 (87.1)	94 (90.04)	2 (4.8)	0 (0.0)	2 (1.9)	0 (0.0)	8 (12.9)	8 (7.7)	42 (100)	62 (100)	104 (100)
Post graduation and above	25 (71.4)	19 (95.0)	44 (80.0)	3 (8.6)	0 (0.0)	3 (5.5)	7 (20.0)	1 (5.0)	8 (14.5)	35 (100)	20 (100)	55 (100)
Professional degree	15 (34.1)	8 (61.5)	23 (40.4)	4 (9.1)	0 (0.0)	4 (7.0)	25 (56.8)	1 (5.0)	30 (52.6)	44 (100)	13 (100)	57 (100)
total	158 (79.9)	211 (91.7)	369 (85.8)	10 (5.0)	2 (0.9)	12 (2.8)	32 (16.0)	17 (7.4)	49 (11.4)	200 (100)	230 (100)	430 (100)

Source: primary survey ( $\chi^2_u = 87.679, \chi^2_r = 43.462, \chi^2 = 133.88$ .)

(Figures inside the parenthesis represent percentage)

It is seen from the table that, there is a close relation between education and technology adoption but with a rural urban bias. In urban as well as rural area, professional degree holders have the high level of technology adoption. In urban area, 56.8 per cent of the professionals and in rural area 38.5 per cent of the professionals have a high level of technology adoption. It is because of the digital literacy and tech savvy nature of the professional group. In total, only 11.4 percent adopts a high level technology where 16 per cent belongs to urban area and 7.4 per cent belongs to rural area. But 79 percent of urban customers and 91.7 per cent of rural customers have a low technology adoption.

#### 5.6.4 Technology banking Acceptance across area of residence

The table depicts the relation between area of residence and level of technology banking acceptance.

**Table 5.6.4**

**Technology banking Acceptance across area of residence**

<b>Area</b>	<b>Low technology banking acceptance</b>	<b>Moderate technology banking acceptance</b>	<b>High technology banking acceptance</b>	<b>Total</b>
<b>Urban</b>	158	10	32	200
	(79.0)	(5.0)	(16.0)	(100.0)
<b>Rural</b>	211	2	17	230
	(91.7)	(0.9)	(7.4)	(100.0)
<b>Total</b>	369	12	49	430
	(85.8)	(2.8)	(11.4)	(100.0)

*Source: primary survey*

$$\chi^2=15.520$$

*(Figures inside the parenthesis represent percentage)*

. Urban residents have very high level of technology acceptance comparing to the rural counter parts. In urban area, 16 per cent residents have high technology acceptance whereas only 7.4 per cent have high technology acceptance in rural area.

## 5.6.5 Technology banking Acceptance across Activity groups

**Table 5.6.5**

### **Technology acceptance across activity groups**

The table gives a picture on the usefulness of technology banking among different activity groups

Activity groups	Low technology banking acceptance			Moderate technology banking acceptance			High technology banking acceptance			total		Grand total
	Urban	rural	total	urban	rural	total	urban	rural	total	urban	rural	
Regular	25 (64.1)	9 (81.8)	34 (68.0)	4 (10.3)	0 (0.0)	4 (8.0)	10 (25.6)	2 (18.2)	12 (24.0)	39 (100)	11 (100)	50
Private	52 (67.5)	62 (83.8)	114 (75.5)	4 (5.2)	2 (2.7)	6 (4.0)	21 (27.3)	10 (13.5)	31 (20.5)	77 (100)	74 (100)	151
Business	4 (80)	0 (0.0)	4 (57.1)	0 (0.0)	0 (0.0)	0 (0.0)	1 (20)	2 (100)	3 (42.9)	5 (100)	2 (100)	7
Casual	8 (88.9)	30 (93.8)	38 (92.7)	1 (11.1)	0 (0.0)	1 (2.4)	0 (0.0)	2 (6.3)	2 (4.9)	9 (100)	32 (100)	41
Retired	14 (93.3)	15 (100)	29 (96.7)	1 (6.7)	0 (0.0)	1 (1.3)	0 (0.0)	0 (0.0)	0 (0.0)	15 (100)	15 (100)	30
Unearned group	55 (100)	95 (99.0)	150 (99.3)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (1.0)	1 (0.7)	55 (100)	96 (100)	151
total	158 (79.9)	211 (91.7)	369 (85.8)	10 (5.0)	2 (0.9)	12 (2.8)	32 (16.0)	17 (7.4)	49 (11.4)	200 (100)	230 (100)	430 (100)

Source: primary survey ( $\chi^2_u = 32.937, \chi^2_r = 42.44, \chi^2 = 62.64,$ )

(Figures inside the parenthesis represent percentage)

It is found that, in urban area, people belonging to private sector (31.2 per cent) has the highest usefulness followed by regular workers (28.2 per cent). In rural area cent per cent customers under business group found high usefulness for technology banking followed by persons working under private sector with 13.5 per cent. Low usefulness for technology banking is highly found among casual workers. (80.5 per cent).

### 5.6.6 Technology banking Acceptance across Age groups

There is variation in technology adoption among different age groups with a rural urban bias, which is clear from the table.

**Table 5.6.6**

#### Technology banking acceptance across Age groups

Age groups	Low technology banking acceptance			Moderate technology banking acceptance			High technology banking acceptance			total		Grand total
	Urban	rural	total	urban	rural	total	urban	rural	total	urban	rural	
Below 35 years	33 (50.0)	76 (80)	109 (67.7)	3 (4.5)	2 (2.1)	5 (3.1)	30 (45.5)	17 (17.9)	47 (29.2)	66 (100)	95 (100)	161 (100)
35-59 years	93 (91.2)	98 (100)	191 (95.5)	7 (6.9)	0 (0.0)	7 (3.5)	2 (2.0)	0 (0.0)	2 (1.0)	102 (100)	98 (100)	200 (100)
60 years and above	32 (100)	37 (100)	69 (100)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	32 (100)	37 (100)	69 (100)
total	158 (79.0)	211 (91.7)	369 (85.8)	10 (5.0)	2 (0.9)	12 (2.8)	32 (16.0)	17 (7.4)	49 (11.4)	200 (100)	230 (100)	430 (100)

Source: primary survey  $(\chi^2_u = 66.53, \chi^2_r = 29.43, \chi^2 = 83.88,)$

(Figures inside the parenthesis represent percentage)

Both in urban as well as rural areas, people belonging to the age group of below 35 years have a high level of high technology adoption. In urban area, 45.5 percent and in rural area, 17.9 per cent customers belonging to below 35 years group has a high level technology adoption. It is because of their internet usage level, tech savvy nature and usefulness in the same. The grand total picture tells 16 per cent and 7.4 per cent has a high level technology adoption in urban and rural areas respectively. But as a whole 67.7 per cent of persons belong to below 35 age group has a low level of technology adoption.

### 5.6.7 Technology banking Acceptance across Income groups

The table explains the variation in technology adoption among different income groups in urban and rural areas.

**Table 5.6.7**  
**Technology banking acceptance across income groups**

Income groups	Low technology banking acceptance			Moderate technology banking acceptance			High technology banking acceptance			total		Grand total
	Urban	rural	total	urban	rural	total	urban	rural	total	urban	rural	
Less than or equal to 5000	14 (100)	29 (100)	43 (100)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	14 (100)	29 (100)	43 (100)
5001 to 10000	38 (100)	59 (98.3)	97 (99)	0 (0)	1 (1.7)	1 (1)	0 (0)	0 (0)	0 (0)	38 (100)	60 (100)	98 (100)
10001 to 25000	47 (100)	70 (85.4)	117 (90.7)	0 (0)	1 (1.2)	1 (0.8)	0 (0)	11 (13.4)	11 (8.5)	47 (100)	82 (100)	129 (100)
25001 to 50000	55 (67.1)	50 (92.6)	105 (77.2)	6 (7.3)	0 (0)	6 (4.4)	21 (25.6)	4 (7.2)	25 (18.4)	82 (100)	54 (100)	136 (100)
50001 and above	4 (21.1)	3 (60)	7 (29.2)	4 (21.1)	0 (0)	4 (16.7)	11 (57.9)	2 (40)	13 (54.2)	19 (100)	5 (100)	24 (100)
total	158 (79)	211 (91.7)	369 (85.8)	10 (5)	2 (0.9)	12 (2.8)	32 (16)	17 (7.4)	49 (11.4)	200 (100)	230 (100)	430 (100)

Source: primary survey

( $\chi^2_u = 72.11$ ,  $\chi^2_r = 20.53$ ,  $\chi^2 = 96.86$ )

(Figures inside the parenthesis represent percentage)

The high technology adoption is prominent among customers who earn more than Rs 50000 per month. In urban area, about 60 per cent belonging to this group has a high technology adoption where as in rural it is 40 per cent. Thus income and technology adoption is closely associated as people with higher income have more transactions and they find usefulness in technology banking. Thus higher the income, higher is the tendency to use technology banking.

### 5.7 Technology banking usefulness Index

According to technology acceptance model, a person accepts technology only if he has perceived usefulness for the same. Perceived usefulness is the degree to which a person believes that using a particular system would enhance his or her

job performance. It is the perception of the consumer regarding the outcome of the experience.

In order to study the extend of perceived usefulness by the sample respondents, a perceived usefulness index was formed by taking the positive responses of the 10 perceived usefulness variables felt by the sample respondents. The variables are

1. Time saving
2. Performance of plastic cards
3. Cost effectiveness of ATM
4. Cost effectiveness of net banking
5. Cost effectiveness of mobile banking
6. Security of ATMs
7. Security of internet banking.
8. Security of mobile banking
9. Prestige
10. Privacy.

Technology banking usefulness index =  $\frac{X_i - \text{Minimum}(X_i)}{\text{Maximum}(X_i) - \text{Minimum}(X_i)}$

Where  $X_i$  = actual value of the  $I^{\text{th}}$  indicator.

The value of index ranges between 0 – 1. Scoring method has been used here. Scores given are 1 for positive response and 0 for negative response. Those responses that lies between 0 to 0.33 has been categorized as low technology banking usefulness, between 0.34 to 0.65 as moderate technology banking usefulness and between 0.65 to 1 as high technology banking usefulness. The relation between technology banking usefulness index and the major socio-economic variables are shown in the following tables. The association between various socio-economic variables and technology acceptance index is analyzed by testing the hypothesis that there is no association between technology banking



usefulness and different variables considered.  $X^2$  statistic has been used to test the hypothesis.

### 5.7.1 Usefulness of technology banking to the respondents.

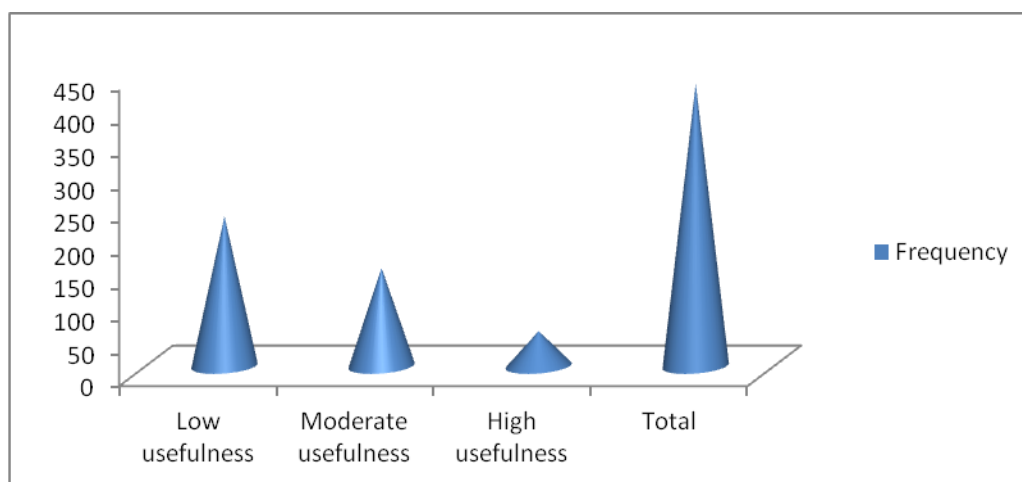
The table gives that more than half of the respondents have low usefulness for technology banking.

**Table 5.15**  
**Usefulness of technology banking for the respondents**

Usefulness	Frequency	Percent
Low usefulness	228	53
Moderate usefulness	149	34.7
High usefulness	53	12.3
Total	430	100

Among the respondents, 53 per cent of the people don't find technology banking will help them to save time and cost. Only 12.3 per cent has high usefulness for technology banking. The major proportion of respondents with high usefulness pertains to urban area.

**Figure 5.7.1**  
**Usefulness of technology banking for the respondents**



### 5.7.2 Usefulness of technology banking across gender

The usefulness of technology banking across the gender has been given in the table.

**Table 5.7.2**  
**Usefulness of technology banking across gender**

Gender	Low usefulness of technology banking			Moderate usefulness of technology banking			High usefulness of technology banking			total		Grand total
	Urban	rural	total	urban	rural	total	urban	rural	total	urban	rural	
Male	36 (37.9)	83 (63.4)	119 (52.7)	37 (38.9)	36 (27.5)	73 (32.3)	22 (23.2)	12 (9.2)	34 (15)	95 (100)	131 (100)	226 (100)
Female	44 (41.9)	65 (65.7)	109 (53.4)	46 (43.8)	30 (30.3)	76 (37.3)	15 (14.3)	4 (4)	19 (9.3)	105 (100)	99 (100)	204 (100)
Total	80 (40)	148 (64.3)	228 (53)	83 (41.5)	66 (28.7)	149 (34.7)	37 (18.5)	16 (7)	53 (12.3)	200 (100)	230 (100)	430 (100)

Source: primary survey

( $\chi^2_u = 2.60$ ,  $\chi^2_r = 2.32$ ,  $\chi^2 = 3.62$ .)

(Figures inside the parenthesis represent percentage)

It is obviously revealed that only 15 per cent of males felt a high usefulness for technology banking in which 23.2 percent belongs to urban area and 9.2 per cent belongs to rural area. Females have less usefulness comparing to their male counterpart with 9.3 per cent., out of which 14.3 belongs to urban area and 4 per cent belongs to rural area. Most of the females are using technology banking in order to collect foreign remittances

### 5.7.3 Usefulness of technology banking across area

**Table 5.7.3**  
**Usefulness of technology banking across area**

Area	Low usefulness	Moderate usefulness	High usefulness	Total
urban	80 (40)	83 (41.5)	37 (18.5)	200 (100)
rural	148 (64.3)	66 (28.7)	16 (7)	230 (100)
Total	228 (53)	149 (34.7)	53 (12.3)	430 (100)

Source: primary survey

$\chi^2 = 28.57$

(Figures inside the parenthesis represent percentage)

As per the table, the urban respondents have high level of usefulness for technology banking. 18.5 per cent of them have high level of usefulness, where as in rural areas only 7 percent has high usefulness for technology banking but 53 percent respondents opined that they have a low usefulness for technology banking.

#### 5.7.4 Usefulness of Technology banking across education groups

The table gives insights in to the usefulness of technology banking among various education groups.

**Table 5.7.4**

#### Usefulness of Technology banking across education groups

Education groups	Low usefulness of technology banking			Moderate usefulness of technology banking			High usefulness of technology banking			total		Grand total
	Urban	rural	total	urban	rural	total	urban	rural	total	urban	rural	
Below matriculation	37 (90.2)	79 (97.5)	116 (95.1)	4 (9.8)	2 (2.5)	6 (4.9)	0 (0)	0 (0)	0 (0)	41 (100)	81 (100)	122 (100)
Matriculation	6 (33.3)	11 (32.4)	17 (32.7)	12 (66.7)	23 (67.6)	35 (67.3)	0 (0)	0 (0)	0 (0)	18 (100)	34 (100)	52 (100)
Technical diploma	5 (25)	10 (50)	15 (37.5)	15 (75)	7 (35)	22 (55)	0 (0)	3 (15)	3 (7.5)	20 (100)	20 (100)	40 (100)
Graduation	15 (35.7)	36 (58.1)	51 (49)	25 (59.5)	19 (30.6)	44 (42.3)	2 (4.8)	7 (11.3)	9 (8.7)	42 (100)	62 (100)	104 (100)
Post graduation and above	9 (25.7)	6 (30)	15 (27.3)	16 (45.7)	13 (65)	29 (52.7)	10 (28.6)	1 (5)	11 (20)	35 (100)	20 (100)	55 (100)
Professional degree	8 (18.2)	6 (46.2)	14 (24.6)	11 (25)	2 (15.4)	13 (22.8)	25 (56.8)	5 (38.5)	30 (52.6)	44 (100)	13 (100)	57 (100)
total	80 (40)	148 (64.3)	228 (53)	83 (41.5)	66 (28.7)	149 (34.7)	37 (18.5)	16 (7)	53 (12.3)	200 (100)	230 (100)	430 (100)

Source: primary survey ( $\chi^2_u = 114.59, \chi^2_r = 102.55, \chi^2 = 224.73$ )

(Figures inside the parenthesis represent percentage)

It is seen that usefulness is high for urban users with 18.5 percent comparing to their rural counterparts with 7 per cent. In case of both urban and rural, usefulness is higher for persons with professional degree. In urban it is 56.6

percent where as in rural it is 38.5 percent. In total, high usefulness of technology banking is felt by only 12.3 percent in which 52.6 percent belongs to professional degree holders followed by people with post graduation and above. (20 per cent). It is because they find it easy to use and cost effective and time saving. At the same time 24.6 per cent of professional degree holders find less usefulness for technology banking because of the risk associated and high service charges.

### 5.7.5 Usefulness of Technology banking across activity groups

The table gives a picture on the usefulness of technology banking among different activity groups

**Table 5.7.5**  
**Usefulness of Technology banking across activity groups**

Activity groups	Low usefulness of technology banking			Moderate usefulness of technology banking			High usefulness of technology banking			total		Grand total
	Urban	rural	total	urban	rural	total	urban	rural	total	urban	rural	
Regular	3 (7.7)	1 (9.1)	4 (8)	25 (64.1)	9 (81.8)	34 (68)	11 (28.2)	1 (9.1)	12 (24)	39 (100)	11 (100)	50 (100)
Private	24 (31.2)	43 (58.1)	67 (44.4)	29 (37.7)	21 (28.4)	50 (33.1)	24 (31.2)	10 (13.5)	34 (22.5)	77 (100)	74 (100)	151 (100)
Business	1 (20)	0 (0)	1 (14.3)	3 (60)	0 (0)	3 (42.9)	1 (20)	2 (100)	3 (42.9)	5 (100)	2 (100)	7 (100)
Casual	5 (55.5)	28 (87.5)	33 (80.5)	4 (44.4)	2 (6.3)	6 (14.6)	0 (0)	2 (6.3)	2 (4.9)	9 (100)	32 (100)	41 (100)
Retired	14 (93.3)	9 (60)	23 (76.7)	0 (0)	6 (40)	6 (20)	1 (6.7)	0 (0)	1 (3.3)	15 (100)	15 (100)	30 (100)
Unearned group	33 (60)	67 (69.8)	100 (66.2)	22 (40)	28 (29.2)	50 (33.1)	0 (0)	1 (1)	1 (0.7)	55 (100)	96 (100)	151 (100)
total	80 (40)	148 (64.3)	228 (53)	83 (41.5)	66 (28.7)	149 (34.7)	37 (18.5)	16 (7)	53 (12.3)	200 (100)	230 (100)	430 (100)

Source: primary survey

( $\chi^2_u = 62.29$ ,  $\chi^2_r = 63.22$ ,  $\chi^2 = 104.20$ )

(Figures inside the parenthesis represent percentage)

It is found that, in urban area, people belonging to private sector (31.2 per cent) has the highest usefulness followed by regular workers (28.2 per cent). In rural area cent per cent customers under business group found high usefulness for technology banking followed by persons working under private sector with 13.5 per cent. Low usefulness for technology banking is highly found among casual workers. (80.5 per cent).

### 5.7.6 Usefulness of technology banking across age group

**Table 5.7.6**

#### Usefulness of technology banking across age group

Age groups	Low usefulness of technology banking			Moderate usefulness of technology banking			High usefulness of technology banking			total		Grand total
	Urban	rural	total	urban	rural	total	urban	rural	total	urban	rural	
Below 35 years	10 (15.2)	57 (60)	67 (41.6)	26 (39.4)	22 (23.2)	48 (29.8)	30 (45.5)	16 (16.8)	46 (28.6)	66 (100)	95 (100)	161 (100)
35-59 years	38 (37.3)	54 (55.1)	92 (46)	57 (55.9)	44 (44.9)	101 (50.5)	7 (6.9)	0 (0)	7 (3.5)	102 (100)	98 (100)	200 (100)
60 years and above	32 (100)	37 (100)	69 (100)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	32 (100)	37 (100)	69 (100)
total	80 (40)	148 (64.3)	228 (53)	83 (41.5)	66 (28.7)	149 (34.7)	37 (18.5)	16 (7)	53 (12.3)	200 (100)	230 (100)	430 (100)

Source: primary survey  $(\chi^2_u = 96.92, \chi^2_r = 52.22, \chi^2 = 129.64)$

(Figures inside the parenthesis represent percentage)

The table clearly depicts that there exist a relation between age group and usefulness in technology banking. Technology banking has been highly useful to persons belonging to the age group of below 35 years with 28.6 per cent. The situation is same with that of urban and rural. In urban area, 45.5 percent of persons and in rural area, 16.8 percent have high usefulness for technology banking. This is again because of the benefits of technology banking such as cost

effective, time saving and enables them to do anywhere anytime banking in their busy life.

### 5.7.7 Usefulness of technology banking across income group

**Table 5.7.7**

#### Usefulness of technology banking across income group

Income groups	Low usefulness of technology banking			Moderate usefulness of technology banking			High usefulness of technology banking			total		Grand total
	Urban	rural	total	urban	rural	total	urban	rural	total	urban	rural	
Less than or equal to 5000	14 (100)	29 (100)	43 (100)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	14 (100)	29 (100)	43 (100)
5001 to 10000	23 (60.5)	50 (83.2)	73 (74.5)	15 (39.5)	10 (16.7)	25 (25.5)	0 (0)	0 (0)	0 (0)	38 (100)	60 (100)	98 (100)
10001 to 25000	26 (55.3)	52 (63.4)	78 (60.5)	21 (44.7)	19 (23.2)	40 (31)	0 (0)	11 (13.4)	11 (8.5)	47 (100)	82 (100)	129 (100)
25001 to 50000	15 (18.3)	16 (22.8)	31 (29.6)	42 (51.2)	35 (64.8)	77 (56.6)	25 (30.5)	3 (5.6)	28 (20.6)	82 (100)	54 (100)	136 (100)
50001 and above	2 (10.5)	1 (20)	3 (12.5)	5 (26.3)	2 (40)	7 (29.2)	12 (63.2)	14 (58.3)	2 (40)	19 (100)	5 (100)	24 (100)
total	80 (40)	148 (64.3)	228 (53)	83 (41.5)	66 (28.7)	149 (34.7)	37 (18.5)	16 (7)	53 (12.3)	200 (100)	230 (100)	430 (100)

Source: primary survey

( $\chi^2_u = 87.198$ ,  $\chi^2_r = 76.84$ ,  $\chi^2 = 163.17$ )

(Figures inside the parenthesis represent percentage)

The table reveals that as the income increases, people experiences more usefulness for the technology both in urban and rural areas but with variations. Technology banking has been highly useful to persons earning above Rs 50000 (58.3 per cent). In urban area, 63.2 per cent and in rural area, 40 percent of people who earns above Rs 50000 have a high usefulness for technology banking. But none earning less than Rs 5000 has felt usefulness for the same.

## 5.8 Ease of use index

Another component of Technology Acceptance Model is ease of use. The customer should find easiness in using technology banking instruments to accept them. Easiness is the extent to which a person accepts as true that using a method would be at no cost to that individual.

In order to study the extend of perceived Easiness by the sample respondents, a perceived Easiness index was formed by taking the positive responses of the 13 perceived Easiness variables felt by the sample respondents. The variables are

1. Faster log in facility.
2. Language for ATM.
3. Language for internet banking.
4. Language for mobile banking.
5. Easy reversal of transactions.
6. Easy navigation of mobile banking menu.
7. Easy navigation of net banking page.
8. Easiness to transfer money through mobile banking.
9. Easiness to transfer money through ATM/CDM.
10. Easiness to transfer money through net banking.
11. Easiness in balance enquiry through ATM.
12. Easiness in balance enquiry through mobile banking.
13. Easiness in balance enquiry through internet banking.

Technology banking Easiness index =  $X_i - \text{Minimum}(X_i) / \text{Maximum}(X_i) - \text{Minimum}(X_i)$

Where  $X_i$  = actual value of the  $I^{\text{th}}$  indicator.

The value of index ranges between 0 – 1. Scoring method has been used here. Scores given are 1 for positive response and 0 for negative response. Those responses that lies between 0 to 0.33 has been categorized as low technology banking acceptance, between 0.34 to 0.65 as moderate technology banking acceptance and between 0.65 to 1 as high technology banking acceptance. The relation between technology banking acceptance index and the major socio-

economic variables are shown in the following tables. The association between various socio-economic variables and technology banking easiness index is analyzed by testing the hypothesis that there is no association between technology banking acceptance level and different variables considered.  $X^2$  statistic has been used to test the hypothesis.

The relation between Easiness index and the major socio-economic variables are shown in the following tables.

### 5.8.1 Ease of use of technology banking for sample respondents.

**Table 5.8.1**

**Technology banking easiness among sample respondents**

<b>Ease of use</b>	<b>Frequency</b>	<b>Percent</b>
Low ease of use	373	86.7
Moderate ease of use	1	.2
High ease of use	56	13
Total	430	100

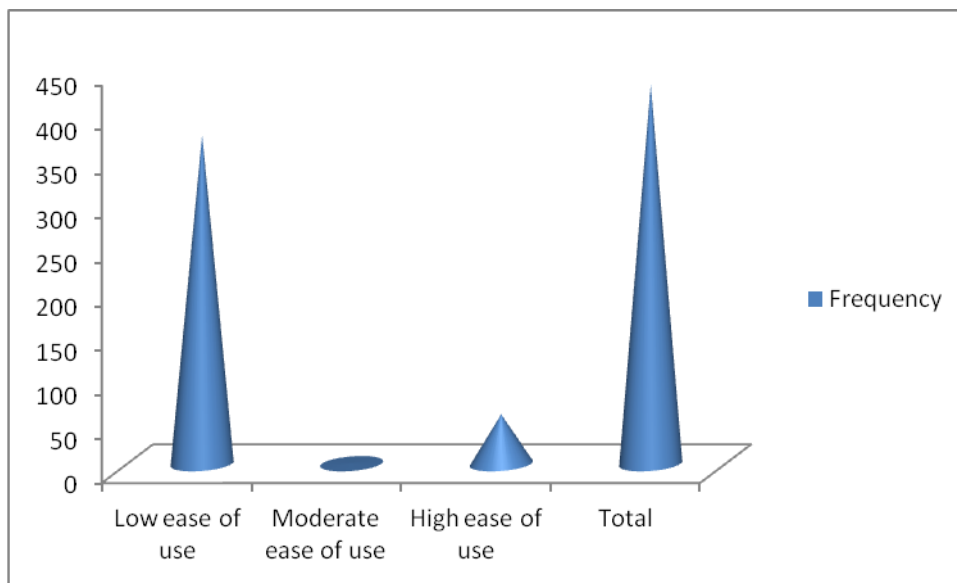
*Source: primary survey*

The ease of use index shows how easily people can use technology banking. The table explains the ease of use in technology banking for the sample respondents. It is seen that, majority of the people feels less easy to do digital banking due to lack of knowledge, fear, risk, difficulty in reversing a transaction etc. 86.7 percent opined so. Only 13 per cent of the respondents opined that it is highly easy for them to do their transactions through technology banking.



**Figure 5.8.1**

**Technology banking easiness among sample respondents**



**5.8.2 Ease of use of technology banking across gender**

**Table 5.8.2**

**Ease of use of technology banking across gender**

gender	Low ease of use of technology banking			Moderate ease of use of technology banking			High ease of use of technology banking			total		Grand total
	Urban	rural	total	urban	rural	total	urban	rural	total	urban	rural	
male	73 (76.8)	119 (90.8)	192 (85)	0 (0)	0 (0)	0 (0)	22 (23.2)	12 (9.2)	34 (15)	95 (100)	131 (100)	226 (100)
female	87 (82.9)	94 (64.9)	181 (88.7)	0 (0)	1 (1)	1 (0.5)	18 (17.1)	4 (4)	22 (10.8)	105 (100)	99 (100)	204 (100)
total	160 (80)	213 (92.6)	373 (86.7)	0 (0)	1 (0.4)	1 (0.2)	40 (20)	16 (7)	56 (13)	200 (100)	230 (100)	430 (100)

Source: primary survey

( $\chi^2_u = 1.128$ ,  $\chi^2_r = 3.55$ ,  $\chi^2 = 2.78$ )

(Figures inside the parenthesis represent percentage)

The table depicts the gender variations in easiness in using technology banking in both rural and urban areas. It is seen from the table that males (15 per cent) have more easiness in adopting technology banking comparing to their female (10.8 per cent) folks. The situation in both urban and rural is same with that of the grand total. In urban area, 23.2 per cent of males find it easy to use technology banking instruments , where as only 17.1 per cent of females found it easier to use in case of rural area, 9.2 per cent males have easiness to use technology banking where as only 4 per cent females find it easy to use. But it is noteworthy that overall, 85 per cent of males and 88.7 per cent of females do not find easiness to use technology banking instruments.

### 5.8.3 Ease of use of technology banking across area

**Table 5.8.3**  
**Ease of use of technology banking across area**

Area	Low ease of use	Moderate ease of use	High ease of use	Total
Urban	160 (800)	0 (00)	40 (200)	200 (1000)
Rural	213 (92.60)	1 (0.40)	16 (70)	230 (1000)
Total	373 (86.70)	1 (0.20)	56 (130)	430 (1000)

*Source: primary survey*

$\chi^2=16.81$

*(Figures inside the parenthesis represent percentage)*

The area of residence highly influences the usage pattern of technology banking by individuals. It is clear from the table that people experiencing high ease in using technology banking are from urban area (20 per cent). Only 7 per cent of rural residents experience easiness in using digital banking.

## 5.8.4 Ease of use of technology banking across education groups

**Table 5.8.4**

### Ease of use of technology banking across education groups

Education groups	Low ease of use of technology banking			Moderate ease of use of technology banking			High ease of use of technology banking			total		Grand total
	Urban	rural	total	urban	rural	total	urban	rural	total	urban	rural	
Below matriculation	41 100	81 100	122 100	0 0	0 0	0 0	0 0	0 0	0 0	41 100	81 100	122 100
Matriculation	18 100	34 100	52 100	0 0	0 0	0 0	0 0	0 0	0 0	18 100	34 100	52 100
Technical diploma	20 100	17 85	37 92.5	0 0	0 0	0 0	0 0	3 15	3 7.5	20 100	20 100	40 100
Graduation	40 95.2	54 87.1	94 90.4	0 0	1 1.6	1 1	2 4.8	7 11.3	9 8.7	42 100	62 100	104 100
Post graduation and above	25 71.4	19 95	44 80	0 0	0 0	0 0	10 28.6	1 5	11 20	35 100	20 100	55 100
Professional degree	16 36.4	8 61.5	24 42.1	0 0	0 0	0 0	28 63.6	5 38.5	33 57.9	44 100	13 100	57 100
total	160 80	213 92.6	373 86.7	0 0	1 0.4	1 0.2	40 20	16 7	56 13	200 100	230 100	430 100

Source: primary survey

( $\chi^2_u = 79.82$ ,  $\chi^2_r = 35.28$ ,  $\chi^2 = 135.66$ )

(Figures inside the parenthesis represent percentage)

It is evident from the table that easiness to use is highly related to the educational qualification of the customer. The easiness in using technology banking is high among professionally qualified customers (57.9 per cent). It is the same with that of the urban and rural areas. In urban areas, 63.6 per cent and in rural area 38.5 per cent can easily use technology banking instruments. Thus together with education, their digital literacy also plays an important role in determining their easiness to use technology banking.

