Chapter - II

Review of Literature

It is an essential part of any research work to review an existing literature related to objectives of the study. It provides an insight of the problem and gives the knowledge about the various parameters. There is a need of available literature because it provides a detail of previous studies to fill up the gaps, if any. There are few studies which are related with the objectives of this study. This chapter is dedicated to previous studies related to electronic banking. Available literature supports to draw some important conclusions about gap of the studies that can serve as a guide mark for the study. Review of literature has been displayed in four parts in this chapter which capture studies related to efficiency of banks, attitude of customers & employees, productivity of banks and technology acceptance model.

2.1 STUDIES RELATED TO EFFICIENCY OF BANKS:

Bhattacharyya et al. (1997) checked efficiency during 1986-1991 among 70 Indian commercial banks. Researchers combined two approaches in this paper i.e. Data Envelopment Analysis (DEA) and stochastic frontier analysis (SFA). DEA was used to calculate technical efficiency and SFA was applied to explain variation in the efficiencies. Researchers concluded that DEA was eminently suitable for examining the performance of Indian banks, due to the institutional framework in which they operate. Banks provide several financial services, which greatly complicates the application of
SFA to quantity data to measure technical efficiency. Results showed improvement over the period of time in the performance of foreign banks. On the other hand, no trend in the performance of privately Indian banks, and a temporal decline in the performance of publicly-owned Indian banks.

Saha and Ravisankar (2000) computed relative efficiency of Indian public sector banks with Data Envelopment Analysis. 25 public sector banks were included in this study and the data was collected from annual reports of banks. The study used post reform period. 1991-92 was taken as starting point and 1994-95 was taken as a terminal point. Result explores that public sector banks have improved their efficiency scores over the observed years. Banks like United Bank of India, UCO Bank, Syndicate Bank and Central Bank of India continued to be at the lower end of the relative efficiency scales during the study period. It was observed that banks like Corporation Bank, Oriental Bank of Commerce, State Bank of India, Canara Bank, State Bank of Hyderabad, Bank of Baroda and Dena Bank have consistently been among the relatively more efficient banks. It was observed that consistent banks were traded much in most of the observed period which depicts that analysis with the help of DEA was consistent enough.

Sathye (2001) found the efficiency scores with the help of DEA using two sets of inputs and outputs. On the basis of one set of inputs and outputs, it was observed that public sector banks have a higher mean efficiency score as compared to the private banks and foreign banks in India. But on the basis of other model, foreign banks have a better efficiency score than other banks.

Sathye (2003) used non-parametric DEA to efficiency scores, for three groups of banks, that is, publicly owned, privately owned and foreign owned. This study used the
data for the year 1997–1998. 27 public sector banks, 33 private sector banks and 34 foreign banks were taken as sample. Thus, the total observations consisted of 94 banks in this study. Two models were used i.e. Model A & Model B. Two input and two output variables, namely, interest expenses, non-interest expenses (inputs) and net interest income and non-interest income (outputs) were taken and referred to as Model A. Deposits and staff numbers as inputs and net loans and non-interest income as outputs were taken and referred to as Model B. These two models were used to show how efficiency scores differ when inputs and outputs were changed in this study. Finding shows that when efficiency was checked with Model A, the public sector banks have a higher mean efficiency score as compared to the private sector and foreign banks in India. On the other side, when model B was applied, they have lower mean efficiency score than the foreign banks but still higher than private sector banks.

Debasish (2006) analyzed ninety-three Indian commercial banks including 27, the public sector, 30 in the private sector and 36 foreign banks. The output-oriented CRR DEA model was applied in this study and taken nine input variables and seven output variables. It was also found that the new banks were more efficient than the old ones, Large-sized & small-sized banks were relatively more efficient than the medium-sized banks. New economy and old economy banks showed an increasing trend in average efficiency although old economy banks were more efficient than new economy banks.

Sanjeev (2006) found the technical Efficiency of the public, private and foreign banks operating in India. The study has also investigated the relationship between the efficiency and the percentage of non-performing assets (NPAs) of the commercial banks operating in India. This all was done with the help of Data Envelopment Analysis (DEA).
This study considered the data of 94 commercial banks which were operating in India during the period 1997-2001. The relationship between the public sector banks and NPAs was significantly negative. The correlation coefficient between efficiency and gross NPAs was -0.52358. The public sector banks displayed the highest negative relationship across public, private and foreign banks. The banks have shown an increase in efficiency in the deregulated era and foreign banks have better than both private sector and public sector banks.

