Chapter 2
Review of Literature

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Chapter 2

Review of Literature

2.1 Introduction

An extensive literature survey has been conducted by the researcher to know the type and extend of empirical research work done on the topic and to identify the research gap. This chapter presents the review of existing literature in the area of research which is classified into four sections. The sections are:

I. Studies on Financial Innovation
II. Studies on Banking Industry
III. Studies on Performance Measurement
IV. Studies on Customer Satisfaction

I. Studies on Financial Innovation:

Allen (2011) assesses the evidence for negative and positive contributions for financial innovation to economic welfare and they conclude with the statement that it seems likely its effects have been positive rather than negative.

Beck, Chen, Lin, & Song (2012) in their study measures the relationship between financial innovation and economic growth and volatility. The study also attempts to measure the relationship between financial innovation and banks’ risk-taking and fragility. To systematically explore the consequences of financial innovation in a consistent cross-country setting the study used three levels of data of 32 countries, i.e. bank, industry and country level data. The study identified both the bright and dark sides of financial innovation. The result of the study shows that financial innovation encourages banks to take on more risks, which helps in the provision of valuable credit and risk diversification services to firms and households. This will enhance capital allocation efficiency and economic growth.
Berk (2002) reviewed the literature regarding the impact of financial innovation on the monetary transmission mechanism and on the way the central bank can achieve its ultimate goal, which is to control the price level. They argued that, although the form of central bank instruments and current methods for implementing monetary policy may change, the goals that the policy makers try to achieve by employing these instruments remain valid and achievable.

Bhatt (1987) examines the nature and characteristics of financial innovations and evolution of credit markets. The author discusses the role of policy intervention in quickening the pace of financial development. A case study of an innovative bank is used to illustrate innovations essential for financing small farm and non-farm enterprises and mobilising resources from middle and low-income groups in developing countries. The main focus of this paper is the historical background of various steps taken by the Syndicate Bank, including innovative deposit schemes such as pigmy deposits with a low transaction-cost.

Boot & Thakor (1997) explored the implication of financial system design for financial innovation. They begin with assumptions about the investment opportunities of firms, their observable attributes, and the roles of commercial banks, investment banks and financial market. They examine the borrower’s choice between the bank and financial market funding, the commercial bank’s choice of monitoring capacity, & the investment bank’s choice of whether or not to invest in financial innovation. Their main result is that financial innovation in a universal banking system is stochastically lower than innovation in a financial system in which commercial & investment bank is functionally separated.

Calvet, Gonzalez-Eiras, & Sodini (2004) investigates the pricing effects of financial innovation in an economy. The introduction of non-redundant assets endogenously modifies the participation set, reduces the covariance between dividends and participants' consumption and thus leads to lower risk premia. In multisector economies, financial innovation spreads across markets through the diversified portfolio of new entrants and has rich effects on the cross-section of expected returns. The price changes can also lead some investors to leave the markets and give rise to non-degenerate forms of participation turnover. The model is consistent with several features of financial
markets over the past few decades: substantial innovation, higher participation, significant turnover in investor composition, improved risk management practices, a slight increase in real interest rates, and a reduction in risk premia.

Chavan & Somanath (2011) enquire about the financial innovations in the capital market, insurance industry and the mutual fund industry. In the insurance sector, new innovative products provide the features of guaranteed return, safety against inflation, social security, reimbursement of medical and hospitalization expenses. The capital market innovations have the feature of investor protection, transparency, enhanced liquidity, reduced cost and mitigation of risk. The mutual fund innovations have the feature of diversification, risk reduction and superior return in the volatile market. They concluded that existing innovative financially engineered products lack the protection against inflation and here remains a scope for development of insurance exchanges, credit reinsurance market, carbon market, property future, weather derivatives, freight derivatives and inflation derivatives.

Cristian (2012) has made an attempt to give a conceptual clarity about financial innovation and so it is important to give the definition of financial innovation. It is also relevant to provide the classification and functions of financial innovation. The study has also concentrated on giving the linkage between financial innovations, markets and agents. The innovations were classified as Type A, Type C, Type B, D and E and Type F innovations. The impact of these different type of innovations, with repercussions on economic policy related to them, was also analysed and their importance is correlated with financial instability.

Crockett (1995) in third LK Jha memorial lecture has said that the innovations in the capital market have posed new challenges to economics & financial stability. The theme of the lecture was that seizing the opportunities by capital market innovation while avoiding the risk of instability, is one of the greatest challenges facing central banks & supervisory authorities in both the developed and developing world. He has reviewed deregulation, uncertainty, increase in data processing power, globalisation and securitisation etc as the important key developments and driving forces behind them.

Damanpour & Gopalakrishnan (2001) focused on exploring the pattern of adoption of product and process innovations at firm level by examining the relationship
between product and process innovations. The study concentrates on 101 commercial banks in the United States. The innovation introduced between 1982 and 1993 were taken for the study and it was divided into 2 periods of six years. Return on Equity, Return on Assets and Executing rating were the performance measures used. The study comes to the conclusion that high-performance banks adopt product and process innovations more than low-performance banks and the product-process pattern of adoption is more likely than the process-product pattern.

Guidotti (1993) presented a framework in which the domestic effects and the international transmission of financial innovation in the presence of currency substitution can be examined. In this study, Financial Innovation is explained as the technological change which affects the way individuals carry out their transactions. The analysis provides a number of insights; one is that financial innovation leads to a negative co-movement between the real and nominal exchange rates. Another one is that the international transmission and domestic effects of financial innovation depend on how it affects the cross-border transfer of seigniorage.

Harsha (2011) attempts to conceptualise the term financial engineering, its motivating factors, need for product innovations through financial engineering and suggest the strategies for the same.