### 5.8.5 Ease of use of technology banking across activity groups

**Table 5.8.5**  
**Ease of use of technology banking across activity groups**

Activity groups	Low ease of use of technology banking			Moderate ease of use of technology banking			High ease of use of technology banking			total		Grand total
	Urban	rural	total	urban	rural	total	urban	rural	total	urban	rural	
Regular	26 (66.7)	9 (81.8)	35 (70)	0 (0)	1 (9.1)	1 (2)	13 (33.3)	1 (9.1)	16 (7)	39 (100)	11 (100)	50 (100)
Private	52 (67.5)	64 (86.5)	116 (76.8)	0 (0)	0 (0)	0 (0)	25 (32.5)	10 (13.5)	35 (23.2)	77 (100)	74 (100)	151 (100)
Business	4 (80)	0 (0)	4 (57.1)	0 (0)	0 (0)	0 (0)	1 (20)	2 (100)	3 (42.9)	5 (100)	2 (100)	7 (100)
Casual	9 (100)	30 (93.8)	39 (95.1)	0 (0)	0 (0)	0 (0)	0 (0)	2 (6.3)	2 (4.9)	9 (100)	32 (100)	41 (100)
Retired	14 (93.3)	15 (100)	29 (96.7)	0 (0)	0 (0)	0 (0)	1 (6.7)	0 (0)	1 (3.3)	15 (100)	15 (100)	30 (100)
Unearned group	55 (100)	95 (99)	150 (99.3)	0 (0)	0 (0)	0 (0)	0 (0)	1 (1)	1 (0.7)	55 (100)	96 (100)	151 (100)
total	160 (80)	213 (92.6)	373 (86.7)	0 (0)	1 (0.4)	1 (0.2)	40 (20)	16 (7)	56 (13)	200 (100)	230 (100)	430 (100)

Source: primary survey  $(\chi^2_u = 29.48, \chi^2_r = 58.14, \chi^2 = 62.39)$

(Figures inside the parenthesis represent percentage)

From the table it is clear that, regarding easiness to use there exist disparities amongst various activity groups with rural urban differences too. Over all easiness is high among the business class with 42.9 per cent. Technology banking helps in doing a number of transactions without visiting a bank branch thus lowers the cost and saves time. The easiness is high among regular class (33.3 per cent) and business class (42.9 per cent) in urban and rural areas respectively.

## 5.8.6 Ease of use of technology banking across age groups

**Table 5.8.6**

### Ease of use of technology banking across age groups

Age groups	Low ease of use of technology banking			Moderate ease of use of technology banking			High ease of use of technology banking			total		Grand total
	Urban	rural	total	urban	rural	total	urban	rural	total	urban	rural	
Below 35 years	33 (50)	78 (82.1)	111 (68.9)	0 (0)	1 (1.1)	1 (0.6)	33 (50)	16 (16.8)	49 (30.4)	66 (100)	95 (100)	161 (100)
35-59 years	95 (93.1)	98 (100)	193 (96.5)	0 (0)	0 (0)	0 (0)	7 (6.9)	0 (0)	7 (3.5)	102 (100)	98 (100)	200 (100)
60 years and above	32 (100)	37 (100)	69 (100)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	32 (100)	37 (100)	69 (100)
total	160 (80)	213 (92.6)	373 (86.7)	0 (0)	1 (0.4)	1 (0.2)	40 (20)	16 (7)	56 (13)	200 (100)	230 (100)	430 (100)

Source: primary survey

( $\chi^2_u = 56.13$ ,  $\chi^2_r = 267$ ,  $\chi^2 = 71.54$ )

(Figures inside the parenthesis represent percentage)

The easiness to use technology banking among different age groups is depicted in the table. It is evident that youngsters pertaining to below 35 years find it easy to get used to technology banking. This is mainly because of their tech savvy nature and digital literacy. 30.4 per cent of the customers less than 35 years are easily doing digital banking. In urban area, 50 per cent of the customers and in rural area 16.8 per cent of the customers who are below 35 years have high easiness to use technology banking.

### 5.8.7 Ease of use of technology banking across income groups

**Table 5.8.7**

#### Ease of use of technology banking across income groups

Income groups	Low ease of use of technology banking			Moderate ease of use of technology banking			High ease of use of technology banking			total		Grand total
	Urban	rural	total	urban	rural	total	urban	rural	total	urban	rural	
Less than or equal to 5000	14 (100)	29 (100)	43 (100)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	14 (100)	29 (100)	43 (100)
5001 to 10000	38 (100)	60 (100)	98 (100)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	38 (100)	60 (100)	98 (100)
10001 to 25000	47 (100)	71 (86.6)	118 (91.5)	0 (0)	0 (0)	0 (0)	0 (0)	11 (13.4)	11 (8.5)	47 (100)	82 (100)	129 (100)
25001 to 50000	56 (68.3)	50 (92.6)	106 (77.9)	0 (0)	1 (1.9)	1 (0.7)	26 (31.7)	3 (5.6)	29 (21.3)	82 (100)	54 (100)	136 (100)
50001 and above	5 (26.3)	3 (60)	8 (33.3)	0 (0)	0 (0)	0 (0)	14 (73.7)	2 (40)	16 (66.7)	19 (100)	5 (100)	24 (100)
total	160 (80)	213 (92.6)	373 (86.7)	0 (0)	1 (0.4)	1 (0.2)	40 (20)	16 (7)	56 (13)	200 (100)	230 (100)	430 (100)

Source: primary survey

( $\chi^2_u = 65.99$ ,  $\chi^2_r = 23.79$ ,  $\chi^2 = 955$ )

(Figures inside the parenthesis represent percentage)

The opinion on easiness to use technology banking among different income groups is given in the table. The higher the income is more is the easiness to use digital banking. The highest level of easiness can be found among those who earn above Rs 50000 per month. The case is same with the rural as well as urban areas with 40 per cent and 73.7 per cent respectively. For higher income groups, there is a need to depend bank to deal with their income and technology banking reduces their bank visit and makes their dealings easy and secured. No customer earning less than Rs 10000 finds easiness in doing technology banking.

## 5.9 Interpretation of Technology Acceptance Model

According to technology acceptance model, technology acceptance is determined by the usefulness and easiness in using technology. Thus in the case of technology banking also, the case is not different. Thus it is imperative to check the relation of technology banking acceptance with that of usefulness of technology banking index and easiness of technology banking index.

### 5.9.1 Technology banking acceptance and Usefulness

**Table 5.9.1**

**Technology banking acceptance and Usefulness**

Technology adoption index group	Usefulness index group			Total
	Low usefulness	Moderate usefulness	High usefulness	
Low technology adoption	228 (61.8)	141 (38.2)	0 (0)	369 (100)
Moderate technology adoption	0 (0)	4 (33.3)	8 (66. )7	12 (100)
High technology adoption	0 (0)	4 (8.2)	45 (91.8)	49 (100)
Total	228 (53)	149 (34.7)	53 (12.3)	430 (100)

*Source: primary survey*

$(\chi^2=374.53)$

*(Figures inside the parenthesis represent percentage)*

Another pre condition of technology adoption is usefulness of technology banking for the customer. The relation is well seen in the table. As usefulness increases chances are more to adopt technology banking. 91.8 per cent of customers who has felt high usefulness has a high adoption for technology banking. But more than half (53 per cent) of the sample respondents have low usefulness and hence have a low level of technology adoption. Customers should first of all feel safe and secured about their transactions via technology banking. Technology banking should also be cost effective and time saving for the customers to feel usefulness in these instruments.

### 5.9.2 Technology banking acceptance and easiness

Easiness to use is another determinant of technology acceptance. Customers should be able to perform their banking activities without much struggle. Then only they will be ready to use it further. Thus it is necessary to check the association between technology acceptance and easiness to use.

**Table 5.9.2**  
**Technology banking Acceptance and easiness**

Technology Acceptance index group	Ease of use index			Total
	Low ease of use	Moderate ease of use	High ease of use	
Low Technology acceptance	369 (100)	0 (00)	0 (00)	355 (1000)
Moderate Technology acceptance	22 (33.30)	1 (0)	32 (66.7)	55 (1000)
High Technology acceptance	0 (00)	0 (20)	20 (980)	20 (1000)
total	373 (86.70)	1 (0.20)	56 (130)	430 (1000)

Source: primary survey

( $\chi^2=407.703$ )

(Figures inside the parenthesis represent percentage)

The table explains that technology adoption is directly related to easiness in using technology. As easiness increases adoption too increases. 98 per cent of people who has adopted high technology found it highly easy to use technology banking. A cent per cent person who has low easiness to use digital banking has not adopted it. The majority sections i.e., 86.7 per cent of respondents have low technology adoption as they find it difficult to use. Thus to popularize technology banking, it has to be ensured that people find it easy to use. A good understanding about the payment methods and procedures is necessary. There should be easy navigation of mobile banking pages and internet banking pages



and the language and instructions for these should not be confusing. Customers should also be able to easily transfer money and check balance through these instruments and options to reverse a transaction already done should be provided. The performance of the plastic cards should be robust so that the customers find it easy to transfer money and check balance using an ATM.

### 5.10 Frequency of using technology banking services

The frequency of using technology banking services in a month has been discussed in this section. The instruments selected are ATM, internet banking, mobile banking and other services which include NEFT, ECS etc.

#### 5.10.1 Frequency of using ATM in a month

**Table 5.10.1**  
**Frequency of using ATM in a month**

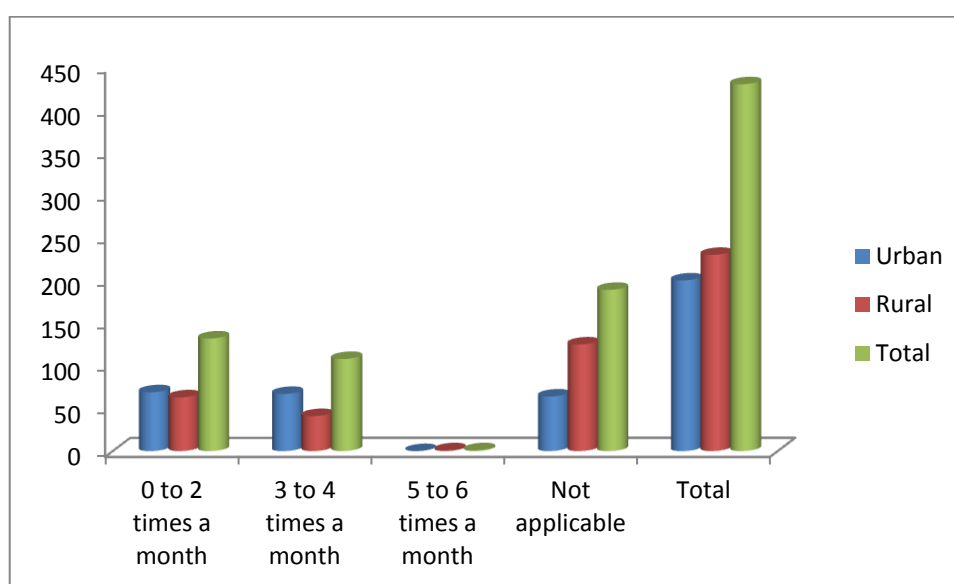
Frequency	area		Total
	urban	rural	
0 to 2 times a month	69 (52.3)	63 (47.7)	132 (100)
3 to 4 times a month	67 (62)	41 (38)	108 (100)
5 to 6 times a month	0 (0)	1 (100)	1 (100)
Not applicable	64 (33.9)	125 (66.1)	189 (100)
Total	200 (46.5)	230 (53.5)	430 (100)

*Source: primary survey* ( $\chi^2=25.25$ )  
*(Figures inside the parenthesis represent percentage)*

ATM is the most popular technology banking instrument. In rural area, under various provisions such as Jan Dhan Yojana, government has been distributing ATM cards. Thus debit cards are the most familiar technology banking instrument for rural residents. Among those who use ATM card less than twice a month, 52.3 per cent are from urban area and 47.7 per cent from rural area. also, among those who use 3 to 4 times a month, 62 per cent are urban residents. It is also noteworthy that among those who owns ATM card, 12.5 per cent urban

residents entrusts their cards with others. The reasons for entrusting ATM cards with others are lack of knowledge on using ATMs, no perceived needs etc. some of them handover the ATM cards to relatives. Also, 32 per cent of urban users and 68 per cent of rural users are not aware of the extra charges related to ATM usage.

**Figure 5.10.1**  
**Frequency of using ATM in a month**



### 5.10.2 Frequency of using internet banking in a month

The table represents the frequency of using internet banking in a month.

**Table 5.10.2**  
**Frequency of using internet banking in a month**

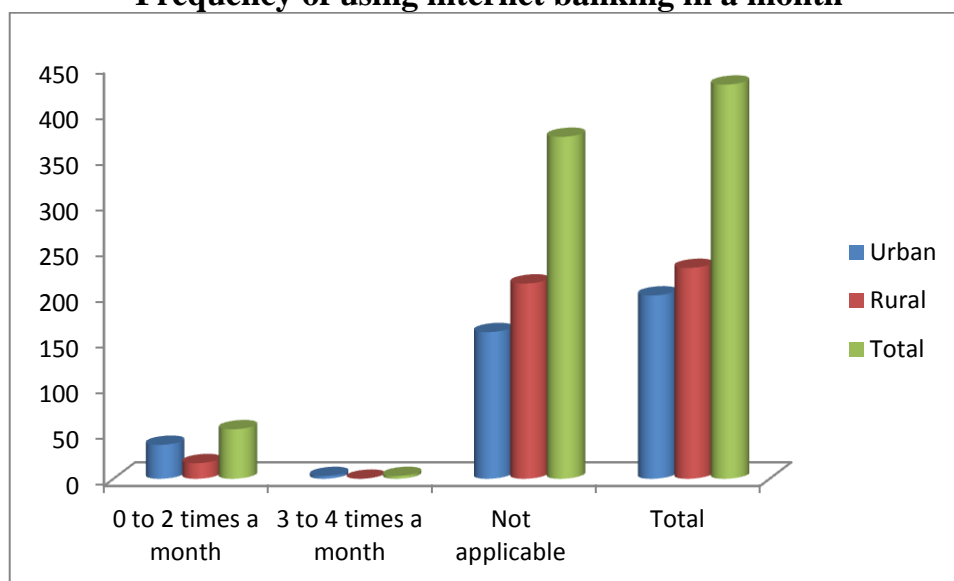
Frequency	area		Total
	urban	rural	
0 to 2 times a month	37 (68.5)	17 (31.5)	54 (100)
3 to 4 times a month	3 (100)	0 (0)	3 (100)
Not applicable	160 (42.9)	213 (57.1)	373 (100)
Total	200 (46.5)	230 (53.5)	430 (100)

Source: primary survey  $(\chi^2=15.92)$   
(Figures inside the parenthesis represent percentage)

Internet banking is more prominent among urban residents than rural residents. Among those who use internet banking less than 2 times a month, 68.5 per cent are urban users and 31.5 per cent are rural users. None in the rural area uses internet banking facilities more than thrice a month.

**Figure 5.10.2**

**Frequency of using internet banking in a month**



### 5.10.3 Frequency of using mobile banking in a month

The frequency of mobile banking usage is given in the table.

**Table 5.10.3**

**Frequency of using mobile banking in a month**

Frequency	Area		Total
	urban	rural	
0 to 2 times a month	36 (67.9)	17 (32.1)	53 (100)
3 to 4 times a month	4 (100)	0 (0)	4 (100)
Not applicable	160 (42.9)	213 (57.1)	373 (100)
Total	200 (46.5)	230 (53.5)	430 (100)

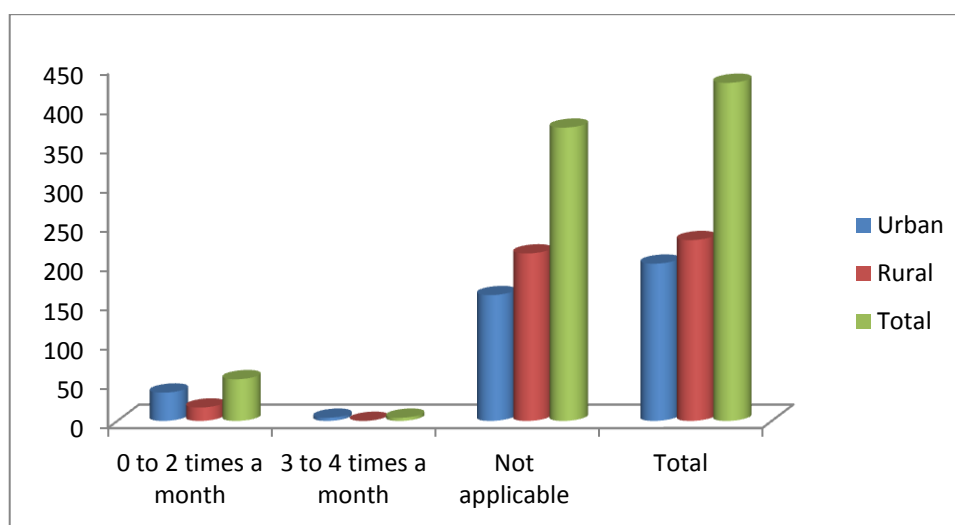
Source: primary survey

( $\chi^2=16.33$ )

(Figures inside the parenthesis represent percentage)

Mobile banking is popular among the respondents due to subscription to SMS alerts. Again urban-rural disparity exists in mobile banking usage. Among those who use mobile banking services less than twice a month 67.9 per cent are urban residents and 32.1 per cent rural residents. None in rural area uses mobile banking more than twice a month.

**Figure 5.10.3**  
**Frequency of using mobile banking in a month**



#### 5.10.4 Frequency of using other services in a month

**Table 5.10.4**  
**Frequency of using other services in a month**

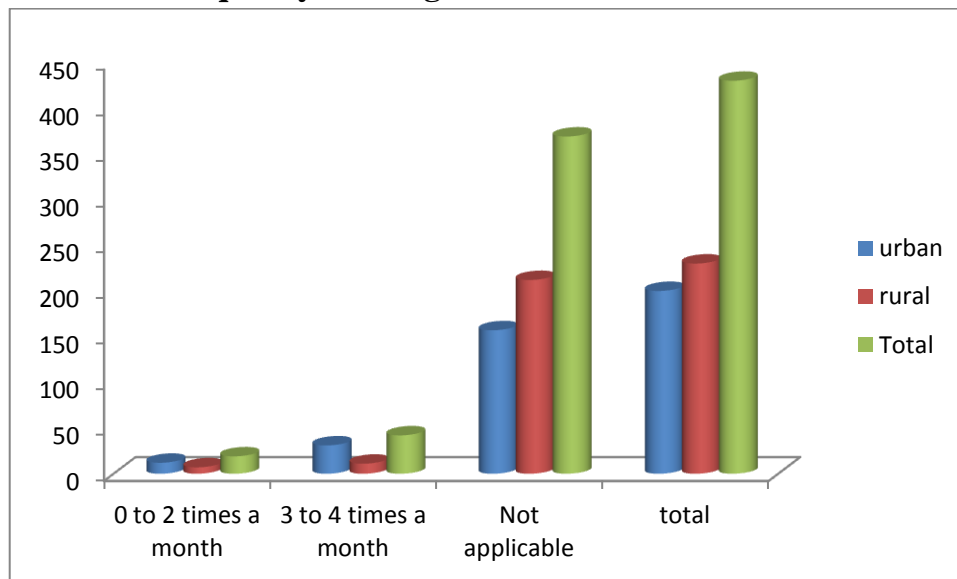
Frequency	area		Total
	urban	rural	
0 to 2 times a month	12 (63.2)	7 (36.8)	19 (100)
3 to 4 times a month	31 (73.8)	11 (26.2)	42 (100)
Not applicable	157 (42.5)	212 (57.5)	369 (100)
Total	200 (46.5)	230 (53.5)	430 (100)

Source: primary survey ( $\chi^2=173$ )

(Figures inside the parenthesis represent percentage)

Other services include, RTGS, and ECS etc. among those who use these services less than 2 times a month, 63.2 per cent belongs to urban area and rest 36.8 per cent belongs to rural area. Among the respondents using these services more than twice a month, the urban proportion (73.8 per cent) is higher compared to rural.

**Figure 5.10.4**  
**Frequency of using other services in a month**



### **5.11 Purpose of using selected technology banking instruments.**

The purpose for which the sample respondents use technology banking instruments such as ATMs, mobile banking and internet banking is given in the following tables.

#### **5.11.1 Purpose of using ATM cards**

The purpose for which ATM cards are used is given in the table.

**Table 5.11.1**

**Purpose of using ATMs**

purpose	always		regularly		frequently		occasionally		rarely		never		Total	
	urban	rural	urban	rural	urban	rural	urban	rural	urban	rural	urban	rural	urban	rural
Balance enquiry	96 (61.1)	88 (52.7)	0 (0)	0 (0)	1 (0.6)	12 (7.2)	41 (26.1)	5 (3)	1 (0.6)	0 (0)	18 (11.5)	62 (37.1)	157 (100)	167 (100)
Withdrawal	133 (84.7)	105 (62.9)	3 (1.9)	0 (0)	0 (0)	0 (0)	1 (0.6)	0 (0)	2 (1.3)	0 (0)	18 (11.5)	62 (37.1)	157 (100)	167 (100)
Transfer	0 (0)	0 (0)	7 (4.5)	0 (0)	25 (15.9)	9 (5.4)	8 (5.1)	17 (10.2)	50 (31.8)	69 (41.3)	67 (42.7)	72 (43.1)	157 (100)	167 (100)
Ministatement	10 (6.4)	23 (13.8)	36 (22.9)	38 (22.8)	38 (24.2)	13 (7.8)	24 (15.3)	8 (4.8)	30 (19.1)	21 (12.6)	19 (12.1)	64 (38.3)	157 (100)	167 (100)
shopping	18 (11.5)	0 (0)	31 (19.7)	16 (9.6)	17 (10.8)	33 (19.8)	35 (22.3)	36 (21.6)	0 (0)	0 (0)	56 (35.7)	82 (49.1)	157 (100)	167 (100)
Investment	0 (0)	0 (0)	14 (8.9)	0 (0)	2 (1.3)	0 (0)	0 (0)	0 (0)	24 (15.3)	40 (24)	117 (74.5)	127 (76)	157 (100)	167 (100)
Collection of pension and stipends	0 (0)	9 (5.4)	0 (0)	0 (0)	0 (0)	0 (0)	1 (0.6)	0 (0)	38 (24.2)	31 (18.6)	118 (75.2)	127 (76)	157 (100)	167 (100)
Utility services	0 (0)	0 (0)	5 (3.2)	3 (1.8)	34 (21.7)	15 (9)	19 (12.1)	15 (9)	6 (3.8)	19 (11.4)	93 (59.2)	115 (68.9)	157 (100)	167 (100)

*Source: primary survey*

*(Figures inside the parenthesis represent percentage)*

The main purpose for which the ATM card is used is for enquiring the balance in account and for withdrawal of cash. The urban bias is clearly seen in the usage of ATM cards. Cards are mainly used for withdrawing cash and 84.7 per cent urban users and 62.9 per cent rural users make use of their cards always to withdraw cash from their account. 61.1 per cent of urban users always use cards for balance enquiry while only 52.7 per cent of rural users utilize their cards for enquiring balance. 11.5 per cent of urban users always use cards for shopping.

Other purposes for which cards are used include collection of stipends and pensions, for making investment and for paying utility bills.

Some of the youngsters prefer credit card over debit card, since they believe credit cards pose less challenge in the context of hacking, hence less risky. They are also attracted to the extra incentives provided by the banks for using credit cards. But majority consider credit card as risky due to the interest payments involved in it.

### 5.11.2 Purpose of using internet banking

The main purpose for which internet banking is used is given in the table.

**Table 5.11.2**

#### **Purpose of using internet banking**

purpose	always		regularly		frequently		occasionally		rarely		never		Total	
	urban	rural	urban	rural	urban	rural	urban	rural	urban	rural	urban	rural	urban	rural
Balance enquiry	20	0	1	0	0	0	19	17	0	0	0	0	40	17
	(50)	(0)	(2.5)	(0)	(0)	(0)	(47.5)	(100)	(0)	(0)	(0)	(0)	(100)	(100)
Transfer	9	13	19	3	12	0	0	1	0	0	0	0	40	17
	(22.5)	(76.5)	(47.5)	(17.6)	(30)	(0)	(0)	(5.9)	(0)	(0)	(0)	(0)	(100)	(100)
shopping	13	0	0	9	27	7	0	0	0	1	0	0	40	17
	(32.5)	(0)	(0)	(52.9)	(67.5)	(41.2)	(0)	(0)	(0)	(5.9)	(0)	(0)	(100)	(100)
Investment	2	0	0	0	9	0	15	11	14	6	0	0	40	17
	(5)	(0)	(0)	(0)	(22.5)	(0)	(37.5)	(64.7)	(35)	(35.3)	(0)	(0)	(100)	(100)
Utility services	13	9	2	2	20	5	5	1	0	0	0	0	40	17
	(32.5)	(52.9)	(5)	(11.8)	(50)	(29.4)	(12.5)	(5.9)	(0)	(0)	(0)	(0)	(100)	(100)

*Source: primary survey*

*(Figures inside the parenthesis represent percentage)*

Internet banking is popular among urban residents than rural ones. Still we can see it is getting popular among educated high earning youngsters in rural area. Net banking is intensively used by urban residents for balance enquiry, shopping and payment of utility bills. Among the users, 50 per cent of the urban residents

always use it for balance enquiry. They never visit bank branch for enquiring about the balance. But regarding transfer of money using internet banking, it is very high among rural users with 76.5 per cent. 32.5 per cent of urban residents always pay for their shopping's via internet banking. Regarding utility bill payments, 52.9 per cent rural users depend on net banking. In urban areas, since other technology banking services such as ECS system is popular, they depend less on internet banking for payment of their bills.

### 5.11.3 PURPOSE OF USING MOBILE BANKING

The table gives insights on purpose of using mobile banking both in rural and urban areas.

**Table 5.11.3**

#### **Purpose of using mobile banking**

purpose	always		regularly		frequently		occasionally		rarely		never		Total	
	urban	rural	urban	rural	urban	rural	urban	rural	urban	rural	urban	rural	urban	rural
Balance enquiry	15 (26.8)	7 (16.3)	20 (35.7)	7 (16.3)	0 (0)	0 (0)	0 (0)	5 (11.6)	0 (0)	0 (0)	21 (37.5)	24 (55.8)	56 (100)	43 (100)
Transfer	0 (0)	1 (2.3)	0 (0)	0 (0)	10 (17.9)	0 (0)	6 (10.7)	8 (18.6)	19 (33.9)	9 (20.9)	21 (37.5)	25 (58.1)	56 (100)	43 (100)
shopping	0 (0)	0 (0)	35 (62.5)	19 (44.2)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	21 (37.5)	24 (55.8)	56 (100)	43 (100)
Investment	0 (0)	0 (0)	3 (5.4)	0 (0)	0 (0)	0 (0)	13 (23.2)	5 (11.6)	17 (30.4)	14 (32.6)	23 (41.1)	24 (41.1)	56 (100)	43 (100)
Utility services	0 (0)	1 (2.3)	0 (0)	0 (0)	17 (30.4)	2 (4.7)	10 (17.9)	3 (7)	8 (14.3)	15 (34.9)	21 (37.5)	22 (51.2)	56 (100)	43 (100)
SMS	135 (88.8)	154 (100)	16 (10.5)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (0.7)	0 (0)	152 (100)	154 (100)

*Source: primary survey*

*(Figures inside the parenthesis represent percentage)*



The main purpose of using mobile banking is to receive SMS alerts. 88.8 per cent of urban users and 100 per cent rural users receive SMS alerts. 26.8 per cent urban users and 16.3 per cent rural users use mobile banking for balance enquiry. Banks are trying to popularize mobile banking services by introducing new customer friendly soft wares and also by providing incentives for using mobile banking.

### **5.12 Reduction in bank branch visit**

Another significant indicator of acceptance of technology banking is reduction in bank branch visit. The very aim of technology banking is to provide anywhere any time banking, so that the customer need not visit a bank branch personally in order to get their transactions done. Thus a reduction in bank branch visit shows that the users has accepted technology banking and they are switching from traditional mode of banking to new gen banking which is virtual in nature. It is also necessary to check the reduction in bank branch visit across various socio-economic groups. The analysis has been done only by taking the users of technology banking instruments. About 4.3 per cent of the sample respondents do not use any kind of technology banking instruments and not even own plastic cards. This section of the sample respondents has been excluded while analyzing. The tables given below represent an analysis on the same.

### 5.12.1 Reduction in bank visit across gender

**Table 5.12.1**

**Reduction in bank visit across gender**

Area	Gender	strongly agree	Agree	Neutral	Disagree	Strongly disagree	Total
urban	male	68 (97.1)	1 (1.4)	1 (1.4)	0 (0)	0 (0)	70 (100)
	female	64 (97)	2 (3)	0 (0)	0 (0)	0 (0)	66 (100)
Total		132 (97.1)	3 (2.2)	1 (0.7)	0 (0)	0 (0)	136 (100)
rural	male	50 (94.3)	0 (0)	3 (5.7)	0 (0)	0 (0)	53 (100)
	female	29 (55.8)	7 (13.5)	16 (30.8)	0 (0)	0 (0)	52 (100)
Total		79 (75.2)	7 (6.7)	19 (18.1)	0 (0)	0 (0)	105 (100)

*Source: primary survey* ( $\chi^2_u = 1.33, \chi^2_r = 21.47, \chi^2 = 16.47,$ )

*(Figures inside the parenthesis represent percentage)*

Across gender, the reduction in bank visit has been enjoyed more by males rather than females. Also an urban bias is also seen with the same. In urban area, 97.1 per cent of males and in rural area, 94.3 per cent males strongly agrees that they do not prefer to visit banks to get their transactions done after the adoption of technology banking. In case of females, 97 per cent of urban females had their bank visit reduced after resorting to technology banking whereas among rural females it is only for 55.8 per cent. thus in urban area, both male and female equally agrees on reduction in frequency of bank visits where as in rural area, gender disparity exist with 94.3 per cent rural males and only 55.8 per cent females agreeing the reduction in bank visit.