Mostafa (2007a) has taken top 100 Arab Banks to measure the relative efficiency with the help of Data envelopment analysis (DEA) method. Sensitivity analysis with DEA provides rich diagnostic information and it was used in this paper for each bank. Data for the year 2005 were used to conduct this empirical analysis. Researcher has used a commercial package called Frontier Analyst Professional Version 3.0 for this analysis. Finding of the study was this that several banks out of the sample of 100 banks have been found to be operating at a decreasing return to scale. So it was needed for the management of these banks to refrain from further investments in these banks. On the contrary, banks found to be operating under an increasing return to scale may prefer to expand their operations. Analysis revealed inefficiencies prevalent with respect to asset mismanagement in selected Arab banks. Few banks showed that there was considerable scope for reduction of assets.

Mostafa (2007b), has taken the top 50 Gulf Cooperation Council (GCC) banks to measure the relative efficiency with the help of Data envelopment analysis (DEA) method. Sensitivity analysis with DEA provided rich diagnostic information and it was used in this paper for each bank. Data for the year 2005 were used to conduct this
empirical analysis. The sensitivity of the results was also investigated. Finding of the study is this that several banks out of the sample of 50 Gulf Cooperation Council (GCC) banks have been found to be operating at a decreasing return to scale. So it was needed for the management of these banks to refrain from further investments in these banks, On the contrary, banks found to be operating under an increasing return to scale may prefer to expand their operations. Analysis revealed inefficiencies prevalent with respect to asset mismanagement in selected 50 Gulf Cooperation Council (GCC) banks. Few GCC banks showed that there is considerable scope for reduction of assets.

Kumar and Gulati (2008) analysed 27 public sector banks operating in India to evaluate the extent of technical efficiency to give rating to the selected public sector banks. Data envelopment analysis (DEA) models i.e. CCR model and Andersen and Petersen’s super-efficiency model, were utilized for this purpose. The data for only one financial year i.e. 2004-2005 was employed for obtaining technical efficiency scores for observed public sector banks. It was observed by the researchers that technical efficiency scores ranged from 0.632 to 1, with an average of 0.885 among 27 banks. Andhra banks topped and declared as most efficient bank in the study period of 2004-2005. SBI group was found to be more efficient than nationalized bank group. Only seven of the 27 banks were found to be efficient and thus, defined the efficient frontier in this study.

Akhtar (2010) calculated the data envelopment analysis (DEA) efficiency scores and productivity indices of 9 local commercial banks in Saudi Arabia during the period 2000-06. The results of Malmquist productivity index reflected an improvement in the productivity of banks. The DEA results reflected that scale inefficiency was a larger source of technical inefficiency relative to the contribution by pure technical inefficiency.
This study was an attempt to estimate the technical inefficiency and productivity growth of the banking sector. Results on technical efficiency represented the effects of an economic slowdown in the Saudi economy emerging out of volatility across the hydrocarbon sector. Saudi Arabia was an oil based economy. Hence researchers concluded that the relationship between oil prices and income-generating activities of banks in the country should not be ignored.

**Kumar and Gulati (2010)** checked the efficiency, effectiveness, and performance of 27 public sector banks functioning in India with the help of two-stage performance evaluation model. The overall performance scores have been derived by taking the product of efficiency and effectiveness scores. Researchers have tested the efficiency and effectiveness scores for individual public sector banks (PSBs) for only one financial year i.e. 2006-2007 with the help of data envelopment analysis. High correlation was found between effectiveness and performance measures. Efficiency scores for the PSBs range from 0.7831 to 1. Out of 27 PSBs, only 15 percent of banks have been observed to be fully efficient. Effectiveness scores for the PSBs ranged from 0.7052 to 1, with an average of 0.8579. It was observed that the estimated performance scores for an individual banks range from 0.6284 to 0.9634, with an average of 0.7812 in terms of overall performance. None of the PSBs has attained overall performance score equal to one in this study.

**Rajput and Gupta (2011)** used DEA to assess the efficiency and profitability of selected Indian commercial banks and to analyze the role of Information Technology and its relevancy in Indian banks in the recent era. The sample size of 86 banks was taken which was sufficiently large to take care of the constraints imposed by the requirement of
the DEA model. The study period was of five years (2005-06 to 2009-10). As a result, it was found that there is an increasing trend in performance of Indian banks caused by IT innovation and distended investment in new information technology during the selected time period. The most efficient banks group was foreign banks followed by public sector bank and private sector bank groups. There was not so much difference in public sector bank and private sector bank but as compared in both, private sector banks were the best.