Ibraheem (2013) in his study has investigated the different mechanism that are used to solve various problems in finance. i.e. about the financial engineering instruments. He also seeks to find out whether there is any impact of financial engineering on the financial system. In this study, financial engineering activities are classified into three steps (1) Designing innovative financial instrument, (2) implementation of innovative financial instruments, (3) The development of financial instruments.

Joshi (2009) lays focus on credit derivatives. The growth of the global credit derivatives market is explained in the study. After describing the benefit and demerits of credit derivatives the author explains that there is a need to introduce credit derivatives in India. The study states that the banks are the major players in the credit market and are therefore exposed to credit risk. As the credit risk grew year by year, there is a need for
some financial product which offers security to the financial institutions. The article was concluded with the expectation of the launching of the credit derivatives in the near future.

Lewrick (2008) developed a model which can be used to audit the management’s capability to innovate and to monitor the relationship between innovativeness and the increase in the sales. It was named as ICP model, i.e the Innovativeness, Capabilities and Potential model and was found predicting the result of innovation strategy adopted by the company. The model was developed as the outcome of a study of companies in the high technology cluster around Munich.

Moos, Beimborn, Wagner, & Weitzel (2010) derives suggestions for the measurement of organisational innovativeness. They assert that innovation is an important measure of organisational performance. After reviewing various articles which provide measurement model of innovation, they categorised the models based on three different perspectives i.e (1) Innovation adoption vs creation,(2) Innovation type: product vs process and (3) Input oriented and output oriented. The study was concluded by proposing models for both inputs oriented and output-oriented measurement.

Necrep (2013) examined the innovativeness of banks and insurance companies in the developing financial market of Slovenia. The study focused on the impact of three core factors on the financial services development process. The difference in the way banks and insurance companies responded to the increased competition was also analysed by the researcher. Data was collected from managers of marketing and development departments of banks and insurance companies. Sales profit was taken as the financial indicator and domestic market share, sales growth and profitability of new services was used to measure market success. The stages of the new service development process were identified as:

i. Idea generation and screening
ii. Business analysis and marketing planning
iii. Service development and testing
iv. Service launch
The study was concluded with the statement that without improving the existing processes and developing innovative processes, it will be difficult for any bank or insurance company to achieve successful business performance.

**Philipass (2011)** studies the influence of diffusion of financial innovation to market participants frictions and their values through a mathematical, theoretical and empirical framework. They derived a novel measure of the influence of financial innovation to the market participants based on their correlation friction patterns. The main objective was to highlight a number of aspects and dimensions of this field. They aimed to present (i) The theoretical framework on the role of financial innovation at the financial structure (the fundamental generating root causes and the effects on the function of financial markets etc) and (ii) the parameterisation of the influence of financial innovation to market participants through a mathematical and econometric framework based on the participants minimum need for the change, the diffusion rate and the time parameter. They concluded that the parametric function, which is followed in order to show the influence of financial innovation, has a statistically significant impact on returns and volatility of financial and economic indices.

**Rangarajan (2012)** referred the relationship between innovation and regulation. He states that banking sector has taken big strides in the last two decades and it would be inappropriate in his view to classify all of or even most of financial innovations introduced in the last few decades as socially unproductive. The financial system must be able to meet the diversifying needs of a growing economy. In this context financial innovations needs to be encouraged. In the Indian context, there is a need to encourage the emergence of a vibrant corporate debt market. Efficient debt market will not only help larger industries but also small and medium enterprises. He also feels that we also need institutions which will serve as market makers offering the two-way course. This will provide liquidity to the markets and make it attractive to the investors. Innovative ways of financing infrastructure should be explored. Too little regulation may encourage financial instability but too much of it can impede financial innovations which are badly needed. Regulatory oversight of innovation is necessary but the regulatory perspective on innovation must not become too restrictive. In short, the policymakers must strike an
appropriate balance between the need for financial innovation to sustain growth and the need for regulation to ensure stability.

**Silber (1983)** pointed out that profit maximization of financial institution is the key reason for financial innovation. There are some restrictions in achieving profit maximisation such as policies and organisational management. Though these restrictions not only guarantee the stability of management, they reduce the efficiency of financial institution, so financial institutions strive toward casting them off. Constraint-induced innovation theory discussed the financial innovation from microeconomics, so it is originated and representative. But it emphasized “innovation in adversity” excessively.

**Verghese (1990)** takes a close look at the main features of the financial innovation and evaluated objectively what it has achieved and at what cost. The regulatory environment, financial instability, changes in lending capacity and profit margins of banks, the revolution of IT etc are identified as the complex factors contributed to initiate and accelerate the process of financial innovation.

**Verma (2015)** investigated the impact of liberalisation on the growth of business in the life insurance sector. For this, a comparison of the rate of growth of business during two decades is done. It is found that apart from the liberalisation, factors like increase in the number of companies, distribution network and increased manpower also influence the growth of insurance business. But a significant contribution is given by the innovation and creativity. The role of product innovations like ULIP and bancassurance was also discussed in the study. After evaluating the adverse effect of liberalisation the author had concluded the study by mentioning about the possible future innovations in the sector.

**Wang & Ahmed (2004)** depicts an organisation's overall ability to produce innovative outcomes. They contend that innovation is considered as an important factor for an organisations success. But a low attention has been paid to develop a measurement construct of organisational innovativeness and they have identified five dimensions which form the component factors of organisational innovativeness. Conformatory factor analysis was used for validating the measurement constructs. The study was concluded by recommending the further studies to include more items to the constructs and to test the
discriminant validity and predictive validity apart from the convergent validity which was tested in this study.

II. Studies on Banking Industry

Achimba, Ongonga, Nyarondia, Amos, & Okwara (2014) in their article ‘Innovation in Banking Industry: Achieving Customer Satisfaction’ tries to find out the effect of technology in the banking industry. They also examined the role of technology in the customer relationship management process and implementation. Self-appraisal reports for the banks and customers were used to collect data and the result of the study shows that technology has a major role in the customer relationship management process and if the bank has to operate effectively in the implementation of the CRM process it is necessary to adopt technology as a supportive tool.