## 5.12.2 Reduction in bank visit across education groups

Table 5.12.2

### Reduction in bank visit across education groups

Area	Education groups	strongly agree	agree	neutral	Disagree	Strongly disagree	Total
Urban	below matriculation	2 (50)	1 (25)	1 (25)	0 (0)	0 (0)	4 (100)
	matriculation	12 (85.7)	2 (14.3)	0 (0)	0 (0)	0 (0)	14 (100)
	technical diploma	15 (100)	0 (0)	0 (0)	0 (0)	0 (0)	15 (100)
	graduation	29 (100)	0 (0)	0 (0)	0 (0)	0 (0)	29 (100)
	post graduation and above	33 (100)	0 (0)	0 (0)	0 (0)	0 (0)	33 (100)
	PROFESSIONAL DEGREE	41 (100)	0 (0)	0 (0)	0 (0)	0 (0)	41 (100)
	Total	132 (97.1)	3 (2.2)	1 (0.7)	0 (0)	0 (0)	136 (100)
Rural	below matriculation	2 (100)	0 (0)	0 (0)	0 (0)	0 (0)	2 (100)
	matriculation	19 (76)	5 (20)	1 (4)	0 (0)	0 (0)	25 (100)
	technical diploma	10 (76.9)	0 (0)	3 (23.1)	0 (0)	0 (0)	13 (100)
	graduation	25 (65.8)	2 (5.3)	11 (28.9)	0 (0)	0 (0)	38 (100)
	post graduation and above	12 (80)	0 (0)	3 (20)	0 (0)	0 (0)	15 (100)
	Professional degree	11 (91.7)	0 (0)	1 (8.3)	0 (0)	0 (0)	12 (100)
	Total	79 (75.2)	7 (6.7)	19 (18.1)	0 (0)	0 (0)	105 (100)

Source: primary survey

( $\chi^2_u = 55.48$ ,  $\chi^2_r = 179$ ,  $\chi^2 = 383$ .)

(Figures inside the parenthesis represent percentage)

The table explains the frequency of bank visit across education groups. It is generally seen that as education increases people have a tendency to use more digital banking which reduces their visit to banks. Among the users in urban area, cent per cent of respondents with graduation, post graduation and professional degree experience a reduction in number of bank visits due to usage of technology banking instruments. In rural area, cent per cent users qualified below matriculation level agrees with reduction in frequency of visiting bank branch. It is noteworthy that these matriculates had an experience of working abroad. The professional degree holders (91.7 per cent) followed by post

graduates (80 per cent) experience a decline in bank visit due to technology banking usage in rural area.

### 5.12.3 Reduction in bank visit across Activity groups

**Table 5.12.3**  
**Reduction in bank visit across activity groups**

Area	Activity groups	strongly agree	agree	neutral	disagree	Strongly disagree	Total
Urban	Regular	38 (100)	0 (0)	0 (0)	0 (0)	0 (0)	38 (100)
	Private	52 (96.3)	1 (1.9)	1 (1.9)	0 (0)	0 (0)	54 (100)
	Business	3 (75)	1 (25)	0 (0)	0 (0)	0 (0)	4 (100)
	Casual	5 (100)	0 (0)	0 (0)	0 (0)	0 (0)	5 (100)
	Retired	11 (100)	0 (0)	0 (0)	0 (0)	0 (0)	11 (100)
	Unearned group	23 (95.8)	1 (4.2)	0 (0)	0 (0)	0 (0)	24 (100)
	Total	132 (97.1)	3 (2.2)	1 (0.7)	0 (0)	0 (0)	136 (100)
Rural	Regular	11 (100)	0 (0)	0 (0)	0 (0)	0 (0)	11 (100)
	Private	33 (97.1)	0 (0)	1 (2.9)	0 (0)	0 (0)	34 (100)
	Business	2 (100)	0 (0)	0 (0)	0 (0)	0 (0)	2 (100)
	Casual	4 (100)	0 (0)	0 (0)	0 (0)	0 (0)	4 (100)
	Retired	10 (100)	0 (0)	0 (0)	0 (0)	0 (0)	10 (100)
	Unearned group	19 (43.2)	7 (15.9)	18 (40.9)	0 (0)	0 (0)	44 (100)
	Total	79 (75.2)	7 (6.7)	19 (18.1)	0 (0)	0 (0)	105 (100)

Source: primary survey

( $\chi^2_u = 12.84$ ,  $\chi^2_r = 41.92$ ,  $\chi^2 = 62.33$ )

(Figures inside the parenthesis represent percentage)

The changes in bank visit due to adoption of technology banking among various activity groups are presented in the table. 97.1 per cent of urban users and 75.2 per cent rural users strongly agreed that the visit to bank branch has reduced due to usage of digital banking. The reduction is very high for the regular working class (100 per cent) in urban area and rural area. In case of rural area, reduction

is clearly visible for users belonging to business group, casual laborers and retired persons especially due to usage of ATM cards.

#### 5.12.4 Reduction in bank visit across Age groups

**Table 5.12.4**  
**Reduction in bank visit across Age groups**

Area	Age groups	Strongly Agree	Agree	Neutral	Disagree	Strongly disagree	Total
Urban	Below 35 years	58 (100)	0 (0)	0 (0)	0 (0)	0 (0)	58 (100)
	35 - 59 years	65 (94.2)	3 (4.3)	1 (1.4)	0 (0)	0 (0)	69 (100)
	60 years and above	9 (100)	0 (0)	0 (0)	0 (0)	0 (0)	9 (100)
	Total	132 (97.1)	3 (2.2)	1 (0.7)	0 (0)	0 (0)	136 (100)
Rural	Below 35 years	32 (64)	0 (0)	18 (36)	0 (0)	0 (0)	50 (100)
	35 - 59 years	43 (84.3)	7 (13.7)	1 (2)	0 (0)	0 (0)	51 (100)
	60 years and above	4 (100)	0 (0)	0 (0)	0 (0)	0 (0)	4 (100)
	Total	79 (75.2)	7 (6.7)	19 (18.1)	0 (0)	0 (0)	105 (100)

Source: primary survey

( $\chi^2_u = 402$ ,  $\chi^2_r = 265$ ,  $\chi^2 = 27.17$ )

(Figures inside the parenthesis represent percentage)

The changes in the number of bank visit across age group are given in the table. It is seen that the number of bank visit has reduced for cent per cent youngsters and old aged users in urban area and in rural area. In rural area, only 64 per cent users experience a reduction in bank visit.

### 5.12.5 Reduction in bank visit across Income groups

**Table 5.12.5**  
**Reduction in bank visit across Income groups**

Area	Income groups	Strongly Agree	Agree	Neutral	Disagree	Strongly disagree	Total
urban	5001 to 10000	17 (100)	0 (0)	0 (0)	0 (0)	0 (0)	17 (100)
	10001 to 25000	21 (91.3)	2 (8.7)	0 (0)	0 (0)	0 (0)	23 (100)
	25001 to 50000	75 (97.4)	1 (1.3)	1 (1.3)	0 (0)	0 (0)	77 (100)
	50001 and above	19 (100)	0 (0)	0 (0)	0 (0)	0 (0)	19 (100)
	Total	132 (97.1)	3 (2.2)	1 (0.7)	0 (0)	0 (0)	136 (100)
rural	5001 to 10000	8 (72.7)	0 (0)	3 (27.3)	0 (0)	0 (0)	11 (100)
	10001 to 25000	28 (68.3)	2 (4.9)	11 (26.8)	0 (0)	0 (0)	41 (100)
	25001 to 50000	38 (79.2)	5 (10.4)	5 (10.4)	0 (0)	0 (0)	48 (100)
	50001 and above	5 (100)	0 (0)	0 (0)	0 (0)	0 (0)	5 (100)
	Total	79 (75.2)	7 (6.7)	19 (18.1)	0 (0)	0 (0)	105 (100)

Source: primary survey

( $\chi^2_u = 6.35$ ,  $\chi^2_r = 7.76$ ,  $\chi^2 = 14.52$ )

(Figures inside the parenthesis represent percentage)

The changes in the number of bank visit across income group are given in the table. It is seen that for the number of bank visit has reduced for high income group both in urban area and in rural areas. Cent per cent customer earning above Rs 50000 in rural area and in urban area strongly agrees a reduction in bank visit due to digital banking. in case of urban users who earn below Rs 10 000, also felt a reduction in their bank visit. With respect to users in other

income categories, in urban area, there is a significant reduction compared to rural area.

### 5.13 Reduction in liquidity

Reduction in liquidity is another indicator of increasing digital banking. As people go on resorting digital banking, they keep less amount in cash form in their hands, as it facilitates any time payment via virtual channels. They can use card payment or internet banking or mobile banking to make the payment. This also increases safety of the people. But in developing nation like India, where the rural segment is larger than urban segment, reduction in liquidity may pose some macro-economic threats. The following tables explain the liquidity position of the sample respondents across socio-economic groups.

#### 5.13.1 Reduction in liquidity across gender

**Table 5.13.1**

**Reduction in liquidity across gender**

area	gender	strongly agree	agree	neutral	disagree	Strongly disagree	Total
urban	male	62 (88.6)	8 (11.4)	0 (0)	0 (0)	0 (0)	70 (100)
	female	63 (95.5)	2 (3)	1 (1.5)	0 (0)	0 (0)	66 (100)
	Total	125 (91.9)	10 (7.4)	1 (0.7)	0 (0)	0 (0)	136 (100)
rural	male	48 (90.6)	4 (7.5)	1 (1.9)	0 (0)	0 (0)	53 (100)
	female	47 (90.4)	4 (7.6)	0 (0)	1 (1.9)	0 (0)	52 (100)
	Total	95 (90.5)	8 (7.6)	1 (1)	1 (1)	0 (0)	105 (100)

Source: primary survey

( $\chi^2_u = 4.94$ ,  $\chi^2_r = 20$ ,  $\chi^2 = 2.89$ )

(Figures inside the parenthesis represent percentage)

The table shows whether there is a reduction in liquidity due to the usage of technology banking. In urban area, among the users, 88.6 per cent males and 95.5 per cent females agree that the liquidity has reduced due to technology banking. The females have given a positive response compared to men. In rural area, 90.4 per cent of females opined that the liquidity has reduced due to the usage of digital banking where as 90.6 per cent of males strongly agreed the reduction in liquidity. For females the reduction in liquidity is mainly due to usage of ATM cards. Thus there is no significant gender disparity regarding usage of technology banking instruments.

### 5.13.2 Reduction in liquidity across education groups

**Table 5.13.2**  
**Reduction in liquidity across education groups**

Area	Education groups	Strongly Agree	Agree	Neutral	Disagree	Strongly disagree	Total
urban	below matriculation	2 (50)	1 (25)	1 (25)	0 (0)	0 (0)	4 (100)
	matriculation	11 (78.6)	3 (21.4)	0 (0)	0 (0)	0 (0)	14 (100)
	technical diploma	9 (60)	6 (40)	0 (0)	0 (0)	0 (0)	15 (100)
	graduation	29 (100)	0 (0)	0 (0)	0 (0)	0 (0)	29 (100)
	post graduation and above	33 (100)	0 (0)	0 (0)	0 (0)	0 (0)	33 (100)
	PROFESSIONAL DEGREE	41 (100)	0 (0)	0 (0)	0 (0)	0 (0)	41 (100)
	Total	125 (91.9)	10 (7.4)	1 (0.7)	0 (0)	0 (0)	136 (100)
rural	below matriculation	2 (100)	0 (0)	0 (0)	0 (0)	0 (0)	2 (100)
	matriculation	20 (80)	4 (16.0)	0 (0)	1 (4)	0 (0)	25 (100)
	technical diploma	12 (92.3)	1 (7.7)	0 (0)	0 (0)	0 (0)	13 (100)
	graduation	34 (89.5)	3 (7.9)	1 (2.6)	0 (0)	0 (0)	38 (100)
	post graduation and above	15 (100)	0 (0)	0 (0)	0 (0)	0 (0)	15 (100)
	PROFESSIONAL DEGREE	12 (100)	0 (0)	0 (0)	0 (0)	0 (0)	12 (100)
	Total	95 (41.3)	8 (3.5)	1 (0.4)	1 (0.4)	0 (0)	230 (100)

Source: primary survey

( $\chi^2_u = 71.21$ ,  $\chi^2_r = 108$ ,  $\chi^2 = 545$ )

(Figures inside the parenthesis represent percentage)



The table reveals that generally it is the educated class which enjoys the benefits of technology banking such as reduction in keeping liquid cash. In urban area, cent per cent graduates, professionals and post graduates, strongly agrees a reduction in liquidity after using technology banking. In rural area, 100 per cent professionals and post graduates benefits out of technology banking usage by experiencing a reduction in their liquidity, whereas only 89.5 per cent graduates agree a reduction in liquidity. The users who are qualified below matriculation level do strongly agree a reduction in liquidity. They were working abroad, thus are used with technology banking instruments.

### 5.13.3 Reduction in liquidity across activity groups

**Table 5.13.3**  
**Reduction in liquidity across activity groups**

Area	Activity	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total
urban	Regular	38 (100)	0 (0)	0 (0)	0 (0)	0 (0)	38 (100)
	Private	49 (90.7)	4 (7.4)	1 (1.9)	0 (0)	0 (0)	54 (100)
	Business	3 (75)	1 (25)	0 (0)	0 (0)	0 (0)	4 (100)
	Casual	1 (20)	4 (80)	0 (0)	0 (0)	0 (0)	5 (100)
	Retired	11 (100)	0 (0)	0 (0)	0 (0)	0 (0)	11 (100)
	Unearned group	23 (95.8)	1 (4.2)	0 (0)	0 (0)	0 (0)	24 (100)
	TOTAL	125 (91.9)	10 (7.4)	1 (0.7)	0 (0)	0 (0)	136 (100)
rural	Regular	11 (100)	0 (0)	0 (0)	0 (0)	0 (0)	11 (100)
	Private	28 (82.4)	4 (11.8)	1 (2.9)	1 (2.9)	0 (0)	34 (100)
	Business	2 (100)	0 (0)	0 (0.0)	0 (0)	0 (0)	2 (100)
	Casual	4 (100)	0 (0)	0 (0)	0 (0)	0 (0)	4 (100)
	Retired	10 (100)	0 (0)	0 (0)	0 (0)	0 (0)	10 (100)
	Unearned group	40 (90.9)	4 (9.1)	0 (0)	0 (0)	0 (0)	44 (100)
	TOTAL	95 (90.5)	8 (7.6)	1 (1)	1 (1)	0 (0)	105 (100)

Source: primary survey

( $\chi^2_u = 46.37$ ,  $\chi^2_r = 7.65$ ,  $\chi^2 = 29.94$ )

(Figures inside the parenthesis represent percentage)

The reduction in keeping liquid cash among the users of technology banking instruments is depicted in the table. Among the urban users, cent per cent government employees and retired persons strongly agrees a reduction in their liquidity due to technology banking services. In rural area, cent per cent government employees, business class, casual workers and retired persons also strongly agrees with the reduction of liquidity. Thus those with better activity status rely on technology banking leading to a reduction in their liquidity as they are confident of doing anytime, anywhere banking.

#### 5.13.4 Reduction in liquidity across age groups

**TABLE 5.13.4**

**Reduction in liquidity across age groups**

Area	age groups	strongly agree	agree	neutral	disagree	Strongly disagree	Total
urban	Below 35 years	54 (93.1)	3 (5.2)	1 (1.7)	0 (0)	0 (0)	58 (100)
	35 - 59 years	62 (89.9)	7 (10.1)	0 (0)	0 (0)	0 (0)	69 (100)
	60 years and above	9 (100)	0 (0)	0 (0)	0 (0)	0 (0)	9 (100)
	Total	125 (91.9)	10 (7.4)	1 (0.7)	0 (0)	0 (0)	136 (100)
rural	Below 35 years	46 (92)	2 (4)	1 (2)	1 (2)	0 (0)	50 (100)
	35 - 59 years	45 (88.2)	6 (11.8)	0 (0)	0 (0)	0 (0)	51 (100)
	60 years and above	4 (100)	0 (0)	0 (0)	0 (0)	0 (0)	4 (100)
	Total	95 (90.5)	8 (7.6)	1 (1)	1 (1)	0 (0)	105 (100)

Source: primary survey

( $\chi^2_u = 3.22$ ,  $\chi^2_r = 4.59$ ,  $\chi^2 = 7.84$ )

(Figures inside the parenthesis represent percentage)

The table looks in to the reduction in liquidity due to technology banking among respondents of various age groups. Both in urban and rural areas, cent percent

old age people experience a reduction in liquidity. But the proportion of old aged respondents who are used with technology banking services is less as it is difficult for the old age people. Regarding youth, 93.1 per cent urban youth has strongly agreed a reduction in liquidity. The youth opined that there should be improvement in technology banking facilities, so that they can confidently part with liquidity.

### 5.13.5 Reduction in liquidity across income groups

**TABLE 5.13.5**

**Reduction in liquidity across income groups**

Area	Income	Strongly Agree	Agree	Neutral	Disagree	Strongly disagree	Total
urban	less than or equal to 5000	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	14 (100)
	5001 to 10000	13 (76.5)	3 (17.6)	1 (2.6)	0 (0)	0 (0)	17 (100)
	10001 to 25000	20 (87)	3 (13)	0 (0)	0 (0)	0 (0)	23 (100)
	25001 to 50000	73 (94.8)	4 (5.2)	0 (0)	0 (0)	0 (0)	77 (100)
	50001 and above	19 (100)	0 (0)	0 (0)	0 (0)	0 (0)	19 (100)
	Total	125 (91.9)	10 (7.4)	1 (0.7)	0 (0)	0 (0)	136 (100)
rural	less than or equal to 5000	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	29 (100)
	5001 to 10000	8 (72.7)	1 (9.1)	1 (9.1)	1 (9.1)	0 (0)	11 (100)
	10001 to 25000	38 (92.7)	3 (7.3)	0 (0)	0 (0)	0 (0)	41 (100)
	25001 to 50000	44 (91.7)	4 (8.3)	0 (0)	0 (0)	0 (0)	54 (100)
	50001 and above	5 (100)	0 (0)	0 (0)	0 (0)	0 (0)	5 (100)
	Total	95 (90.5)	8 (7.6)	1 (1)	1 (1)	0 (0)	105 (100)

Source: primary survey

( $\chi^2_u = 13.65$ ,  $\chi^2_r = 180$ ,  $\chi^2 = 27.95$ )

(Figures inside the parenthesis represent percentage)

The table explains the reduction in liquidity after using technology banking across income groups. Both in urban as well as rural case, all those who earn above Rs 50000 per month experience much reduction in liquidity. This has been

followed by those who earn Rs 25000 to Rs50000 a month. Among those who earn between Rs 25000 Rs50000, 94.8 per cent in urban area and 91.7 per cent in rural area of the same opinion. Those who earn less than Rs 5000 a month, irrespective of their area, do not find a reduction in liquidity due to advent of technology banking as they are not users.

#### **5.14 Disparities in the acceptance of technology banking**

From the primary survey, it is evident that technology banking has been accepted only by a section of the society. The awareness regarding the technological advancements has been studied (section 5.5) across socio-economic groups which reveals that urban people have a better level of awareness regarding technology banking products comparing to their rural counterparts. Debit card is the most popular technology banking instruments in rural area, 87.8 per cent of the rural residents are aware of debit cards. In terms of gender, males have a better awareness than females, again with an urban bias. The level of awareness is higher as the education and income increases. Youngsters seem to be more aware of technology banking especially those who are engaged in regular activities and business activities. The Technology Banking Acceptance Index has been used to study the acceptance of technology banking. The acceptance is high for young, high earning; educated, urban males as they find technology banking as useful and they find it easy to use. Whereas other sections of the respondents, i.e., less educated, low income earning rural respondents does not find usefulness for technology banking instruments and does not possess the skill to use them. Thus the use of technology banking by certain section of the society is creating a digital divide, i.e., users and non-users of technology banking and this divide is aggravated when the Scheduled Commercial banks move forward to meet the growing demand of users of technology banking by creating advanced versions of technology banking instruments. Thus the scope of technology banking as a means to achieve financial inclusion is narrowed here.

Technology is fast changing and does not suit every economic agent. Therefore, while implementing technology based instruments, the feasibility has to be checked and should be user friendly so that the beneficiaries of all sections of the society can use it and the benefits can be reaped fully. Only then, technology can be considered as a means to reduce inequalities and cater inclusive growth.

### **5.15 Problems while using technology banking**

It is widely known, India lags behind in technology banking comparing to developed nations. The infrastructural facilities, which are a pre requisite for the working of digital banking is not fully fledged in India leading to difficulties for those who use technology banking. This section deals with the problems faced by customers while using technology banking. Here, for the purpose of study, 17 commonly faced problems are taken. The problems were presented in the form of statements using five point likert scale to collect opinion from the customers. The factor analysis has been used to reduce the data collected on 17 variables in to smaller number of manageable variables by exploring common dimensions existing among the variables.

The problems identified are

1. Blocking of plastic cards
2. ATMs going out of cash
3. non printing of statements
4. ATMs out of order
5. long queue before ATM counters
6. reduction in balance without cash payments or failure of transfer of funds
7. restricted amount of transaction
8. lack of information for net banking
9. leaving operations unfinished during net banking
10. lengthy procedure for net banking
11. lack of appropriate software for net banking
12. restricted delivery of services during off time
13. lack of appropriate software for mobile banking
14. lengthy procedure for mobile banking
15. lengthy procedure for operating ATMs
16. difficulty in remembering pass words

17. Fear of loss of plastic cards.

**5.15.1 Problems related to ATMs**

**Table 5.15.1  
Problems related to ATMs**

Problems	Very high		high		moderate		Low		Very low		Total	
	urban	rural	urban	rural	urban	rural	urban	rural	urban	rural	urban	rural
Pass word	0 (0)	0 (0)	6 (3.8)	24 (14.4)	8 (5.1)	23 (13.8)	104 (66.2)	63 (37.7)	39 (24.8)	57 (34.1)	157 (100)	167 (100)
Fear	32 (20.4)	10 (6)	41 (26.1)	69 (41.3)	23 (14.6)	36 (21.6)	41 (26.1)	32 (19.2)	20 (12.7)	20 (12)	157 (100)	167 (100)
Queue	35 (22.3)	7 (4.2)	66 (42)	80 (47.9)	29 (18.5)	53 (31.7)	25 (15.9)	25 (15)	2 (1.3)	2 (1.2)	157 (100)	167 (100)
Out of cash	1 (0.6)	1 (0.6)	70 (44.6)	79 (47.3)	28 (17.8)	40 (24)	56 (35.7)	45 (26.9)	2 (1.3)	2 (1.2)	157 (100)	167 (100)
Out of order	1 (0.6)	16 (9.6)	122 (77.7)	79 (47.3)	20 (12.7)	42 (25.1)	12 (7.6)	28 (16.8)	2 (1.3)	2 (1.2)	157 (100)	167 (100)
Delivery restrictions	3 (1.9)	8 (4.8)	41 (26.1)	28 (16.8)	51 (32.5)	75 (44.9)	54 (34.4)	53 (31.7)	8 (5.1)	3 (1.8)	157 (100)	167 (100)
Lengthy ATM procedures	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	118 (75.2)	73 (43.7)	39 (24.8)	94 (56.3)	157 (100)	167 (100)
Non printing statements	1 (0.6)	0 (0)	48 (30.6)	66 (39.5)	84 (53.5)	73 (43.7)	22 (14)	26 (15.6)	2 (1.3)	2 (1.2)	157 (100)	167 (100)
Blocking	2 (1.3)	0 (0)	9 (5.7)	19 (11.4)	49 (31.2)	48 (28.7)	81 (51.6)	91 (54.5)	16 (10.2)	9 (5.4)	157 (100)	167 (100)
Amount restrictions	0 (0)	1 (0.6)	28 (17.8)	46 (27.5)	36 (22.9)	62 (37.1)	92 (58.6)	51 (30.5)	1 (0.6)	7 (4.2)	157 (100)	167 (100)
Balance reduction	0 (0)	0 (0)	10 (6.4)	15 (9)	29 (18.5)	9 (5.4)	61 (38.9)	58 (34.7)	57 (36.3)	85 (50.9)	157 (100)	167 (100)

*Source: primary survey*

*(Figures inside the parenthesis represent percentage)*

The main problems faced by users of ATM cards are given in the table. 22.3 per cent urban users opined that they face long queues whereas in rural area only 4.2 per cent faces the same. 20 per cent urban residents have fear of losing their plastic cards whereas only 6 per cent users in rural area expressed the same

concern. In rural area, lack of proper maintenance of machines seems to be the main problem. Thus there is a difference in concerns regarding ATMs in rural and urban area.

### 5.15.2 Problems related to mobile banking and internet banking

**Table 5.15.2**

#### **Problems related to mobile banking and internet banking**

Problems	Very high		high		moderate		Low		Very low		Total	
	urban	rural	urban	rural	urban	rural	urban	rural	urban	rural	urban	rural
Lack of information for i-banking	0 (0)	0 (0)	12 (30)	10 (58.8)	5 (12.5)	3 (17.6)	23 (57.5)	4 (23.5)	0 (0)	0 (0)	40 (100)	17 (100)
Leaving operation incomplete	0 (0)	0 (0)	15 (37.5)	6 (35.3)	11 (27.5)	0 (0)	13 (32.5)	0 (0)	1 (2.5)	11 (64.7)	40 (100)	17 (100)
Lengthy procedure for i-banking	0 (0)	0 (0)	0 (0)	14 (82.4)	1 (2.5)	1 (5.9)	39 (97.5)	2 (11.8)	0 (0)	0 (0)	40 (100)	17 (100)
Lack of software for i-banking	0 (0)	0 (0)	7 (17.5)	4 (23.5)	0 (0)	0 (0)	33 (82.5)	13 (76.5)	0 (0)	0 (0)	40 (100)	17 (100)
Lack of software for m-banking	0 (0)	0 (0)	1 (1.8)	13 (30.2)	45 (80.4)	17 (39.5)	9 (16.1)	11 (25.6)	1 (1.8)	2 (4.7)	40 (100)	17 (100)
Lengthy m-banking procedures	0 (0)	0 (0)	2 (3.6)	11 (25.6)	11 (19.6)	15 (34.9)	43 (76.8)	15 (34.9)	0 (0)	2 (4.7)	40 (100)	17 (100)

*Source: primary survey*

*(Figures inside the parenthesis represent percentage)*

The table gives insights in to the problems faced by the users of mobile banking and internet banking. In urban area, customers find difficulty in using internet banking mainly because of internet connectivity problems. 37.5 per cent of the users opine that often they are forced to leave their net banking operations in between due to internet problems. 82.4 per cent of rural users highly find the net banking procedures as cumber some and lengthy. Technology banking would have been easier for them if there is appropriate and customer friendly software for both internet banking and mobile banking.

### 5.15.3 Cronbach's reliability test

The Cronbach's reliability test has been performed to check the reliability of the variables taken.

**Table 5.15.3**

#### **Reliability Statistics**

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	Number of Items
0.961	0.959	17

*Source: primary survey*

The Cronbach's Alpha for the reliability test is 0.961 which indicates that the internal consistency for the scale in this context is high and no item has been deleted.

### 5.15.4 Factor analysis

Factor analysis is a technique that is used to reduce a large number of variables into fewer numbers of factors. Factor analysis extracts maximum common variance from all variables and puts them into a common score.

**Table 5.15.4**

#### **KMO and Bartlett's Test**

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.915
Bartlett's Test of Sphericity	Approx. Chi-Square	50396.877
	df	136
	Sig.	.000

High value of KMO (0.915 > 5) of indicates that a factor analysis is useful for the present data. The significant value for Bartlett's test of Sphericity is 000 and is less than 5 which indicates that there exist significant relationships among the variables (Table-5.2). The resultant value of KMO test and Bartlett's test indicate that the present data is useful for factor analysis.



By using Principal Component Analysis method, the number of factors to be derived is decided. Those factors for which the Eigen value is greater than unity is taken. The total variance accounted for, by the two factors with Eigen value greater than 1 is 94.29 percent and the remaining variance is explained by other variables. Among the two factors, the first factor accounts for 64.57 percent of variance which is the represents the major problem faced by technology banking users.

**Table 5.15.5**  
**Rotated Component Matrix<sup>a</sup>**

	Component	
	1	2
Difficulty in remembering pass words	.996	
Fear of loss of plastic cards	.996	
Long queue before ATM counters	.996	
ATM machines out of cash	.996	
ATM machines out of order	.995	
Restricted delivery of services during off time	.995	
Lengthy procedures for operating ATMs	.995	
Non printing of statements	.995	
Blocking of plastic cards	.995	
Restricted amount of transactions	.995	.100
Reduction in balance without cash payments/ failure in transfer of funds	.995	.101
Lengthy procedure for net banking	.138	.958
Lack of appropriate software for net banking	.138	.957
Lack of information for net banking	.139	.957
Leaving operations unfinished during net banking	.138	.957
Lack of appropriate software for mobile banking		.805
Lengthy procedure for mobile banking		.802

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization

a. Rotation converged in 3 iterations

It can be seen from the table that the statements are converted in to 2 factors using factor analysis. The first factor includes 11 statements which are problems faced by customers while using technology banking. The statements are

difficulty in remembering pass words, Fear of loss of plastic cards, Long queue before ATM counters, ATM machines out of cash, ATM machines out of order, Restricted delivery of services during off time, Lengthy procedures for operating ATMs, Non printing of statements, Blocking of plastic cards, Restricted amount of transactions and Reduction in balance without cash payments/ failure in transfer of funds. The second factor includes 6 statements or problems and they are Lengthy procedure for net banking, Lack of appropriate software for net banking, Lack of information for net banking, leaving operations unfinished during net banking, Lack of appropriate software for mobile banking, and Lengthy procedure for mobile banking.

**Table 5.15.6**

**Factors and variance explained**

S. No	Problems	Variance Explained
1	Problems associated with ATMs.	64.572
2	Problems associated with internet banking and mobile banking.	29.718

In table 5.5, the derived factors through factor analysis are renamed and the percentage of variance explained by the two factors is also given. The first factor is renamed as problems associated with ATMs and it explains 64.57 per cent of variance. The second factor is renamed as problems associated with internet banking and mobile banking which explains 29.72 per cent of variance.

## 5.16 Reasons for not using technology banking

Table 5.16.1

### Reasons for not using technology banking

Reasons	Strongly disagree		disagree		No opinion		agree		Strongly agree		total	
	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural
Inaccessible	29 (18.1)	23 (10.8)	17 (10.6)	19 (8.9)	62 (38.8)	93 (43.7)	52 (32.5)	69 (32.4)	0 (0.0)	9 (4.2)	160 (100.0)	213 (100.0)
Lack of human touch	26 (16.3)	35 (16.4)	6 (3.8)	6 (2.8)	40 (25.0)	74 (34.7)	53 (33.1)	71 (33.3)	35 (21.9)	27 (12.7)	160 (100.0)	213 (100.0)
Lack of knowledge	39 (24.4)	27 (12.7)	17 (10.6)	20 (9.4)	28 (17.5)	15 (7.0)	5 (3.1)	13 (6.1)	71 (44.4)	13 (6.8)	160 (100.0)	213 (100.0)
Costly	56 (35.0)	26 (12.2)	25 (15.6)	31 (14.6)	70 (43.8)	138 (64.8)	9 (5.6)	13 (6.1)	0 (0.0)	5 (2.3)	160 (100.0)	213 (100.0)
Risky	0 (0.0)	23 (10.8)	0 (0.0)	0 (0.0)	44 (27.5)	59 (27.7)	22 (13.8)	70 (32.9)	94 (58.8)	61 (28.6)	160 (100.0)	213 (100.0)
No perceived needs	0 (0.0)	23 (10.8)	0 (0.0)	0 (0.0)	0 (0.0)	4 (1.9)	36 (22.5)	74 (34.7)	12 (7.5)	11 (5.2)	160 (100.0)	213 (100.0)

Source: primary survey

The table throws light in to why customers are reluctant towards using technology banking. In rural area, the main reason for not using technology banking instruments is lack of knowledge (64.8 per cent) whereas in urban area,

it is because of lack of perceived needs (77.5 per cent). The other reasons are inaccessibility, technology banking usage incurs an extra cost and it involves risk. In order to popularize technology banking instruments, people should be made aware of technology banking; it should be made risk free and should spread digital literacy.