**Jagwani (2012)** examined 42 banks with the tool of DEA for measuring the efficiency of sample banks. Group-wise sample comprised 15 public, 15 private domestic banks and 12 foreign banks. The period of the study was two years and the financial years 2008–09 and 2009–10 were taken by the researcher under consideration. CCR and BCC models were applied with eight input and five output variables. It was found that public sector banks were more efficient than private-domestic and foreign banks. This study found that ownership has an impact on the Indian banking industry in terms of technical and pure efficiencies of banks. Public and foreign banks were relatively more efficient as compared to private-domestic banks in terms of managerial efficiency, because the differences were found to be significant.

**Rajan and Pandit (2012)** examined technical efficiency & productivity performance of Indian scheduled commercial banks and made a comparison of efficiency gained across different groups of banks during the period 1979–2008. Result showed that the banking system had a significant impact on efficiency and productivity in different ways. Significant changes in the policy environment have clearly enabled banks to expand their operations efficiently under the new liberalized era. It was found that public sector banks, which includes nationalised banks (NB) and the SBI & its associates were
more efficient compared to domestic private banks and foreign banks were relatively less efficient than public Sector Banks.

Ebrahimnejad et al. (2014) examined a case of banking industry to exhibit the efficacy of the proposed model. Data envelopment analysis was used for comparing the inputs and outputs of a set of homogenous decision making units by evaluating their relative efficiency. The input and output values for the 49 branches of Peoples Bank which is the largest local bank in the State of East Virginia were taken under consideration. As per the researchers traditional DEA treats DMUs as black boxes and calculates their efficiencies by considering their initial inputs and their final outputs. As a result, some intermediate measures were lost in the process of changing the inputs to outputs. In this study researcher proposed extended three-stage DEA model with two independent parallel stages linking to a third final stage. This extended model reported for the 49 branches of Peoples Bank. This paper exhibited the efficacy of the procedures and demonstrated the applicability of the proposed method to a three-stage performance evaluation problem in the banking industry.

2.2 STUDIES RELATED TO PRODUCTIVITY OF BANKS:

Various studies found the relevance of technology for the improved banking facilities. Shastri (2001) found the importance of technology in banks with the new challenges of new technologies. He has observed that manual day to day work was very slow in the banks before the use of technology. Technology is saving time and less effort is required with modern banking methods which lead in better performance of the Indian banking sector.
Swamy (2001) evaluated the impact of deregulation and competition in a liberalized economy. Researcher found that asset size of public sector banks of all scheduled commercial banks was highest but continuous decline was observed. On the other hand, new private sector banks have succeeded to increase their share in assets with increasing profits. The positive effect of technology adoption was found in case of private and foreign banks. Public sector banks have reduced cost and NPA but still, need of improvement was observed in case of public banks instead of private and foreign banks.

Janki (2002) evaluated the employees’ productivity in the banking sector and found the impact of technology on employees’ productivity. Researcher concluded that technology was needed for the improvement in operational efficiency and customer services and there was a need of updated technology today to develop new products and strengthen risk management.

Prasuna (2004) studied the performance of Indian banking industry with the help of CAMEL model of selected 65 banks. It was observed that banks increased in their overall performance and performance of 2003-04 was found better than 2002-03. Better liquidity was observed in banks. The total income of nationalized banks, private sector banks and foreign banks has grown significantly and capital adequacy has been improved by all selected banks with reduced NPA.

Shroff (2004) expressed that Information technology transformed the working of banks and banks could create their own web pages now. Customers of the banks could access these web pages through the web browsers by sitting at their homes. Reasons of this transformation were increased personal computer (PC) penetration and technology stabilization. Customer gets their account information easily with the advent of IT.
Arora and Verma (2005) analysed the performance evaluation of public sector banks on the basis of four performances. This research work was conducted for post reform period. It was found as a result that Corporation Bank was best in case of financial and operational parameters. Negative growth was observed for UCO bank for almost all profitability parameter. United Bank of India has topped in case of productivity and it was concluded through this research work that although there was different situation for every single bank but Indian banking sector was becoming increasingly mature in transformation of banks.

Kasman and Kasman (2006) investigated role of technical change on the costs. It was observed that decline in technical change during 2000-02, indicated that the introduction of new technology has been fully utilized during this time period. Researcher explored that larger banks were benefited more than smaller banks.