Ansong (2012) looks into how innovative banking products are accepted by the customers. A questionnaire was employed by the university students to gather data and purposive sampling technique was used for selecting samples. The students were used as samples because according to Schiffman and Kanuk(2009) young and educated people are normally the first to adopt new products. The study revealed that there is a general awareness of innovative products among university students and ATM and E-Zwich are the most popular innovative products. Convenience, reliability, security and ease of use are stated as the drivers of innovation in this study. The study is concluded by stating that though the banks in Ghana can continue with the innovative banking activities that aim at young generation, intensive public education will be needed to inform the public about the innovative banking products.

Chavda & Solanki (2014) in their conceptual paper “Innovative banking products: Win-Win situation for customers and banks” has reviewed various articles relating to the topic. After systematic screening and processing of the gathered literature review, they have tried to give a detailed explanation about the various types of innovation, different factors affecting innovative banking, theoretical models, methodologies adopted and the types of sampling used. The article was concluded by stating the important findings of the articles reviewed.
**Eisawi, Sekhon, & Tanna (2012)** focused on examining how banks can improve the service excellence i.e. what banks can do to provide superior services to the customers. Purposive sampling was used for selecting the samples and questionnaire were distributed among 260 banking customers of UK. Questions were related to innovations, service excellence and other determinants of service excellence like rates, reputation, technology and excellent employees. The result of the Structural Equation Modelling shows that innovations is a determinant of service excellence and the study suggests that banks should be continually updated, reliable and should provide flexible products and all this will help the bank to be innovative.

**Gopalakrishnan, Mishra, & Gupta (2015)** studied the technological innovations in India’s largest bank, State Bank of India. This case study aims at analysing how many technological innovations lead to customer satisfaction in the Indian banking sector. The study reviewed various models for measuring customer satisfaction like the model developed by Berry (Bart Allen) and Brodeur between 1990 and 1998, work done by Parasuraman, Zeithaml and Berry (Leonard L) between 1985 and 1988 and the work done by Cronin and Taylor. The study result shows that SBI has succeeded in introducing various technological innovations which improve service quality and thereby leads to increased customer satisfaction and also the retention. From the viewpoint of banks, they are able to perform more efficiently with less capacity and leads to cost reduction. The study was concluded by suggesting other banks to adopt the success model of State Bank of India.

**Ilo, Ani, & Chioke (2014)** conducted a study to analyse the relationship between technological innovations and the performance of banks in Nigeria. The research was also focused on the relationship between ICT adoption and customer satisfaction. Automated Teller Machines, Electronic Fund Transfer, smart cards, telephone banking, computerized credit rating, point of sales system, electronic home and office banking and electronic data exchange were the ICT products identified in the study. ICT applications identified were treasury operations, human resources, bank master, reconciliation, loan and deposit, money market, asset management, fund transfer and general ledger. The study used random sampling method and the data was collected from the employees and
customers of fifteen major Nigerian banks with their headquarters in Lagos. The findings of the study demonstrate that technological innovations have a positive relationship with the performance of banks and ICT adoption have improved the customer satisfaction and retention.

**Kaur (2016)** aims to impart knowledge about the innovative banking activities in the national and international level banks. The research was based on secondary data and highlighted some of the innovative banking activities of foreign banks and how far it is adopted by the Indian banks. The use of biometric technology, In-car apps, facial recognition technology, smart watches, google glass technology, robotics, Augmented Reality (AR) apps, beacon technology, oculus rift, cryptocurrencies, Artificial Intelligence(AI) and cheque truncation was explained in the study. The researcher comes to the conclusion that Indian banks have to understand the importance of adopting latest technology in the banking activities to ensure their survival. Most of the foreign banks adopt new technologies much earlier than Indian banks but some private banks in India like ICICI, HDFC and Axis banks are taking initiatives in the field of innovative banking.

**Kesavan (2015)** in his conceptual paper made an attempt to identify various innovations initiated by the selected bank. The study also analysed how these innovations are benefited to the society especially to the backward classes and how profitable it is for the banks. It also deals with the strategies adopted by the banks to retain its existing customers and for social inclusion. IndusInd Bank was selected for the study and innovative initiatives of the bank like video branch, super saver pack, my account my number, check on cheque, denomination selection, cash on mobile, quick redeem, direct connect, green champions program, share2care program, financial literacy and promoting art, culture and sports was analysed in detail by the researcher. The study was concluded by stating that even though the rate of innovation adopted by the bank is very high it has to concentrate more on grievance redressal mechanism.

**Kumar & Raju (2015)** carried out a study to examine the products and services of new generation banks. Technological developments and other emerging trends in the banking sector were also analysed. Internet, Society for Worldwide Interbank Financial Telecommunications(SWIFT), Automated Teller Machine(ATM), Cash Dispensers,
Electronic Clearing Service, Banknet, Chip Card, Phone Banking, telebanking, Internet banking, Mobile Banking Anywhere banking, Voicemail and Kiosks were identified as the new developments in new generation banks. The study concluded that the Indian banking sector is developing with the huge customer base and innovative products and services. By revaluing the existing strategies with the government support they can become bigger and stronger with the global customer base.

Malik (2014) focused on how the financial innovations have contributed to the development of banking sector. The researcher also looks into the benefits and challenges of the recent trends in banking. The study gives a conceptual clarity about the innovations like ATM, debit card, credit card, NEFT and RTGS. With the help of reports on the increased number of ATMs, debit cards, credit cards, and the volume of transaction using electronic banking the researcher concluded that the innovations in banking sector have contributed to the development of banking sector.