### **5.17 Conclusion**

It has been clearly stated in the chapter that even though technology banking have many benefits, those benefits have been reaped only by a particular section in the economy. The disparities in usage of technology banking across socio-economic variables are visible. A male dominated urban youth with high education and digital literacy and high earnings find it useful and easy to use. It is also affordable for them than other sections of the society. The majority are sidelined. But those who are using it enjoy a wider choice of banking channels in a cost effective and time saving manner. Thus technology banking itself is creating digital divide between the users and non users of technology banking. While using technology banking for achieving financial inclusion, this has to be kept in mind and should use technology banking as a tool for financial inclusion with caution.

*Chapter V*  
*Pattern and Determinants of Technology*  
*Banking Acceptance*

## **Chapter V**

### **Pattern and Determinants of Technology Banking Acceptance**

#### **5.1 Introduction**

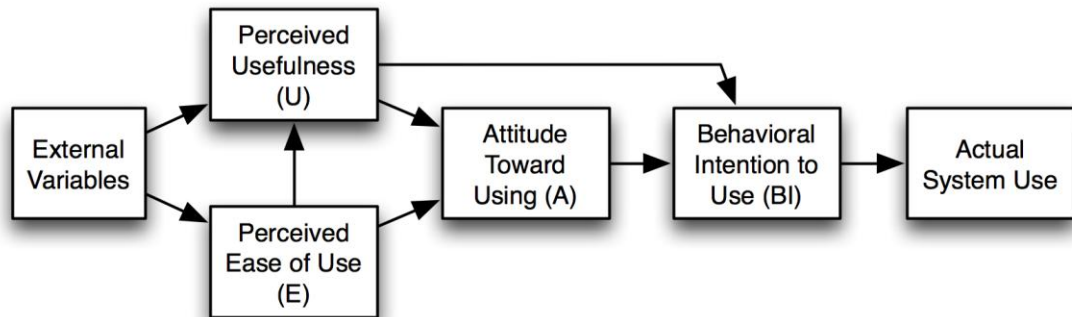
The chapter explains the technology banking acceptance by the customers across socio-economic groups and the problems related to the use of technology banking. The review of literature points out the influence of socio-economic variables on the usage of technology banking and the chance for disparities in usage across these socio-economic constructs. Thus it has been examined in Kerala context. To use technology banking it is necessary to use internet. The internet usage pattern has been examined in the previous chapter and has found that even in the case of internet usage there exist socio-economic disparities. Thus the chapter, in depth discusses on source of information on technology banking for the users, level of awareness about technology banking across socio-economic groups, usage pattern of ATMs, mobile banking and net banking and problems faced by users and also the reason for not using technology banking instruments.

#### **5.2 Technology banking acceptance**

. By technology banking acceptance we mean, usage of technology banking by customers so that their banking needs are satisfied without visiting a brick and mortar institution efficiently and effectively. The acceptance of technology by the people can be explained by using Technology Acceptance Model suggested by David in 1989.

**Figure 5.2.1**

**Technology Acceptance Model**



*Source: (Davis, Bagozzi & Warshaw 1989)*

An individual accepts any technology if he/she finds perceived usefulness and perceived ease of use in using that technology, which is determined by a number of external variables.. Perceived usefulness is defined as "the degree to which a person believes that using a particular system would enhance his or her performance". Perceived ease of use can be defined as "the degree to which a person believes that using a particular system would be free from effort". These two elements determine the individual's attitude towards using the technology and intention to use it. Due to uncertainty about new technology individual will at first try the technology and later on such an experience will lead to actual use of the technology or actual system use.

Many studies have emerged out with different models to study the information technology acceptance by the customers. Other popular models include Theory of Reasoned Action (TRA), Theory of Planned Behavior (TPB) and Unified Theory of Acceptance and Use of Technology (UTAUT). The Theory of Reasoned Action developed by Fishbein and Ajzen (1975) asserts that the behavior of a person is determined by his/her intention to perform it. And the behavioral intention is an outcome of attitude and the subjective norms, the person holds. Thus the theory explores the link between attitude, norms,

intentions, beliefs and behavior of the individuals. The theory of Planned Behavior propounded by Ajzen (1988, 1991) attempts to predict deliberate human behavior. The model actually aims at strengthening the Theory of Reasoned Action by taking in to consideration the role of perceived behavioral control. The Unified Theory of Acceptance and Use of Technology (UTAUT) formulated by Venkatesh and others to look in to the user intention to use an information system and its usage behavior. The theory makes use of four constructs such as performance expectancy, effort expectancy, social influence and facilitating conditions.

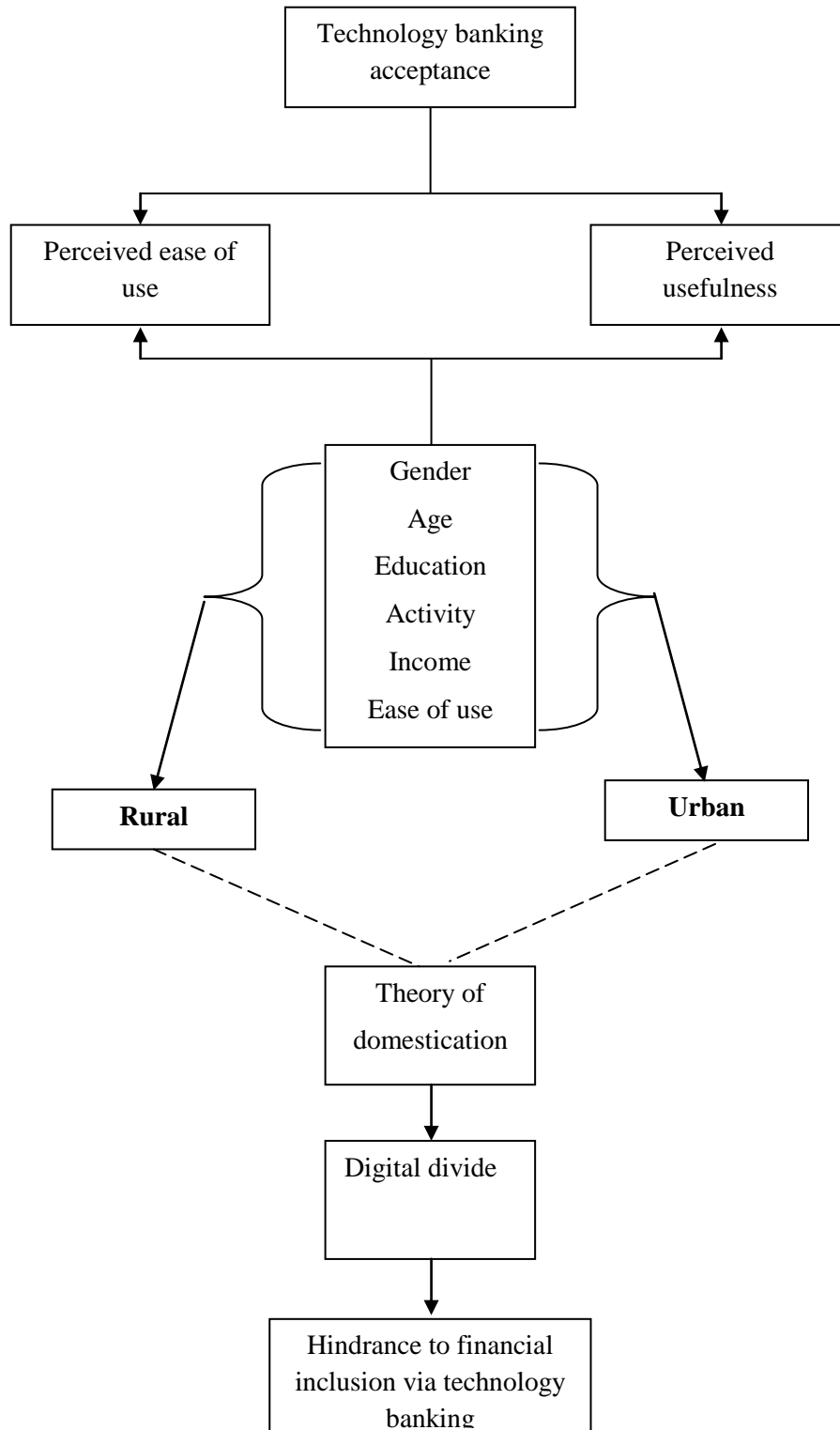
The present study makes use of an analytical framework based on Technology Acceptance Model.



### 5.3 Technology banking acceptance: analytical frame work

Figure 5.3.1

#### Analytical frame work



According to technology acceptance model, an individual accepts and adopt technology, when he/she found usefulness in that and also should feel easiness in using technology. Both usefulness and easiness to use technology is determined by certain socio-economic variables such as gender, education, age, activity status, income and area of residence. We can find differences in technology adoption across the mentioned variables with an urban bias. It may be easy for the urban customers to adopt technology banking compared to their rural counter parts. Hence the theory of domestication works. The urban customers have the capability both in terms of infrastructure and skills to use digital banking. They will also recognize the benefits of technology banking which makes their banking activities smooth functioning. They can save time and money out of using digital banking. it will also ensure them privacy, prestige and suits their tech savvy nature. Since they are aware of the boons and banes of digital banking, they can keep themselves safe and secured too. The urban customers will get used to the technology banking instruments and gradually they demands new products and services to meet their growing banking demands where as the rural people will not be in a position to use even the basic technology based banking services. This creates a digital divide among people and it arises out of usage of technology banking, leaving the vulnerable in vulnerability itself. Thus it can hinder its very aim of achieving financial inclusion. Thus financial inclusion via technology banking is possible only when we apply technology banking cautiously by taking care of the divide it may create.

#### **5.4 Source of information on technology banking**

To popularize technology banking, it is imperative to give information about technology banking to the customers. The table looks in to the major source of information about technology banking instruments.

**Table5.4.1**  
**Source of information on technology banking**

source	ATM			Internet banking			Mobile banking			others		
	urban	rural	total	urban	rural	total	urban	rural	total	urban	rural	total
Advertisement	3 (33.3)	6 (66.7)	9 (100)	12 (46.2)	14 (53.8)	26 (100)	16 (47.1)	18 (52.9)	34 (100)	11 (91.7)	1 (8.3)	12 (2.8)
Friends and relatives	7.1 (33.2)	143 (66.8)	214 (100)	58 (40.3)	86 (59.7)	144 (100)	73 (44.8)	90 (55.2)	163 (100)	15 (31.3)	33 (68.8)	48 (11.2)
Brochures and booklets	6 (60.0)	4 (40.0)	10 (100)	2 (25.0)	6 (75.0)	8 (100)	24 (38.1)	39 (61.9)	63 (100)	8 (53.3)	7 (46.7)	15 (3.5)
Bank employees	170 (48.2)	183 (51.8)	353 (100)	144 (57.4)	107 (42.6)	251 (100)	117 (57.4)	87 (42.6)	204 (100)	46 (68.7)	21 (31.3)	67 (15.6)
Training and demo	0 (0.0)	0 (0.0)	0 (00.0)	0 (00.0)	0 (00.0)	0 (00.0)	0 (00.0)	0 (00.0)	8 (100)	0 (00.0)	0 (00.0)	0 (00.0)
Bank websites	17 (65.4)	9 (34.6)	26 (100)	20 (69.0)	9 (31.0)	29 (100)	0 (00.0)	0 (00.0)	0 (00.0)	0 (00.0)	1 (100)	1 (0.2)
SMS	10 (45.5)	12 (54.5)	22 (100)	1 (20.0)	4 (80.0)	5 (100)	12 (48.0)	13 (52.0)	25 (100)	0 (00.0)	18 (100)	18 (4.2)
E mails	17 (42.5)	23 (57.5)	40 (100)	11 (55.0)	9 (45.0)	20 (100)	8 (44.4)	10 (55.6)	18 (100)	0 (00.0)	0 (0.0)	0 (0.0)

*Source: primary survey*

*(Figures inside the parenthesis represent percentage)*

The main source of information regarding ATM, internet banking, mobile banking and other services such as RTGS, NEFT and ECS is bank employees. The proportion of respondents informed by bank employees are 82.1 per cent, 58.4 per cent, 47.4 per cent and 15.6 per cent regarding ATMs, internet banking, mobile banking and others respectively. The second major source of information for ATMs (49.8 per cent), internet banking (33.5 per cent) and mobile banking (37.9 per cent) is friends and relatives. E mails and bank websites are a major source of information for educated, high earning youths especially in urban area. Also only a small proportion of the population receives information from training programs. It is necessary to choose a source carefully to popularize technology banking as all sources may not be suiting customers from different strata.

### **5.5 Familiarity with technological advancements in banking sector across socio-economic variables**

In this section an attempt is made to assess how far the respondents are aware about the instruments of technology banking. 10 mostly used technology banking instruments are taken for this purpose. Also a general assessment is made with the help of a five point likert scale across socio economic variables.

**Table 5.5.1****Familiarity with major technology banking instruments**

Instruments	Known		Unknown		Total	
	Urban	Rural	Urban	Rural	Urban	Rural
Debit card	184 (92.0)	202 (87.8)	16 (8.0)	28 (12.2)	200 (100.0)	230 (100.0) <sup>v</sup>
Credit card	141 (70.5)	111 (48.3)	59 (29.5)	119 (51.7)	200 (100.0)	230 (100.0)
RTGS	60 (30.0)	49 (21.3)	140 (70.0)	181 (78.7)	200 (100.0)	230 (100.0)
ECS	18 (9.0)	14 (6.1)	182 (91.0)	216 (93.9)	200 (100.0)	230 (100.0)
NEFT	65 (32.5)	62 (27.0)	135 (67.5)	168 (73.0)	200 (100.0)	230 (100.0)
Mobile banking	138 (69.0)	117 (50.9)	62 (31.0)	113 (49.1)	200 (100.0)	230 (100.0) <sup>v</sup>
Internet banking	150 (75.0)	124 (53.9)	50 (25.0)	106 (46.1)	200 (100.0)	230 (100.0)
Tele banking	57 (28.5)	44 (19.1)	143 (71.5)	186 (80.9)	200 (100.0)	230 (100.0)
Point Of Sales	121 (60.5)	67 (29.1)	79 (39.5)	163 (70.9)	200 (100.0)	230 (100.0)
CDM	120 (60.0)	63 (27.4)	80 (40.0)	167 (72.6)	200 (100.0)	230 (100.0)

*Source: primary survey*

*(Figures inside the parenthesis represent percentage)*

It is seen from the table that, regarding the technology banking instruments urban people are more aware comparing to rural residents. Among the technology banking instruments debit card is more popular as 92 percent urban residents and 87.8 percent rural residents knew debit card, whereas credit card is more popular among urban people. 30 per cent urban residents knew about RTGS where as only 21.3 per cent in rural area knew it. ECS is comparatively a less popular instrument it seems as only 9 per cent urban respondents and 6.1 per cent rural respondents knew it. National electronic Fund Transfer ( NEFT) is known to 32.5 per cent and 27 per cent urban and rural respondents respectively. 69 per cent urban people and 50.9 per cent rural people knew about mobile banking. Internet banking is known to 75 per cent urban respondents whereas in rural area only 53.9 per cent knew it. Regarding tele banking 28.5 per cent from

urban area and 19.1 per cent from rural area knew it. Point of sales is much known to urban residents (60.5 per cent) whereas only 29.1 per cent rural respondents are aware of such a facility. Cash Deposit Machine is also popular among urban people than rural ones as 60 percent of urban respondents are aware.

### 5.5.1 Familiarity with technological advancements in banking across gender

**Table 5.5.2**  
**Familiarity with technological advancements in banking across gender**

Area	Gender	VERY HIGH	HIGH	MODE RATE	LOW	VERY LOW	Total
Urban	Male	16 (16.8)	34 (35.8)	20 (21.1)	19 (20.0)	6 (6.3)	95 (100.0)
	Female	9 (8.6)	18 (17.1)	42 (40.0)	23 (21.9)	13 (12.4)	105 (100.0)
	Total	25 (12.5)	52 (26.0)	62 (31.0)	42 (21.0)	19 (9.5)	200 (100.0)
Rural	Male	13 (9.9)	12 (9.2)	16 (12.2)	56 (42.7)	34 (26.0)	131 (100.0)
	Female	3 (3.0)	9 (9.1)	39 (39.4)	26 (26.3)	22 (22.2)	99 (100.0)
	Total	16 (7.0)	21 (9.1)	55 (23.9)	82 (35.7)	56 (24.3)	230 (100.0)

Source: primary survey ( $\chi^2_u = 17.19, \chi^2_r = 25.89, \chi^2 = 34.05$ )

(Figures inside the parenthesis represent percentage)

It is visible from the table that both in urban and rural area, disparity in familiarity of technological advancements in banking are seen between male and female. Males are having better awareness about technology banking instruments with an urban bias. In urban area, 16.8 per cent males have very high awareness on technology banking whereas in the case of rural males, it is only 9.9 per cent. In the case of females, 8.6 per cent are aware of technology banking

in urban area, but only 3 per cent of them have awareness in rural area. Thus there is a significant association between gender and familiarity with technological advancements in banking.

### 5.5.2 Familiarity with technological advancements in banking across education groups

The table gives insights in to the relation between education and familiarity with technological advancements in banking.

**Table 5.5.3**  
**Familiarity with technological advancements in banking across education groups**

AREA	EDUCATION	VERY HIGH	HIGH	MODERATE	LOW	VERY LOW	TOTAL
urban	Below matriculation	0 (0.0)	0 (0.0)	11 (26.8)	12 (29.3)	18 (43.9)	41 (100.0)
	Matriculation	0 (0.0)	0 (0.0)	16 (88.9)	2 (11.1)	0 (0.0)	18 (100.0)
	technical diploma	2 (10.0)	5 (25.0)	8 (40.0)	5 (25.0)	0 (0.0)	20 (100.0)
	graduation	0 (0.0)	8 (19.0)	16 (38.1)	18 (42.9)	0 (0.0)	42 (100.0)
	post graduation and above	0 (0.0)	27 (77.1)	3 (8.6)	5 (14.3)	0 (0.0)	35 (100.0)
	professional degree	23 (52.3)	12 (27.3)	8 (18.2)	0 (0.0)	1 (2.3)	44 (100.0)
	Total	25 (12.5)	52 (26.0)	62 (31.0)	42 (21.0)	19 (9.5)	200 (100.0)
rural	below matriculation	0 (0.0)	0 (0.0)	5 (6.2)	33 (40.7)	43 (53.1)	81 (100.0)
	matriculation	3 (8.8)	3 (8.8)	16 (47.1)	9 (26.5)	3 (8.8)	34 (100.0)
	technical diploma	3 (15.0)	2 (10.0)	5 (25.0)	10 (50.0)	0 (0.0)	20 (100.0)
	graduation	4 (6.5)	3 (4.8)	24 (38.7)	22 (35.5)	9 (14.5)	62 (100.0)
	post graduation and above	3 (15.0)	8 (40.0)	2 (10.0)	6 (30.0)	1 (5.0)	20 (100.0)
	professional degree	3 (23.1)	5 (38.5)	3 (23.1)	2 (15.4)	0 (0.0)	13 (100.0)
	Total	16 (7.0)	21 (9.1)	55 (23.9)	82 (35.7)	56 (24.3)	230 (100.0)

Source: primary survey

( $\chi^2_u = 239.34$ ,  $\chi^2_r = 130.41$ ,  $\chi^2 = 370.74$ )

(Figures inside the parenthesis represent percentage)

It is seen that as education increase awareness about technological innovations in banking too increases. Respondents who are qualified below matriculation level have a very low level of awareness. 43.9 percent in urban area and 53.1 per cent

in rural area have a low level of awareness. A very high level of familiarity is seen among professionals, with 52.3 per cent in urban area and 23.1 per cent in rural area. Thus as education increases awareness level too increases with an urban bias.

### 5.5.3 Familiarity with technological advancements in banking across Income groups

The table explains the level of awareness regarding technology banking among different income groups.

**Table 5.5.4**  
**Familiarity with technological advancements in banking across Income groups**

Area	Income	Very High	High	Moderate	Low	Very low	Total
urban	less than or equal to 5000	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	14 (100.0)	14 (100.0)
	5001 to 10000	0 (0.0)	4 (10.5)	19 (50.0)	11 (28.9)	4 (10.5)	38 (100.0)
	10001 to 25000	0 (0.0)	2 (4.3)	30 (63.8)	14 (29.8)	1 (2.1)	47 (100.0)
	25001 to 50000	14 (17.1)	42 (51.2)	9 (11.0)	17 (20.7)	0 (0.0)	82 (100.0)
	50001 and above	11 (57.9)	4 (21.1)	4 (21.1)	0 (0.0)	0 (0.0)	19 (100.0)
	Total	25 (12.5)	52 (26.0)	62 (31.0)	42 (21.0)	19 (9.5)	200 (100.0)
rural	less than or equal to 5000	0 (0.0)	0 (0.0)	0 (0.0)	5 (17.2)	24 (82.8)	29 (100.0)
	5001 to 10000	0 (0.0)	2 (3.3)	12 (20.0)	30 (50.0)	16 (26.7)	60 (100.0)
	10001 to 25000	6 (7.3)	3 (3.7)	27 (32.9)	33 (40.2)	13 (15.9)	82 (100.0)
	25001 to 50000	9 (16.7)	15 (27.8)	15 (27.8)	12 (22.2)	3 (5.6)	54 (100.0)
	50001 and above	1 (20.0)	1 (20.0)	1 (20.0)	2 (40.0)	0 (0.0)	5 (100.0)
	Total	16 (7.0)	21 (9.1)	55 (23.9)	82 (35.7)	56 (24.3)	230 (100.0)

Source: primary survey

( $\chi^2_u = 260.14$ ,  $\chi^2_r = 115.69$ ,  $\chi^2 = 342.73$ )

(Figures inside the parenthesis represent percentage)

Both in urban as well as rural area, those who earn less than Rs 5000 a month has only low level of awareness regarding technology banking. In urban area,



those who earn more than Rs 50000 a month have high level of awareness whereas in rural area, only 20 per cent of the respondents have a high level of awareness. Thus it is clear that higher income earning urban people found it worthwhile easy an affordable to indulge in technology banking whereas the lower income people are not. Hence awareness level is also high for them.

#### 5.5.4 Familiarity with technological advancements in banking across age groups

**Table 5.5.5**

**Familiarity with technological advancements in banking across age group**

Area	Age group	Very High	High	Moderate	Low	Very low	Total
urban	Below 35 years	22 (33.3)	19 (28.8)	15 (22.7)	10 (15.2)	0 (0.0)	66 (100.0)
	35 - 59 years	2 (2.0)	22 (21.6)	45 (44.1)	32 (31.4)	1 (1.0)	102 (100.0)
	60 years and above	1 (3.1)	11 (34.4)	2 (6.3)	0 (0.0)	18 (56.3)	32 (100.0)
	Total	25 (12.5)	52 (26.0)	62 (31.0)	42 (21.0)	19 (9.5)	200 (100.0)
rural	Below 35 years	8 (8.4)	5 (5.3)	30 (31.6)	45 (47.4)	7 (7.4)	95 (100.0)
	35 - 59 years	4 (4.1)	11 (11.2)	25 (25.5)	37 (37.8)	21 (21.4)	98 (100.0)
	60 years and above	4 (10.8)	5 (13.5)	0 (0.0)	0 (0.0)	28 (75.7)	37 (100.0)
	Total	16 (7.0)	21 (9.1)	55 (23.9)	82 (35.7)	56 (24.3)	230 (100.0)

Source: primary survey

( $\chi^2_u = 150.20$ ,  $\chi^2_r = 84.93$ ,  $\chi^2 = 184.94$ )

(Figures inside the parenthesis represent percentage)

It is evident from the table that familiarity regarding technological innovations in banking is high among youths in urban area where as in rural area, it very high

among retired persons. This is because of the fact that these retired persons were once working in urban area and are used with technology banking. But 75.7 per cent of rural retired persons have very low awareness.

### 5.5.5 Familiarity with technological advancements in banking across activity groups

The table shows that there is an association between activity in which the person is engaged and the level awareness in technology banking.

**Table 5.5.6**

#### Familiarity with technological advancements in banking across activity group

Area	Activity group	very high	High	Moderate	Low	Very low	Total
urban	Regular	8 (20.5)	14 (35.9)	13 (33.3)	3 (7.7)	1 (2.6)	39 (100.0)
	Private	13 (16.9)	23 (29.9)	16 (20.8)	21 (27.3)	4 (5.2)	77 (100.0)
	Business	1 (20.0)	2 (40.0)	2 (40.0)	0 (0.0)	0 (0.0)	5 (100.0)
	Casual	0 (0.0)	0 (0.0)	2 (22.2)	5 (55.6)	2 (22.2)	9 (100.0)
	Retired	1 (6.7)	11 (73.3)	3 (20.0)	0 (0.0)	0 (0.0)	15 (100.0)
	Unearne d group	0 (0.0)	2 (3.6)	26 (47.3)	13 (23.6)	14 (25.5)	55 (100.0)
	Total	25 (12.5)	52 (26.0)	62 (31.0)	42 (21.0)	19 (9.5)	200 (100.0)
rural	Regular	2 (18.2)	1 (9.1)	2 (18.2)	3 (27.3)	3 (27.3)	11 (100.0)
	Private	5 (6.8)	2 (2.7)	16 (21.6)	40 (54.1)	11 (14.9)	74 (100.0)
	Business	2	0	0	0	0	2

		(100.0)	(0.0)	(0.0)	(0.0)	(0.0)	(100.0)
	Casual	3 (9.4)	1 (3.1)	1 (3.1)	12 (37.5)	15 (46.9)	32 (100.0)
	Retired	4 (26.7)	11 (73.3)	0 (0.0)	0 (0.0)	0 (0.0)	15 (100.0)
	Unearne d group	0 (0.0)	6 (6.3)	36 (37.5)	27 (28.1)	27 (28.1)	96 (100.0)
	Total	16 (7.0)	21 (9.1)	55 (23.9)	82 (35.7)	56 (24.3)	230 (100.0)

Source: primary survey

( $\chi^2_u=83.01$ ,  $\chi^2_r=162.17$ ,  $\chi^2=187.86$ )

(Figures inside the parenthesis represent percentage)

In urban area, those who are indulged in regular work have the highest level of familiarity with that of developments in technology banking. Among the regularly working class 20.5 per cent have very high level of awareness followed by the business class with 20 per cent. In rural area, the business group has the highest level of awareness with cent per cent. The lowest level of awareness is seen among unearned group (25.5 per cent) in urban area and among casual workers (46.9 per cent) in rural area.

### 5.6 Technology banking Acceptance Index

In order to study the extend of technology banking acceptance by the sample respondents, a technology banking acceptance index was formed by taking the positive responses of the 10 technology banking instruments accepted and adopted by the sample respondents. The variables are

1. Debit card
2. Credit card
3. RTGS
4. ECS
5. NEFT

6. Mobile banking
7. Internet banking
8. Telebanking
9. Cash deposit machine
10. Point of Sales

Technology banking acceptance index =  $\frac{X_i - \text{Minimum}(X_i)}{\text{Maximum}(X_i) - \text{Minimum}(X_i)}$

Where  $X_i$  = actual value of the  $I^{\text{th}}$  indicator.

The value of index ranges between 0 – 1. Scoring method has been used here. Scores given are 1 for positive response and 0 for negative response. Those responses that lies between 0 to 0.33 has been categorized as low technology banking acceptance, between 0.34 to 0.65 as moderate technology banking acceptance and between 0.65 to 1 as high technology banking acceptance. The relation between technology banking acceptance index and the major socio-economic variables are shown in the following tables. The association between various socio-economic variables and technology acceptance index is analyzed by testing the hypothesis that there is no association between technology banking acceptance level and different variables considered.  $X^2$  statistic has been used to test the hypothesis.

### 5.6.1 Technology banking acceptance of the sample respondents.

**Table 5.6.1**

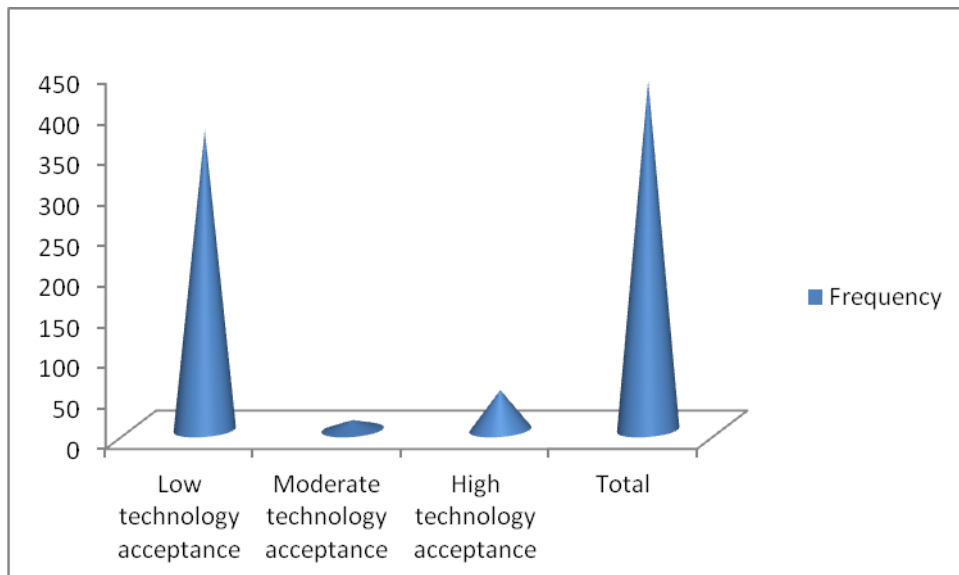
**Technology banking Acceptance of the Respondents**

<b>Level of Technology Banking Acceptance</b>	<b>Frequency</b>	<b>Percent</b>
Low technology banking acceptance	369	85.8
Moderate technology banking acceptance	12	2.8
High technology banking acceptance	49	11.4
<b>Total</b>	<b>430</b>	<b>100.0</b>

*Source: primary survey*

**Figure 5.6.1**

**Technology banking Acceptance of the Respondents**



The technology banking Acceptance Index shows that 85.8 per cent of the sample respondents have low level of technology acceptance. Only a small proportion of the respondents have a high level technology acceptance. 11.4 per

cent of the respondents have high technology acceptance where as 2.8 per cent has moderate technology acceptance.