Uppal and Kaur (2007) examined the efficiency of different bank groups and concluded that the efficiency of all the bank groups has increased in the second post banking sector reforms period and these reforms were more beneficial for new private sector banks and foreign banks while these banking sector reforms were less beneficial for public sector banks and old private sector banks.

Manoj (2010) investigated the impact of information technology on efficiency of old private banks in India. Results of this research indicated that significant positive relationship was observed between noninterest margin and changes of the technology and this became the reason that technology upgradation made great impact over the growth of non-interest income of banks while net interest margin showed negative figure. It was
also observed that there was significant and positive correlation of net interest margin and noninterest margin of old private banks with the degree of risk bear by them.

**Stella (2010)** checked the role of IT on the growth and productivity of Nigerian Banking sector. It was observed that output and other assets have increased with the development of IT, whereas labor expenses on IT have more affected on bank output than capital expenditure on IT. It can be concluded with this research work that productivity of banks has increased with the investment in IT.

**Uppal (2010)** has analyzed the e-banking era and divided e-banking in two parts i.e. pre e-banking era and post e-banking era where post e-banking era was the era after Information Technology Act. The study has taken these two periods for analysis and found Indian banking industry got a significant growth in the post e-banking era as compared to pre e-banking era. This research paper explained that although there was a paradigm shift in the performance of all bank groups in the post e-banking period but new private sector banks and foreign banks have an edge over public sector banks (PSBs) among all bank groups.

**Rao (2011)** examined the comparative performance of two bank groups i.e. public and private sector banks for a period of four years from 2007-08 to 2010-11 and taken some parameters and it was observed that private sector banks have an edge over public sector banks on five parameters and these are like business per employee, return on assets, spread as percentage of assets, net NPA to net advances and the capital adequacy ratio while public sector banks have an edge over private sector banks on three parameters i.e. business per employee, operating expenses as a percentage of total expenses and credit deposit ratio.
Uppal (2011) investigated about the productivity and profitability of selected banks in the pre and post e-banking era in India and results explored that all selected banks were performed better in post e-banking era but public sector banks found the lower position while foreign banks topped in performance in the post e-banking era. Researcher has also given measures to public sector banks to tackle the emerging challenges in this competitive environment.

Kaur (2012) has checked an impact of IT on branch productivity of Indian banking in the era of transformation and found that post e-banking period confirms greater impact of IT in managing banking business of the industry on public sector banks, foreign banks and industry because IT is significantly affecting the branch productivity of these bank groups whereas not so in case of old private sector banks & new private sector banks. Researcher admitted that IT enables these banks to compete robustly with the other players in national as well as international market.

2.3 STUDIES RELATED TO THE ATTITUDE OF CUSTOMERS AND EMPLOYEES:

Information technology plays very important role in the modern development of banking industry and there are various research in this context to check the perception of customers and employees regarding these developments. Nitsure (2003) analyzed that E-banking has strongly impacted the strategic business considerations for banks by significantly cutting down costs of delivery and transactions in India too. Researcher identified some such impediments in the Indian context and suggested ways to overcome them in order to move forward with the wave of e-banking successfully. Public sector
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banks were highlighted for breaches of security and to disruptions in the system’s availability and hence to reputational risk.

**Xanthidis and Nicholas (2004)** expressed that although internet access has grown significantly and e-commerce is yet to reach measurable levels in Greece. A large and healthy (as far as income goes) part of the population, i.e. the working force, was still far from getting involved and utilising the new technology & e-commerce and only few enterprises and a small number of companies have engaged in e-business/ e-commerce activities on their own as a result of mature corporate strategy targeting the country’s digital consumers.

**Sylvie and Xiaoyan (2005)** found that issue of security was found to be the key factor that influenced Chinese consumer adoption of online banking and barriers to online banking were the perception of risks, Chinese traditional cash-carry banking culture and computer and technological skills. Researchers have suggested for removing the barriers of mobile banking adoption and these barriers were lack of awareness and understanding of the benefits provided by mobile banking as current target market for online and mobile banking was found relatively small.

**Malhotra and Singh (2007)** analysed the relationship between the bank’s adoption decision and various bank and market characteristics. The data of 88 banks was collected covering the financial years 1997-1998 to 2004-2005.Logistic regression technique was applied to study the relationship between the bank’s adoption decision and various bank and market characteristics. Researchers suggested that banks with lower market share also see the internet banking technology as a means to increase the market share by attracting more customers through this new channel of delivery.
Manoharan (2007) discussed the electronic payment system in India and its impact on the Indian banking industry of India and the study argued that the huge scope of opportunity for e-payment system in India, still 90% of the transactions are cash-based.