Martovoy & Mention (2016) tried to find out whether the New Service Development (NSD) process have any impact on the financial services and also to analyse the patterns in the development of service innovations. Data were collected from executives and innovation managers of banks located in Luxembourg. The study explains NSD process in seven stages, i.e. definition of problems, idea generation, idea screening, testing, business analysis and introduction to a market and four patterns of NSD process namely problem driven pattern, proactivity driven pattern, market-driven pattern and strategy-driven pattern were identified.

Nath, Schrick, & Parzinger (2001) focuses on the effect of internet banking on the banking industry. Both strategic and operational dimensions were measured in the study. It also assesses the effect of internet banking on banks’ customer, bank-customer relationships and technology considerations. Data were collected from 75 bricks and mortar banks in a large state in the Midwestern United States and the result shows that full benefits of internet banking are not realised by many banks and suggests that banks that do not offer internet banking should quickly move towards it. And from the operational perspective, it is found that internet banking has many benefits and this lead to the increase in the number of customers.
**Pennings & Harianto (1992)** carried out a study to examine the propensity of an organisation to adopt technological innovations. A sample of 152 banks from 300 large banks in the United States covering a period of 11 years was selected for the study. The research was done to address the introduction of a new form of innovation, video banking services. They tested whether the experience in computer and telecom, capital investments in system and equipment and interfirm linkages with firms from computer, insurance etc have an impact on the adoption of video banking services. The study resulted that the experience in IT and interfirm linkages have an impact on the adoption of innovations and the capital investments have no specific impact on the adoption of video banking in the American banking industry.

**Phuong Nam (2014)** targets to discover the reasons, motivations and challenges involved in the implementation process of e-banking services in Vietnam. It was a case study and after reviewing several kinds of literature and conducting semi-structured interviews with the representatives and customers the researcher concludes that the motivations for the implementation of e-banking services are to expand the market and to increase customer satisfaction. The study also identified the challenges in the e-banking implementation i.e. unwillingness and lack of knowledge of customers and underdeveloped infrastructure.

**Prakash & Kumar (2016)** gives an overview of the history and structure of Indian banking sector. The study gives a clear idea of the present state of banking in India. The concept of Customer Experience Management, differential branding and customer 3.0 was explained in the study. The study states that simplicity which is mutually beneficial to both customers and banks is the mantra of modern banking and to simplify the procedures banks should introduce multi-channel banking. The study was concluded with the statement that Indian banking is moving faster to the change from sellers market to buyers market. Indian banking industry will work on new benchmarks and will result in quality services at cheaper cost.

**Rahman, Ferdousi, Chowdhury, & Haque (2015)** aims to measure the impact of factors like core services, security and trust on the internet and the awareness about the services on the usage of online banking. The survey was done among 180 customers
living in the urban areas of Dhaka, the capital city of Bangladesh. Purposive sampling was employed for the sample selection and the criteria used for this was that only the customers having six months of online banking experience and with a bachelor degree was selected as samples for the study. The findings of the study after employing Structural Equation Modelling reveals that the effect of security and trust and the awareness of customers is significant and the factor core services are insignificant.

**Ramakrishna (2012)** intended to identify service innovations offered by selected public and private sector banks in India. The study was based on two innovation models developed by Bessant and Tidd (2007) and Six Dimensional Model of Service Innovation developed by Pim den Hertog, Wietze van der Aa and Mark W. de Jong. Bessant and Tidd (2007) identified 4Ps of innovation i.e. Product innovation, Process innovation, Position innovation and Paradigm innovation. Six-dimensional innovation model was developed by Pim den Hertog (2010) with the dimensions new service concept, new customer interaction, new value system, new revenue model and new organisational or technological service delivery system. The researcher aimed to make a comparative study of the innovative banking initiatives with reference to these models. State Bank of India, Andhra Bank, YES Bank and ICICI Bank were selected for the study. The study concluded that ICICI banks are more aggressive in innovation and more innovative services are offered by them. The study also come to the conclusion that both public and private sector banks have taken service innovation as their future strategy.

**Reuben (2012)** focus on the role of innovation in improving the banking sector and customer satisfaction. Both financial and technological innovations were taken into consideration and for this purpose four dimensions of innovations were identified, i.e. product, process, position and paradigm. The study focused on product, process and position and was conducted in two major banks in Ghana namely, Barclays bank and Nordea bank. From the research, it was concluded that innovation cannot be fully beneficial to both customers and bank without quality improvement. It was also found that the customers do not patronise some kinds of innovations and it was suggested to conduct further studies to find the reasons for the low patronage ratio.
Singh (2014) discussed the historical background, evolution and the recent trends of the Indian banking sector. The researcher has explained in detail the three phases of Indian banking system. Phase 1 is the early phase from 1786 to 1969 i.e. till nationalisation, Phase 2 is nationalization of Indian banks and unto 1991 and Phase 3 is phase of Indian banking sector reform after 1991. The study analysed various innovative banking activities like Credit cards, Global cards, Charge cards, Debit cards, Smart cards, ATMs, Intercity banking, Net banking, Mobile banking, Demat account, Online banking services, emphasis on Customer Relationship Management (CRM), Mergers Acquisitions and Takeovers and Moving to global markets. The paper was concluded by suggesting that the future focus should be on growth based on calculated risks.

Singh, Pandey, & Gupta (2011) gives an overview about the present state of the Indian banking sector and the important events taken place in the transformation of banking industry, i.e. from the traditional banking to the innovative banking. The driving force behind the transformation of banking and the factors that hinder this transformation was discussed in the study. Some important innovations like introduction of Electronic Clearing Service, Electronic Fund Transfer, Core Banking Solution, ATMs, CRM, Corporate Internet banking, Payment systems etc were explained in the study. They also discussed the risk factors associated with innovative banking like cheque frauds, ATM frauds (Phishing, Skimming & Spoofing) & Credit card frauds. Data was collected using a structured questionnaire, fifty customers using innovative banking products were selected as samples. The study was concluded by suggesting to design a system that widens the gap between marginal benefit and marginal cost involved in the transformation of banking sector and to promote the marginal efficiency of investment in technological advancement. some preventive measures to avoid banking frauds were also suggested.