### 5.6.2 Technology banking Acceptance across gender

**Table 5.6.2**

**Technology banking Acceptance across gender**

gender	Low technology banking acceptance			Moderate technology banking acceptance			High technology banking acceptance			total		Grand total
	Urban	rural	total	urban	rural	total	urban	rural	total	urban	rural	
male	71 (74.7)	117 (89.3)	188 (83.2)	8 (8.4)	2 (1.5)	10 (4.4)	16 (16.8)	12 (9.2)	28 (12.4)	95 (100)	131 (100)	226 (100)
female	87 (82.9)	94 (94.9)	181 (88.7)	2 (1.9)	0 (0.0)	2 (1.0)	16 (15.2)	5 (5.1)	21 (10.3)	105 (100)	99 (100)	204 (100)
total	158 (79.0)	211 (91.7)	369 (85.8)	10 (5.0)	2 (0.9)	12 (2.8)	32 (16)	17 (7.4)	49 (11.4)	200 (100)	230 (100)	430 (100)

Source: primary survey

( $\chi^2_u=4.732$ ,  $\chi^2_r=2.995$ ,  $\chi^2=5.355$ )

(Figures inside the parenthesis represent percentage)

The table describes the technology adoption pattern across gender in rural and urban areas. It is clear from the table that, in the urban area, there is not much variation between male and female in the case of high technology adoption. 16.8 percent males and 15.2 percent females have high level of technology adoption. In case of moderate and low technology acceptance, we can see a serious gender disparity, where men fall short of women. It is also notable that 83.2 per cent of men and 88.7 per cent of women has low technology adoption level. According to World Bank studies, this is mainly because of the high exposure men receive comparing to women and also due to variations in ownership of mobile phones etc. the grand total picture also depicts the same. In all the possible three cases, low moderate and high technology adoption, men outstands women.

### 5.6.3 Technology banking Acceptance across Education groups

The level of technology adoption among different education groups are clearly given in the table

**Table 5.6.3**  
**Technology banking acceptance across Education groups**

Education groups	Low technology banking acceptance			Moderate technology banking acceptance			High technology banking acceptance			Total		Grand total
	Urban	rural	total	urban	rural	total	urban	rural	total	urban	rural	
Below matriculation	41 (100)	81 (100)	122 (100)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	41 (100)	81 (100)	122 (100)
Matriculation	18 (100)	32 (94.1)	50 (96.2)	0 (0.0)	2 (5.9)	2 (3.8)	0 (0.0)	0 (0.0)	0 (0.0)	18 (100)	34 (100)	52 (100)
Technical diploma	19 (95.0)	17 (85.0)	36 (90.0)	1 (5.0)	0 (0.0)	1 (2.5)	0 (0.0)	3 (15.0)	3 (7.5)	20 (100)	20 (100)	40 (100)
Graduation	40 (95.2)	54 (87.1)	94 (90.04)	2 (4.8)	0 (0.0)	2 (1.9)	0 (0.0)	8 (12.9)	8 (7.7)	42 (100)	62 (100)	104 (100)
Post graduation and above	25 (71.4)	19 (95.0)	44 (80.0)	3 (8.6)	0 (0.0)	3 (5.5)	7 (20.0)	1 (5.0)	8 (14.5)	35 (100)	20 (100)	55 (100)
Professional degree	15 (34.1)	8 (61.5)	23 (40.4)	4 (9.1)	0 (0.0)	4 (7.0)	25 (56.8)	1 (5.0)	30 (52.6)	44 (100)	13 (100)	57 (100)
total	158 (79.9)	211 (91.7)	369 (85.8)	10 (5.0)	2 (0.9)	12 (2.8)	32 (16.0)	17 (7.4)	49 (11.4)	200 (100)	230 (100)	430 (100)

Source: primary survey ( $\chi^2_u = 87.679, \chi^2_r = 43.462, \chi^2 = 133.88$ .)

(Figures inside the parenthesis represent percentage)

It is seen from the table that, there is a close relation between education and technology adoption but with a rural urban bias. In urban as well as rural area, professional degree holders have the high level of technology adoption. In urban area, 56.8 per cent of the professionals and in rural area 38.5 per cent of the professionals have a high level of technology adoption. It is because of the digital literacy and tech savvy nature of the professional group. In total, only 11.4 percent adopts a high level technology where 16 per cent belongs to urban area and 7.4 per cent belongs to rural area. But 79 percent of urban customers and 91.7 per cent of rural customers have a low technology adoption.

#### 5.6.4 Technology banking Acceptance across area of residence

The table depicts the relation between area of residence and level of technology banking acceptance.

**Table 5.6.4**

**Technology banking Acceptance across area of residence**

<b>Area</b>	<b>Low technology banking acceptance</b>	<b>Moderate technology banking acceptance</b>	<b>High technology banking acceptance</b>	<b>Total</b>
<b>Urban</b>	158	10	32	200
	(79.0)	(5.0)	(16.0)	(100.0)
<b>Rural</b>	211	2	17	230
	(91.7)	(0.9)	(7.4)	(100.0)
<b>Total</b>	369	12	49	430
	(85.8)	(2.8)	(11.4)	(100.0)

*Source: primary survey*

$$\chi^2=15.520$$

*(Figures inside the parenthesis represent percentage)*

. Urban residents have very high level of technology acceptance comparing to the rural counter parts. In urban area, 16 per cent residents have high technology acceptance whereas only 7.4 per cent have high technology acceptance in rural area.



## 5.6.5 Technology banking Acceptance across Activity groups

**Table 5.6.5**

### **Technology acceptance across activity groups**

The table gives a picture on the usefulness of technology banking among different activity groups

Activity groups	Low technology banking acceptance			Moderate technology banking acceptance			High technology banking acceptance			total		Grand total
	Urban	rural	total	urban	rural	total	urban	rural	total	urban	rural	
Regular	25 (64.1)	9 (81.8)	34 (68.0)	4 (10.3)	0 (0.0)	4 (8.0)	10 (25.6)	2 (18.2)	12 (24.0)	39 (100)	11 (100)	50
Private	52 (67.5)	62 (83.8)	114 (75.5)	4 (5.2)	2 (2.7)	6 (4.0)	21 (27.3)	10 (13.5)	31 (20.5)	77 (100)	74 (100)	151
Business	4 (80)	0 (0.0)	4 (57.1)	0 (0.0)	0 (0.0)	0 (0.0)	1 (20)	2 (100)	3 (42.9)	5 (100)	2 (100)	7
Casual	8 (88.9)	30 (93.8)	38 (92.7)	1 (11.1)	0 (0.0)	1 (2.4)	0 (0.0)	2 (6.3)	2 (4.9)	9 (100)	32 (100)	41
Retired	14 (93.3)	15 (100)	29 (96.7)	1 (6.7)	0 (0.0)	1 (1.3)	0 (0.0)	0 (0.0)	0 (0.0)	15 (100)	15 (100)	30
Unearned group	55 (100)	95 (99.0)	150 (99.3)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (1.0)	1 (0.7)	55 (100)	96 (100)	151
total	158 (79.9)	211 (91.7)	369 (85.8)	10 (5.0)	2 (0.9)	12 (2.8)	32 (16.0)	17 (7.4)	49 (11.4)	200 (100)	230 (100)	430 (100)

Source: primary survey ( $\chi^2_u = 32.937, \chi^2_r = 42.44, \chi^2 = 62.64,$ )

(Figures inside the parenthesis represent percentage)

It is found that, in urban area, people belonging to private sector (31.2 per cent) has the highest usefulness followed by regular workers (28.2 per cent). In rural area cent per cent customers under business group found high usefulness for technology banking followed by persons working under private sector with 13.5 per cent. Low usefulness for technology banking is highly found among casual workers. (80.5 per cent).

### 5.6.6 Technology banking Acceptance across Age groups

There is variation in technology adoption among different age groups with a rural urban bias, which is clear from the table.

**Table 5.6.6**

#### Technology banking acceptance across Age groups

Age groups	Low technology banking acceptance			Moderate technology banking acceptance			High technology banking acceptance			total		Grand total
	Urban	rural	total	urban	rural	total	urban	rural	total	urban	rural	
Below 35 years	33 (50.0)	76 (80)	109 (67.7)	3 (4.5)	2 (2.1)	5 (3.1)	30 (45.5)	17 (17.9)	47 (29.2)	66 (100)	95 (100)	161 (100)
35-59 years	93 (91.2)	98 (100)	191 (95.5)	7 (6.9)	0 (0.0)	7 (3.5)	2 (2.0)	0 (0.0)	2 (1.0)	102 (100)	98 (100)	200 (100)
60 years and above	32 (100)	37 (100)	69 (100)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	32 (100)	37 (100)	69 (100)
total	158 (79.0)	211 (91.7)	369 (85.8)	10 (5.0)	2 (0.9)	12 (2.8)	32 (16.0)	17 (7.4)	49 (11.4)	200 (100)	230 (100)	430 (100)

Source: primary survey  $(\chi^2_u = 66.53, \chi^2_r = 29.43, \chi^2 = 83.88,)$

(Figures inside the parenthesis represent percentage)

Both in urban as well as rural areas, people belonging to the age group of below 35 years have a high level of high technology adoption. In urban area, 45.5 percent and in rural area, 17.9 per cent customers belonging to below 35 years group has a high level technology adoption. It is because of their internet usage level, tech savvy nature and usefulness in the same. The grand total picture tells 16 per cent and 7.4 per cent has a high level technology adoption in urban and rural areas respectively. But as a whole 67.7 per cent of persons belong to below 35 age group has a low level of technology adoption.

### 5.6.7 Technology banking Acceptance across Income groups

The table explains the variation in technology adoption among different income groups in urban and rural areas.

**Table 5.6.7**  
**Technology banking acceptance across income groups**

Income groups	Low technology banking acceptance			Moderate technology banking acceptance			High technology banking acceptance			total		Grand total
	Urban	rural	total	urban	rural	total	urban	rural	total	urban	rural	
Less than or equal to 5000	14 (100)	29 (100)	43 (100)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	14 (100)	29 (100)	43 (100)
5001 to 10000	38 (100)	59 (98.3)	97 (99)	0 (0)	1 (1.7)	1 (1)	0 (0)	0 (0)	0 (0)	38 (100)	60 (100)	98 (100)
10001 to 25000	47 (100)	70 (85.4)	117 (90.7)	0 (0)	1 (1.2)	1 (0.8)	0 (0)	11 (13.4)	11 (8.5)	47 (100)	82 (100)	129 (100)
25001 to 50000	55 (67.1)	50 (92.6)	105 (77.2)	6 (7.3)	0 (0)	6 (4.4)	21 (25.6)	4 (7.2)	25 (18.4)	82 (100)	54 (100)	136 (100)
50001 and above	4 (21.1)	3 (60)	7 (29.2)	4 (21.1)	0 (0)	4 (16.7)	11 (57.9)	2 (40)	13 (54.2)	19 (100)	5 (100)	24 (100)
total	158 (79)	211 (91.7)	369 (85.8)	10 (5)	2 (0.9)	12 (2.8)	32 (16)	17 (7.4)	49 (11.4)	200 (100)	230 (100)	430 (100)

Source: primary survey

( $\chi^2_u = 72.11$ ,  $\chi^2_r = 20.53$ ,  $\chi^2 = 96.86$ )

(Figures inside the parenthesis represent percentage)

The high technology adoption is prominent among customers who earn more than Rs 50000 per month. In urban area, about 60 per cent belonging to this group has a high technology adoption where as in rural it is 40 per cent. Thus income and technology adoption is closely associated as people with higher income have more transactions and they find usefulness in technology banking. Thus higher the income, higher is the tendency to use technology banking.

### 5.7 Technology banking usefulness Index

According to technology acceptance model, a person accepts technology only if he has perceived usefulness for the same. Perceived usefulness is the degree to which a person believes that using a particular system would enhance his or her

job performance. It is the perception of the consumer regarding the outcome of the experience.

In order to study the extend of perceived usefulness by the sample respondents, a perceived usefulness index was formed by taking the positive responses of the 10 perceived usefulness variables felt by the sample respondents. The variables are

1. Time saving
2. Performance of plastic cards
3. Cost effectiveness of ATM
4. Cost effectiveness of net banking
5. Cost effectiveness of mobile banking
6. Security of ATMs
7. Security of internet banking.
8. Security of mobile banking
9. Prestige
10. Privacy.

Technology banking usefulness index =  $\frac{X_i - \text{Minimum}(X_i)}{\text{Maximum}(X_i) - \text{Minimum}(X_i)}$

Where  $X_i$  = actual value of the  $I^{\text{th}}$  indicator.

The value of index ranges between 0 – 1. Scoring method has been used here. Scores given are 1 for positive response and 0 for negative response. Those responses that lies between 0 to 0.33 has been categorized as low technology banking usefulness, between 0.34 to 0.65 as moderate technology banking usefulness and between 0.65 to 1 as high technology banking usefulness. The relation between technology banking usefulness index and the major socio-economic variables are shown in the following tables. The association between various socio-economic variables and technology acceptance index is analyzed by testing the hypothesis that there is no association between technology banking

usefulness and different variables considered.  $X^2$  statistic has been used to test the hypothesis.

### 5.7.1 Usefulness of technology banking to the respondents.

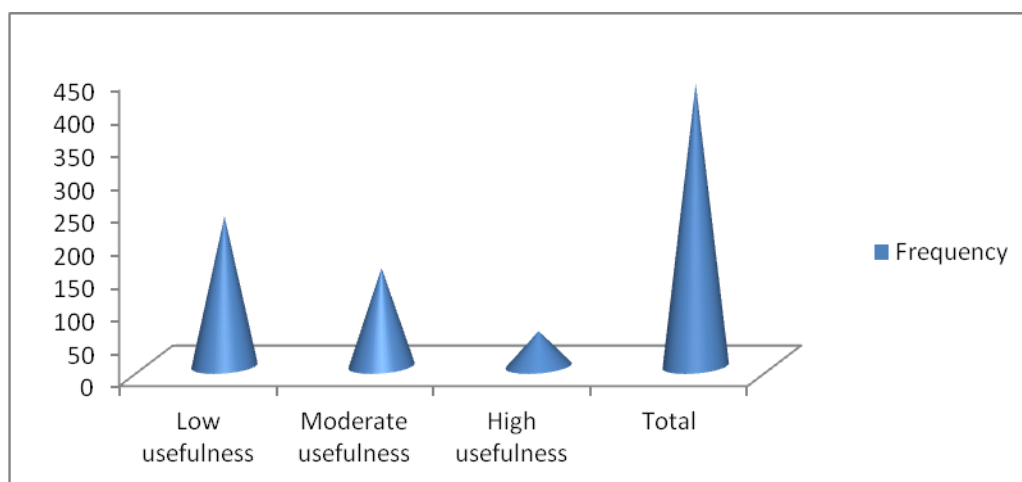
The table gives that more than half of the respondents have low usefulness for technology banking.

**Table 5.15**  
**Usefulness of technology banking for the respondents**

Usefulness	Frequency	Percent
Low usefulness	228	53
Moderate usefulness	149	34.7
High usefulness	53	12.3
Total	430	100

Among the respondents, 53 per cent of the people don't find technology banking will help them to save time and cost. Only 12.3 per cent has high usefulness for technology banking. The major proportion of respondents with high usefulness pertains to urban area.

**Figure 5.7.1**  
**Usefulness of technology banking for the respondents**



### 5.7.2 Usefulness of technology banking across gender

The usefulness of technology banking across the gender has been given in the table.

**Table 5.7.2**  
**Usefulness of technology banking across gender**

Gender	Low usefulness of technology banking			Moderate usefulness of technology banking			High usefulness of technology banking			total		Grand total
	Urban	rural	total	urban	rural	total	urban	rural	total	urban	rural	
Male	36 (37.9)	83 (63.4)	119 (52.7)	37 (38.9)	36 (27.5)	73 (32.3)	22 (23.2)	12 (9.2)	34 (15)	95 (100)	131 (100)	226 (100)
Female	44 (41.9)	65 (65.7)	109 (53.4)	46 (43.8)	30 (30.3)	76 (37.3)	15 (14.3)	4 (4)	19 (9.3)	105 (100)	99 (100)	204 (100)
Total	80 (40)	148 (64.3)	228 (53)	83 (41.5)	66 (28.7)	149 (34.7)	37 (18.5)	16 (7)	53 (12.3)	200 (100)	230 (100)	430 (100)

Source: primary survey

( $\chi^2_u = 2.60$ ,  $\chi^2_r = 2.32$ ,  $\chi^2 = 3.62$ .)

(Figures inside the parenthesis represent percentage)

It is obviously revealed that only 15 per cent of males felt a high usefulness for technology banking in which 23.2 percent belongs to urban area and 9.2 per cent belongs to rural area. Females have less usefulness comparing to their male counterpart with 9.3 per cent., out of which 14.3 belongs to urban area and 4 per cent belongs to rural area. Most of the females are using technology banking in order to collect foreign remittances

### 5.7.3 Usefulness of technology banking across area

**Table 5.7.3**  
**Usefulness of technology banking across area**

Area	Low usefulness	Moderate usefulness	High usefulness	Total
urban	80 (40)	83 (41.5)	37 (18.5)	200 (100)
rural	148 (64.3)	66 (28.7)	16 (7)	230 (100)
Total	228 (53)	149 (34.7)	53 (12.3)	430 (100)

Source: primary survey

$\chi^2 = 28.57$

(Figures inside the parenthesis represent percentage)

As per the table, the urban respondents have high level of usefulness for technology banking. 18.5 per cent of them have high level of usefulness, where as in rural areas only 7 percent has high usefulness for technology banking but 53 percent respondents opined that they have a low usefulness for technology banking.

#### 5.7.4 Usefulness of Technology banking across education groups

The table gives insights in to the usefulness of technology banking among various education groups.

**Table 5.7.4**

#### Usefulness of Technology banking across education groups

Education groups	Low usefulness of technology banking			Moderate usefulness of technology banking			High usefulness of technology banking			total		Grand total
	Urban	rural	total	urban	rural	total	urban	rural	total	urban	rural	
Below matriculation	37 (90.2)	79 (97.5)	116 (95.1)	4 (9.8)	2 (2.5)	6 (4.9)	0 (0)	0 (0)	0 (0)	41 (100)	81 (100)	122 (100)
Matriculation	6 (33.3)	11 (32.4)	17 (32.7)	12 (66.7)	23 (67.6)	35 (67.3)	0 (0)	0 (0)	0 (0)	18 (100)	34 (100)	52 (100)
Technical diploma	5 (25)	10 (50)	15 (37.5)	15 (75)	7 (35)	22 (55)	0 (0)	3 (15)	3 (7.5)	20 (100)	20 (100)	40 (100)
Graduation	15 (35.7)	36 (58.1)	51 (49)	25 (59.5)	19 (30.6)	44 (42.3)	2 (4.8)	7 (11.3)	9 (8.7)	42 (100)	62 (100)	104 (100)
Post graduation and above	9 (25.7)	6 (30)	15 (27.3)	16 (45.7)	13 (65)	29 (52.7)	10 (28.6)	1 (5)	11 (20)	35 (100)	20 (100)	55 (100)
Professional degree	8 (18.2)	6 (46.2)	14 (24.6)	11 (25)	2 (15.4)	13 (22.8)	25 (56.8)	5 (38.5)	30 (52.6)	44 (100)	13 (100)	57 (100)
total	80 (40)	148 (64.3)	228 (53)	83 (41.5)	66 (28.7)	149 (34.7)	37 (18.5)	16 (7)	53 (12.3)	200 (100)	230 (100)	430 (100)

Source: primary survey ( $\chi^2_u = 114.59, \chi^2_r = 102.55, \chi^2 = 224.73$ )

(Figures inside the parenthesis represent percentage)

It is seen that usefulness is high for urban users with 18.5 percent comparing to their rural counterparts with 7 per cent. In case of both urban and rural, usefulness is higher for persons with professional degree. In urban it is 56.6

percent where as in rural it is 38.5 percent. In total, high usefulness of technology banking is felt by only 12.3 percent in which 52.6 percent belongs to professional degree holders followed by people with post graduation and above. (20 per cent). It is because they find it easy to use and cost effective and time saving. At the same time 24.6 per cent of professional degree holders find less usefulness for technology banking because of the risk associated and high service charges.

### 5.7.5 Usefulness of Technology banking across activity groups

The table gives a picture on the usefulness of technology banking among different activity groups

**Table 5.7.5**  
**Usefulness of Technology banking across activity groups**

Activity groups	Low usefulness of technology banking			Moderate usefulness of technology banking			High usefulness of technology banking			total		Grand total
	Urban	rural	total	urban	rural	total	urban	rural	total	urban	rural	
Regular	3 (7.7)	1 (9.1)	4 (8)	25 (64.1)	9 (81.8)	34 (68)	11 (28.2)	1 (9.1)	12 (24)	39 (100)	11 (100)	50 (100)
Private	24 (31.2)	43 (58.1)	67 (44.4)	29 (37.7)	21 (28.4)	50 (33.1)	24 (31.2)	10 (13.5)	34 (22.5)	77 (100)	74 (100)	151 (100)
Business	1 (20)	0 (0)	1 (14.3)	3 (60)	0 (0)	3 (42.9)	1 (20)	2 (100)	3 (42.9)	5 (100)	2 (100)	7 (100)
Casual	5 (55.5)	28 (87.5)	33 (80.5)	4 (44.4)	2 (6.3)	6 (14.6)	0 (0)	2 (6.3)	2 (4.9)	9 (100)	32 (100)	41 (100)
Retired	14 (93.3)	9 (60)	23 (76.7)	0 (0)	6 (40)	6 (20)	1 (6.7)	0 (0)	1 (3.3)	15 (100)	15 (100)	30 (100)
Unearned group	33 (60)	67 (69.8)	100 (66.2)	22 (40)	28 (29.2)	50 (33.1)	0 (0)	1 (1)	1 (0.7)	55 (100)	96 (100)	151 (100)
total	80 (40)	148 (64.3)	228 (53)	83 (41.5)	66 (28.7)	149 (34.7)	37 (18.5)	16 (7)	53 (12.3)	200 (100)	230 (100)	430 (100)

Source: primary survey ( $\chi^2_u = 62.29, \chi^2_r = 63.22, \chi^2 = 104.20$ )

(Figures inside the parenthesis represent percentage)



It is found that, in urban area, people belonging to private sector (31.2 per cent) has the highest usefulness followed by regular workers (28.2 per cent). In rural area cent per cent customers under business group found high usefulness for technology banking followed by persons working under private sector with 13.5 per cent. Low usefulness for technology banking is highly found among casual workers. (80.5 per cent).

### 5.7.6 Usefulness of technology banking across age group

**Table 5.7.6**

#### Usefulness of technology banking across age group

Age groups	Low usefulness of technology banking			Moderate usefulness of technology banking			High usefulness of technology banking			total		Grand total
	Urban	rural	total	urban	rural	total	urban	rural	total	urban	rural	
Below 35 years	10 (15.2)	57 (60)	67 (41.6)	26 (39.4)	22 (23.2)	48 (29.8)	30 (45.5)	16 (16.8)	46 (28.6)	66 (100)	95 (100)	161 (100)
35-59 years	38 (37.3)	54 (55.1)	92 (46)	57 (55.9)	44 (44.9)	101 (50.5)	7 (6.9)	0 (0)	7 (3.5)	102 (100)	98 (100)	200 (100)
60 years and above	32 (100)	37 (100)	69 (100)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	32 (100)	37 (100)	69 (100)
total	80 (40)	148 (64.3)	228 (53)	83 (41.5)	66 (28.7)	149 (34.7)	37 (18.5)	16 (7)	53 (12.3)	200 (100)	230 (100)	430 (100)

Source: primary survey  $(\chi^2_u = 96.92, \chi^2_r = 52.22, \chi^2 = 129.64)$

(Figures inside the parenthesis represent percentage)

The table clearly depicts that there exist a relation between age group and usefulness in technology banking. Technology banking has been highly useful to persons belonging to the age group of below 35 years with 28.6 per cent. The situation is same with that of urban and rural. In urban area, 45.5 percent of persons and in rural area, 16.8 percent have high usefulness for technology banking. This is again because of the benefits of technology banking such as cost

effective, time saving and enables them to do anywhere anytime banking in their busy life.

### 5.7.7 Usefulness of technology banking across income group

**Table 5.7.7**

#### **Usefulness of technology banking across income group**

Income groups	Low usefulness of technology banking			Moderate usefulness of technology banking			High usefulness of technology banking			total		Grand total
	Urban	rural	total	urban	rural	total	urban	rural	total	urban	rural	
Less than or equal to 5000	14 (100)	29 (100)	43 (100)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	14 (100)	29 (100)	43 (100)
5001 to 10000	23 (60.5)	50 (83.2)	73 (74.5)	15 (39.5)	10 (16.7)	25 (25.5)	0 (0)	0 (0)	0 (0)	38 (100)	60 (100)	98 (100)
10001 to 25000	26 (55.3)	52 (63.4)	78 (60.5)	21 (44.7)	19 (23.2)	40 (31)	0 (0)	11 (13.4)	11 (8.5)	47 (100)	82 (100)	129 (100)
25001 to 50000	15 (18.3)	16 (22.8)	31 (29.6)	42 (51.2)	35 (64.8)	77 (56.6)	25 (30.5)	3 (5.6)	28 (20.6)	82 (100)	54 (100)	136 (100)
50001 and above	2 (10.5)	1 (20)	3 (12.5)	5 (26.3)	2 (40)	7 (29.2)	12 (63.2)	14 (58.3)	2 (40)	19 (100)	5 (100)	24 (100)
total	80 (40)	148 (64.3)	228 (53)	83 (41.5)	66 (28.7)	149 (34.7)	37 (18.5)	16 (7)	53 (12.3)	200 (100)	230 (100)	430 (100)

Source: primary survey

( $\chi^2_u = 87.198$ ,  $\chi^2_r = 76.84$ ,  $\chi^2 = 163.17$ )

(Figures inside the parenthesis represent percentage)

The table reveals that as the income increases, people experiences more usefulness for the technology both in urban and rural areas but with variations. Technology banking has been highly useful to persons earning above Rs 50000 (58.3 per cent). In urban area, 63.2 per cent and in rural area, 40 percent of people who earns above Rs 50000 have a high usefulness for technology banking. But none earning less than Rs 5000 has felt usefulness for the same.

## 5.8 Ease of use index

Another component of Technology Acceptance Model is ease of use. The customer should find easiness in using technology banking instruments to accept them. Easiness is the extent to which a person accepts as true that using a method would be at no cost to that individual.

In order to study the extend of perceived Easiness by the sample respondents, a perceived Easiness index was formed by taking the positive responses of the 13 perceived Easiness variables felt by the sample respondents. The variables are

1. Faster log in facility.
2. Language for ATM.
3. Language for internet banking.
4. Language for mobile banking.
5. Easy reversal of transactions.
6. Easy navigation of mobile banking menu.
7. Easy navigation of net banking page.
8. Easiness to transfer money through mobile banking.
9. Easiness to transfer money through ATM/CDM.
10. Easiness to transfer money through net banking.
11. Easiness in balance enquiry through ATM.
12. Easiness in balance enquiry through mobile banking.
13. Easiness in balance enquiry through internet banking.

Technology banking Easiness index =  $X_i - \text{Minimum}(X_i) / \text{Maximum}(X_i) - \text{Minimum}(X_i)$

Where  $X_i$  = actual value of the  $I^{\text{th}}$  indicator.

The value of index ranges between 0 – 1. Scoring method has been used here. Scores given are 1 for positive response and 0 for negative response. Those responses that lies between 0 to 0.33 has been categorized as low technology banking acceptance, between 0.34 to 0.65 as moderate technology banking acceptance and between 0.65 to 1 as high technology banking acceptance. The relation between technology banking acceptance index and the major socio-

economic variables are shown in the following tables. The association between various socio-economic variables and technology banking easiness index is analyzed by testing the hypothesis that there is no association between technology banking acceptance level and different variables considered.  $X^2$  statistic has been used to test the hypothesis.

The relation between Easiness index and the major socio-economic variables are shown in the following tables.

### 5.8.1 Ease of use of technology banking for sample respondents.

**Table 5.8.1**

**Technology banking easiness among sample respondents**

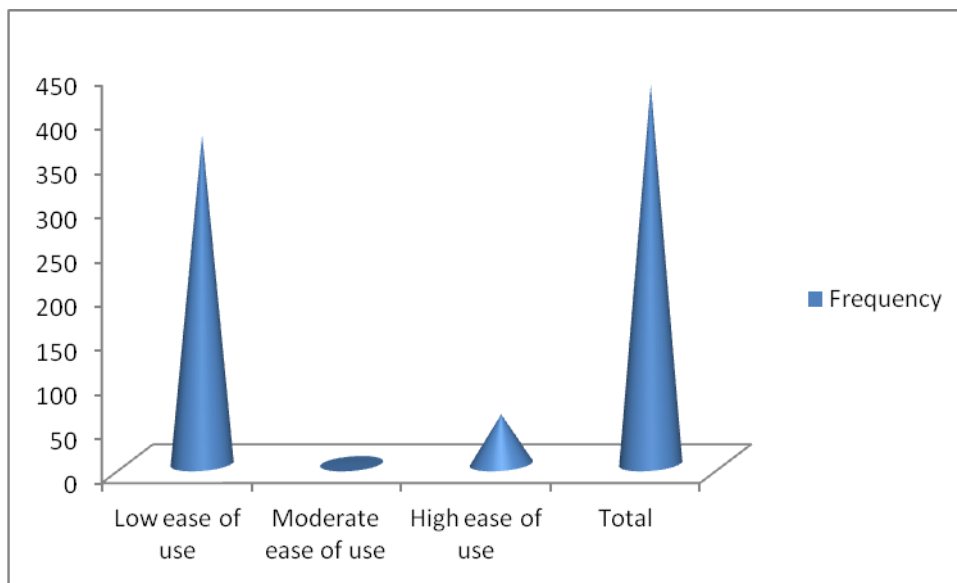
<b>Ease of use</b>	<b>Frequency</b>	<b>Percent</b>
Low ease of use	373	86.7
Moderate ease of use	1	.2
High ease of use	56	13
Total	430	100

*Source: primary survey*

The ease of use index shows how easily people can use technology banking. The table explains the ease of use in technology banking for the sample respondents. It is seen that, majority of the people feels less easy to do digital banking due to lack of knowledge, fear, risk, difficulty in reversing a transaction etc. 86.7 percent opined so. Only 13 per cent of the respondents opined that it is highly easy for them to do their transactions through technology banking.

**Figure 5.8.1**

**Technology banking easiness among sample respondents**



**5.8.2 Ease of use of technology banking across gender**

**Table 5.8.2**

**Ease of use of technology banking across gender**

gender	Low ease of use of technology banking			Moderate ease of use of technology banking			High ease of use of technology banking			total		Grand total
	Urban	rural	total	urban	rural	total	urban	rural	total	urban	rural	
male	73 (76.8)	119 (90.8)	192 (85)	0 (0)	0 (0)	0 (0)	22 (23.2)	12 (9.2)	34 (15)	95 (100)	131 (100)	226 (100)
female	87 (82.9)	94 (64.9)	181 (88.7)	0 (0)	1 (1)	1 (0.5)	18 (17.1)	4 (4)	22 (10.8)	105 (100)	99 (100)	204 (100)
total	160 (80)	213 (92.6)	373 (86.7)	0 (0)	1 (0.4)	1 (0.2)	40 (20)	16 (7)	56 (13)	200 (100)	230 (100)	430 (100)

Source: primary survey

( $\chi^2_u = 1.128$ ,  $\chi^2_r = 3.55$ ,  $\chi^2 = 2.78$ )

(Figures inside the parenthesis represent percentage)

The table depicts the gender variations in easiness in using technology banking in both rural and urban areas. It is seen from the table that males (15 per cent) have more easiness in adopting technology banking comparing to their female (10.8 per cent) folks. The situation in both urban and rural is same with that of the grand total. In urban area, 23.2 per cent of males find it easy to use technology banking instruments , where as only 17.1 per cent of females found it easier to use in case of rural area, 9.2 per cent males have easiness to use technology banking where as only 4 per cent females find it easy to use. But it is noteworthy that overall, 85 per cent of males and 88.7 per cent of females do not find easiness to use technology banking instruments.

### 5.8.3 Ease of use of technology banking across area

**Table 5.8.3**  
**Ease of use of technology banking across area**

Area	Low ease of use	Moderate ease of use	High ease of use	Total
Urban	160 (800)	0 (00)	40 (200)	200 (1000)
Rural	213 (92.60)	1 (0.40)	16 (70)	230 (1000)
Total	373 (86.70)	1 (0.20)	56 (130)	430 (1000)

*Source: primary survey*

$\chi^2=16.81$

*(Figures inside the parenthesis represent percentage)*

The area of residence highly influences the usage pattern of technology banking by individuals. It is clear from the table that people experiencing high ease in using technology banking are from urban area (20 per cent). Only 7 per cent of rural residents experience easiness in using digital banking.

## 5.8.4 Ease of use of technology banking across education groups

**Table 5.8.4**

### **Ease of use of technology banking across education groups**

Education groups	Low ease of use of technology banking			Moderate ease of use of technology banking			High ease of use of technology banking			total		Grand total
	Urban	rural	total	urban	rural	total	urban	rural	total	urban	rural	
Below matriculation	41 100	81 100	122 100	0 0	0 0	0 0	0 0	0 0	0 0	41 100	81 100	122 100
Matriculation	18 100	34 100	52 100	0 0	0 0	0 0	0 0	0 0	0 0	18 100	34 100	52 100
Technical diploma	20 100	17 85	37 92.5	0 0	0 0	0 0	0 0	3 15	3 7.5	20 100	20 100	40 100
Graduation	40 95.2	54 87.1	94 90.4	0 0	1 1.6	1 1	2 4.8	7 11.3	9 8.7	42 100	62 100	104 100
Post graduation and above	25 71.4	19 95	44 80	0 0	0 0	0 0	10 28.6	1 5	11 20	35 100	20 100	55 100
Professional degree	16 36.4	8 61.5	24 42.1	0 0	0 0	0 0	28 63.6	5 38.5	33 57.9	44 100	13 100	57 100
total	160 80	213 92.6	373 86.7	0 0	1 0.4	1 0.2	40 20	16 7	56 13	200 100	230 100	430 100

Source: primary survey

( $\chi^2_u = 79.82$ ,  $\chi^2_r = 35.28$ ,  $\chi^2 = 135.66$ )

(Figures inside the parenthesis represent percentage)

It is evident from the table that easiness to use is highly related to the educational qualification of the customer. The easiness in using technology banking is high among professionally qualified customers (57.9 per cent). it is same with that of the urban and rural areas. In urban areas, 63.6 per cent and in rural area 38.5 per cent can easily use technology banking instruments. Thus together with education, their digital literacy also plays an important role in determining their easiness to use technology banking.

### 5.8.5 Ease of use of technology banking across activity groups

**Table 5.8.5**  
**Ease of use of technology banking across activity groups**

Activity groups	Low ease of use of technology banking			Moderate ease of use of technology banking			High ease of use of technology banking			total		Grand total
	Urban	rural	total	urban	rural	total	urban	rural	total	urban	rural	
Regular	26 (66.7)	9 (81.8)	35 (70)	0 (0)	1 (9.1)	1 (2)	13 (33.3)	1 (9.1)	16 (7)	39 (100)	11 (100)	50 (100)
Private	52 (67.5)	64 (86.5)	116 (76.8)	0 (0)	0 (0)	0 (0)	25 (32.5)	10 (13.5)	35 (23.2)	77 (100)	74 (100)	151 (100)
Business	4 (80)	0 (0)	4 (57.1)	0 (0)	0 (0)	0 (0)	1 (20)	2 (100)	3 (42.9)	5 (100)	2 (100)	7 (100)
Casual	9 (100)	30 (93.8)	39 (95.1)	0 (0)	0 (0)	0 (0)	0 (0)	2 (6.3)	2 (4.9)	9 (100)	32 (100)	41 (100)
Retired	14 (93.3)	15 (100)	29 (96.7)	0 (0)	0 (0)	0 (0)	1 (6.7)	0 (0)	1 (3.3)	15 (100)	15 (100)	30 (100)
Unearned group	55 (100)	95 (99)	150 (99.3)	0 (0)	0 (0)	0 (0)	0 (0)	1 (1)	1 (0.7)	55 (100)	96 (100)	151 (100)
total	160 (80)	213 (92.6)	373 (86.7)	0 (0)	1 (0.4)	1 (0.2)	40 (20)	16 (7)	56 (13)	200 (100)	230 (100)	430 (100)

Source: primary survey  $(\chi^2_u = 29.48, \chi^2_r = 58.14, \chi^2 = 62.39)$

(Figures inside the parenthesis represent percentage)

From the table it is clear that, regarding easiness to use there exist disparities amongst various activity groups with rural urban differences too. Over all easiness is high among the business class with 42.9 per cent. Technology banking helps in doing a number of transactions without visiting a bank branch thus lowers the cost and saves time. The easiness is high among regular class (33.3 per cent) and business class (42.9 per cent) in urban and rural areas respectively.



## 5.8.6 Ease of use of technology banking across age groups

**Table 5.8.6**

### Ease of use of technology banking across age groups

Age groups	Low ease of use of technology banking			Moderate ease of use of technology banking			High ease of use of technology banking			total		Grand total
	Urban	rural	total	urban	rural	total	urban	rural	total	urban	rural	
Below 35 years	33 (50)	78 (82.1)	111 (68.9)	0 (0)	1 (1.1)	1 (0.6)	33 (50)	16 (16.8)	49 (30.4)	66 (100)	95 (100)	161 (100)
35-59 years	95 (93.1)	98 (100)	193 (96.5)	0 (0)	0 (0)	0 (0)	7 (6.9)	0 (0)	7 (3.5)	102 (100)	98 (100)	200 (100)
60 years and above	32 (100)	37 (100)	69 (100)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	32 (100)	37 (100)	69 (100)
total	160 (80)	213 (92.6)	373 (86.7)	0 (0)	1 (0.4)	1 (0.2)	40 (20)	16 (7)	56 (13)	200 (100)	230 (100)	430 (100)

Source: primary survey

( $\chi^2_u = 56.13$ ,  $\chi^2_r = 267$ ,  $\chi^2 = 71.54$ )

(Figures inside the parenthesis represent percentage)

The easiness to use technology banking among different age groups is depicted in the table. It is evident that youngsters pertaining to below 35 years find it easy to get used to technology banking. This is mainly because of their tech savvy nature and digital literacy. 30.4 per cent of the customers less than 35 years are easily doing digital banking. In urban area, 50 per cent of the customers and in rural area 16.8 per cent of the customers who are below 35 years have high easiness to use technology banking.

### 5.8.7 Ease of use of technology banking across income groups

**Table 5.8.7**

#### Ease of use of technology banking across income groups

Income groups	Low ease of use of technology banking			Moderate ease of use of technology banking			High ease of use of technology banking			total		Grand total
	Urban	rural	total	urban	rural	total	urban	rural	total	urban	rural	
Less than or equal to 5000	14 (100)	29 (100)	43 (100)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	14 (100)	29 (100)	43 (100)
5001 to 10000	38 (100)	60 (100)	98 (100)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	38 (100)	60 (100)	98 (100)
10001 to 25000	47 (100)	71 (86.6)	118 (91.5)	0 (0)	0 (0)	0 (0)	0 (0)	11 (13.4)	11 (8.5)	47 (100)	82 (100)	129 (100)
25001 to 50000	56 (68.3)	50 (92.6)	106 (77.9)	0 (0)	1 (1.9)	1 (0.7)	26 (31.7)	3 (5.6)	29 (21.3)	82 (100)	54 (100)	136 (100)
50001 and above	5 (26.3)	3 (60)	8 (33.3)	0 (0)	0 (0)	0 (0)	14 (73.7)	2 (40)	16 (66.7)	19 (100)	5 (100)	24 (100)
total	160 (80)	213 (92.6)	373 (86.7)	0 (0)	1 (0.4)	1 (0.2)	40 (20)	16 (7)	56 (13)	200 (100)	230 (100)	430 (100)

Source: primary survey

( $\chi^2_u = 65.99$ ,  $\chi^2_r = 23.79$ ,  $\chi^2 = 955$ )

(Figures inside the parenthesis represent percentage)

The opinion on easiness to use technology banking among different income groups is given in the table. The higher the income is more is the easiness to use digital banking. The highest level of easiness can be found among those who earn above Rs 50000 per month. The case is same with the rural as well as urban areas with 40 per cent and 73.7 per cent respectively. For higher income groups, there is a need to depend bank to deal with their income and technology banking reduces their bank visit and makes their dealings easy and secured. No customer earning less than Rs 10000 finds easiness in doing technology banking.

## 5.9 Interpretation of Technology Acceptance Model

According to technology acceptance model, technology acceptance is determined by the usefulness and easiness in using technology. Thus in the case of technology banking also, the case is not different. Thus it is imperative to check the relation of technology banking acceptance with that of usefulness of technology banking index and easiness of technology banking index.

### 5.9.1 Technology banking acceptance and Usefulness

**Table 5.9.1**

**Technology banking acceptance and Usefulness**

Technology adoption index group	Usefulness index group			Total
	Low usefulness	Moderate usefulness	High usefulness	
Low technology adoption	228 (61.8)	141 (38.2)	0 (0)	369 (100)
Moderate technology adoption	0 (0)	4 (33.3)	8 (66. )7	12 (100)
High technology adoption	0 (0)	4 (8.2)	45 (91.8)	49 (100)
Total	228 (53)	149 (34.7)	53 (12.3)	430 (100)

Source: primary survey

( $\chi^2=374.53$ )

(Figures inside the parenthesis represent percentage)

Another pre condition of technology adoption is usefulness of technology banking for the customer. The relation is well seen in the table. As usefulness increases chances are more to adopt technology banking. 91.8 per cent of customers who has felt high usefulness has a high adoption for technology banking. But more than half (53 per cent) of the sample respondents have low usefulness and hence have a low level of technology adoption. Customers should first of all feel safe and secured about their transactions via technology banking. Technology banking should also be cost effective and time saving for the customers to feel usefulness in these instruments.

### 5.9.2 Technology banking acceptance and easiness

Easiness to use is another determinant of technology acceptance. Customers should be able to perform their banking activities without much struggle. Then only they will be ready to use it further. Thus it is necessary to check the association between technology acceptance and easiness to use.

**Table 5.9.2**  
**Technology banking Acceptance and easiness**

Technology Acceptance index group	Ease of use index			Total
	Low ease of use	Moderate ease of use	High ease of use	
Low Technology acceptance	369 (100)	0 (00)	0 (00)	355 (1000)
Moderate Technology acceptance	22 (33.30)	1 (0)	32 (66.7)	55 (1000)
High Technology acceptance	0 (00)	0 (20)	20 (980)	20 (1000)
total	373 (86.70)	1 (0.20)	56 (130)	430 (1000)

Source: primary survey

( $\chi^2=407.703$ )

(Figures inside the parenthesis represent percentage)

The table explains that technology adoption is directly related to easiness in using technology. As easiness increases adoption too increases. 98 per cent of people who has adopted high technology found it highly easy to use technology banking. A cent per cent person who has low easiness to use digital banking has not adopted it. The majority sections i.e., 86.7 per cent of respondents have low technology adoption as they find it difficult to use. Thus to popularize technology banking, it has to be ensured that people find it easy to use. A good understanding about the payment methods and procedures is necessary. There should be easy navigation of mobile banking pages and internet banking pages

and the language and instructions for these should not be confusing. Customers should also be able to easily transfer money and check balance through these instruments and options to reverse a transaction already done should be provided. The performance of the plastic cards should be robust so that the customers find it easy to transfer money and check balance using an ATM.

### 5.10 Frequency of using technology banking services

The frequency of using technology banking services in a month has been discussed in this section. The instruments selected are ATM, internet banking, mobile banking and other services which include NEFT, ECS etc.

#### 5.10.1 Frequency of using ATM in a month

**Table 5.10.1**  
**Frequency of using ATM in a month**

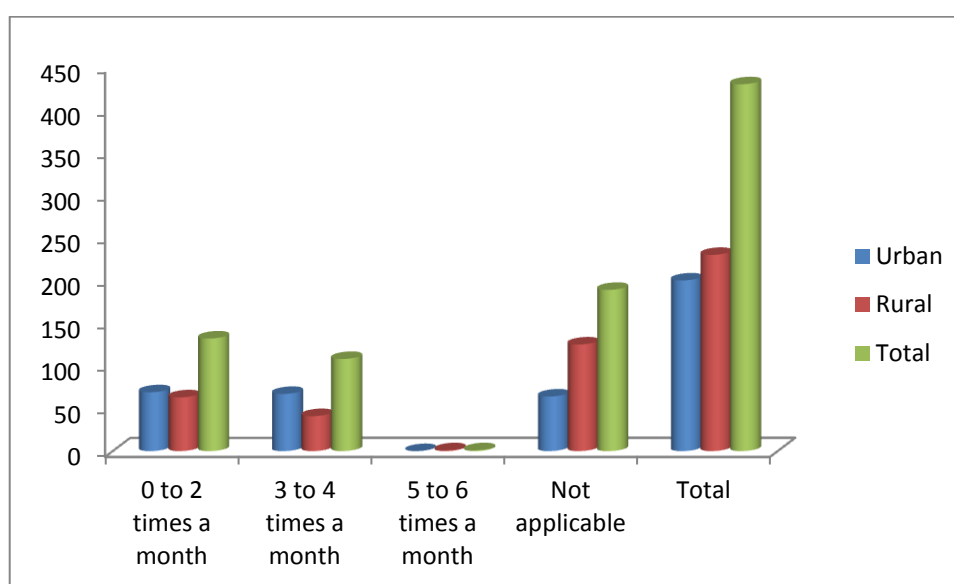
Frequency	area		Total
	urban	rural	
0 to 2 times a month	69 (52.3)	63 (47.7)	132 (100)
3 to 4 times a month	67 (62)	41 (38)	108 (100)
5 to 6 times a month	0 (0)	1 (100)	1 (100)
Not applicable	64 (33.9)	125 (66.1)	189 (100)
Total	200 (46.5)	230 (53.5)	430 (100)

*Source: primary survey* ( $\chi^2=25.25$ )  
*(Figures inside the parenthesis represent percentage)*

ATM is the most popular technology banking instrument. In rural area, under various provisions such as Jan Dhan Yojana, government has been distributing ATM cards. Thus debit cards are the most familiar technology banking instrument for rural residents. Among those who use ATM card less than twice a month, 52.3 per cent are from urban area and 47.7 per cent from rural area. also, among those who use 3 to 4 times a month, 62 per cent are urban residents. It is also noteworthy that among those who owns ATM card, 12.5 per cent urban

residents entrusts their cards with others. The reasons for entrusting ATM cards with others are lack of knowledge on using ATMs, no perceived needs etc. some of them handover the ATM cards to relatives. Also, 32 per cent of urban users and 68 per cent of rural users are not aware of the extra charges related to ATM usage.

**Figure 5.10.1**  
**Frequency of using ATM in a month**



### 5.10.2 Frequency of using internet banking in a month

The table represents the frequency of using internet banking in a month.

**Table 5.10.2**  
**Frequency of using internet banking in a month**

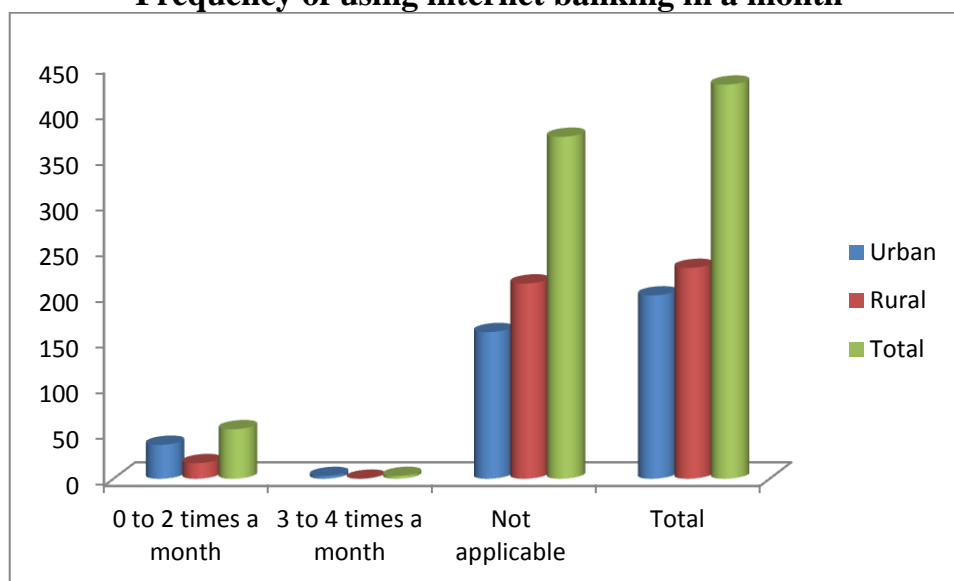
Frequency	area		Total
	urban	rural	
0 to 2 times a month	37 (68.5)	17 (31.5)	54 (100)
3 to 4 times a month	3 (100)	0 (0)	3 (100)
Not applicable	160 (42.9)	213 (57.1)	373 (100)
Total	200 (46.5)	230 (53.5)	430 (100)

Source: primary survey  $(\chi^2=15.92)$   
(Figures inside the parenthesis represent percentage)

Internet banking is more prominent among urban residents than rural residents. Among those who use internet banking less than 2 times a month, 68.5 per cent are urban users and 31.5 per cent are rural users. None in the rural area uses internet banking facilities more than thrice a month.

**Figure 5.10.2**

**Frequency of using internet banking in a month**



### 5.10.3 Frequency of using mobile banking in a month

The frequency of mobile banking usage is given in the table.

**Table 5.10.3**

**Frequency of using mobile banking in a month**

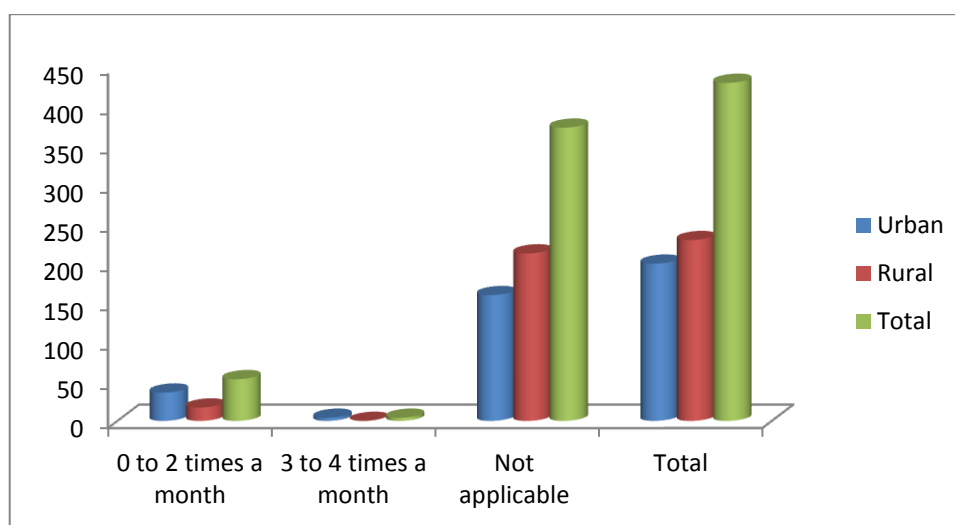
Frequency	Area		Total
	urban	rural	
0 to 2 times a month	36 (67.9)	17 (32.1)	53 (100)
3 to 4 times a month	4 (100)	0 (0)	4 (100)
Not applicable	160 (42.9)	213 (57.1)	373 (100)
Total	200 (46.5)	230 (53.5)	430 (100)

Source: primary survey ( $\chi^2=16.33$ )

(Figures inside the parenthesis represent percentage)

Mobile banking is popular among the respondents due to subscription to SMS alerts. Again urban-rural disparity exists in mobile banking usage. Among those who use mobile banking services less than twice a month 67.9 per cent are urban residents and 32.1 per cent rural residents. None in rural area uses mobile banking more than twice a month.

**Figure 5.10.3**  
**Frequency of using mobile banking in a month**



#### 5.10.4 Frequency of using other services in a month

**Table 5.10.4**

**Frequency of using other services in a month**

Frequency	area		Total
	urban	rural	
0 to 2 times a month	12 (63.2)	7 (36.8)	19 (100)
3 to 4 times a month	31 (73.8)	11 (26.2)	42 (100)
Not applicable	157 (42.5)	212 (57.5)	369 (100)
Total	200 (46.5)	230 (53.5)	430 (100)

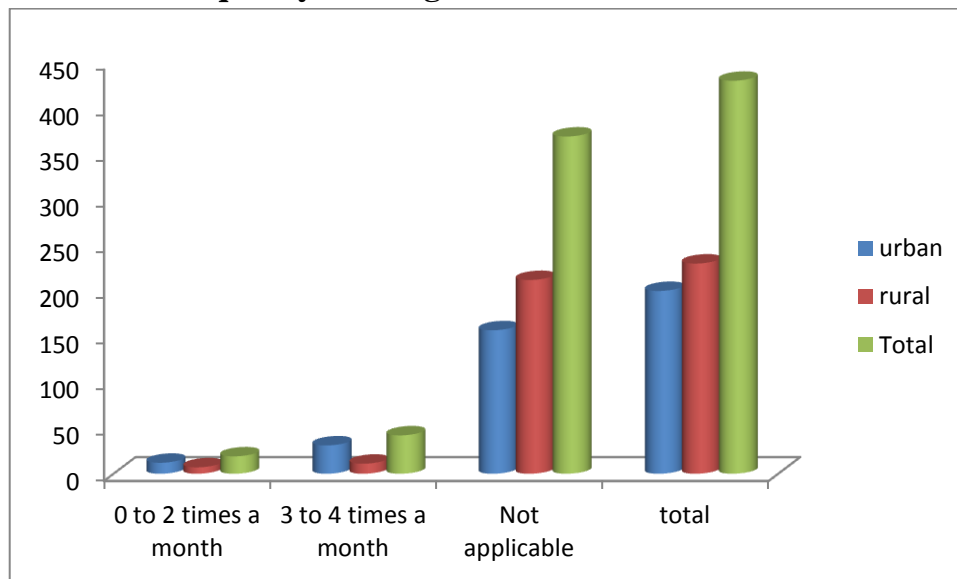
Source: primary survey ( $\chi^2=173$ )

(Figures inside the parenthesis represent percentage)



Other services include, RTGS, and ECS etc. among those who use these services less than 2 times a month, 63.2 per cent belongs to urban area and rest 36.8 per cent belongs to rural area. Among the respondents using these services more than twice a month, the urban proportion (73.8 per cent) is higher compared to rural.

**Figure 5.10.4**  
**Frequency of using other services in a month**



### **5.11 Purpose of using selected technology banking instruments.**

The purpose for which the sample respondents use technology banking instruments such as ATMs, mobile banking and internet banking is given in the following tables.

#### **5.11.1 Purpose of using ATM cards**

The purpose for which ATM cards are used is given in the table.

**Table 5.11.1**

**Purpose of using ATMs**

purpose	always		regularly		frequently		occasionally		rarely		never		Total	
	urban	rural	urban	rural	urban	rural	urban	rural	urban	rural	urban	rural	urban	rural
Balance enquiry	96 (61.1)	88 (52.7)	0 (0)	0 (0)	1 (0.6)	12 (7.2)	41 (26.1)	5 (3)	1 (0.6)	0 (0)	18 (11.5)	62 (37.1)	157 (100)	167 (100)
Withdrawal	133 (84.7)	105 (62.9)	3 (1.9)	0 (0)	0 (0)	0 (0)	1 (0.6)	0 (0)	2 (1.3)	0 (0)	18 (11.5)	62 (37.1)	157 (100)	167 (100)
Transfer	0 (0)	0 (0)	7 (4.5)	0 (0)	25 (15.9)	9 (5.4)	8 (5.1)	17 (10.2)	50 (31.8)	69 (41.3)	67 (42.7)	72 (43.1)	157 (100)	167 (100)
Ministatement	10 (6.4)	23 (13.8)	36 (22.9)	38 (22.8)	38 (24.2)	13 (7.8)	24 (15.3)	8 (4.8)	30 (19.1)	21 (12.6)	19 (12.1)	64 (38.3)	157 (100)	167 (100)
shopping	18 (11.5)	0 (0)	31 (19.7)	16 (9.6)	17 (10.8)	33 (19.8)	35 (22.3)	36 (21.6)	0 (0)	0 (0)	56 (35.7)	82 (49.1)	157 (100)	167 (100)
Investment	0 (0)	0 (0)	14 (8.9)	0 (0)	2 (1.3)	0 (0)	0 (0)	0 (0)	24 (15.3)	40 (24)	117 (74.5)	127 (76)	157 (100)	167 (100)
Collection of pension and stipends	0 (0)	9 (5.4)	0 (0)	0 (0)	0 (0)	0 (0)	1 (0.6)	0 (0)	38 (24.2)	31 (18.6)	118 (75.2)	127 (76)	157 (100)	167 (100)
Utility services	0 (0)	0 (0)	5 (3.2)	3 (1.8)	34 (21.7)	15 (9)	19 (12.1)	15 (9)	6 (3.8)	19 (11.4)	93 (59.2)	115 (68.9)	157 (100)	167 (100)

*Source: primary survey*

*(Figures inside the parenthesis represent percentage)*

The main purpose for which the ATM card is used is for enquiring the balance in account and for withdrawal of cash. The urban bias is clearly seen in the usage of ATM cards. Cards are mainly used for withdrawing cash and 84.7 per cent urban users and 62.9 per cent rural users make use of their cards always to withdraw cash from their account. 61.1 per cent of urban users always use cards for balance enquiry while only 52.7 per cent of rural users utilize their cards for enquiring balance. 11.5 per cent of urban users always use cards for shopping.

Other purposes for which cards are used include collection of stipends and pensions, for making investment and for paying utility bills.

Some of the youngsters prefer credit card over debit card, since they believe credit cards pose less challenge in the context of hacking, hence less risky. They are also attracted to the extra incentives provided by the banks for using credit cards. But majority consider credit card as risky due to the interest payments involved in it.

### 5.11.2 Purpose of using internet banking

The main purpose for which internet banking is used is given in the table.

**Table 5.11.2**

#### **Purpose of using internet banking**

purpose	always		regularly		frequently		occasionally		rarely		never		Total	
	urban	rural	urban	rural	urban	rural	urban	rural	urban	rural	urban	rural	urban	rural
Balance enquiry	20	0	1	0	0	0	19	17	0	0	0	0	40	17
	(50)	(0)	(2.5)	(0)	(0)	(0)	(47.5)	(100)	(0)	(0)	(0)	(0)	(100)	(100)
Transfer	9	13	19	3	12	0	0	1	0	0	0	0	40	17
	(22.5)	(76.5)	(47.5)	(17.6)	(30)	(0)	(0)	(5.9)	(0)	(0)	(0)	(0)	(100)	(100)
shopping	13	0	0	9	27	7	0	0	0	1	0	0	40	17
	(32.5)	(0)	(0)	(52.9)	(67.5)	(41.2)	(0)	(0)	(0)	(5.9)	(0)	(0)	(100)	(100)
Investment	2	0	0	0	9	0	15	11	14	6	0	0	40	17
	(5)	(0)	(0)	(0)	(22.5)	(0)	(37.5)	(64.7)	(35)	(35.3)	(0)	(0)	(100)	(100)
Utility services	13	9	2	2	20	5	5	1	0	0	0	0	40	17
	(32.5)	(52.9)	(5)	(11.8)	(50)	(29.4)	(12.5)	(5.9)	(0)	(0)	(0)	(0)	(100)	(100)

*Source: primary survey*

*(Figures inside the parenthesis represent percentage)*

Internet banking is popular among urban residents than rural ones. Still we can see it is getting popular among educated high earning youngsters in rural area. Net banking is intensively used by urban residents for balance enquiry, shopping and payment of utility bills. Among the users, 50 per cent of the urban residents

always use it for balance enquiry. They never visit bank branch for enquiring about the balance. But regarding transfer of money using internet banking, it is very high among rural users with 76.5 per cent. 32.5 per cent of urban residents always pay for their shopping's via internet banking. Regarding utility bill payments, 52.9 per cent rural users depend on net banking. In urban areas, since other technology banking services such as ECS system is popular, they depend less on internet banking for payment of their bills.

### 5.11.3 PURPOSE OF USING MOBILE BANKING

The table gives insights on purpose of using mobile banking both in rural and urban areas.

**Table 5.11.3**

#### **Purpose of using mobile banking**

purpose	always		regularly		frequently		occasionally		rarely		never		Total	
	urban	rural	urban	rural	urban	rural	urban	rural	urban	rural	urban	rural	urban	rural
Balance enquiry	15 (26.8)	7 (16.3)	20 (35.7)	7 (16.3)	0 (0)	0 (0)	0 (0)	5 (11.6)	0 (0)	0 (0)	21 (37.5)	24 (55.8)	56 (100)	43 (100)
Transfer	0 (0)	1 (2.3)	0 (0)	0 (0)	10 (17.9)	0 (0)	6 (10.7)	8 (18.6)	19 (33.9)	9 (20.9)	21 (37.5)	25 (58.1)	56 (100)	43 (100)
shopping	0 (0)	0 (0)	35 (62.5)	19 (44.2)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	21 (37.5)	24 (55.8)	56 (100)	43 (100)
Investment	0 (0)	0 (0)	3 (5.4)	0 (0)	0 (0)	0 (0)	13 (23.2)	5 (11.6)	17 (30.4)	14 (32.6)	23 (41.1)	24 (41.1)	56 (100)	43 (100)
Utility services	0 (0)	1 (2.3)	0 (0)	0 (0)	17 (30.4)	2 (4.7)	10 (17.9)	3 (7)	8 (14.3)	15 (34.9)	21 (37.5)	22 (51.2)	56 (100)	43 (100)
SMS	135 (88.8)	154 (100)	16 (10.5)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (0.7)	0 (0)	152 (100)	154 (100)

*Source: primary survey*

*(Figures inside the parenthesis represent percentage)*

The main purpose of using mobile banking is to receive SMS alerts. 88.8 per cent of urban users and 100 per cent rural users receive SMS alerts. 26.8 per cent urban users and 16.3 per cent rural users use mobile banking for balance enquiry. Banks are trying to popularize mobile banking services by introducing new customer friendly soft wares and also by providing incentives for using mobile banking.

### **5.12 Reduction in bank branch visit**

Another significant indicator of acceptance of technology banking is reduction in bank branch visit. The very aim of technology banking is to provide anywhere any time banking, so that the customer need not visit a bank branch personally in order to get their transactions done. Thus a reduction in bank branch visit shows that the users has accepted technology banking and they are switching from traditional mode of banking to new gen banking which is virtual in nature. It is also necessary to check the reduction in bank branch visit across various socio-economic groups. The analysis has been done only by taking the users of technology banking instruments. About 4.3 per cent of the sample respondents do not use any kind of technology banking instruments and not even own plastic cards. This section of the sample respondents has been excluded while analyzing. The tables given below represent an analysis on the same.

### 5.12.1 Reduction in bank visit across gender

**Table 5.12.1**

**Reduction in bank visit across gender**

Area	Gender	strongly agree	Agree	Neutral	Disagree	Strongly disagree	Total
urban	male	68 (97.1)	1 (1.4)	1 (1.4)	0 (0)	0 (0)	70 (100)
	female	64 (97)	2 (3)	0 (0)	0 (0)	0 (0)	66 (100)
Total		132 (97.1)	3 (2.2)	1 (0.7)	0 (0)	0 (0)	136 (100)
rural	male	50 (94.3)	0 (0)	3 (5.7)	0 (0)	0 (0)	53 (100)
	female	29 (55.8)	7 (13.5)	16 (30.8)	0 (0)	0 (0)	52 (100)
Total		79 (75.2)	7 (6.7)	19 (18.1)	0 (0)	0 (0)	105 (100)

*Source: primary survey* ( $\chi^2_u = 1.33, \chi^2_r = 21.47, \chi^2 = 16.47,$ )

*(Figures inside the parenthesis represent percentage)*

Across gender, the reduction in bank visit has been enjoyed more by males rather than females. Also an urban bias is also seen with the same. In urban area, 97.1 per cent of males and in rural area, 94.3 per cent males strongly agree that they do not prefer to visit banks to get their transactions done after the adoption of technology banking. In case of females, 97 per cent of urban females had their bank visit reduced after resorting to technology banking whereas among rural females it is only for 55.8 per cent. thus in urban area, both male and female equally agrees on reduction in frequency of bank visits where as in rural area, gender disparity exist with 94.3 per cent rural males and only 55.8 per cent females agreeing the reduction in bank visit.

## 5.12.2 Reduction in bank visit across education groups

Table 5.12.2

### Reduction in bank visit across education groups

Area	Education groups	strongly agree	agree	neutral	Disagree	Strongly disagree	Total
Urban	below matriculation	2 (50)	1 (25)	1 (25)	0 (0)	0 (0)	4 (100)
	matriculation	12 (85.7)	2 (14.3)	0 (0)	0 (0)	0 (0)	14 (100)
	technical diploma	15 (100)	0 (0)	0 (0)	0 (0)	0 (0)	15 (100)
	graduation	29 (100)	0 (0)	0 (0)	0 (0)	0 (0)	29 (100)
	post graduation and above	33 (100)	0 (0)	0 (0)	0 (0)	0 (0)	33 (100)
	PROFESSIONAL DEGREE	41 (100)	0 (0)	0 (0)	0 (0)	0 (0)	41 (100)
	Total	132 (97.1)	3 (2.2)	1 (0.7)	0 (0)	0 (0)	136 (100)
Rural	below matriculation	2 (100)	0 (0)	0 (0)	0 (0)	0 (0)	2 (100)
	matriculation	19 (76)	5 (20)	1 (4)	0 (0)	0 (0)	25 (100)
	technical diploma	10 (76.9)	0 (0)	3 (23.1)	0 (0)	0 (0)	13 (100)
	graduation	25 (65.8)	2 (5.3)	11 (28.9)	0 (0)	0 (0)	38 (100)
	post graduation and above	12 (80)	0 (0)	3 (20)	0 (0)	0 (0)	15 (100)
	Professional degree	11 (91.7)	0 (0)	1 (8.3)	0 (0)	0 (0)	12 (100)
	Total	79 (75.2)	7 (6.7)	19 (18.1)	0 (0)	0 (0)	105 (100)

Source: primary survey

( $\chi^2_u = 55.48$ ,  $\chi^2_r = 179$ ,  $\chi^2 = 383$ .)

(Figures inside the parenthesis represent percentage)

The table explains the frequency of bank visit across education groups. It is generally seen that as education increases people have a tendency to use more digital banking which reduces their visit to banks. Among the users in urban area, cent per cent of respondents with graduation, post graduation and professional degree experience a reduction in number of bank visits due to usage of technology banking instruments. In rural area, cent per cent users qualified below matriculation level agrees with reduction in frequency of visiting bank branch. It is noteworthy that these matriculates had an experience of working abroad. The professional degree holders (91.7 per cent) followed by post

graduates (80 per cent) experience a decline in bank visit due to technology banking usage in rural area.

### 5.12.3 Reduction in bank visit across Activity groups

**Table 5.12.3**  
**Reduction in bank visit across activity groups**

Area	Activity groups	strongly agree	agree	neutral	disagree	Strongly disagree	Total
Urban	Regular	38 (100)	0 (0)	0 (0)	0 (0)	0 (0)	38 (100)
	Private	52 (96.3)	1 (1.9)	1 (1.9)	0 (0)	0 (0)	54 (100)
	Business	3 (75)	1 (25)	0 (0)	0 (0)	0 (0)	4 (100)
	Casual	5 (100)	0 (0)	0 (0)	0 (0)	0 (0)	5 (100)
	Retired	11 (100)	0 (0)	0 (0)	0 (0)	0 (0)	11 (100)
	Unearned group	23 (95.8)	1 (4.2)	0 (0)	0 (0)	0 (0)	24 (100)
	Total	132 (97.1)	3 (2.2)	1 (0.7)	0 (0)	0 (0)	136 (100)
Rural	Regular	11 (100)	0 (0)	0 (0)	0 (0)	0 (0)	11 (100)
	Private	33 (97.1)	0 (0)	1 (2.9)	0 (0)	0 (0)	34 (100)
	Business	2 (100)	0 (0)	0 (0)	0 (0)	0 (0)	2 (100)
	Casual	4 (100)	0 (0)	0 (0)	0 (0)	0 (0)	4 (100)
	Retired	10 (100)	0 (0)	0 (0)	0 (0)	0 (0)	10 (100)
	Unearned group	19 (43.2)	7 (15.9)	18 (40.9)	0 (0)	0 (0)	44 (100)
	Total	79 (75.2)	7 (6.7)	19 (18.1)	0 (0)	0 (0)	105 (100)

Source: primary survey  $(\chi^2_u = 12.84, \chi^2_r = 41.92, \chi^2 = 62.33)$

(Figures inside the parenthesis represent percentage)

The changes in bank visit due to adoption of technology banking among various activity groups are presented in the table. 97.1 per cent of urban users and 75.2 per cent rural users strongly agreed that the visit to bank branch has reduced due to usage of digital banking. The reduction is very high for the regular working class (100 per cent) in urban area and rural area. In case of rural area, reduction



is clearly visible for users belonging to business group, casual laborers and retired persons especially due to usage of ATM cards.

#### 5.12.4 Reduction in bank visit across Age groups

**Table 5.12.4**  
**Reduction in bank visit across Age groups**

Area	Age groups	Strongly Agree	Agree	Neutral	Disagree	Strongly disagree	Total
Urban	Below 35 years	58 (100)	0 (0)	0 (0)	0 (0)	0 (0)	58 (100)
	35 - 59 years	65 (94.2)	3 (4.3)	1 (1.4)	0 (0)	0 (0)	69 (100)
	60 years and above	9 (100)	0 (0)	0 (0)	0 (0)	0 (0)	9 (100)
	Total	132 (97.1)	3 (2.2)	1 (0.7)	0 (0)	0 (0)	136 (100)
Rural	Below 35 years	32 (64)	0 (0)	18 (36)	0 (0)	0 (0)	50 (100)
	35 - 59 years	43 (84.3)	7 (13.7)	1 (2)	0 (0)	0 (0)	51 (100)
	60 years and above	4 (100)	0 (0)	0 (0)	0 (0)	0 (0)	4 (100)
	Total	79 (75.2)	7 (6.7)	19 (18.1)	0 (0)	0 (0)	105 (100)

Source: primary survey

( $\chi^2_u = 402$ ,  $\chi^2_r = 265$ ,  $\chi^2 = 27.17$ )

(Figures inside the parenthesis represent percentage)

The changes in the number of bank visit across age group are given in the table. It is seen that the number of bank visit has reduced for cent per cent youngsters and old aged users in urban area and in rural area. In rural area, only 64 per cent users experience a reduction in bank visit.

### 5.12.5 Reduction in bank visit across Income groups

**Table 5.12.5**  
**Reduction in bank visit across Income groups**

Area	Income groups	Strongly Agree	Agree	Neutral	Disagree	Strongly disagree	Total
urban	5001 to 10000	17 (100)	0 (0)	0 (0)	0 (0)	0 (0)	17 (100)
	10001 to 25000	21 (91.3)	2 (8.7)	0 (0)	0 (0)	0 (0)	23 (100)
	25001 to 50000	75 (97.4)	1 (1.3)	1 (1.3)	0 (0)	0 (0)	77 (100)
	50001 and above	19 (100)	0 (0)	0 (0)	0 (0)	0 (0)	19 (100)
	Total	132 (97.1)	3 (2.2)	1 (0.7)	0 (0)	0 (0)	136 (100)
rural	5001 to 10000	8 (72.7)	0 (0)	3 (27.3)	0 (0)	0 (0)	11 (100)
	10001 to 25000	28 (68.3)	2 (4.9)	11 (26.8)	0 (0)	0 (0)	41 (100)
	25001 to 50000	38 (79.2)	5 (10.4)	5 (10.4)	0 (0)	0 (0)	48 (100)
	50001 and above	5 (100)	0 (0)	0 (0)	0 (0)	0 (0)	5 (100)
	Total	79 (75.2)	7 (6.7)	19 (18.1)	0 (0)	0 (0)	105 (100)

Source: primary survey

( $\chi^2_u = 6.35$ ,  $\chi^2_r = 7.76$ ,  $\chi^2 = 14.52$ )

(Figures inside the parenthesis represent percentage)

The changes in the number of bank visit across income group are given in the table. It is seen that for the number of bank visit has reduced for high income group both in urban area and in rural areas. Cent per cent customer earning above Rs 50000 in rural area and in urban area strongly agrees a reduction in bank visit due to digital banking. in case of urban users who earn below Rs 10 000, also felt a reduction in their bank visit. With respect to users in other

income categories, in urban area, there is a significant reduction compared to rural area.

### 5.13 Reduction in liquidity

Reduction in liquidity is another indicator of increasing digital banking. As people go on resorting digital banking, they keep less amount in cash form in their hands, as it facilitates any time payment via virtual channels. They can use card payment or internet banking or mobile banking to make the payment. This also increases safety of the people. But in developing nation like India, where the rural segment is larger than urban segment, reduction in liquidity may pose some macro-economic threats. The following tables explain the liquidity position of the sample respondents across socio-economic groups.

#### 5.13.1 Reduction in liquidity across gender

**Table 5.13.1**

**Reduction in liquidity across gender**

area	gender	strongly agree	agree	neutral	disagree	Strongly disagree	Total
urban	male	62 (88.6)	8 (11.4)	0 (0)	0 (0)	0 (0)	70 (100)
	female	63 (95.5)	2 (3)	1 (1.5)	0 (0)	0 (0)	66 (100)
	Total	125 (91.9)	10 (7.4)	1 (0.7)	0 (0)	0 (0)	136 (100)
rural	male	48 (90.6)	4 (7.5)	1 (1.9)	0 (0)	0 (0)	53 (100)
	female	47 (90.4)	4 (7.6)	0 (0)	1 (1.9)	0 (0)	52 (100)
	Total	95 (90.5)	8 (7.6)	1 (1)	1 (1)	0 (0)	105 (100)

Source: primary survey

( $\chi^2_u = 4.94$ ,  $\chi^2_r = 20$ ,  $\chi^2 = 2.89$ )

(Figures inside the parenthesis represent percentage)

The table shows whether there is a reduction in liquidity due to the usage of technology banking. In urban area, among the users, 88.6 per cent males and 95.5 per cent females agree that the liquidity has reduced due to technology banking. The females have given a positive response compared to men. In rural area, 90.4 per cent of females opined that the liquidity has reduced due to the usage of digital banking where as 90.6 per cent of males strongly agreed the reduction in liquidity. For females the reduction in liquidity is mainly due to usage of ATM cards. Thus there is no significant gender disparity regarding usage of technology banking instruments.

### 5.13.2 Reduction in liquidity across education groups

**Table 5.13.2**  
**Reduction in liquidity across education groups**

Area	Education groups	Strongly Agree	Agree	Neutral	Disagree	Strongly disagree	Total
urban	below matriculation	2 (50)	1 (25)	1 (25)	0 (0)	0 (0)	4 (100)
	matriculation	11 (78.6)	3 (21.4)	0 (0)	0 (0)	0 (0)	14 (100)
	technical diploma	9 (60)	6 (40)	0 (0)	0 (0)	0 (0)	15 (100)
	graduation	29 (100)	0 (0)	0 (0)	0 (0)	0 (0)	29 (100)
	post graduation and above	33 (100)	0 (0)	0 (0)	0 (0)	0 (0)	33 (100)
	PROFESSIONAL DEGREE	41 (100)	0 (0)	0 (0)	0 (0)	0 (0)	41 (100)
	Total	125 (91.9)	10 (7.4)	1 (0.7)	0 (0)	0 (0)	136 (100)
rural	below matriculation	2 (100)	0 (0)	0 (0)	0 (0)	0 (0)	2 (100)
	matriculation	20 (80)	4 (16.0)	0 (0)	1 (4)	0 (0)	25 (100)
	technical diploma	12 (92.3)	1 (7.7)	0 (0)	0 (0)	0 (0)	13 (100)
	graduation	34 (89.5)	3 (7.9)	1 (2.6)	0 (0)	0 (0)	38 (100)
	post graduation and above	15 (100)	0 (0)	0 (0)	0 (0)	0 (0)	15 (100)
	PROFESSIONAL DEGREE	12 (100)	0 (0)	0 (0)	0 (0)	0 (0)	12 (100)
	Total	95 (41.3)	8 (3.5)	1 (0.4)	1 (0.4)	0 (0)	230 (100)

Source: primary survey

( $\chi^2_u = 71.21$ ,  $\chi^2_r = 108$ ,  $\chi^2 = 545$ )

(Figures inside the parenthesis represent percentage)

The table reveals that generally it is the educated class which enjoys the benefits of technology banking such as reduction in keeping liquid cash. In urban area, cent per cent graduates, professionals and post graduates, strongly agrees a reduction in liquidity after using technology banking. In rural area, 100 per cent professionals and post graduates benefits out of technology banking usage by experiencing a reduction in their liquidity, whereas only 89.5 per cent graduates agree a reduction in liquidity. The users who are qualified below matriculation level do strongly agree a reduction in liquidity. They were working abroad, thus are used with technology banking instruments.

### 5.13.3 Reduction in liquidity across activity groups

**Table 5.13.3**  
**Reduction in liquidity across activity groups**

Area	Activity	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total
urban	Regular	38 (100)	0 (0)	0 (0)	0 (0)	0 (0)	38 (100)
	Private	49 (90.7)	4 (7.4)	1 (1.9)	0 (0)	0 (0)	54 (100)
	Business	3 (75)	1 (25)	0 (0)	0 (0)	0 (0)	4 (100)
	Casual	1 (20)	4 (80)	0 (0)	0 (0)	0 (0)	5 (100)
	Retired	11 (100)	0 (0)	0 (0)	0 (0)	0 (0)	11 (100)
	Unearned group	23 (95.8)	1 (4.2)	0 (0)	0 (0)	0 (0)	24 (100)
	TOTAL	125 (91.9)	10 (7.4)	1 (0.7)	0 (0)	0 (0)	136 (100)
rural	Regular	11 (100)	0 (0)	0 (0)	0 (0)	0 (0)	11 (100)
	Private	28 (82.4)	4 (11.8)	1 (2.9)	1 (2.9)	0 (0)	34 (100)
	Business	2 (100)	0 (0)	0 (0.0)	0 (0)	0 (0)	2 (100)
	Casual	4 (100)	0 (0)	0 (0)	0 (0)	0 (0)	4 (100)
	Retired	10 (100)	0 (0)	0 (0)	0 (0)	0 (0)	10 (100)
	Unearned group	40 (90.9)	4 (9.1)	0 (0)	0 (0)	0 (0)	44 (100)
	TOTAL	95 (90.5)	8 (7.6)	1 (1)	1 (1)	0 (0)	105 (100)

Source: primary survey

( $\chi^2_u = 46.37$ ,  $\chi^2_r = 7.65$ ,  $\chi^2 = 29.94$ )

(Figures inside the parenthesis represent percentage)

The reduction in keeping liquid cash among the users of technology banking instruments is depicted in the table. Among the urban users, cent per cent government employees and retired persons strongly agrees a reduction in their liquidity due to technology banking services. In rural area, cent per cent government employees, business class, casual workers and retired persons also strongly agrees with the reduction of liquidity. Thus those with better activity status rely on technology banking leading to a reduction in their liquidity as they are confident of doing anytime, anywhere banking.

#### 5.13.4 Reduction in liquidity across age groups

**TABLE 5.13.4**

**Reduction in liquidity across age groups**

Area	age groups	strongly agree	agree	neutral	disagree	Strongly disagree	Total
<b>urban</b>	Below 35 years	54 (93.1)	3 (5.2)	1 (1.7)	0 (0)	0 (0)	58 (100)
	35 - 59 years	62 (89.9)	7 (10.1)	0 (0)	0 (0)	0 (0)	69 (100)
	60 years and above	9 (100)	0 (0)	0 (0)	0 (0)	0 (0)	9 (100)
	Total	125 (91.9)	10 (7.4)	1 (0.7)	0 (0)	0 (0)	136 (100)
<b>rural</b>	Below 35 years	46 (92)	2 (4)	1 (2)	1 (2)	0 (0)	50 (100)
	35 - 59 years	45 (88.2)	6 (11.8)	0 (0)	0 (0)	0 (0)	51 (100)
	60 years and above	4 (100)	0 (0)	0 (0)	0 (0)	0 (0)	4 (100)
	Total	95 (90.5)	8 (7.6)	1 (1)	1 (1)	0 (0)	105 (100)

Source: primary survey

( $\chi^2_u = 3.22$ ,  $\chi^2_r = 4.59$ ,  $\chi^2 = 7.84$ )

(Figures inside the parenthesis represent percentage)

The table looks in to the reduction in liquidity due to technology banking among respondents of various age groups. Both in urban and rural areas, cent percent

old age people experience a reduction in liquidity. But the proportion of old aged respondents who are used with technology banking services is less as it is difficult for the old age people. Regarding youth, 93.1 per cent urban youth has strongly agreed a reduction in liquidity. The youth opined that there should be improvement in technology banking facilities, so that they can confidently part with liquidity.

### 5.13.5 Reduction in liquidity across income groups

**TABLE 5.13.5**

**Reduction in liquidity across income groups**

Area	Income	Strongly Agree	Agree	Neutral	Disagree	Strongly disagree	Total
urban	less than or equal to 5000	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	14 (100)
	5001 to 10000	13 (76.5)	3 (17.6)	1 (2.6)	0 (0)	0 (0)	17 (100)
	10001 to 25000	20 (87)	3 (13)	0 (0)	0 (0)	0 (0)	23 (100)
	25001 to 50000	73 (94.8)	4 (5.2)	0 (0)	0 (0)	0 (0)	77 (100)
	50001 and above	19 (100)	0 (0)	0 (0)	0 (0)	0 (0)	19 (100)
	Total	125 (91.9)	10 (7.4)	1 (0.7)	0 (0)	0 (0)	136 (100)
rural	less than or equal to 5000	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	29 (100)
	5001 to 10000	8 (72.7)	1 (9.1)	1 (9.1)	1 (9.1)	0 (0)	11 (100)
	10001 to 25000	38 (92.7)	3 (7.3)	0 (0)	0 (0)	0 (0)	41 (100)
	25001 to 50000	44 (91.7)	4 (8.3)	0 (0)	0 (0)	0 (0)	54 (100)
	50001 and above	5 (100)	0 (0)	0 (0)	0 (0)	0 (0)	5 (100)
	Total	95 (90.5)	8 (7.6)	1 (1)	1 (1)	0 (0)	105 (100)

Source: primary survey

( $\chi^2_u = 13.65$ ,  $\chi^2_r = 180$ ,  $\chi^2 = 27.95$ )

(Figures inside the parenthesis represent percentage)

The table explains the reduction in liquidity after using technology banking across income groups. Both in urban as well as rural case, all those who earn above Rs 50000 per month experience much reduction in liquidity. This has been

followed by those who earn Rs 25000 to Rs50000 a month. Among those who earn between Rs 25000 Rs50000, 94.8 per cent in urban area and 91.7 per cent in rural area of the same opinion. Those who earn less than Rs 5000 a month, irrespective of their area, do not find a reduction in liquidity due to advent of technology banking as they are not users.

#### **5.14 Disparities in the acceptance of technology banking**

From the primary survey, it is evident that technology banking has been accepted only by a section of the society. The awareness regarding the technological advancements has been studied (section 5.5) across socio-economic groups which reveals that urban people have a better level of awareness regarding technology banking products comparing to their rural counterparts. Debit card is the most popular technology banking instruments in rural area, 87.8 per cent of the rural residents are aware of debit cards. In terms of gender, males have a better awareness than females, again with an urban bias. The level of awareness is higher as the education and income increases. Youngsters seem to be more aware of technology banking especially those who are engaged in regular activities and business activities. The Technology Banking Acceptance Index has been used to study the acceptance of technology banking. The acceptance is high for young, high earning; educated, urban males as they find technology banking as useful and they find it easy to use. Whereas other sections of the respondents, i.e., less educated, low income earning rural respondents does not find usefulness for technology banking instruments and does not possess the skill to use them. Thus the use of technology banking by certain section of the society is creating a digital divide, i.e., users and non-users of technology banking and this divide is aggravated when the Scheduled Commercial banks move forward to meet the growing demand of users of technology banking by creating advanced versions of technology banking instruments. Thus the scope of technology banking as a means to achieve financial inclusion is narrowed here.



Technology is fast changing and does not suit every economic agent. Therefore, while implementing technology based instruments, the feasibility has to be checked and should be user friendly so that the beneficiaries of all sections of the society can use it and the benefits can be reaped fully. Only then, technology can be considered as a means to reduce inequalities and cater inclusive growth.

### **5.15 Problems while using technology banking**

It is widely known, India lags behind in technology banking comparing to developed nations. The infrastructural facilities, which are a pre requisite for the working of digital banking is not fully fledged in India leading to difficulties for those who use technology banking. This section deals with the problems faced by customers while using technology banking. Here, for the purpose of study, 17 commonly faced problems are taken. The problems were presented in the form of statements using five point likert scale to collect opinion from the customers. The factor analysis has been used to reduce the data collected on 17 variables in to smaller number of manageable variables by exploring common dimensions existing among the variables.

The problems identified are

1. Blocking of plastic cards
2. ATMs going out of cash
3. non printing of statements
4. ATMs out of order
5. long queue before ATM counters
6. reduction in balance without cash payments or failure of transfer of funds
7. restricted amount of transaction
8. lack of information for net banking
9. leaving operations unfinished during net banking
10. lengthy procedure for net banking
11. lack of appropriate software for net banking
12. restricted delivery of services during off time
13. lack of appropriate software for mobile banking
14. lengthy procedure for mobile banking
15. lengthy procedure for operating ATMs
16. difficulty in remembering pass words

17. Fear of loss of plastic cards.

**5.15.1 Problems related to ATMs**

**Table 5.15.1  
Problems related to ATMs**

Problems	Very high		high		moderate		Low		Very low		Total	
	urban	rural	urban	rural	urban	rural	urban	rural	urban	rural	urban	rural
Pass word	0 (0)	0 (0)	6 (3.8)	24 (14.4)	8 (5.1)	23 (13.8)	104 (66.2)	63 (37.7)	39 (24.8)	57 (34.1)	157 (100)	167 (100)
Fear	32 (20.4)	10 (6)	41 (26.1)	69 (41.3)	23 (14.6)	36 (21.6)	41 (26.1)	32 (19.2)	20 (12.7)	20 (12)	157 (100)	167 (100)
Queue	35 (22.3)	7 (4.2)	66 (42)	80 (47.9)	29 (18.5)	53 (31.7)	25 (15.9)	25 (15)	2 (1.3)	2 (1.2)	157 (100)	167 (100)
Out of cash	1 (0.6)	1 (0.6)	70 (44.6)	79 (47.3)	28 (17.8)	40 (24)	56 (35.7)	45 (26.9)	2 (1.3)	2 (1.2)	157 (100)	167 (100)
Out of order	1 (0.6)	16 (9.6)	122 (77.7)	79 (47.3)	20 (12.7)	42 (25.1)	12 (7.6)	28 (16.8)	2 (1.3)	2 (1.2)	157 (100)	167 (100)
Delivery restrictions	3 (1.9)	8 (4.8)	41 (26.1)	28 (16.8)	51 (32.5)	75 (44.9)	54 (34.4)	53 (31.7)	8 (5.1)	3 (1.8)	157 (100)	167 (100)
Lengthy ATM procedures	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	118 (75.2)	73 (43.7)	39 (24.8)	94 (56.3)	157 (100)	167 (100)
Non printing statements	1 (0.6)	0 (0)	48 (30.6)	66 (39.5)	84 (53.5)	73 (43.7)	22 (14)	26 (15.6)	2 (1.3)	2 (1.2)	157 (100)	167 (100)
Blocking	2 (1.3)	0 (0)	9 (5.7)	19 (11.4)	49 (31.2)	48 (28.7)	81 (51.6)	91 (54.5)	16 (10.2)	9 (5.4)	157 (100)	167 (100)
Amount restrictions	0 (0)	1 (0.6)	28 (17.8)	46 (27.5)	36 (22.9)	62 (37.1)	92 (58.6)	51 (30.5)	1 (0.6)	7 (4.2)	157 (100)	167 (100)
Balance reduction	0 (0)	0 (0)	10 (6.4)	15 (9)	29 (18.5)	9 (5.4)	61 (38.9)	58 (34.7)	57 (36.3)	85 (50.9)	157 (100)	167 (100)

*Source: primary survey*

*(Figures inside the parenthesis represent percentage)*

The main problems faced by users of ATM cards are given in the table. 22.3 per cent urban users opined that they face long queues whereas in rural area only 4.2 per cent faces the same. 20 per cent urban residents have fear of losing their plastic cards whereas only 6 per cent users in rural area expressed the same

concern. In rural area, lack of proper maintenance of machines seems to be the main problem. Thus there is a difference in concerns regarding ATMs in rural and urban area.

### 5.15.2 Problems related to mobile banking and internet banking

**Table 5.15.2**

#### **Problems related to mobile banking and internet banking**

Problems	Very high		high		moderate		Low		Very low		Total	
	urban	rural	urban	rural	urban	rural	urban	rural	urban	rural	urban	rural
Lack of information for i-banking	0 (0)	0 (0)	12 (30)	10 (58.8)	5 (12.5)	3 (17.6)	23 (57.5)	4 (23.5)	0 (0)	0 (0)	40 (100)	17 (100)
Leaving operation incomplete	0 (0)	0 (0)	15 (37.5)	6 (35.3)	11 (27.5)	0 (0)	13 (32.5)	0 (0)	1 (2.5)	11 (64.7)	40 (100)	17 (100)
Lengthy procedure for i-banking	0 (0)	0 (0)	0 (0)	14 (82.4)	1 (2.5)	1 (5.9)	39 (97.5)	2 (11.8)	0 (0)	0 (0)	40 (100)	17 (100)
Lack of software for i-banking	0 (0)	0 (0)	7 (17.5)	4 (23.5)	0 (0)	0 (0)	33 (82.5)	13 (76.5)	0 (0)	0 (0)	40 (100)	17 (100)
Lack of software for m-banking	0 (0)	0 (0)	1 (1.8)	13 (30.2)	45 (80.4)	17 (39.5)	9 (16.1)	11 (25.6)	1 (1.8)	2 (4.7)	40 (100)	17 (100)
Lengthy m-banking procedures	0 (0)	0 (0)	2 (3.6)	11 (25.6)	11 (19.6)	15 (34.9)	43 (76.8)	15 (34.9)	0 (0)	2 (4.7)	40 (100)	17 (100)

*Source: primary survey*

*(Figures inside the parenthesis represent percentage)*

The table gives insights in to the problems faced by the users of mobile banking and internet banking. In urban area, customers find difficulty in using internet banking mainly because of internet connectivity problems. 37.5 per cent of the users opine that often they are forced to leave their net banking operations in between due to internet problems. 82.4 per cent of rural users highly find the net banking procedures as cumber some and lengthy. Technology banking would have been easier for them if there is appropriate and customer friendly software for both internet banking and mobile banking.

### 5.15.3 Cronbach's reliability test

The Cronbach's reliability test has been performed to check the reliability of the variables taken.

**Table 5.15.3**

#### **Reliability Statistics**

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	Number of Items
0.961	0.959	17

*Source: primary survey*

The Cronbach's Alpha for the reliability test is 0.961 which indicates that the internal consistency for the scale in this context is high and no item has been deleted.

### 5.15.4 Factor analysis

Factor analysis is a technique that is used to reduce a large number of variables into fewer numbers of factors. Factor analysis extracts maximum common variance from all variables and puts them into a common score.

**Table 5.15.4**

#### **KMO and Bartlett's Test**

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.915
Bartlett's Test of Sphericity	Approx. Chi-Square	50396.877
	df	136
	Sig.	.000

High value of KMO (0.915 > 5) of indicates that a factor analysis is useful for the present data. The significant value for Bartlett's test of Sphericity is 000 and is less than 5 which indicates that there exist significant relationships among the variables (Table-5.2). The resultant value of KMO test and Bartlett's test indicate that the present data is useful for factor analysis.

By using Principal Component Analysis method, the number of factors to be derived is decided. Those factors for which the Eigen value is greater than unity is taken. The total variance accounted for, by the two factors with Eigen value greater than 1 is 94.29 percent and the remaining variance is explained by other variables. Among the two factors, the first factor accounts for 64.57 percent of variance which is the represents the major problem faced by technology banking users.

**Table 5.15.5**  
**Rotated Component Matrix<sup>a</sup>**

	Component	
	1	2
Difficulty in remembering pass words	.996	
Fear of loss of plastic cards	.996	
Long queue before ATM counters	.996	
ATM machines out of cash	.996	
ATM machines out of order	.995	
Restricted delivery of services during off time	.995	
Lengthy procedures for operating ATMs	.995	
Non printing of statements	.995	
Blocking of plastic cards	.995	
Restricted amount of transactions	.995	.100
Reduction in balance without cash payments/ failure in transfer of funds	.995	.101
Lengthy procedure for net banking	.138	.958
Lack of appropriate software for net banking	.138	.957
Lack of information for net banking	.139	.957
Leaving operations unfinished during net banking	.138	.957
Lack of appropriate software for mobile banking		.805
Lengthy procedure for mobile banking		.802

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization

a. Rotation converged in 3 iterations

It can be seen from the table that the statements are converted in to 2 factors using factor analysis. The first factor includes 11 statements which are problems faced by customers while using technology banking. The statements are

difficulty in remembering pass words, Fear of loss of plastic cards, Long queue before ATM counters, ATM machines out of cash, ATM machines out of order, Restricted delivery of services during off time, Lengthy procedures for operating ATMs, Non printing of statements, Blocking of plastic cards, Restricted amount of transactions and Reduction in balance without cash payments/ failure in transfer of funds. The second factor includes 6 statements or problems and they are Lengthy procedure for net banking, Lack of appropriate software for net banking, Lack of information for net banking, leaving operations unfinished during net banking, Lack of appropriate software for mobile banking, and Lengthy procedure for mobile banking.