Venkatesan and Kumar (2007) found in their study that public sector banks have large network of traditional branches to approach their customers as compared to the private and foreign players and IT has given a platform to private and foreign banks to reach their customers without any physical branch and to improve their customer base. Hence, private and foreign players were taking the help of e-banking services like EFT, internet banking, plastic cards, PC banking to increase their customer base.

Kaur and Kaur (2008) evaluated the importance of plastic cards as electronic payment tool to be used by customers. Plastic cards market has long way to go if compared to the usage trends of other countries. The change in demographic features of consumers in terms of their income, marital status, education level, upgradation of technology and its awareness has brought the relevant changes in consumers’ preferences. Study indicated the tremendous growth potential of banking with this payment system and study highlighted that this can be considered as mere beginning which indicates the bright future prospects of plastic card market in India.

Agarwal et al. (2009) suggested that customers were influenced in their usage of e-banking services and consider security & trust most important in affecting their satisfaction level and slow transaction speed was the problem faced by them while using e-banking.
Uppal (2009) explained the role of IT era and highlighted that speed of rendering services made services of banks different from others. Time has been observed as a major factor which affected the quality and reputation of banks. E-banks has provided quick services and became more popular. Researcher concluded that all bank groups should put in place the right kind of system to further cut down on service time and render instantaneous services to the customers.

Abukhzam & Lee (2010) analysed the factors affecting bank staff attitude towards e-banking adoption in Libya and it was obtained by the researchers that Libyan bank staff were pleased to use and apply technological options to traditional manual procedures if they find the new procedures to be easy to use and help them in accomplish their banking tasks effectively. Researchers have also recommended various points like there was a need to improve the existing telecommunications infrastructure at the local and national level etc.

Chong et al. (2010) analyzed on the sample population of Vietnam with the help of correlation and multiple regression analysis and found that perceived usefulness, trust and government support all positively associated with the intention to use online banking in Vietnam. On the other side, perceived ease of use was found to be not significant in this study. Researchers have recommended banks for improving the security and privacy of the websites, which will increase the trust of users and government should also play a role to support banks in their efforts to increase online banking adoption.

Devi and Malavizhi (2010), in their paper, showed that customers are satisfied with the quality of e-banking services. But the study also showed that among the varied e-banking services, only ATM was found more popular and most cost effective. While
using e – banking services, customers faced problems such as technical hurdles, more formalities, less social relation with banks, skill Upgradation, lack of knowledge and insufficient number of ATM centers. To popularize the e – banking services, it was felt that more training programs must be conducted for bank customer through demo fair at centers. Further, the empirical analysis revealed that in the global competition world, bank must ensure quality in customer service to promote e -banking services. ‘Quality in work’ and ‘satisfaction of the customers’ were found the two keywords which must be given attention to promote.

Khatri and Ahuja (2010) concluded that the Indian banking industry has witnessed heightened competition with so many banks coming up with all their potential and using their global strength to their advantage in order to establish themselves in the market. Researchers have concluded that private banks seem to have satisfied its customers with good services and they have been successful in retaining its customers by providing better facilities than public sector banks.

Malhotra and Singh (2010) found as a result of comparison between private and foreign banks that the private and foreign Internet banks have performed better in offering a wider range and more advanced services of internet banking in comparison with public sector banks. Researchers examined the factors affecting the extent of internet banking services. Size of the bank, experience of the bank in offering internet banking, financing pattern and ownership of the bank were found to be significant for affecting extent of use of internet banking services.

Safina (2010) found the consumer’s perspectives on internet banking adoption and concluded that majority of customers were accepting online banking. Researcher
concluded that perceived usefulness, ease of use of the system, awareness about online banking and risks related to it were the main perusing factors to accept online banking system. These factors have a strong and positive effect on customers to accept online banking system.

Chaudhary and Sharma (2011) suggested on the basis of their analysis that bank staff involved in sanctioning the advances should be trained about the proper documentation and charge of securities and motivated to take measures in preventing advances turning into non-performing asset. Public banks must pay attention on their functioning to compete private banks. Banks should be well versed in proper selection of borrower/project and in analyzing the financial statement. This study revealed that non-performing asset has decreased after a proper customer relationship management department in the public and private banks in India and an efficient management information system should be developed.

Geeta (2011) highlighted the importance of online identity theft in India and expressed, India has been a victim of increase in identity theft in the last few years, which could pose a serious problem in the future resulting in loss of trust from the customer towards net banking and suggested that with the combined effort by everyone concerned, these incidents can be minimized if not stopped forever.

Mann and Sahni (2011) found that web site interactivity leads to positive customer outcomes in the context of internet Banking web sites. The dimension of customer outcomes has been studied through customer service quality; customer satisfaction, perceived security risk and trust of the web site. For measuring the data for internal consistency, various reliability and validity procedures have been carried out.
AMOS software has been used for analysis of the data using Structural Equation Modeling technique. The findings indicated that website design factors like navigation structure and information content were vital background to customer service quality which further influenced customer satisfaction and the faith of internet Banking websites.

Singh (2011) concluded that ICT channels have positive impact on the customer satisfaction. Various features such as availability of cash and location/proximity of ATM, time to process request have very high customer satisfaction across for private sector banks as well as public sector banks, whereas some other characteristics such as the numbers of ATMs in the locality and availability of shared ATMs of other banks have the lower overall customer satisfaction for private sector banks & public sector banks and these were the major concern areas for the banks and there was a need to pay more attention.

Uppal (2011) study concluded that transformation has taken place almost in all categories of the banks. It was concluded that mere introduction of IT alone will not be sufficient to bring necessary performance improvement and to get the competitive edge. Intelligent people were required to use such intelligent tools. IT management was found a challenge flow in future banking scenario. Researcher found that private banks have taken a big share of cake while public sector banks still lagged behind regarding the various financial parameters and immense opportunities are found available for the public sector banks if they change/modify and adopt new policies to combat the different recent challenges.

Vinayek and Jindel (2011) judged service quality of the banks with multivariate analysis of Statistics in few areas of Haryana. The conclusion of factor analysis
explained, four factors were responsible in case of service quality judgment namely, customer care quality, service performance, information quality and efficiency. Discriminant analysis highlighted the priority areas for achieving customers’ preference in respect of the internet banking service. The results of this analysis revealed that among the various service quality dimensions, ‘efficiency’ is best predictor followed by ‘information quality’. Customers inclined to perceive private sector banks’ internet banking sites more user-friendly features in comparison to public sector banks’ internet banking sites which showed that public sector banks should lay more emphasize on efficiency and information quality aspect to attract and retain customers.

**Bapat (2012)** analyzed awareness level, usage of generic products and usage of specific products offered by banks for various electronic payment products. Details like awareness & usage of various electronic payment products, sources of awareness, respondent’s view on speed & efficiency of services, respondent’s view on employee responsiveness & name of the primary bank were considered. The study was conducted in Pune city of Maharashtra state. Researcher found that age, asset class—two wheeler & asset class—four wheeler, debit cards and internet banking showed relationship with primary bank. Word-of-mouth publicity was found to be an important factor among communication sources of electronic payment products.

**George and Kumar (2012)** found that popular internet banking services among the customers were checking balances, followed by inter-account transfer, payment to other account and e-ticketing and items associated with financial and social risk, security and time risk, and performance risk contribute to the risk perceptions of banking
customers. It was concluded by research that variables related to different dimension of risk were different and it was almost same to different categories of customers.

Govindarajan et al. (2012) identified that banking customers agreed that debit card reduced the need for holding cash, charges collected for using debit card in other ATMs were reasonable, debit card can be used for making other payments and payment through debit card was found safe and secure. It was also concluded on the basis of this research work that people were having an apprehension that debit card will force people to spend more.

Khare et al. (2012) analysed the moderating influence of multi-item list of value on credit card attributes, age, and gender in credit use among Indian customers and examined the impact of “lifestyle” variables (convenience, use patterns, and status) on credit card use. Use and convenience were proved as the major determinants of credit card use among Indian customers. Young customers were likely to use credit cards than others.

Komal and Rani (2012) concluded about the immense opportunities in e-banking and felt the need to explore these opportunities to more people. Researchers suggested through this study that E-banks need to shift now from product centric to customer. It was criticized by the researchers that ICT infrastructure facilities were also not well developed and the banks were unable to extend the e-banking services.