Ughetto (2006) investigated to what extent the convergence of banks over risk-adjusted capital standards set by the new Basel capital accord may affect the way in which they screen innovative firms. It also gives an overview of the existing firms of credit support to R & D activities. The study is built upon a survey conducted in January and February 2006 on 12 main Italian banking groups. The study provides interesting insights on the use of non-financing parameters to assess the credit worthiness of
potential borrowers and on the architecture of the internal rating systems in the light of Basel II requirements. Results suggest that the majority of banks does not consider intangibles as meaningful determinants in credit risk assessment. This could imply that the sole implementation of the accord might not lead to reduce informational asymmetries between lenders and borrowers as it could be expected. However, such an effect could be compensated by specific measures provided by single financial intermediaries.

**Wambuaa & Datcheb (2013)** analysed the impact of innovations on financial inclusion with the help of the independent variables like perceived risk, perceived trust, ease of use and Anti Money Laundering. Innovative channels were used as an intervening variable in the study. E-banking, M banking and Agency banking was the innovative channels under consideration and customers of any of the five branches of equity bank Ltd in Mombassa country, using any of these innovative channels were selected as the sample respondents. Stratified sampling was used for selecting the required sample of 200 customers. The findings of the study reveal that even though there are many innovative delivery channels, queues in the banks remain the same especially in the enquiry and customer service counters and if stringent measures like improving reliability will be introduced in the banks it will lead to increase in customer confidence and satisfaction.

### III. Studies on Performance Measurement:

**Agbolade (2011)** conducted a study to analyse the role of ICT adoption in the profitability of banks in Nigeria. Ordinary Least Square approach was used by the researcher to examine the relationship between the variables. The findings of the research reveal that a marginal change in the investment level in ICT results in a proportionate change in the profit level of banks. The study recommended to increase the usage of ICT in banking services and to formulate appropriate policies to ensure proper monitoring and to identify the optimum size to attain organisational efficiency.

**Akhisar, Tunay, & Tunay (2015)** conducted a study to evaluate the effect of electronic banking services on the performance of banks. The bank's performance was measured in terms of ROA and ROE. Dynamic panel data model was used for the analysis of 23 developed and developing countries banking data. Both lagged level and
lagged differences of the variables were measured using GMM estimator. The findings of the study reveal that the number of customers using internet banking and the number of POS terminals has negative effect on profitability where as the ratio of ATM to the number of branches effects in positive profitability.

Bikker (2010) demonstrates that performance measurement is a difficult process and the indicators used for measuring performance differs in quality. Simple indicators and complex models have been used both in theory and practice to measure the performance and this study investigates which method should be preferred and how stronger measures can be formed by combining indicators. Twenty simple indicators of competition were analysed and after predictive validity test was combined to form five types of performance indicators i.e. cost, profit, market structure, competition and efficiency.

Dauda & Akingbade (2011) examined the relationship between technological innovation and performance of banks by analysing the responses of employees and customers. Customers and employees of 15 Nigerian banks were selected as the samples of the study. The study tested the relationship between technological innovation and employee performance and also the relationship between technological innovation and customer satisfaction and concluded that the introduction of ICT has contributed to the enhancement of customer satisfaction and also the performance of employees thereby leading to the improved performance of the banks. The study recommended that the investment in ICT should be an important component of the banking strategy.

Ebarefimia & Inedegbor (2013) investigated the relationship between organisational performance and product development by innovation. The study used product development and innovation as the independent variable and organisational innovation as dependent variable. Organisational performance is measured in terms of:

1. Profitability
2. Sales Volume
3. Market Share
4. Customer Satisfaction
5. Customer Loyalty
Cross-sectional design was used by the researchers to study the relationship between the variables. Convenience sampling was used to collect data from the managers of Nigerian manufacturing and services firms. The study result shows that when consumer perceives product innovation as more favourable, stronger and unique, there will be more impact of product innovation on organisational performance.

**Gichungu (2015)** studies the relationship between technology-based bank innovations and the financial performance of commercial banks. Secondary data i.e. annual reports of banks over a period of five years were used for analysing the impact of innovations on the financial performance of the banks. The study concluded that the banking innovations like mobile banking, agency banking and ATM positively impacted the financial performance of banks when the online banking was not having the expected level of impact on the financial performance of banks over the period of five years.

**Githikwa (2009)** conducted a study to measure the impact of financial innovation on profitability of commercial banks in Kenya. The study concluded that banks consider financial innovation as a way to create an impact on the performance of banks by increasing profitability. The study also revealed that for the smooth implementation of financial innovation, all banks should have more resources and should implement cost reduction both in its operations and transactions, and should focus on customer satisfaction. Implementation of product, process and institutional innovation will aid in the increased flexibility of commercial banks in their operations.

**Hossein (2013)** in his article tries to examine the relationship between e-banking profitability, economic growth and total deposits. The study used panel data from selected Asian countries during the period 1990 to 2010. First, the existence of unit root in the data series was tested by the researcher, followed by determining the existence of long-run cointegration between GDP and independent variables. This was done with the help of panel cointegration tests. The study adapted an empirical model of Ceylan Onay et al (2008). The study result shows that in the year of adoption, online banking does not have a significant impact on the performance of banks and there exist a decrease in the profitability. This may be because of the high IT expenditures for the adoption process. But in the second year, a positive coefficient is visible on the ROE estimation. So the
researcher concluded that financial result of investment in IT is a gradual process and the adoption of online banking have a positive impact on the performance of banks.