**Table 5.15.6**

**Factors and variance explained**

S. No	Problems	Variance Explained
1	Problems associated with ATMs.	64.572
2	Problems associated with internet banking and mobile banking.	29.718

In table 5.5, the derived factors through factor analysis are renamed and the percentage of variance explained by the two factors is also given. The first factor is renamed as problems associated with ATMs and it explains 64.57 per cent of variance. The second factor is renamed as problems associated with internet banking and mobile banking which explains 29.72 per cent of variance.

## 5.16 Reasons for not using technology banking

Table 5.16.1

### Reasons for not using technology banking

Reasons	Strongly disagree		disagree		No opinion		agree		Strongly agree		total	
	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural
Inaccessible	29 (18.1)	23 (10.8)	17 (10.6)	19 (8.9)	62 (38.8)	93 (43.7)	52 (32.5)	69 (2.4)	0 (0.0)	9 (4.2)	160 (100.0)	213 (100.0)
Lack of human touch	26 (16.3)	35 (16.4)	6 (3.8)	6 (2.8)	40 (25.0)	74 (34.7)	53 (33.1)	71 (3.3)	35 (21.9)	27 (12.7)	160 (100.0)	213 (100.0)
Lack of knowledge	39 (24.4)	27 (12.7)	17 (10.6)	20 (9.4)	28 (17.5)	15 (7.0)	5 (3.1)	13 (6.1)	71 (44.4)	13 (6.8)	160 (100.0)	213 (100.0)
Costly	56 (35.0)	26 (12.2)	25 (15.6)	31 (14.6)	70 (43.8)	138 (64.8)	9 (5.6)	13 (6.1)	0 (0.0)	5 (2.3)	160 (100.0)	213 (100.0)
Risky	0 (0.0)	23 (10.8)	0 (0.0)	0 (0.0)	44 (27.5)	59 (27.7)	22 (13.8)	70 (2.9)	94 (58.8)	61 (28.6)	160 (100.0)	213 (100.0)
No perceived needs	0 (0.0)	23 (10.8)	0 (0.0)	0 (0.0)	0 (0.0)	4 (1.9)	36 (22.5)	74 (4.7)	12 (7.5)	11 (5.2)	160 (100.0)	213 (100.0)

Source: primary survey

The table throws light in to why customers are reluctant towards using technology banking. In rural area, the main reason for not using technology banking instruments is lack of knowledge (64.8 per cent) whereas in urban area,

it is because of lack of perceived needs (77.5 per cent). The other reasons are inaccessibility, technology banking usage incurs an extra cost and it involves risk. In order to popularize technology banking instruments, people should be made aware of technology banking; it should be made risk free and should spread digital literacy.

### **5.17 Conclusion**

It has been clearly stated in the chapter that even though technology banking have many benefits, those benefits have been reaped only by a particular section in the economy. The disparities in usage of technology banking across socio-economic variables are visible. A male dominated urban youth with high education and digital literacy and high earnings find it useful and easy to use. It is also affordable for them than other sections of the society. The majority are sidelined. But those who are using it enjoy a wider choice of banking channels in a cost effective and time saving manner. Thus technology banking itself is creating digital divide between the users and non users of technology banking. While using technology banking for achieving financial inclusion, this has to be kept in mind and should use technology banking as a tool for financial inclusion with caution.



## *Chapter VI*

### *Summary, Findings and Conclusion*

## Chapter VI

### Summary, Findings and Conclusion

#### 6.1 Summary of the study

Technology revolution has picked up its pace in India after the introduction of globalization, privatization and liberalization. Technology adoption was experienced in every walk of life and banking sector was not an exception. It has reengineered business process and made banking services branchless by paving way for E-banking. A thorough study of the banking literature gives insights on technology adoption by banks and technology acceptance by customers. We can find that information technology adoption is still continuing in Indian banks but most of the studies points out customer reluctance towards technology banking towards due to socio economic constructs and the perception of the customers. This stands as a hindrance to exploring the full potential and benefits of technology banking, especially in achieving one of the important aims of financial inclusion.

Since the technology adoption in Indian banking sector is continuing, there is a need for reassessing the extend of technological innovations in banking and how far technology banking has been adopted and accepted by banking sector customers belonging to various socio-economic groups, its determinants and possible implication on financial inclusion. Today a lot of efforts are taking place to spread digitalization in all the sectors. Comparing to other states, Kerala has a higher profile of socio-economic factors. Many studies have conducted regarding the acceptance and adoption of technology banking in urban Kerala. It is imperative to look in to technology banking adoption and acceptance among various socio-economic groups as the existing literature gives the possibility of having disparities across socio-economic groups in terms of gender, age, education, activity, income and area of residence. Thus the study tries to find out the extent of technological innovations in banking, acceptance and usage of technology banking among the sample

respondents and the socio-economic disparities in acceptance and usage of technology banking and there by its implications on financial inclusion.

The study makes use of both primary data and secondary data. The secondary data is collected from various publications of RBI, economic survey etc. the secondary data. The primary data has been collected from two districts in kerala-Ernamkulum and Thrissur. The sample size is 430. Likert scale has been used to catch customer attitude. In order to analyze the data, indexes has been made and the hypothesis has been tested using chi square. To identify the problems in using technology banking factor analysis has done. The secondary data analysis shows that the demand for technology banking instruments are increasing as the transaction through technology banking instruments is on rise. But technology banking is often affected by international conditions too. The primary data analysis throws light on the general banking habits of the customers, their internet usage frequency and pattern and their technology banking usage and acceptance. While choosing a bank the customers irrespective of their region are bothered about the safety and security. Majority of the customers preferred nationalized banks as the numbers of branches are more and customers believe them to be safe. Private Banks are preferred by those who are fond of customer care whereas foreign banks are not so popular among the respondents. While choosing their bank in rural area, technology banking users often looks at the ATM facilities whereas in urban area, they are more conscious about internet banking facilities. The bank employees are the first hand source of information for the respondents. In the case of internet usage, there exists a disparity across various socio-economic groups. It is widely used by young educated urban males. The same trend can be seen in the usage of technology banking too. One difference is that, in the case of technology banking usage there no gender difference among those who are always using technology banking. But apart from regular users, there exist gender disparity. The main purpose of using ATM is to withdraw cash whereas internet banking is widely used by users for transaction purpose. Mobile banking is mainly used for receiving SMS alerts. The main problems suffered by ATM users in urban area

is long queues in front of ATM counter and fear of losing plastic cards, whereas the rural ATM users complain about out of order ATM machines. Those who use internet banking and mobile banking in urban area always face internet connectivity problems while performing online transactions. The rural users do find the internet banking procedures as lengthy. The main reason for not using technology banking in urban area is because they don't have any perceived needs to use them as they are happy with traditional banking methods, whereas in rural area the main obstacle is lack of knowledge.

The primary data analysis reveals that the technology banking is only popular among certain sections of the society. Its reach is limited with urban males who are educated young and with high income. It is argued that technology banking when used well can help in achieving financial inclusion. But in the current context, where technology banking can be mainly used by a certain section, its capability to achieve financial inclusion is doubtful. Thus the technology itself requires modifications to suit the needs of the customer from any socio-economic strata.

## **6.2 Findings of the study**

The study uses both secondary and primary data to satisfy the objectives. The first objective is to assess the extent of technological innovations in banking which is fully based on secondary data published by the Reserve Bank of India by using growth rate and trend line. The second objective is to examine the acceptance and usage of technology banking among the sample respondents. The objective is based on primary data and in order to satisfy the same, the general banking perception of the sample customers', their internet accessibility and usage is examined and their acceptance is studied by constructing Technology Banking Acceptance Index using the elements of Technology Acceptance Model. The third objective is to analyze the socio-economic disparities in the acceptance of technology banking. The samples collected has been categorized in to groups on the basis gender, age, area of residence, education, activity and income and their acceptance of technology has been examined through a chi-

square analysis. The purpose for which the sample respondents belonging to both urban and rural area uses technology banking instruments such as ATM, internet banking and mobile banking is used and whether it has affected their frequency of bank branch visit and their liquidity position has been examined. The problems in using technology banking have been studied using factor analysis. Finally the reasons for not using technology banking instruments are also examined. The fourth objective is to examine the implication of acceptance of technology banking on financial inclusion, which has been inferred from the study.

The findings are presented together with the objectives.

**I. To assess the extent of technological innovations in banking.**

1. The secondary data analysis shows that the demand for technology banking instruments such as RTGS, NEFT, and ECS, mobile banking, internet banking, mobile wallets, debit card and credit cards are increasing.
2. The electronic payments are affected by international factors. As a consequence of global financial crisis in 2007-'08, the electronic payments experienced a decline. The uncertain and risky situation, the unemployment in IT sector could be the reasons for such a decline.

**II. To examine the acceptance and usage of technology banking among the sample respondents.**

**III. To analyze the socio-economic disparities in the acceptance of technology banking.**

The Second and third objectives have been analyzed together.

Here the first discussion is about the general banking perceptions of the customers.

1. The main factor that affects the choice of a bank by a customer is safety and security. 78.6 percent of sample respondents opined so. It is followed by convenient location and trust in bank. In urban area, 81.4 per cent

respondents choose banks on the basis of their salary account. Regarding technology based facilities, in urban area customers do look in to internet banking facilities and mobile banking facilities whereas in rural area ATM is the prominent factor.

2. The preference is for nationalized banks as the numbers of branches are more and customers believe them to be safe. Those who prefer private banks are attracted by the customer care offered by them. Foreign banks are less popular as they are urban centric.
3. The main first hand source of information about new banking products to the customers are bank employees. In rural area, after bank employees it is the friends and relatives. Among the technology based sources SMS is the most popular one.
4. Regarding the branch visit by the customer, none in urban area visit their home branch more than twice in a month mainly because they use technology banking. The main purpose of visiting bank branch is for cash withdrawal especially for rural residents.
5. 62.9 per cent urban residents and 37.1 per cent rural residents have their bank branch with 5 kilometers from their residence.
6. ATM is the preferred method to know account details both in rural and urban area even though in rural area not everyone handles ATM on their own.
7. To communicate about new banking services, the preferred way is person to person approach followed by SMS.
8. Frequency of using banking services is more among urban residents than rural ones. In urban area, 80.8 per cent uses banking services more than twice a month whereas in rural area only 19.2 per cent uses banking services more than two times in a month.

The internet accessibility, usage pattern and number of years of internet usage across various socio-economic groups have been studied. The findings are:

1. Urban customers had more accessibility and experience in using internet comparing to the rural counter parts. 37 per cent of urban bank customers and 52.6 per cent of rural bank customers are not using internet. 16.5 per cent of urban customers has been using for more than 6 years whereas in rural area it is only 10.4 per cent.
2. There exists a difference between males and females across area in the case of number of years of internet usage. In rural area, among those who uses internet for more than 6 years, there exists a gender disparity as 13.7 per cent are men whereas only 6.1 per cent are women but there is no gender disparity in urban area regarding the long term users. It is found that internet penetration is a recent phenomenon in rural area.
3. Customers with high qualification has started using internet long before and has more experience with them. Majority of the less qualified people are not at all using internet.
4. Customers who are employed in regular sector and business class have been using internet for longer period.
5. Both in urban as well as rural area, respondents between the age of 35 to 59 years are having more than 6 years of experience in using internet. But frequency of using internet is high among the youth who are less than 35 years
6. High income people have been using internet for long period as they can afford it than other income groups. Also once internet was considered as a matter of status rather than a necessity.
7. It is found that urban residents spent more hours using internet than the rural counter parts. 67.3 per cent of urban respondents spend more than 18 hours per week using internet, whereas in rural area it is only 32.7 per cent.
8. There exists disparity in the frequency of using internet across area. 57.2 per cent urban residents are daily users of internet whereas in rural area it is only 42.8 per cent.

9. Urban residents are performing many activities online on a regular basis comparing to rural residents. This shows their skill in handling computer and internet is much higher than the rural customers. Regarding communication services also, the urban people are using more compared to rural people.
10. Majority of the people browse in their mobiles and lap tops rather than using desktop versions. Both urban and rural people somewhat equally suffer from internet connectivity problems. But problems that emerge out of daily usage such as hanging, file errors, etc has been experienced more by urban respondents which indicates their frequency of usage is high.

The technology banking acceptance and usage has been studied across various socio-economic groups. The awareness about various technology banking instruments and its frequency of usage has been observed. And the acceptance has been captured by using technology banking acceptance index, ease of using technology banking index and usefulness of technology banking index. The usage of technology banking will lead to reduction in number of bank visits and reduction in liquidity. Since India lag behind technology banking when compared to other nations, due to infrastructural constraints the users may face problems in using technology banking has also been studied. The study also looks in to the reasons for not using technology banking. The findings are as follows:

1. The main source of information regarding ATM, internet banking, mobile banking and other services such as RTGS, NEFT and ECS is bank employees.
2. There exist clear disparities in familiarity about technology banking instruments. Regarding the technology banking instruments urban people are more aware of comparing to rural residents. With respect to gender, males are having better awareness about technology banking instruments with an urban bias. It is seen that as education increase awareness about technological innovations in banking too increases. The higher income



earning urban people found it worthy, easy and affordable to indulge in technology banking whereas the lower income people are not. Hence awareness level is also high for them. It is evident from the table that familiarity regarding technological innovations in banking is high among youths in urban area where as in rural area, it very high among retired persons. In urban area, those who are indulged in regular work and in rural area, the business class have the highest level of familiarity with that of developments in technology banking.

3. The technology banking Acceptance Index shows that 85.8 per cent of the sample respondents have low level of technology acceptance. Technology acceptance is high among educated, high earning, young urban youths. In the urban area, there is not much variation between male and female in the case of high technology adoption. In urban as well as rural area, professional degree holders have the high level of technology adoption because of the digital literacy and tech savvy nature of the professional group. Such a group has high level of easiness and usefulness in using technology banking and thus has a high level of technology banking acceptance. The group which uses technology banking heavily experiences a reduction in both bank visits and liquidity in hand.
4. Debit cards are the most familiar technology banking instrument for rural residents due to government efforts through various programs. Internet banking is more prominent among urban residents than rural residents and SMS is popular as most of them have subscribed for SMS alerts.
5. The main purpose for which the ATM card is used is for enquiring the balance in account and for withdrawal of cash where as net banking is intensively used by urban residents for balance enquiry, shopping and payment of utility bills. Mobile banking is mainly used to receive SMS alerts.
6. The main problems suffered by ATM users in urban area is long queues in from of ATM counter and fear of losing plastic cards, whereas the rural ATM users complaints about of out of order ATM machines. Those who

use internet banking and mobile banking in urban area always face internet connectivity problems while performing online transactions. The rural users do find the internet banking procedures as lengthy.

7. The main reason for not using technology banking in urban area is because they don't have any perceived needs to use them as they are happy with traditional banking methods, whereas in rural area the main obstacle is lack of knowledge.

#### **IV. To examine the implications of acceptance of technology banking on financial inclusion**

1. The primary data analysis reveals that the technology banking is only popular among certain sections of the society. Its reach is limited with urban males who are educated young and with high income. It is argued that technology banking when used well can help in achieving financial inclusion. But in the current context, its capability to achieve financial inclusion is doubtful. The use of technology banking by a section of society leads to digital divide, which is a form of inequality. It creates two classes in the society –users and non-users of technology banking. Those who are financially excluded are from rural region and less educated, low earning members and technology banking may not worthy and affordable for them. Digital literacy and accessibility to internet are the pre-requisite in using technology banking which is absent among less educated rural people. They may not have enough digital literacy to operate technology banking and may not find need for the same. Thus it may not be easy to achieve financial inclusion via, technology banking, unless location specific efforts have been taken so that technology banking becomes user friendly and affordable to all. Only then the customers can find perceived needs to use technology banking to become a part of formal financial system.

### **6.3 Contribution of the researcher**

The present study contributes to the literature as well as to the society. They are:

1. A number of studies are available in technology banking in Commerce, but in studies in the line of Economics is few. In Kerala, the studies available in technology banking focus only on urban customers.
2. The socio-economic disparities existing in the usage of technology banking has been analyzed in Kerala context.
3. The study highlights the need for being conscious while using technology banking for achieving financial inclusion.

### **6.4 Policy implications**

The study has looked in to suggestions that can improve the efficiency of technology banking and its usage.

1. The internet connectivity and its speed should be improved. It should be affordable for all sections of the society. An information super highway should be built.
2. To popularize internet banking or mobile banking, smart phone or any such device is a pre requisite. Regarding such devices, affordability and its usage is a problem for low income and illiterate people.
3. The maintenance and security of ATMs should be ensured especially in rural areas.
4. Efforts should be taken in order to improve over all security in transactions, which will improve confidence in customers.
5. Together with banks, government and citizens should join hands to popularize technology banking. A well defined institutional frame work together with private investments can make a change.
6. The Business Correspondence model can be continued so that in the absence of a physical bank branch, people can avail banking facilities.

They can be used to spread digital and financial literacy among people from rural areas.

7. Constant efforts to create digital literacy are also required.

## **6.5 Conclusion**

Cash has been in use for over 2600 years and is the dominant form of transaction. But undoubtedly, digital payments are more efficient than cash payments as it can reduce the cost of wages, social security payments and can contribute to financial inclusion. Our present study gives insight into the acceptance pattern of digital banking in Kerala context and the socio-economic disparities in it. Even though Kerala has a high level of socio-economic indicators; disparities can be traced across gender, education groups, activity groups, age groups and income groups with urban bias. Hence it is obvious that the benefits of technology banking are not reaching the backward sections of the society who should actually be brought to the mainstream financial activity. Also by the acceptance of technology banking by one section of the society alone, is creating digital divide. Thus how to achieve financial inclusion via technology banking requires a deep thought. It should be also considered, it is for the people to have the incentives to decide whether it makes sense for them to transact in cash or in digital form. To make the benefits for technology banking available for vulnerable sections, conscious and deliberate efforts should be taken by the government and banks together. The technology basically has certain in-built problems as it is changing from time to time which makes it unaffordable for certain sections. Also the masses may lack the knowledge to handle the changing technology. Thus the focus should be addressing the challenges, to make a new pathway into the financial system for the disadvantaged via technology banking.

## **6.6 Limitations of the study**

The study is not free from limitations. The major limitations are:

1. The availability of secondary data sources is limited as it is a recent phenomenon in Indian economy. The RBI has started publishing data on major variables from 2005 onwards and data on some of the variables are available only from 2011 onwards.
2. The limitations of factor analysis and chi-square are the limitations of the study also.
3. Time and cost constraints were involved as the selected sampling type is purposive sampling and all the limitations of purposive sampling is reflected in the study too.
4. The survey has done only in two districts of Kerala and the sample size is 430 individuals.
5. The study is in lines with the basic Technology Acceptance Model and modified versions of TAM has not considered.

## **6.7 Areas for future research**

1. Acceptance of technology banking can be analyzed using modified versions of Technology acceptance Model with additional variables.
2. The legal issues and security aspects of technology banking can be studied which is the need of the hour.
3. Attempts can be made to build models of financial inclusion via technology banking taking in to consideration the inferences made by the present study.

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## *Appendix*



## APPENDIX 1

### TECHNOLOGY BANKING IN KERALA: SOCIO-ECONOMIC DISPARITIES AND IMPLICATIONS IN ACCEPTANCE

#### SCHEDULE

1. Name :
2. Gender : Male   
Female
3. Marital status :
4. Age :
5. Educational qualification.....
6. Activity status: .....
7. The organization you work belongs to  
Public sector   
Private sector   
Non- profit organization   
Others
8. Monthly income: .....
9. Do you have a bank account?  
Yes   
No
10. In which all banks you have account?  
.....
11. Mention the type of account you hold?  
Current account   
Saving account   
Fixed account
12. Which bank you prefer as the best bank?  
National banks   
Private Banks   
Foreign banks   
Others
13. Reason for preference  
.....  
.....
14. How far is your bank branch?.....

15. Please rank the factors you consider while choosing a bank

factors	Strongly disagree	Disagree	No opinion	Agree	Strongly agree
Bank offers security in transactions					
Reputation enjoyed by the bank					
The bank is trust worthy					
Banking procedures are easy					
The bank is conveniently located					
Satisfactory approach of the employees					
Salary account					
Number of ATMs					
ATM services offered by bank					
Internet banking facilities					
Mobile banking facilities					
Other technology related factors such as NEFT, RTGS. ECS,etc					

16. Please rank the source of information about new banking products and services

Source	
Advertisement	
Friends and relatives	
Brochures and booklets	
Bank employees	
Training and demo	
Bank websites	
Bank notifications (e-mails and SMS )	

17. For what all needs you depend your bank

services	Always	Regularly	Frequently	occasionally	rarely	never
deposits						
loans						
Withdraw money						
Payment of electricity bills						
Payment of telephone bills						
Payment of insurance premium						
Payment of rent						
Money transfer						
Demat account						
Purchase and sale of shares						
Investment in bank's mutual funds						
Currency trading						

Others.....  
 .....

18. Mention the frequency of visiting your bank in a month.....

19. Rank the reasons for which you visit your bank branch

Reasons	Ranks
To make deposit	
To avail loan facilities	
To get advice for investment options	
To inquire about balance	
To withdraw cash	
To register complaint	
To apply for new services	
To pay interest on loan	
Utility services (bill payments, rent payment, Premium payment etc..)	
To collect grants, fellowships and other government financial assistance	
To avail locker facility	

20. How do you usually pay your bills? (please rank)

PAYMENT POINTS	RANKS
Direct to company	
At the bank teller	
ATMs	
Pay outlet by company	
Third party pay outlet	
Mobile banking	
internet banking	
By cheque	
Credit cards	
Prepaid cards	
others	

21. Mention the frequency of using banking services in a month

- Nil   
 Once in a month   
 1 to 3 times   
 3 to 5 times   
 Above 5 times

22. Please rank the following according to your preference to know your account details

ATM	
Internet banking	
Mobile banking	
Pass book	
Memory recall	

23. Rank the means by which you want your banks to communicate about new services and products

MEANS	RANK
Person to person	
Telephone call	
TV advertisements	
Radio advertisements	
Print advertisements (news paper, notice etc..)	
Bill boards / outdoor advertisements)	
Community members	
Mail	
SMS	
e-mails	

### COMPUTER AND INTERNET USAGE

- How long have you been using the Internet?.....
- From which of the following places you access internet?.....
- Frequency of using internet in a week .....
- How much time you spend on internet in a week?.....
- Mention the speed of internet that you usually use.....
- Are you satisfied with the speed of internet facility available  
Yes   
No
- Mention the operating system you usually use.....
- Mention the browser you usually use.....
- Are you browsing in  
Mobile   
Desktop   
Lap top/tab/notebook
- Which of the following you have done online?

services	Always	Regularly	Frequently	occasionally	rarely	never
Ordered product						
Purchased products online						
Online chats and discussions						
Entertainment activities						
Registered complaints						
Listened online classes						

Participated in academic discussions and debates						
Tax filing						

11. What all communication services you usually use, please rank them according to the usage.

SERVICES	Always	regularly	Frequently	occasionally	rarely	never
E-mail						
Video conferencing						
Voice chat						
SMS						
others						

12. Mention the problems in using computer.....

### TECHNOLOGY BANKING

1. Are you familiar with technological advancements in banking sector?

- Very high
- High
- Moderate
- Low
- Very low

2. Rank the source of information on technology banking

Source	ATMs	internet banking	mobile banking	other e-banking services
Advertisement				
Friends and relatives				
Brochures and booklets				
Bank employees				
Training and demo				
Bank websites				
Bank notifications (e-mails and SMS )				

3. What are the technology-based services known to you?

Services	
Debit card	
Credit card	
RTGS	
EFT	
ECS	
NEFT	
Mobile banking	
PC banking	
Tele-banking	
Point of sales	
Pass book updating machine	
Cash deposit machine	

4. Please mention the services opted by you

Services	
Debit card	
Credit card	
RTGS	
EFT	
ECS	
NEFT	
Mobile banking	
PC banking	
Tele-banking	
Point of sales	
Cash deposit machine	
Pass book updating machine	
Automatic cheque clearance	

5. Which category of banks you consider as most technologically advanced?

SERVICES	NATIONAL BANKS	PRIVATE BANKS	FOREIGN BANKS	OTHERS (COOPERATIVE BANKS)
ATM				
Internet banking				
Mobile banking				
Tele banking				

6. Have you ever switched to other banks to avail better technology based services? If so

From which bank.....to which bank.....

7. Have you installed any software related to your banking activities?

Yes

No

If yes, specify .....

8. Rank the factors that encourage you to use the new techniques in banking?

FACTORS	Strongly disagree	Disagree	No opinion	Agree	Strongly agree
Time saving					
Cost effective					
Ease of use					
Technology savvy					
prestigious					
privacy					
efficiency					
security					
Reliability and trust					

9. Mention the frequency of using the mentioned technology banking services.

Services	Frequency
ATM	
Internet banking	
Mobile banking	
Tele banking	
others	

10. Mention the time period for which you have been using technology banking services

Services	Time period
ATM	
Internet banking	
Mobile banking	
Tele banking	
others	



11. Does your visit to bank have reduced due to E-banking?

- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly disagree

If so, which service has contributed much in this regard

.....

12. Due to E-banking , whether there is a reduction in keeping liquid cash

- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly disagree

13. Do you used to update passbook after E-banking transactions

SERVICES	Always	Regularly	Frequently	Occasionally	Rarely	Never
ATM						
Internet banking						
Mobile banking						
Tele banking						
others						

14. Please mention your practice of changing PIN

services	Always	regularly	Frequently	occasionally	rarely	never
ATM						
Internet banking						
Mobile banking						
Tele banking						
others						

15. Mention the level of satisfaction regarding the following banking attributes

attributes	very high	high	moderate	low	very low
Modern and up to date equipments and technology					
Sufficiency in number of					

ATMs					
Sufficiency in number cash counting machines					
Sufficiency in Passbook updating machine					
Sufficiency in Cash deposit machines					
Information provided in website are reliable and up to date					
Wide range of products and services are offered					
Handling of requests for technology banking services					
Responsiveness of customer service representative					
speed in offering services					
Speed in confirmation					
Bank website does not freeze after uploading the customer information					
Employees of the banks have the knowledge to answer					
Willingness of the employees					

to help					
Experienced management team					
Time bound work of employees					
Sufficiency in number of help desks and call centers					
Provisions for financial advices					
Understanding on Specific needs					
Faster log in facility					
Performance of plastic cards					
Fast and efficient transfer of funds					
Fast and efficient clearing services					
Language and information content on ATMs					
Language and information content regarding net banking usage					
Language and information content regarding mobile banking usage					
Easy to reverse a transaction					

already done					
Clarity of information given in website					
Easy navigation of mobile banking menu					
Easiness of navigation of internet banking page					
Easiness of transfer of money via mobile banking					
Easiness of transfer of money via internet banking					
Easiness of transfer of money via ATMs					
Easiness in balance enquiry via ATMs					
Easiness in balance enquiry via mobile banking					
Easiness in balance enquiry via internet banking					
Capability of bank in solving complaints					
Customer feedback services					
Methods to					

educate new users					
Special services for elders and differently abled					
Cost effectiveness of ATMs					
Cost effectiveness of net banking					
Cost effectiveness of mobile banking					
Security for ATMs					
Security for internet banking transactions					
Security for mobile banking transactions					
Privacy of customer data in data warehouses					
Online filing of data					

16. Mention the level of satisfaction from using the mentioned technology banking services.

services	very high	high	moderate	low	very low
ATM					
Internet banking					
Mobile banking					
Tele banking					
others					

17. Please mention the frequency of facing the following technology banking problems

problems	very high	high	moderate	low	verylow/never
Blocking of plastic cards					
ATM machines out of cash					
Non-printing of statements					
Machines out of order (ATMs, check printing, cash depositing machines, pass book updating machines)					
Long waiting in queue before ATM counters					
Reduction in balance without cash payments (debit cards and credit cards)					
Restricted amount of transactions					
Not providing adequate information for net banking					
Leaving the operations unfinished during net					

banking					
Lengthy procedure in net banking					
Lack of appropriate softwares for net banking					
Restricted delivery of services during off time					
Lack of appropriate software for mobile banking					
Lengthy procedure in performing mobile banking					
Lengthy procedure of operating ATMs					
Difficulty in remembering passwords					
Fear of loss of plastic cards					

If additional problems, please mention

.....

.....

.....

.....

.....

.....

19. Which banks ATM card you possess?

.....  
 .....  
 .....

If there is more than one card, reasons for preferring to own more than one card.

.....  
 .....  
 .....  
 .....

21. Mention the purpose of using ATMs

PURPOSES	VERY HIGH	HIGH	MODERATE	LOW	VERY LOW
To know account balance					
To withdraw money					
To transfer money					
To get mini statement of the account					
To shop					
Commodity dealings and investment					
Pension funds					
Stipend and other fellowships					
Make flight charge payments					
To pay tax and utility bills( insurance premium, electricity bills etc.)					
To reserve tickets					
To recharge mobile, internet etc					
others					



22. Do you use other banks ATMs to do transactions,

Yes

No

If yes, are you aware of the extra charges related to that?

Yes

No

23. Do you have any suggestions regarding the ATM

service.....  
 .....  
 .....  
 .....  
 .....  
 .....  
 .....  
 .....  
 .....  
 .....

24. Which banks mobile banking facilities you have availed, please mention?

.....  
 .....  
 .....  
 .....

25. Mention the purpose of using mobile banking

PURPOSES	VERY HIGH	HIGH	MODERATE	LOW	VERY LOW
To know account balance					
To transfer money					
To deposit money					
To shop					
International remittance					
Commodity dealings and investment					
Pension funds					
Stipend and					

other fellowships					
Make flight charge payments					
To pay tax and utility bills (insurance premium, electricity bills etc.)					
To reserve tickets					
To recharge mobile, internet etc					
To get SMS alerts					
others					

26. Which banks net banking facilities you have availed?

.....  
.....  
.....  
.....

27. If you are using more than one banks net banking facility, please mention the reason

.....  
.....  
.....  
.....

28. Purpose of using net banking

PURPOSES	VERY HIGH	HIGH	MODERATE	LOW	VERY LOW
To know account balance					
To transfer money					
To deposit money					
To shop International					

remittance					
Commodity dealings and investment					
Pension funds					
Stipend and other fellowships					
Make flight charge payments					
To pay tax and utility bills (insurance premium, electricity bills etc.)					
To reserve tickets					
To recharge mobile, internet etc					
others					

29. Reasons for not using e-banking services offered by banks

reasons	Strongly disagree	Disagree	No opinion	Agree	Strongly agree
Inaccessibility					
Lack of human touch					
Lack of knowledge					
Costly					
Risk involved					
No perceived needs					

30. Suggestions regarding improvement of e-banking in your area

.....

.....

.....

.....

.....

.....

## APPENDIX II

### LIST OF PUBLICATIONS

<b>SL NO.</b>	<b>Paper Title</b>	<b>Details of the Journal</b>
1.	Growth of Automated Teller Machines in India	<i>Southern Economist</i> , Vol.53, (21), PP. 13-15, ISSN- 0038-4046.
2.	Women in The Era of Climate Change: The Hard Facts	<i>EPRA, International Journal of Socio-economic and Environmental Outlook (Annual Peer Reviewed Referred International Journal)</i> , Vol.2, PP. 69-71, Impact Factor (2015):0.445, ISSN – 2348-4101.
3.	Technology Banking in India: Status, Benefits and Challenges	<i>EPRA, International Journal of Economic and Business Review (Monthly Peer Reviewed, Referred and Indexed International Journal)</i> , Vol 3 (1), PP 71-76, Impact factor (international): 0.998, ISSN-2349-0187, Online ISSN – 2347-9671.