Mann and Sahni (2012) concluded internet banking phenomenon primarily by analyzing, the profile, attributes and preferences of the adopter categories of innovators, early adopters, late majority and laggards. The analysis showed that there were significant differences found among the clusters with respect to perceived ease of use,
perceived security risk and demographic characteristics consisting of age, gender, education, income and occupation. Security was found the biggest factor for non-adoption of internet banking. Researchers suggested that in order to attract more users to internet banking, security risk should be reduced as it has major impact on its adoption.

Singh and Kaushal (2012) have taken ten variables to determine the customers’ perception of e-payment system and the impact of electronic banking on payment and clearing system with the help of exploratory factor analysis and concluded that e-banking has made it easier for the customers to transact from anywhere and anytime. Researchers summarized that faster & cheaper movement of funds with the fast realization of checks proved to be beneficial for the customers but the electronic movement of funds means less funds available for floating and they would be left with lower levels of float funds for banks.

Murari & Bindiya (2014) evaluated the attitude of employee towards adoption of IT–based banking services for Indian private sector banks with the help of descriptive research methodology. Five parameters were taken into consideration and those five parameters were relative advantage, complexity, and potential risk, strategic advantage in decision making process and innovation and development to ascertain the attitude of the employees. The results explored that customer satisfaction has been increased due to the use of information technology in banks and banks got a competitive edge.

2.4 STUDIES RELATED TO TECHNOLOGY ACCEPTANCE MODEL:

Agarwal and Karahanna (2000) used SEM to find cognitive absorption and beliefs about information technology usage and described a construct called cognitive absorption that was shown to play a significant role in the context of a nomological
network. This study was done to enrich understanding of user reactions to information technology.

Venkatesh and Davis (2000) applied technology acceptance model that explained perceived usefulness and usage intentions in terms of social influence and cognitive instrumental processes. Results explored that social influence processes and cognitive instrumental processes significantly influenced user acceptance. Although, user acceptance of IT in the workplace remains complex, yet extremely important fact.

Suh and Ingoo (2002) tested the effect of trust on customer acceptance of internet banking. This study introduced trust as another belief that has an impact on the acceptance of internet banking, collected data from 845 cases to survey users’ behavior towards internet banks. Trust had a more direct effect on a customer’s attitude than perceived ease of use in the internet banking context, while perceived ease of use had a greater total effect on a customer’s actual use. This study applied extended TAM using structural equation modeling and found that trust has a significant impact on the acceptance of internet banking.

Venkatesh and Morris (2003) reviewed the eight models and those were the theory of reasoned action, the technology acceptance model, the motivational model, the theory of planned behavior, a model combining the technology acceptance model & the theory of planned behavior, the model of PC utilization, the innovation diffusion theory, and the social cognitive theory. Unified Theory of Acceptance and Use of Technology model was framed, and found to outperform the eight individual models with an adjusted R of 69 percent. Unified Theory of Acceptance and Use of Technology provides a useful tool to managers for knowing the better or the worst role of new technology.
Wang et al. (2003) examined the determinants of user acceptance of internet banking. Using the technology acceptance model (TAM) as a theoretical framework, this research study has taken “perceived credibility” as a new factor which shows the user’s security and privacy concerns while accepting internet banking. Study also focused the effect of computer self-efficacy on the intention to use internet banking. Findings strongly depicted the extended TAM in predicting the intention of users to adopt internet banking. Results also revealed the significant effect of computer self-efficacy on behavioral intention through perceived ease of use, perceived usefulness, and perceived credibility.

Pikkarainen et al. (2004) used the technology acceptance model to determine various factors affecting internet banking by different bank customers and results showed that perceived usefulness & website information on online banking were the reasons to boost the usage of internet banking and perceived ease of use did not have a significant impact on usage.

Lai and Li (2005) analysed the usage of internet banking with the help of the technology acceptance model. It was found the TAM construct was invariant across different gender, age, and IT competence subgroups. These findings suggested that male and female, old and young, IT expert and novice conceptualized the TAM construct in very similar ways. These findings allowed us to understand TAMs validity in technology acceptance research. Results declared that the relationships between perceived ease of use, perceived usefulness, attitude and intention to use were positive and highly significant. The only unexpected finding was the path of perceived usefulness to intention to use because it was not supported in this study.
Cheng et al. (2006) checked the adoption of internet banking in Hong Kong and the data was analyzed using structured equation modeling to evaluate the strength of the hypothesized relationships. Researchers obtained 203 usable responses for the study. Results supported the extended TAM and explored that web security was a significant determinant of customer's Intention. Perceived usefulness was a major determinant of customer's intentions to use internet banking and perceived ease of use was a significant secondary determinant of customer's Intention to use internet banking. Perceived ease of use was mediated through perceived usefulness instead of having a direct impact on Intention.

Gu et al. (2009) analyzed determinants of behavioral intension to mobile banking with the help of structural equation modeling. Researchers analyzed with extended TAM and the trust-based TAM into a unified model of mobile banking, this model was empirically verified by taking real data from mobile banking users in WooriBank and concluded that self-efficacy was the strongest antecedent of perceived ease-of-use, which directly and indirectly affected behavioral intention through perceived usefulness in mobile banking. Behavioral intentions of mobile banking were strongly affected by structural assurance.

Luo et al. (2010) examined multi-dimensional trust and multi-faceted risk in initial acceptance of emerging technologies. Researchers applied a component-based structural equation modeling (SEM) technique, for examining measurement model and tested the proposed hypotheses. Findings of this study indicated that risk perception, derived from eight different facets, was a salient antecedent to innovative technology acceptance. The results of the analysis supported the proposed model of the study and
represented the importance of potential influence and appropriateness of employing personal trait factors in analyzing emerging IT artifacts' acceptance.

**Al-Gahtani (2011)** incorporated technology acceptance model with trust, credibility and risk. These three constructs were applied and these constructs were of paramount importance in predicting individual acceptance of on-line transactions. Study was conducted in Saudi Arabia. The structural equation modeling was used to evaluate the causal model. General internet uses with four demographic variables were also incorporated into the model for getting a broader picture of electronic transaction acceptance in Saudi Arabia. Findings displayed that trust, credibility and risk play an important role toward the acceptance of on-line transactions in the Saudi settings.

**Akturan and Tezcan (2012)** analysed the perceptions and intentions for mobile banking adoption of the youth market with an integration of the technology acceptance model with the help of structural equation modeling and results depicted that perceived usefulness, perceived social risk, perceived performance risk and perceived benefit directly affected attitudes towards mobile banking while no direct relationship was obtained in some cases like perceived usefulness and intention to use, perceived ease of use and attitude, financial risk, time risk, security/privacy risk and attitude. The main contribution of this study was the development of a risk-benefit model by extending TAM.

**Apostolos et al. (2012)** used extension of TAM model with the innovation diffusion theory and security/privacy risk in the adoption of internet banking services in Greece. It was found that TAM with perceived security & privacy risk constructs partially mediated the relationships between compatibility and customers’ behavioral
intentions. However, perceived usefulness partially mediated the relationship between perceived ease of use and customers’ intentions. Younger male were found as a more potential target group to use internet banking.

**Keshawani and Bisht (2012)** used TAM proposed by Davis and an extended TAM with security and privacy related issues for internet banking adoption was conceptualized. The researchers have incorporated various inhibitors of internet banking which restrict the use of internet banking adoption under perceived risk. Bank web site was also marked as a main determinant of perceived risk and of perceived ease of use of internet banking services. Researchers found that perceived risk has a negative impact on behavioral intention of internet banking adoption, whereas trust has a negative impact on perceived risk. Role of web site was also found to be suitable in facilitating easier use and also minimizing perceived risk.

**Nath et al. (2013)** analyzed factors influencing IT adoption by bank employees and applied an extended TAM Approach. Bank employees from the public and private sectors banks were selected as respondents and total 238 responses from Delhi were obtained to find the results of this study. Researchers applied structured equation modeling to sketch the factors influencing IT adoption by bank employees. Results explored that the variables of extended TAM positively influence the adoption of IT for bank employees. Social influence of superiors was the prominent determinant of perceived usefulness of the CBS. While computer self-efficacy was the second strongest determinant to impact perceived usefulness of CBS.

Different efforts have been made by the authors of the above mentioned research studies to give a clear picture of electronic banking. It is obvious from the available
literature that e-banking services have a positive impact on the performance of banks. Banks are becoming more efficient due to the use of technology. Employees and customers are happy with the use of electronic banking but privacy and security are two main concerns for customers. In spite of the growing significance of E-banking services, there is very limited research related to E-banking in Indian context. E-banking services have given alternate delivery channel to provide more effective services. No comprehensive study on electronic banking is conducted which has considered efficiency, productivity, the impact of e-banking services on bank performance, perceptions of customers and employees of banks regarding electronic banking in Indian banks. The lack of comprehensive studies for public and private sector banks in India has inspired the researcher for conducting research on this topic.