Hughes & Mester (2008) discusses the application of the two empirical approaches in measuring the performance of banks i.e structural and non-structural. The study states that the structural approach in measuring the performance depends upon the theoretical model of the banking firm and also on the concept of optimisation. It relies on the cost or profit function i.e the performance is measured in terms of cost minimisation or profit maximisation. Non structural approach is the usage of financial ratios like ROA and ROE or the ratio of fixed costs to total costs to assess different aspects of performance. It also determines the relationship of performance with investment strategies.

Karim & Hamdan (2010) examined the effect of information technology on the Jordanian banking industry. Fifteen Jordanian banks were selected for the study and the level of IT used by these banks for a period of five years was examined. Two forms of the matrix were used for measuring the performance of banks. They are

1. The matrix of Financial Performance:
   a. Market Value Added(MVA)
   b. Return on Investment(ROI)
   c. Earnings Per Share(EPS)
2. The matrix of Operational Performance
   a. Net Profit Margin(NPM)
   b. Operating Return on Assets(OROA)
   c. Profitability per Employee(PE)

The utilisation of IT by Jordanian banks was measured by calculating the level of investment in hardware, software, internet banking, phone banking, number of ATMs, use of cyber branches and banking via SMS. By the use of Pooled Data Regression using Pooled Least Square Manner the study arrived at a result that there is the impact of use of IT in the Jordanian banks in MVA, EPS, ROA, NPM and there is no such impact in the case ROE.
Loof (2000) conducted a study to measure the relationship between the innovation output and firm performance. Innovation output is measured by sales of new products per employee and five different measures of firm performance are:
1. Employment growth
2. Value added per employee
3. Sales per employee
4. Operating profit per employee
5. Return on Assets

Malhotra and Singh (2009) conducted a study to measure the effect of internet banking on bank performance. The result of the study indicates that internet banking is profitable and have operational efficiency. They also found that internet banks have higher asset quality. These banks are better managed which leads to minimization of the expenses for building and equipment. The study also identified that smaller banks that adopt internet banking have a negative impact on profitability.

Mutuku & Nyaribo (2015) conducted a study to offer a better understanding of the effect of Information Technology on employee productivity. The independent variables of the study were Automated Teller Machines, Internet banking, Mobile banking and Electronic Fund Transfers and the dependent variable was employee productivity. The study was done among 150 employees of three selected banks of Nairobi, Kenya and stratified random sampling was employed to select the samples. The result of the study clearly indicates that an increase in the application of IT will certainly lead to an increase in the productivity of employees and the research recommended that the commercial banks in Kenya should improve their innovative capability due to the dynamics in the business.

Mwangi (2013) carried out a research to measure the impact of innovations on financial performance of banks. The study was carried out in the financial industry in Kenya. The findings of the study revealed that bank innovations had a significant impact on the performance of the banks which was measured through the variables like income, return on assets, profitability and customer deposits of commercial banks in Kenya. The study measured the moderating effect of mobile phones and internet services and
concluded that the moderating effect of mobile phones is higher than that of internet services when influencing financial performance of commercial banks in Kenya.

**Nader (2011)** carried out a study to measure the profitability of banks. The study was done in commercial banks of Saudi Arabia during the period 1998-2007. The results of the study indicated phone banking, and number of ATMs and bank branches had a significant positive impact on the profitability of banks. It is also found that the number of point of sale terminals, PC banking and mobile banking have no significant effect on the profitability of the banks.

**Ngari (2014)** aims to find out whether the financial innovations affects the financial performance and profitability of commercial banks in Kenya. 16 commercial banks from the 44 banks were selected for the purpose of the study and Slovin’s formula was used to arrive at the sample size. Profitability ratio’s like Net Profit Margin and Gross Profit and Efficiency ratios were also calculated for the financial performance measurement. By employing multiple linear regression models it was concluded that financial innovations had significant impact on financial performance of the banks.

**Omotoso, Dada, Adelowo, & Siyanbola (2012)** examined the role of ICT in the delivery of services in the Nigerian banking industry. The respondents of the study were the officials and customers randomly selected from the banks. Even though the findings of the study reveals that ICT has made an impact on the productivity of the banks, the study identified some challenges to the application of ICT in the banking sector. The study also suggested some measures to overcome the challenges and to improve the productivity of banks in Nigeria.

**Rub & Abbadi (2012)** promotes the use of balanced score card in evaluating the performance of banks. The study aims to analyse whether the bank managers are aware of these performance measures and whether they use them in their bank’s performance measurement process. They also evaluate the difference between local and foreign banks, branches and head office etc regarding the performance measurement. Norton and Kaplan’s model with four measures (i.e. financial, customer satisfaction, innovation of product and services and commitment, learning and growth of employees) was adopted and modified by the researchers to fit the Palestinian context.
**Sharifi & Akhter (2016)** measured the impact of Credit-Deposit Ratio on the financial performance of public sector banks in India. Financial performance was measured in terms of Return on Assets, Return on Equity and Net Interest Margin. The study was analysed using secondary data obtained from annual reports of RBI for the period 2008 to 2015. Panel data regression model was used for the analysis and the outcome reveals that CD ratio has a positive impact on the profitability of public sector banks in India.

**Shirley and Sushanta (2006)** measured the effect of information technology on the banking sector and identified how spending on information technology can impact bank profits. Panel data of 68 US banks for a period of over 20 years was used to estimate the impact of IT on the profitability of banks. The study found out that spending on IT leads to cost-saving but higher IT spending can lower the bank profits by creating network effects. They contend that the relationship between IT expenditures and bank’s financial performance is conditional to the extent of network effect.

**Stoica, Mehdian, & Sargu (2015)** in their article aimed to analyse the way in which the internet banking services contribute to the overall efficiency of the Romanian banks. DEA approach was used in the study to measure the efficiency of Romanian banks. To identify different strategic groups among the banks PCA was employed to the bank's efficiency values obtained through DEA. 4 inputs and 2 output was used in the model to generate 45 possible combinations and 45 results based on the DEA. The weak and strong aspects of the selected banks can be identified through this. Principal Component Analysis was used to extract relevant data and eliminate redundant information. A sample of 24 banks engaged in universal banking activities was used for the study and the results of the study suggests that “cost-oriented” and “internet banking oriented” are the two business strategies practiced in Romanian banking sector and only 2 banks are able to efficiently use internet banking services and all other banks prefer to use mixed approach between internet banking services and cost reduction strategies.

**Thangam & T (2016)** have made an attempt to measure the productivity of selected banks in India. Three banks each were selected from the three sector of the banks i.e. from public, private and foreign banks. The biggest banks in terms of deposits and
advances were selected for the study and the productivity of these banks for the period of 2009-10 to 2013-15 was measured. The variables used to measure productivity are:

1. Net Profits
2. Deposits
3. Advances
4. Total interest income
5. Total expenditure
6. Total business

Calculation was done on both per employee and per branch basis and it was found that large banks with high number of branches and employees have low productivity and it is suggested that banks should concentrate more on per branch productivity and per employee productivity.

IV. Studies on Customer Satisfaction

Ahmad, Rehman, & Safwan (2011) examined the effect of service quality on banks performance with the mediating effect of customer satisfaction. The proposed model was tested using Structural Equation Modelling(SEM). In this study service quality was measured by using modified version of SERVQUAL model developed by Parasuraman et al (1988,1991) and contains five dimensions i.e. tangibility, reliability, responsiveness, assurance and empathy. Customer satisfaction was measured using five dimensions i.e. core service or service product, human elements of service delivery, systematization of service delivery, tangibles of service and social responsibility. Performance of banks was measured by asking the respondents to rank some aspects of their bank like quality of product, market share, internal process coordination, profitability, personnel rotation, etc. The findings of the study revealed that customer satisfaction is not having any mediating role between service quality and performance of banks due to the lack of customer orientation and awareness campaigns.

Angelova & Zekiri (2011) focused on the application of ACSI model to describe how customers perceive service quality and to know whether they are satisfied with the services offered. Even though the study was done in the context of telecommunication industry, it is applicable to all service industries as it provides a clear idea about the
cause-and-effect model which includes drivers of satisfaction, satisfaction and outcomes of satisfaction. ACSI model measures the effect of customer satisfaction on customer loyalty and by looking at the indexes the users can easily identify that the increase in which driver of satisfaction will have more effect on customer loyalty.

**Ankit (2011)** focused on identifying the major factors that influence the satisfaction of online banking customers with regard to the service quality of the banks. The data was collected from 250 customers who are using or willing to adopt online banking facility in Vadodara. The study identified six factors for determining customer satisfaction. They are:

1. Banking Needs
2. Core Services
3. Problem Resolution
4. Cost Saved
5. Convenience
6. Risk and Privacy concerns

Feature availability and customer continuation were identified as the moderating variable by the researcher. The study suggested that providing education to the customers about the online banking services will increase the confidence of the customers and it will lead to the satisfaction of the customers.

**Dewan & Mahajan (2014)** explored the moderating effects of various demographic and situational factors on the customer satisfaction in the public sector banks. Gender, age, income, educational background, occupation, marital status, frequency of visit to the bank and years of relationship with bank are the various factors considered by the researcher. The researcher collected data from 300 bank customers of State Bank of India using structured questionnaire and the study suggested that the bank managers should assess and monitor customer satisfaction levels in their banks periodically and also focus on improving their relationship with the customers as it is an important factor for increasing the performance of the banks.
**Hong & Marimuthu (2014)** studied the impact of banking service quality on customer satisfaction. Servqual model with five dimensions (Assurance, Reliability, Tangibility, Empathy and Responsiveness) was implemented in the study to determine service quality of the banks. The gap was identified after measuring the difference between the expectation and perception of the customers regarding the dimensions of service quality. The result of the study reveals that the expectation of the customers was higher than the perception and the largest gap is found in the reliability dimension. It was also found that service quality has a positive and significant relationship with customer satisfaction.

**Khanna & Gupta (2015)** aims to focus on the perception of customers about the technological advancement in the delivery of financial products. Factors influencing customer perception were identified by conducting personal interviews with bank managers and customers. Thus the study identified five factors i.e. technology acceptability, safety, accessibility, user-friendliness and availability. The significant direction was given to Public Sector Banks for more effective cross selling and up selling of financial products and services.

**Khondaker (2010)** identifies the factors affecting customer satisfaction and explain how it can be utilised as a corporate government tool in the banking industry. The state-owned commercial banks of Bangladesh were selected for the purpose of the study. After testing the transaction-specific model by the use of factor analysis and multiple regression the findings of the study reveals that customer ranked responsiveness as the important factor for satisfaction and then physical comfort and assurance. The researcher comes to a conclusion that the specific study will guide the commercial banks to improve their customer satisfaction and the improved customer satisfaction will lead to improved financial sustainability and there by contributing to economic development of the country.

**Komal & Rani (2012)** looked into the satisfaction level of customers regarding various aspects of electronic banking i.e. ATM, internet banking, mobile banking and credit cards. The researcher collected data from 450 banking customers using judgemental purposive sampling method and the study results shows that the satisfaction
level of customers was high in the use of ATM facility, internet banking is at the second position and credit cards holds the third position and the mobile banking is at the lowest position. The study concluded that the opportunities in e-banking are immense and there is still an untapped market in India and banking institutions have a lot of scopes to expand their e-banking services.

Mandal (2015) examined the construct of customer satisfaction in relation to Indian retail banking industry by using a qualitative perspective. An attempt was made to explore the dimensions which might affect customer satisfaction. Depth interview and focus group of Indian banking customers were conducted and the analysis was done by using a tool called grounded theory. Open coding, index card coding, axial coding and selective coding were the procedures used to determine the dimensions affecting customer satisfaction and it provides the professionals and practitioners in the banking industry a better idea of customer satisfaction.

Mohajerani (2013) investigated the determinants of customer satisfaction and its consequences. The study was done by identifying 285 customers of 3 star, 4 star and 5-star hotels in Iran by using proportionate simple random sampling method. Structural Equation Modeling and Confirmatory Factor Analysis was used to analyse the relationship between dependant and independent variables. The result of the study reveals that perceived value and customer satisfaction are positively related and two factors namely perceived quality and customer expectation are not identified as the determinants of customer satisfaction. The study also identified that perceived value and perceived quality, perceived quality and image and perceived value and image, have a relationship and by improving one of them, the other one will become higher.

Musara & Fatoki (2010) tried to explore the impact of technological innovations on the efficiency of banking sector. The study also examined whether technological innovations lead to cost reduction to the customers. Data were collected from 200 customers banking with Standard Bank and FNB and residing in the town of Alice, South Africa. Stratified random sampling method was employed and 100 customers of Standard bank and 100 customers of FNB were selected randomly. The result of the
study reveals that ATMs was considered as an important technological innovation by the customers which leads to increased efficiency of the banks.

Osman & Sentosa (2014) carried out a study to understand the mediating role of customer satisfaction on the relationship between service quality and customer loyalty. The study was done in the context of Malaysian commercial banking industry. The result of the study after the application of SEM and PLS technique shows that service quality has a significant direct effect and positive relationship on customer satisfaction. The model also reveals that service quality has a positive and significant direct effect on customer loyalty. The mediating effect of customer satisfaction on service quality and customer loyalty was also justified by the study.

Osman, Mohamad, & Moham (2015) in their article have tried to understand the direct effect of service quality on customer loyalty, effect of customer satisfaction on customer loyalty and also the effect of banks image on customer loyalty in the context of Malaysian banking industry. SEM model was adopted to undertake the study and the model thus created was tested using Partial Least Square method. The servqual model developed by Parasuraman et al. (1985) was modified to measure the dimensions of service quality. The findings of the study show that customer satisfaction, service quality and banks image have a significant and positive effect on customer loyalty and this will lead to banks profitability.

Rizwan et al. (2014) identified six important factors which affect the satisfaction level of customers in using the modern banking services i.e awareness, security, trust, ease of use, responsiveness and reliability. The study was employed by collecting data from 120 banking customers using structured questionnaire. The result of the study shows that all the variables identified by the researcher have a significant positive relationship with the customer satisfaction of banking customers regarding modern banking services. The study implied that bankers should focus more on the development of innovative banking services as it is the main reason for the achievement of customer satisfaction.

Saha, Hasan, & Uddin (2014) gives insight into the quantitative parameters of customer satisfaction by identifying various service quality dimensions. The study was
done in the selected commercial banks in Rajshahi city. The fifteen influencing variables
selected at the first stage were factored in to five important constructs i.e. (1) Bank safety,
guarantees, (2) Branch environment (technical facilities, interior decoration etc.), (3)
Bank opening hours; Request fulfilment time; Bank reputation, (4) Service speed, (5)
Service costs and all the indicators used to measure the constructs were found statistically
significant based on the survey.

Seyaal & Rahim (2011) aims to determine the satisfaction level of online
banking customers and the role of demographic variables in assessing them. The study
used Doll and Torkzadeh model for measuring the customer satisfaction. Hierarchical
regression analysis was done and the result shows that the demographic variables have a
role in determining customer satisfaction. The study concluded that the customers are
satisfied with the online banking services even though there is lack of security issues, low
speed of internet and the lack of skill. They suggested that the bank authorities can
organise customer orientation and training programmes for both existing and prospective
customers.

Zafar, Zaheer, Rahman, & Rehman (2011) intended to test whether the service
quality dimensions will lead to customer satisfaction. A model was developed on the
basis of theoretical background with the dimensions efficiency, reliability,
responsiveness, fulfilment, privacy and assurance. 264 online banking customers were
selected as samples using convenience sampling. The study concluded that the service
quality dimensions have significant impact on customer satisfaction. The proposed model
was accepted and the dimension ‘assurance’ was having the highest value.

Zani & Berzieri (2008) have focused on measuring customer satisfaction using
ordinal variables with a different number of categories. The various dimensions of
customer satisfaction used in the context of the study contact, waiting, courtesy, skill,
quality, speed and complete. In addition to this overall satisfaction is also measured. The
study has tried to consider and compare different approaches for quantifying the ordinal
variables. Initially a pyramid of satisfaction which is a simple graphical method was used
to visualise the entire variables and its categories with shares of each class of
respondents. It was followed by a comparison of linear and non-linear for summarising
the level of satisfaction. The scores of PCA and CATPCA ranging from 0 to 10 were also related. The result of the study shows that multi dimensional approach with classes of unsatisfied, fairly satisfied and very satisfied respondents give a more appropriate estimate.

2.2 Research Gap

The literature survey reveals that though there are a number of empirical studies made on customer satisfaction and financial performance of banks, it is found that there are no specific studies made to assess the effect of financial innovation on the banking industry in terms of innovativeness and financial performance. In addition to this, no study has been made to compare the public and private sector banks on the dimensions of financial innovation and customer satisfaction. Use of econometrics procedure in measuring the financial performance was also not done before in the commerce discipline. As such the above factors are considered as the ‘Gap’ and keeping this gap as the basis this study has been taken up.
References:

I. Studies on Financial Innovation:


II. Studies on Banking Industry:


**III. Studies on Performance Measurement:**


IV Studies on Customer Satisfaction:


