CHAPTER 2

REVIEW OF LITERATURE

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The review of related literature on the research area has been organized in a thematic manner for easy navigation through the progress made in the field. The broad division of the studies is as per the four dimensions of financial development, namely, access, depth, efficiency and stability. The sections and sub-sections of this chapter is outlined below:

2.1: Studies related to Financial Access

- Country-comparison studies on financial access
- Studies on financial access with reference to India
- Studies on Financial Inclusion Index with reference to India
- Studies related to state-wise comparison of financial inclusion in India

2.2: Studies related to Financial Depth

- Studies on country-comparisons of financial deepening
- Single country studies on financial deepening

2.3: Studies related to Financial Efficiency

- Studies on financial efficiency with reference to foreign countries
- Studies on financial efficiency with reference to India using DEA
- Studies on financial Efficiency with reference to India using Financial Ratios
- Studies on efficiency of financial markets with reference to India

2.4: Studies related to Financial Stability

2.5: Studies on interlinkages between the dimensions of financial development

2.6: Studies on linkages between financial development and economic growth

- Early Studies on the finance and growth linkages
- Studies with alternative channels of the positive finance-growth link
- Studies on the finance-growth link with broader concept of financial development
- Studies that do not support positive linkages between finance and growth

2.7: Summary of observations from the Review of Literature

2.1 STUDIES RELATED TO FINANCIAL ACCESS

Financial access is an extensively researched area in the studies related to financial sector. The research work in this area can be classified into country-comparison studies, single-county studies, studies related to particular aspects of financial access and the challenges there of, and studies related to India. Several studies have examined financial inclusion resulting out of financial access.

2.1.1: Country-Comparison Studies on Financial Access

There are several studies in the area of financial sector development which undertake country comparisons. These include Beck, Kunt and Peria (2005), Claessens (2006), Beck and Kunt (2008), Sarma and Pais (2008), Beck, Kunt and Honohan (2008), Sarma (2008), Hannig and Jansen (2010), Rojas-Suarez (2010), Ardic, Hiemann, and Mylenko (2011), Sarma (2012) Rupeika (2014) Amidžić, Massara, and Mialou (2014), Ozili (2018). The studies cover a wide range of countries which are compared on various dimensions of financial development such as access, financial inclusion and usage, both among households and firms. To capture these dimensions of financial development, these studies have used alternative measures of geographical and demographic penetration such as number of bank branches and ATMs and number of deposit and loan accounts with banks, etc., over some number of population. Some of these studies also differentiate between household accounts and those of business firms, particularly, small firms. Average size of credit and deposits as a ratio to per capita GDP has also been employed to represent extent of usage of banking services across the countries compared.

Most of these studies have employed correlation and regression analysis between the dimensions of bank penetration, availability and usage. Some studies have employed factor analysis method to identify the more important ones among the alternative factors on the basis of which they are assigned weights. The findings reveal positive association of volume of deposits and number of bank accounts of households. Likewise, positive association is also found between share of small firm bank accounts and average size of credit. Most of these studies have grouped countries into different categories of developing countries, be it Asia, Africa, Latin America and the Middle East, as found in the data sources. More countries are concentrated on developing countries than developed countries as financial development is a matter of more relevant concern to them. Some studies do analyse data for individual countries which includes both developed and developing countries. The overall results of these studies

find that, developed countries have a higher level of bank branch penetration compared to underdeveloped countries. Among the developing countries there is a greater degree of variation.

Claessens (2006) finds that OECD (Organization of Economic Cooperation and Development) countries had high percentage of households with bank accounts ranging above 90 percent on average, while developing countries had a much lower range averaging 26 percent. Furthermore, it was found that within developing countries, developed urban areas exhibited higher level of bank penetration. Also, differing from other country-studies, Claessens (2006) uses country-specific data which are based on household surveys carried out in different time periods spread over 1991 to 2004, regarding use of formal and informal sources of finance. The study has focused particularly on access to microfinance by households. The study reports that there is improvement in the use of microfinance by households. However, the study also cautions that the improvement may actually be the outcome of access to more data rather than increase in microfinance, per se.

Beck, Kunt and Honohan (2008), based on World Bank data for the year 2007, compares the proportion of households having an account with financial institutions for groups of countries among developing countries. The findings reveal that European and Central Asian countries had relatively higher financial access, although, within this group of countries there is a wide variation in the proportion ranging from 20 percent to around 70 percent. However, countries in the Sub-Saharan Africa region had the least access, while East and South Asian countries, Latin American and Caribbean countries had within the median range of access. Access in Middle East and North African countries ranged from around 15 percent to 35 percent. The study concludes that government has an important role to play through conducive policy formulations in improving access.

Sarma (2008) has made country comparison by proposing an Index for Financial Inclusion using three variables namely Banking Penetration, that is, the number of bank accounts per 1000 population, Availability of Financial Services, that is, the number of bank branches and ATMs per 1000 population, and Usage of Financial Services measured by the ratio of the volume of credit and deposit to GDP. The study computes two set of indices, first set computes the index using all three dimensions for 55 countries for the year 2004 and by dropping one dimension namely banking penetration the second set computes index for 100 countries for the same year. The results show that Spain ranks first in both the set of indices and India ranks 29th

position in three dimensional index with low Financial inclusion. The study concludes that a large number of economies have low levels of Financial Inclusion. Due to lack of data on many aspects of financial inclusion like affordability of the financial services, promptness of the services, quality of financial product, etc., have not been studied by the researcher. The study reports better extent of financial inclusion for OECD countries. Among the Asian countries, Malaysia and Singapore are found to be better performers.

Sarma and Pais (2008) extend the enquiry by using the index developed by Sarma (2008) to investigate macro level factors that may be connected with financial inclusion. The study also analyses the relationship between Financial Inclusion Index (FII) and Human Development Index (HDI) for 49 countries for the year 2004. The result showed India ranking at the 29th position in FII with low level of financial inclusion and 42nd in the HDI. By performing three sets of regressions it has attempted to find out country specific factors that influence the level of financial inclusion. These include socio-economic factors, physical infrastructure, and banking sector factors. The study concludes that there is a positive correlation between financial inclusion and human development. It points out that the countries with the stronger physical infrastructure have better financial inclusion.

Arora (2010) has focused on the extent of financial access in both developed and developing countries. This study differs from others in that it has computed the Financial Access Index (FAI) instead of the FII. This is because the study has emphasized on bank outreach, quality and cost of penetration, which are essentially supply side indicators for which it includes banking and non-banking companies. The FAI has been constructed for 98 developed and developing countries according to the coverage of data and ranks them accordingly, based on a single year data, 2007. The study examines financial access both in terms of banking sector as well as non-banking companies. India is found to rank 29th with low level of Financial Inclusion. The study has modified the HDI by including financial access as one of its components and terms it as the Economic Development Index (EDI). It ranks the country on the basis of comparisons of EDI and HDI.

Hannig and Jansen (2010), based on data over 2003 to 2009, have examined South Asian, South East Asian and African countries for their level of financial inclusion measured in terms of access, quality and usage. Their findings suggest that countries with development in the financial sector whether in terms of increase in microfinance, access to mobile phone banking, public sector banks, have been responsible for improvement in deposit accounts and credit up-

take. Countries with higher GDP per capita were on an average found to exhibit greater proportion of adult population with bank accounts, although with high degree of variation.

The study by Rojas-Suarez (2010) differs from other country-comparison studies in that it focuses on analysing the factors that create obstacles to financial access. The study has made cross-country comparison of financial access based on World Bank data for the period 1990 to 2007. The study primarily focuses on emerging economies and compares the financial access indicators of these countries with the average values of these indicators with other three country groups, namely, developed, upper-middle income and rest of the developing countries. It analyses the state of financial access in the emerging countries based on branch and ATM density and financial depth indicators such as deposit to GDP and credit to GDP ratio. It further identifies hindrances to financial access, such as, social exclusion, illiteracy and poor levels of education, irregular nature of employment, income inequality, and high inflation volatility. Poor quality of customer service, long waiting time, inadequate information on financial services, insufficient bank branches and ATMs, etc., are found to be the discouraging factors for potential customers. Obstacles on institutional front include capital adequacy requirements, taxes on financial transactions, interest rate ceilings, etc. The study has undertaken an econometric analysis of the impact of these obstacles on financial access in emerging countries. The results indicate that institutional and regulatory factors are important constraints for emerging economies, unlike the developed countries. Income inequality is found to be major hindrance to financial access across all countries.

Among the country studies, Ardic, Hiemann, and Mylenko (2011) further undertakes regression analysis of deposit and credit penetration as a function of country characteristics which include per capita GDP, population density, infrastructure such as landlines and cell phones, financial infrastructure such as number of branches per 100,000 adults, geographic and demographic outreach. Their findings converge with those of Claessens (2006) in that developed countries had higher levels of bank penetration. Ardic, Hiemann, and Mylenko (2011) find that countries with better economic, physical and financial infrastructure had greater penetration, both, in terms of deposits and credit. For instance, countries in Sub-Saharan Africa and South Asia region, including India exhibit low levels of bank penetration. Countries in Latin America and Caribbean, East Asia and Pacific, and Middle East and North Africa regions had median range of bank penetration. Among the developing countries, European countries and those in Central Asia had the highest level of bank penetration. Countries with high incomes among OECD and non-OECD groups were found to have very high levels of

banked population, ranging above 90 percent. These findings are largely consistent with the finding of Beck, Kunt and Honohan (2008).

Sarma (2012) has extended the country comparison study to 154 countries to examine the level of financial inclusion attained by them over the period 2004 to 2010. The study has constructed the index of financial inclusion for these countries, however, the data availability for the countries varies for these years. Also, the data availability varies across the indicators for various countries. Therefore, the index is constructed for different number of countries in different years. The methodology of constructing the index involves using the average of the Euclidean distance and the inverse of Euclidean distance, which provides the correct picture of financial inclusion as it measures the achieved values of the indicators of financial inclusion not just as distance from the worst case scenario but also the distance from the maximum or desired values of those indicators. The results show great degree of variation among countries. The study classifies the countries into three categories based on the level of financial inclusion. Countries with index value ranging from 0.6 to 1 are considered to have high level of financial inclusion, while 0.3 to 0.6 is the medium level. Countries with index value below 0.3 are classified as having low financial inclusion level. The study finds financial inclusion to be positively related with the state of development of the country. Most high income OECD countries are found to exhibit high level of financial inclusion. Although, some middle income countries were also found to have high level of financial inclusion. There are also some instances where high income countries fall under medium level of financial inclusion and vice-versa. Typically, most of the African countries were found to have poor level of financial inclusion. India is found to fall under the medium range of financial inclusion.

Rupeika-Apoga (2014) has examined access to finance by the Baltic countries for the year 2013. The study has made a comparison of the three Baltic states on measures such as availability, affordability and ease of access to financial services. Among the three states, results show that Estonia fared better compared to Latvia and Lithuania. The study emphasizes the need for well-functioning financial system so as to channelize funds to the more profitable use and in allocation of risk, which can reduce poverty and unequal income distribution and increase economic growth.

Amidžić, Massara, and Mialou (2014) divide the countries into upper middle, lower middle, high and low income levels to examine the difference in the state of financial inclusion in these countries over the period 2009 to 2012. The dimensions used to measure financial inclusion

are similar to other studies in this area. The researchers have constructed two sets of Financial Inclusion Indices, the first being the dimensional index prepared for each dimension, separately, i.e., outreach dimension and usage of financial services which have been measured in terms of various alternative indicators. The second index is a composite index which combines the two dimensions. The study uses factor analysis to assign weights to variables in the composite index. The result of the dimensional index shows that the level of financial inclusion is positively associated with the level of income of the countries, that is, high and middle income countries have high financial inclusion, and low income countries have low financial inclusion in terms of both the dimensions. The composite index also shows similar results.

Ozili (2018) has examined the role of digital finance in financial inclusion by being non-discriminatory, low-cost medium, and by improving the operational efficiency of financial intermediaries with the expansion of population with mobile phones.

It may be noted that these country-comparison studies are based on single-year or two-year data, ranging from 1999 to 2012. The common conclusion that emerges out of the country-studies is that, alternative measures of bank penetration and usage of banking services are highly correlated with the level of development of the country. More developed countries tend to exhibit higher level of financial development, although measured by very primary indicators. Also, it may be noted that since these studies involve comparison over a broad base of countries, comparable data for all countries on a given parameter are not found easily. Many of these studies therefore use data corresponding to different years for comparison.

2.1.2: Studies on Financial Access with Reference to India

There are a good number of studies related to financial access and inclusion in the context of India. While some of these studies have attempted to measure the state of financial access in India, others have constructed the Financial Inclusion Index based on alternative indicators of various dimensions of financial access.

Studies related to financial access and financial inclusion in India include Sharma and Kukreja (2013), Shivani (2013), Mohammad (2014) Aggrawal, R. (2014), Aggrawal, V. (2014), Bhan (2014), Malik and Yadav (2014), Garg and Agarwal (2014), Joseph (2014), Kaur (2014), Singh, et.al. (2014), Shah and Dubhashi (2015), Dolli and Panduranga (2016), Reddy (2016), Sujlana and Kiran (2018), Barik and Sharma (2019), to mention a few. Some studies like

Mehrotra and Kandpal (2009), Chakrabarti, et al (2014) and Kumar (2016) have focused on financial access in terms of mutual funds penetration in India along with bank penetration.

Most studies in the context of India are descriptive papers on the measures initiated by the government to improve financial inclusion and the challenges faced in doing so. Kaur, (2014) and Aggrawal, R. (2014), Dolli and Panduranga (2016), Sujlana and Kiran (2018), Barik and Sharma (2019), for instance, discuss the RBIs initiative in adopting bank led approach to achieving the targeted goal of financial inclusion which includes measures like Basic Saving Bank Deposit (BSBD) account, relaxed and simplified KYC norms, simplified branch authorization policy, compulsory requirement of opening branch in unbanked villages, Financial Inclusion Plan, Financial Literacy Centres, etc. Likewise, Malik and Yadav (2014) have also discussed about government initiatives to improve financial access and inclusion. Apart from that the study has examined the growth in bank branches, coverage of villages, BSBD accounts, ICT based accounts, and population group-wise ATM network, over different periods ranging from 2006 to 2013.

Shivani (2013) has also highlighted the causes of financial exclusion in India such as illiteracy, poverty, and under-developed information technology and telecom infrastructure, apart from high cost of provision of financial services. Garg and Agarwal (2014) have examined the extent of financial inclusion among rural population in India for the period 2010 to 2013 by analysing the growth in banking outlets, usage of Kisan Credit Cards, business correspondents and ICT accounts in the rural areas. The study suggests that there is much to be achieved despite the efforts and emphasizes on empowering MSMEs for better access to credit. Singh, et.al (2014) assert the role of mobile phones and banking technology in improving financial inclusion in the rural area.

Some of these studies have particularly focused on excluded sections of the society and the role of microfinance institutions and Self-Help Groups. These include Mohammad (2014), Bhan (2014) and Singh (2018), Barik and Sharma (2019). Those studies which have undertaken quantitative examination of financial access have used similar dimensions like penetration, availability and usage in relation to banks. Demographic and geographic densities of banks, branches and ATMs are the common indicators used for representing bank penetration and availability in most of these studies. Usage of financial services has been largely represented by measures such as ratio of average loan size and deposit size to GDP, number of loan and

deposit accounts per 100,000 population, and so on. Very few of these studies have undertaken in-depth or a long period examination of financial access and inclusion.

The study by Sharma and Kukreja (2013) has compared geographical and demographical penetration of the banking sector in India for a limited period between 2010-2012. The study also compares the data with those of select developed and developing countries. The study concludes that government effort of opening banks in so far unbanked areas has improved the extent of financial inclusion in India. Aggrawal, V. (2014) too has simply made a comparison of select indicators of financial inclusion like bank branch density, ATM density, credit to GDP ratio and deposit ratio in India for the single year 2011, with select countries in South and South East Asia, and Mexico and BRICS countries.

Chakrabarti, et al (2014) have studied geographical penetration, distribution and determinants of mutual funds in India. The analysis shows that geographical penetration of mutual funds and distribution of financial agents are skewed in the favour of top 60 districts in India and a huge amount of presence of mutual funds is originated from Mumbai city. The results do not show strong co-relation between adult literacy and bank penetration on mutual funds penetration. The determinants for low penetration of mutual funds are risk-aversion, complexity in mutual funds, low commission to mutual fund agents vis-a-vis commission on other financial products, inefficient distribution network, inefficient marketing, lack of talent for training and hiring mutual fund agents, lack of investment awareness, and lack of financial sophistication of investors outside top-15 cities, and lack of standardization in process. The findings suggest that it is advisable to use post offices as a distribution channel which can have positive effect on mutual funds penetration and improve marketing and advertising efforts.

Another such study is by Kumar (2016) that has examined market penetration and investment pattern of asset management companies (AMC) in India. The study shows that in recent decades there is massive growth in mutual funds industry in India, both, in terms of assets under management and fund houses in operation. Further findings of the study match with those of Chakrabarti, et al (2014) that the major hindrances to mutual fund penetration are risk aversion, ignorance and product complexities. The study asserts the need to enhance efforts for imparting financial education to potential investors so as to improve market penetration.

Reddy (2016) has discussed twelve pillars for achieving 100 percent financial inclusion in India, which include among others, expansion of banking networks, business correspondents model, Basic Saving Bank Deposit accounts, etc. The study has estimated the time trend of

the different pillars based on regression analysis, which shows positive improvement in the number of branches opened in different areas, viz., rural, urban and metropolitan. Rural areas show significant increase in number of branches over time while metropolitan cities registered the least growth. This is attributed to nationalization of banks with stress on unbanked rural areas. Using two factor ANOVA without replication to measure the variation in banking network across different areas, namely, rural, semi-urban, urban and metropolitan over the years 2012 to 2016. The study finds that there is significant difference between areas with respect to bank branch network over the years, as also, significant difference between different years with respect to bank branch across areas. However, poverty and ignorance on part of the people, and belonging to unorganized sector are pointed out as the major obstacles to full financial inclusion.

The study by Sujlana and Kiran (2018) differs from other studies for the fact that they have made regional comparison of the status of financial inclusion in India for the period 2007 to 2015. However, the study only involves comparison of branches of commercial banks and their growth rates across six regions of India as per the regional classification done by the RBI. The study asserts that the Southern region has the highest spread of bank branches, followed by Central and Northern regions. This is bound to be so as most metropolitan cities are located in these regions.

2.1.3: Studies on Financial Inclusion Index with Reference to India

Some studies in the context of India have constructed financial inclusion indices covering a wide range of dimensions like penetration of the financial sector, availability of financial services and their usage, outreach by banks and other financial institutions, quality of services, etc. These include studies like CRISIL (2013), Sethy (2016), Goel and Sharma (2017), Adhikary, Bagli and Dutta (2017), Deepti and Subramaniam (2018), Singh (2018), Pathan and Fulwari (2020) and RBI (2021) which have used similar indicators to compute Financial Inclusion Index for India over different time periods and with varying scope.

Credit Rating Information Services of India Limited (CRISIL, 2013) has constructed the Financial Inclusion Index for India 'Inclusix' for the year 2013 and thereafter, for 2014, 2015 and 2018, which however, is based on only six measures of penetration related to branch, credit, deposit and insurance penetration. The index differs from all other studies on the aspect that it avoids use of any monetary parameters and rather focuses on number of persons who have been financially included in the formal financial sector. These indices are constructed for all India

level, regional level and district level so as to provide, both, an aerial view as well as ground-level image with data covering remote districts even in the rural areas. This adds to the utility of the indices by guiding policy interventions at different levels. For the year 2013, the study finds India to score on the lower side on the scale with a score of 40.1 out of 100, however, the score is an improvement over previous years. In the state comparison, the findings converge with other studies which show wide disparities between states. With regard to state-level findings, the results converge with those of other studies which find Goa, Kerala, Chandigarh and Delhi to be among the better performers. Likewise, southern region was found to perform better as was found in the case of Sujlana and Kiran (2018).

Sethy (2016), for instance, in his study on the role of financial inclusion in inclusive growth has proposed two composite financial inclusion indices using two data sets, the demand side index for the year 2004 to 2012 and supply side FII for the year 1975 to 2012. The first FII is based on measurement of financial inclusion in terms of demand side factors by using three dimensions, namely, banking penetration, availability of banking services and usage of banking system. The first dimension is measured in terms of deposit accounts per 1000 adults; the second, in terms of density of ATMs and bank branches per one lakh population, and the third in terms of ratio of outstanding volume of deposits to GDP. The supply side FII is based on three variables, namely, proportion of households with access to savings, access to insurance and number of loan accounts of small entrepreneurs. The findings of the study are that the demand side FII for India places it in the range of high financial inclusion. For the supply side FII, the study reports that up to 2009, the level of financial inclusion was low, but it improved between 2010 and 2012.

Apart from the above analysis, Sethy (2016) has also calculated FII for all the states of India and for the SAARC countries. The results show high financial inclusion in India based on demand side FII with values ranging above 0.6, and low supply side FII with values below 0.4. The results show wide disparity among SAARC countries on different parameters of financial inclusion. Compared to other countries within the group, Sri Lanka has better performance than India on some of the indicators. Overall, India and Sri Lanka appear to fare better in a relative sense. The study asserts that narrowing of branch network in rural areas, decline in credit to deposit ratio in the rural areas, high transaction costs, poor attitude, discouraging staff attitude, complexity of financial products, etc., are factors responsible for relatively low level of FII.

The index by Goel and Sharma (2017) is based only on two dimensions, penetration and availability, and spans over ten-year period from 2005-2015. The study shows improvement in India where it ranges from low financial inclusion in mid 2000s to high financial inclusion in 2014-2015. Deepti and Subramaniam (2018) have constructed a multidimensional index for five-year period from 2011-12 to 2015-16, covering variables such as banks, ATMs, POS Terminals, ICT Accounts, etc., and finds significant improvement in the level of financial inclusion. The study affirms the conclusion of other studies that usage dimension needs improvement for greater financial inclusion.

Singh (2018) checks for the validity of the CRISIL Inclusix Index in successfully measuring financial inclusion by particularly focussing on the *Jan Dhan Yojana* (National Mission on Financial Inclusion). The study states that microfinance institutions and *Jan Dhan Yojana* have made more improvement in financial access as both pay more attention to weaker sections of the society.

The study by Pathan and Fulwari (2020) has constructed a bank-centric financial inclusion index with a long term perspective of 27 years which is missing in other studies found in the area. The study has constructed both dimensional indices as well as composite financial inclusion index based on Euclidean Distance method. It finds that banking penetration has improved substantially over time, particularly, from early 2000s onwards. The usage index is found to have improved significantly over the year implying improvement in banking habits of the people in general. The study differs from the previous ones in that it has examined the availability dimension for rural-urban difference in financial inclusion by examining the two separately. The study finds vast difference between rural and urban availability of banking services. The overall index is found to have improved steadily and risen above 0.6 range from the year 2013 onwards.

The Reserve Bank of India (2021) has also constructed the FII with a very broad concept of financial inclusion, including not just the dimensions of penetration, availability and usage but also to represent qualitative aspects of inclusion such as quality of financial services, equality in the distribution of financial services, level of financial literacy, as also, consumer protection, for the period 2017-2021. RBI has constructed sub-indices of select dimensions to highlight which of them has played a greater role in achieving higher level of financial inclusion. It has assigned lower weightage to the supply side dimension of access and greater weightage to usage and quality dimensions which represent deepening measure of financial inclusion. In all

RBI has employed 97 measures across three dimensions, namely, access, usage and quality. It has assigned lower weightage to access on the premise that it represents the supply side initiatives taken in the past to provide financial infrastructure. The financial deepening dimensions of usage and quality have been assigned higher weightage so as to "make the index forward-looking" (RBI, 2021). The RBI FII further studies the quality of financial inclusion by examining the Gini coefficient at district level to gauge inequality therein.

The RBI index also differs in its methodology to the extent of how it has normalized the values of each indicator. Unlike the methodology followed by most studies, it has normalized the indicators by taking extreme values such as zero status of an indicator and its desired value rather than minimum and maximum values. This results into absence of any base year for the index, and zero as the lowest value of the normalized parameter and 100 as the highest value. The results show an improvement in the FII with a CAGR of 5.5 percent. Likewise, the sub-index of access is found to have a higher value at the end of the period indicating much success in coverage of the large population of India under formal financial sector. The study also reports substantial regional disparities on several measures.

2.1.4: Studies Related to State-Wise Comparison of Financial Inclusion in India

Another set of studies relating to India are those that have made state-wise comparison of financial inclusion and ranked states as per the level of financial inclusion reached. These mainly include, Chattopadhyay (2011), Kumar and Mishra (2011), Dutta and Dutta (2011), Bagli and Dutta (2012), Gupta and Singh (2013), Amberkhane, Singh and Venkataramani (2016), Thirupathaiah (2016), Adhikary, Bagli and Dutta (2017), Rajput (2017). Most studies have used three dimensions of financial access, namely, penetration, availability and usage to measure financial inclusion. These dimensions have been measured by the typical indicators largely found in literature, such as, bank accounts per 1000 adults to represent the first dimension. The second dimension is generally represented by the number of branches and ATMs per 1000 square kilometres, and the number of branches and ATM per 1,00,000 population. The third dimension is represented by ratios such as average size of loan to GDP, average size of deposit to GDP, cash in circulation to total bank deposits, number of loan accounts and deposit accounts per 1,00,000 population, ratio of credit utilized to credit sanctioned.

A few of these studies have also constructed state-wise financial inclusion index, such as Chattopadhyay (2011), Bagli and Dutta (2012), Amberkhane, Singh and Venkataramani

(2016), Adhikary, Bagli and Dutta (2017). Each of these studies differ from each other on some aspects such as the type and combination of indicators used, although largely, the indicators and variables used are highly similar to each other. Some studies differ in the methodology as well. However, the common element of all these studies is that they find a great extent of discrepancy between the state performance on the parameter of financial inclusion. The relatively advanced states are found to have higher levels of financial inclusion compared to relatively poor states. Most studies find states like Goa, Kerala, Tamil Nadu, and UT of Chandigarh to have better extent of financial inclusion, while most of the eastern and north-eastern states to fare poor. However, there are mixed results with regard to rural versus urban financial inclusion across developed and less developed states. Also, states with better literacy rates are found to be more financially inclusive, though, only on parameters of penetration and not so much on usage. This is particularly evident when financial inclusion is examined with reference to Pradhan Mantri Jan Dhan Yojana (Dutta and Dutta, 2011; Gupta and Singh, 2013; Thirupathaiah, 2016)

Kumar and Mishra (2011) have differentiated between supply and demand side of financial inclusion and constructed separate indices for the two. While supply side measures of the indicators of financial access are as commonly found in the literature such as banking penetration and availability, the demand side measures are related to household level access, and uses indicators such as formal savings in a vast array of financial products such as shares and debentures of cooperative societies and companies, government certificates, such as, National Savings Certificates, Indira Vikas Patra, Kisan Vikas Patra, RBI bonds, deposit in post offices including national saving scheme deposits, deposits in cooperative societies and banks, deposits in nonbanking companies, and other financial assets. It also includes household access to formal insurance and credit including annuity certificates and provident fund, and cash loans, respectively. Further, the study also incorporates household access to informal credit from non-institutional agencies like landlords, agricultural money lenders, traders, relatives and friends, professionals like doctors, lawyers and others. The study concludes that there is a lot of variation amongst states and in rural and urban regions. Informal sources are particularly found to be significant in rural areas.

Chattopadhyay (2011) in his study based on decadal data for the years 1980, 1990, 2000 and 2009, reports huge disparity between states in India, and between rural and urban areas with regard to financial inclusion. It concludes that both, supply side and demand side factors are responsible for financial exclusion, for which, appropriate policies measures are required.

Among these studies, Dutta and Dutta (2011) and Gupta and Singh (2013) in their state-wise study of financial inclusion, have particularly, examined the correlation between financial inclusion and literacy rates of the various states. While findings of Dutta and Dutta (2011) show that states with higher literacy levels are also the ones with higher index value of financial inclusion, those of Gupta and Singh (2013) reveal that financial literacy is not of particular significance when it comes to usage dimension of financial inclusion. Thus, states with poor literacy levels were found to fare poorly, particularly, in the usage dimension of financial access. These findings suggest that literacy is a necessary but not a sufficient condition for deepening of financial inclusion. Apart from this, their findings converge with those of other state-wise studies in that they report wide disparity among states in the level of financial inclusion.

Bagli and Dutta (2012) differs from other state-comparison study in that it has used the method of principal component analysis to examine the relative significance of the large number of measures used in the study. Also, they have compared the levels of human development of each state of India with their levels of financial inclusion. The study finds that for states with poor information technology it was a major reason for financial exclusion. Further, the study finds that there was a strong association between human development and financial inclusion.

Ambarkhane, Singh and Venkataramani (2016) has constructed state-level financial inclusion index for the year 2011, on three dimensions, namely, demand side, supply side and infrastructure based. While the first two include the usual parameters, the index with financial infrastructure include variables like irrigation, transport, power, literacy and health. It also includes, additionally, drag factors for each state such as population size and law and order situation to construct a Comprehensive Financial Inclusion Index. The study finds that Goa has the highest level of Financial Inclusion followed by Kerala and Tamil Nadu, whereas, Chhattisgarh and Jammu & Kashmir are among the lowest ranking states.

Adhikary, Bagli and Dutta (2017) have measured state-wise FII for the year 2010 based on the concept of spread, width, and depth, although, the measures are the usual as found in the literature. Spread dimension captures the demographic and geographical spread of bank branches; width dimension captures number of persons with deposit and credit accounts; and depth of financial inclusion has been measured by savings and credit to state GDP ratios. Findings of the study are similar to those of other state-comparison studies. The study has also examined the role of human development and the effect of self-help groups on financial

inclusion through linear regression model. It concludes that there is a significantly positive impact of human development on financial inclusion with more advanced states exhibiting higher level of financial inclusion.

The study by Rajput (2017) differs from other state-wise studies in that the researcher has not constructed state-specific financial inclusion index, but has applied panel regression analysis on two models, one being deposit penetration and another being credit penetration. The analysis spans over eight years from 2006 to 2014. The regression is run on explanatory variables such as average population per bank branch, per capita net state domestic product, credit-deposit ratio, the level of industrialization of the state, and individual status of employment. The results of the study indicate that states with high demographic penetration of branches had significant positive impact on deposit penetration but negative effect on credit penetration. Income, level of industrialization and employment status were found to have significantly positive effect on both the dependent variables. The findings of the study imply that the state of development and social characteristics play an important role in the level of financial inclusion.

A few studies were found which are based on primary data to gauge the extent of financial inclusion achieved. One such study is Joseph (2014) which has focused on measuring the intensity of financial inclusion and financial awareness among the people based on primary data collected from a Panchayat in Ernakulam district of Kerala, and secondary data. Using questionnaire method, the study enquires into the banking habits of people, their awareness about financial products and services, their source of information about financial products and services, reasons behind opting for public sector or private sector banks. The study also examines if there is any relationship between the financial product preferences of people and their education level, occupation, and income. It uses chi-square test to test the independence of the relevant attributes, and Likert scale to examine the financial awareness of the respondents. The results of hypotheses tested show significant dependence of the type of bank accounts on the level of income, and between types of bank accounts and occupational status. However, the level of education is not found to influence the financial choices of the respondents. The result of Likert rating scale shows that more than average population is aware about financial products and services.

Likewise, Revathy and Maheshwari (2015) have measured the extent of financial inclusion among rural women in Tirunelveli district of Tamil Nadu. The study measures financial inclusion by taking into account four groups of financial service providers, namely, banks, post

offices, insurance companies and self-help groups. Based on survey of 500 respondents, it was found that there is high level of financial inclusion with respect to banks and post offices, moderate level with respect to insurance, and low level of financial inclusion with respect to self-help groups.

Another study based on primary data is Rashmi and Thimmaiah (2020) where the researchers have tried to identify the level of awareness of financial services among rural households. Using multi-stage sampling method, the researchers interviewed 120 respondents sampled from three talukas of Kodagu district of Karnataka. The results show that majority of the respondents were aware about availability of different financial services. The study further goes on to discuss the impact of financial inclusion on socio economic status of rural households and the infrastructural, institutional and psychological barriers to undertaking banking activities.

2.2: STUDIES RELATED TO FINANCIAL DEPTH

Financial depth implies the size dimension of the financial sector vis-à-vis the size of the real economy. A good number of studies are found in literature that examine the extent of financial deepening experienced in various countries. Since financial deepening is a matter of inquiry and concern for underdeveloped countries, most of these studies are country comparison studies, ranging from Sub-Saharan African countries, Asian countries, middle eastern countries, Asia-Pacific region countries, and emerging countries. Single country studies are largely concentrated on African countries and India too. Largely it is found that the more developed among the country-groups are found to have a greater level of financial deepening.

Most studies combine financial depth in terms of both, financial institutions and financial markets. The objective of majority of these studies is to examine the impact of financial deepening on economic growth of the country. However, many studies in the context of African countries have examined the trend in financial deepening over a period of time. Most of the studies use varied number of variables but mostly they include ratios such as narrow money, broad money, private sector credit, financial savings, financial assets, etc., to GDP. The findings of most studies converge with each other in that they find improvement over the years in financial deepening although not all variables are found to have positive trends.

2.2.1: Studies on Country-Comparisons of Financial Deepening

The country-comparison studies on financial deepening are found in Lynch (1996), Ndebbio (2004), Darrat (2006), Mohan (2006), Beck, Kunt and Levine (2009), Joshi (2016), Le, Ho and Vu (2019). Darrat (2006) found that diversity of economic environment led to highly country-specific results for financial deepening among the middle-eastern countries.

Lynch (1996) has studied financial deepening for select Asia-Pacific countries such Australia, China, Indonesia, Taiwan, Japan, Korea, Malaysia etc., comparing data of 1980 with that of 1990. The variables used narrow money to GDP, broad money to GDP, private sector credit to GDP and financial assets to GDP. The study finds that financial deepening had occurred in most countries examined.

Ndebbio (2004) has examined the impact of financial deepening on economic growth of 34 Sub-Saharan African (SSA) countries, averaging the measure over the decade of 1980, using multiple regression model. The study considers the sum of broad money, liabilities of non-bank financial institutions, treasury bills, value of shares and money market fund as a ratio to national income as a broad measure of financial deepening. The study finds that in most of the alternative models analysed, financial deepening was found to have a positive impact on per capita economic growth, although it was found significant at 6.5 percent level.

Darrat (2006) has made comparison of middle-eastern countries for the extent of financial deepening. The study has focused on three middle-eastern countries, namely, Saudi Arabia, Turkey and United States of Arab Emirates. It has used two variables, the ratio of currency to the narrow money stock and the ratio of broad money stock to nominal GDP. The results support the role of financial deepening in economic growth in general on the basis of which the study recommends increased efforts of government to improve financial depth. The results show that the findings are highly country-specific due to the diversity of economic environment.

Mohan (2006) has made cross country comparisons with Asian countries as well as western developed countries and reports that the level of financial depth in India is much lower despite the increase in the recent years. The author differentiates between financial deepening at the macro economy level with that at micro level, highlighting that there is poor inclusion of rural and semi-urban population and among the poor and low income population.

Beck, Demirguc¸-Kunt and Levine (2009) have made cross country comparison to measure financial deepening. The study focuses on bank, bank-like financial institutions, equity market, insurance sector and bond market. The variables used to measure financial depth in banks are namely, ratios of liquid liability to GDP, currency outside banking system to base money, bank deposit to GDP, private credit by deposit money banks to GDP, central bank asset to GDP and other financial institution assets to GDP. To measure financial depth in capital market, it uses the ratios of stock market capitalization to GDP and stock market total value traded to GDP as variables. For the bond market it uses private and public bond market capitalization to GDP, to measure its size. The variables used to measure the size of insurance sectors are ratios of life insurance premium to GDP and Non-life insurance premium to GDP. The result shows that there is vast variation in financial depth across the countries. Most of the financial deepening is concentrated in high income countries. The countries compare differently based on the measure of financial depth examined. For instance, some African countries have very poor levels of liquid liabilities to GDP ratio, compared to developed countries like Japan and the US. Countries with higher proportion of private credit to GDP ratio have shown higher levels of economic growth.

Joshi (2016) has examined the evolution, progress and performance of the Indian Financial System. The study has also made attempt to measure the extent of financial deepening in India and Asia-Pacific countries, using time series data for the period of 23 years, from 1991-92 to 2012-13. The variables used are, ratio of M2 to GDP and ratio of stock market capitalization to GDP. The results of regression show significant impact of financial depth on economic growth.

Le, Ho and Vu (2019) have examined the relationship between financial depth and economic growth for ASEAN plus three countries for the period 2000 to 2014 using depth measures related to bank credit, liquidity and financial market as a ratio to GDP. They find all to be positively and significantly affecting economic growth of ASEAN plus three countries with important implications for policy formulations that can encourage growth of integrated economies. They also find that the countries with more developed financial systems had a greater level of financial depth on all measures used compared to that with less developed financial sector.

2.2.2: Single Country Studies on Financial Deepening

Several studies are found for African countries, particularly, Nigeria, some of which are Nnanna and Dogo (1998), Nzotto and Okereke (2009), Ume, Nelson, and Onwumere (2015), Nwanna (2016), and Iheanacho (2019). These studies have used different combinations of the common indicators of financial deepening found in the literature, over varying time periods. Some of the findings of these studies are that financial and monetary policy reforms have resulted into improved financial deepening. Nzotto and Okereke (2009) report that Nigeria had low level of financial deepening and only some of the measures were found to have increased in depth.

Nnanna and Dogo (1998) have measured financial deepening in Nigeria for the period after financial reforms from 1986 to 1997. The variables used are M2 to GDP, Private sector credit to GDP, Financial savings to GDP, value of cheques cleared to GDP, and value of cheques to money supply. The result of analysis shows that the financial and monetary policy reforms have strengthened the financial deepening.

Nzotto and Okereke (2009) have studied the financial deepening in Nigeria for the period from 1986 to 2007. The variables used are, M2 to GDP, private sector credit to GDP, financial savings to GDP, value of cheques cleared to GDP, value of cheques to money supply, rate of inflation, deposit money and bank assets to GDP, currency outside banks to money supply and real lending rates. Among all the above measures, financial savings to GDP, value of cheques cleared to GDP, deposit money bank assets to GDP, and real lending rates were found to have significantly deepened the financial sector. However, overall results show that there is relatively low level of financial deepening in Nigeria.

Ume, Nelson, and Onwumere (2015) have examined the financial deepening in Nigeria over the period of 1981 to 2017. The variables used as proxy for financial deepening are namely, broad money (M2) and credit to private sector to GDP. Nwanna (2016) have examined the impact of financial deepening in Nigeria over the period from 1985 to 2014. The variables used to measure financial depth in banks and stock market are, M2 to GDP, private sector credit to GDP, market capitalization to GDP, and financial savings to GDP. Both report improvement in financial depth by these measures, although there is variation in their behaviour.

Studies on financial deepening with reference to India include Goel and Gupta (2011), Chakraborty (2014), Lenka (2015), and Ghildiyal, Pokhriyal and Mohan (2015).

Goel and Gupta (2011) have examined the growth of the stock market in India, its operational efficiency measured in terms of its liquidity and stability in terms of volatility of its returns. They have examined three indicators of stock market development in India, namely, size, liquidity and volatility, particularly, in the context of economic reforms introduced in the country, where size dimension represents financial deepening. They also report that while entry of foreign institutional investors has not influenced the volatility of the stock market, it has certainly helped in increasing the size and liquidity dimensions of the stock market. In fact, they find decline in stock market volatility in terms of stock prices.

Krishnan (2011) has assessed the extent of financial depth across different markets and sectors such as securities, debt and foreign exchange markets, and banking and insurance sectors. The study finds improvement with respect to all the markets and sectors examined. Asserting that financial deepening is a prerequisite for faster economic growth, Chakraborty (2014) has examined the extent of financial deepening in India for the period from 1991 to 2013. The variables used to measure deepening of financial intermediaries are ratios of money supply to GDP, domestic borrowings to GDP, deposits to GDP and cheques cleared to GDP. The study has also examined the impact of financial deepening on the volatility of the stock market, and then in turn, the effect of capital market deepening on economic growth. Based on ordinary least square analysis, the study finds that, both, financial deepening and capital market deepening have increased in India, and have a positive impact on economic growth, although financial deepening was found to increase the volatility in the stock market.

Lenka (2015) has measured financial depth in India using the ratios of M_2 to GDP, financial system deposit to GDP, gross domestic savings as a share of GDP, outstanding private debt securities to GDP, stock market capitalization to GDP, and stock market value traded to GDP, identified using principal component analysis. The study has constructed two indices of financial depth covering different time periods with different number of indicators. The results show that private sector credit to GDP and bank asset to GDP had higher weightage in the index.

Ghildiyal, Pokhriyal and Mohan (2015) have measured the financial depth in India based on assets of banking and non-banking financial institutions, and money market and capital market. It also includes other financial services like lease financing, factoring, merchant banking, credit rating, etc. The variables used are ratios of broad money to GDP, stock market capitalization to GDP, and credit to private sector to GDP. The researchers have studied the relationship

between financial deepening and economic growth of India both in the short run and the long run, using Granger Error Correction Model technique and Autoregressive Distributed Lag (ARDL) Bound testing approach, respectively over the period 1990-91 to 2013-14. The study finds both short run and long run impact of financial deepening on economic growth of India and recommends easing of credit to the private sector, widening of the range of financial services and development of the stock market to further deepen the financial sector.

2.3: STUDIES RELATED TO FINANCIAL EFFICIENCY

Efficiency is a wide concept and there are alternative ways in which it can be conceptualized and measured. For instance, one can conceptualize efficiency as cost efficiency which entails minimization of cost or profit efficiency which implies maximization of profits or revenue. Another concept of efficiency is one which looks into intermediation cost. Intermediation efficiency is one which examines banking efficiency in terms of cost incurred in their intermediation function of deposit mobilization and lending activities. It is typically measured in terms of changes in interest spread and interest margins. Interest spread measures the gap between interest charged on loans and interest paid on deposits. In a perfect world there is expected to be no difference between lending and deposit rates. By this reasoning, greater the friction in the financial system, greater will be the interest rate spread. It is in this premise that more competitive market structures are expected to get reflected in lower interest spreads as banks attempt to efficiently perform their intermediation function. High intermediation costs are also a reflection of market failures or absence of markets compelling banks to charge higher interest rates on lending than they pay on deposits. This section reviews the studies found in the literature on financial efficiency.

Two broad approaches to efficiency studies found in the literature include structural and non-structural approach. Structural approaches use theoretical models of banking behaviour and examine efficiency in terms of optimization problems such as cost minimization or profit maximization. The structural efficiency approach which is based on SFA is called the X-efficiency, the other two alternatives being scale efficiency and scope efficiency which are less explored. X-efficiency essentially relates to cost and profit efficiency. Non-structural approaches involve the use of various financial ratios that represent performance indicators.

2.3.1 Studies on Financial Efficiency with Reference to Foreign Countries

There is large number of studies that examine the factors determining bank efficiency across a wide range of countries from developed to developing and less developed. As cited in Chen (2009), Berger and Humprey (1997) have undertaken an in-depth survey of 130 studies across 21 countries of the world which reveals that majority of the studies have been carried out for the developed countries including the US and other industrial countries, whereas most of the later studies have emerged from developing, emerging or transition economies as their financial sectors are developing and providing ample scope for analysis.

There are several studies that have analyzed the impact of change in the market structure due to entry of foreign banks on interest rate spread and margin. These include Claessens, Demirguc-Kunt and Huizinga, 2001; Barajas, Steiner and Salazar, 2000; Demirguc-Kunt, Laeven and Levine, 2004. They find that intermediation efficiency is found to increase in terms of fall in interest spread and margin, with the entry of foreign banks. Another set of studies have examined the link between efficiency and ownership type of banks, whether foreign or domestic and public sector. Most studies report high profit efficiency for foreign banks whereas private domestic banks score in cost efficiency over the foreign banks. Claessens and Laeven (2004), support the view that competitive systems lead to greater efficiency. They also report that concentration in the banking sector does not mean lower levels of competition as traditionally assumed. Dabla-Norris and Floerkemeier (2007) report in the case of US banking sector that market structure with higher concentration level positively affects net interest margins and that such gains go to banks with higher market power.

Berger et. al. (2004) relate bank efficiency to its ownership type in developing countries and find that foreign banks exhibited the greatest profitability, while private banks and public sector banks ranked second and third, respectively. Patti and Hardy (2005) also find similar results in the case of banks in Pakistan, although, they do not find significant difference in ownership type and cost efficiency.

Bonin, Hasan and Watchel (2004) have investigated the impact of ownership and privatization on banks performance of selected six countries. The six selected countries are namely, Bulgaria, the Czech Republic, Croatia, Hungary, Poland, and Romania. The study uses Data Envelopment Analysis to measure the performance of banks. The input variables used are namely, capital, ratio of non-interest expense to total fixed assets, price of funds and ratio of interest expense to total deposit, and output variables are, total deposit, total loans, total liquid

assets and investments. The obtained scores of efficiency are regressed with the variables for the bank type to measure the impact of privatization on banks efficiency. The result of empirical analysis shows that foreign greenfield banks are comparatively more cost and profit efficient and state owned banks are less cost and profit efficient than domestic private banks. It also states that the early privatized banks are more efficient than later privatized banks. The study concludes that both type and time of privatization have an important impact on banks efficiency.

Other set of studies of studies relate efficiency to the impact of financial sector reforms. These include Bonin, Hasan and Watchel (2004), Hauner and Peiris (2005), Bonaccorsi Di Patti and Hardy (2005) and Isik and Hassan (2003). All studies report improvement in efficiency levels post financial liberalization or privatization of the banking sector. Study on the impact of financial sector reforms on the efficiency of banks by Hauner and Peiris (2005) conclude that consolidation and privatization in the banking sector of Uganda has resulted into higher efficiency, particularly, for larger banks and foreign banks. They found smaller banks to be incompetent to withstand competitive pressure.

Mohmed and Can (2008) have measured cost and profit efficiency of 28 Chinese commercial bank using Data Envelopment Analysis for the period from 1995 to 2004. The study also measures the effect of ownership type, size, risk profile, profitability and environmental changes on bank efficiency using Tobit regression. Inputs used are total loanable funds, number of employees, physical capital and their prices; outputs used are total loan, investment and their prices. The empirical analysis shows that overall cost efficiency is 0.798 and mean profit efficiency is 0.505 which states that banks waste 20% of its cost and earn only 50% profit compare to best practice banks. The result on the type of ownership shows that joint stock commercial bank are more cost and profit efficient followed by city commercial banks and state owned commercial banks. The result of regression of ownership and size shows that state banks are less efficient than joint stock banks, and medium sizes banks are more efficient, profitable banks are more efficient and underperforming banks are more risky.

A study on the banking sector of Sub-Saharan African middle-income countries by Chen (2009) finds that among other factors, the depth of financial development and the degree of market competition are important for efficiency of banks. He has analyzed differences in the efficiency of public sector banks, private banks and foreign banks from the view point of market structure and institutional factors.

Hossain (2010) has analyzed the post liberalization performance of banks in terms of interest rate spread. Applying dynamic panel regression model for Bangladesh, he finds that the private banks existing since the pre-liberalization era had gained market power in place of public sector banks in the post liberalization era, but interest spread and margins continued to remain high, indicating little competitive and efficiency gains even after financial reforms, in absence of appropriate monetary policy and institutional development.

Using stochastic frontier analyses and second stage Tobit regression, Isazadeh and Shaeri (2012) have studied the impact of institutional, financial and bank specific factors on bank efficiency for the Middle Eastern and North African countries. They identify macroeconomic and political stability, financial development, extent of competition, legal framework and enforcement, and governance as crucial factors that determine efficiency of banks, particularly, in the context of deregulation of the banking sector. Another important differentiating factor among banks is technology.

Efficiency can be seen as increase in output with the same level of inputs or alternatively as a reduction in inputs without compromising with the level of output that can be produced (Isazadeh and Shaeri, 2012). The SFA technique captures the difference in bank's actual cost efficiency and economy's cost efficiency production frontier as opposed to accounting measures of efficiency. They conclude that the latter is more efficient and banks can gain if they operate on that frontier.

Amel, et. al (2012) have investigated into whether mergers and acquisitions in the financial sector, induced by fundamental changes in regulation and technology, has had beneficial effect on efficiency of the sector. In their study based on industrialized countries, they find that consolidation helps in appropriating economies of scale up to a relatively small size, however, they do not find strong evidence regarding any benefits in managerial efficiency.

Dong, Guariglia and Hou (2013) in their study for China find strong support to the proposition that entry of foreign banks facilitates the development of the domestic banking sector by having positive effect on profitability and efficiency of the sector. A similar study by Luo (2016) finds that entry of foreign banks in China increased the competitive pressure on domestic Chinese banks to improve their performance.

Titko, Stankeviciene and Lace (2014) have measured the efficiency of Latvian banks by using Data Envelopment Analysis. The study has developed 14 DEA models with different

combination of input and output to measure efficiency scores. For selection of input and output correlation and regression analysis was performed and the variables which are not highly correlated are selected. The result of correlation and regression analysis states the selected inputs are deposits from customer, balance due to credit institutions and interest expense. The uncorrelated output variables were large in number so all the variable with significant coefficient value less than 0.05 were taken as explanatory variable as singular output. To measure the significant difference in the results of 14 DEA Model Kolmogorov Smirnov test was applied and the results shows that only M3 and M8 model provide different result in comparisons with other models, the reason was that only these two have securities as output variables. The paper concludes that Swedbank, ABLV bank, NORVIK bank, Latvijas Pasta bank were efficient banks and Trasta Komercbanka, Private Bank and Regionala investiciju bank were inefficient banks.

2.3.2 Studies on Financial Efficiency with Reference to India Using DEA

Anjum (2012) has surveyed various studies conducted by different authors using financial ratios and Data Envelopment Analysis. The study reveals that financial ratios are the most popular tool used since 1990's and frontier analysis is the next new evolution to measure efficiency. It concludes that several pioneering work is conducted on Data Envelopment Analysis. It is considered to be the best method to measure bank efficiency.

A large number of studies in India on efficiency is concentrated on commercial banks which include Bhattacharya, Lovell, and Sahay (1997), Kumar, Mavaluri, and Boppana (2006), Debnath and Shankar (2008), Kumar (2008), Khankhoje and Sathey (2008), Joshi and Bhalerao (2011), Baidya and Mitra (2012), Bapat (2012), Kaur and Gupta (2015), Anantharaman and Geetha (2017), Madhvi and Shrivastava (2017), Bhatia and Mahendru (2019), Hassan and Mathur (2020), Kumar, Anand and Batra (2020), etc., which have employed the technique of Data Envelopment Analysis. The studies range over different time periods and different bank groups, and different number and size of banks, included in the study. The input and output variables also differ across these studies. However, largely, the findings among the post liberalization studies are that private and foreign have achieved greater efficiency.

Bhattacharya, Lovell, and Sahay (1997) have measured efficiency of Indian Commercial Banks during early phase of liberalization period for six years from 1986 to 1991. The study uses Data Envelopment Analysis to measure the efficiency of individual banks under different bank-ownership groups and uses Stochastic Frontier Analysis to measure variation in the calculated

efficiency. It concludes that publicly owned banks are most efficient banks followed by foreign banks, while private banks are found to be least efficient banks. It also reveals that there was increment in the number of foreign banks; in earlier period of liberalization foreign banks were least efficient and became nearly efficient till end.

Kumar, Mavaluri, and Boppana (2006) have measured the efficiency of scheduled commercial banks in India with four indicators for the period from 1999-00 to 2002-03. The four indicators are namely; productivity, profitability, financial management and asset quality. The study uses Data Envelopment Analysis, and selected seven inputs and 13 outputs for four indicators. To measure productivity, it uses establishment expense to operating expense as input and business per branch, business per profit, operating profit per employee as output. The overall mean efficiency of productivity ranges from 38% - 45% which shows a low technical efficiency because of high transaction cost. For measuring profitability; the study uses net profit to spread establishment expense to operating expense as input and return on asset, return on equity, net interest income to percentage change in asset, net profit to deposit as output. Its overall mean efficiency score ranges from 60% - 79%, which indicate high level of efficiency because of increase in ROA and ROE. The study uses spread to total advance, NPA to net advance as input and average yield in asset, average yield on advance, average yield on investment, capital adequacy ratio as output to measure financial management. The overall efficiency scores ranges from 77% to 85% because of reduction in two ratios, namely spread to total advance and NPA to net advance. For asset quality measurement, it uses gross NPAs/gross advances, Net NPAs/Net advance as inputs and gross NPAs/Total asset, net NPAs/total advances as outputs. Its mean efficiency ranges from 43% - 51%, which reflects that there is average efficiency in all the banks. On the basis of empirical analysis of overall efficiency of different bank groups in the study period, it concludes that public sector banks are highly efficient in all the four indicators followed by private sector banks and private banks are highly inefficient.

Debnath and Shankar (2008) have measured and compared efficiency of 50 banks in India by using Data Envelopment Analysis for the year 2004-05. The study uses intermediation approach for selection of inputs and outputs. The inputs selected are total assets and deposit, and output selected include profit after tax, operating profit, interest income, total income, advances, and net non-performing assets. The analysis shows that small and large sized nationalized banks are more efficient than medium sized banks. The result of hypothetical merging of banks reveals that merging is not the right option as all the banks excluding nine exhibited decreasing returns. Merging is found to be resulting into only increment in deposits

and assets which would remain unutilized. The only option in this situation is to optimize the output from the given input rather than merging banks.

Khankhoje and Sathey (2008) have measured productive efficiency of regional rural banks of India for the period of 1990 to 2002 by using Data Envelopment Analysis. The study uses two inputs namely interest and non-interest expenses, and two outputs namely net interest income and non-interest income. It has also compared the efficiency of commercial banks and regional rural banks (RRBs) in the year 1997-98 and the result shows that regional rural banks were less efficient than commercial bank with mean efficiency score of 0.60. The study has used ANOVA test to test the significance of difference between efficiency of RRBs, before and after restructuring The paper concludes that the mean efficiency score has increased in post restructuring period which implies that restructuring had helped in increasing productive efficiency of RRBs.

Kumar (2008) had tried to measure the relationship between technical efficiency and profitability in the public sector banks of India. The study uses Data Envelopment Analysis to measure the scores of technical efficiency and efficiency-profitability matrix based on technical efficiency scores and return on assets to study the relationship. It uses cross sectional data of 27 public sector banks for the year 2005. The analysis shows that among 27 banks only 7 banks are technically efficient as they score equals to one, all other banks are found to be less efficient which their scores ranging between 0.632 and 0.974. The analysis of efficiency-profitability matrix states that 13 banks fall under the quadrant of under-performing banks with their resource utilization process not functioning well resulting into wastage of resources. Their score of efficiency and profitability is found to be below average, meaning thereby that we were distressed banks. The study concludes that overall level of technical inefficiency in public sector banks is 11.5% and states banks have scope to increase scope of production by 1.13 times from the same output.

Kumar and Gulati (2010) have measured the trends in cost efficiency and its component on public sector banks of India in post de regulation period from 1992-93 to 2007-08. The study uses Data Envelopment Analysis to measure efficiency and uses net-interest income and non-interest income as inputs and physical capital, labour, and loan able funds as output. The result shows that there is upward movement in the cost efficiency level of and has reached 86.7% in 2006-07. It also analysis the cost efficiency bank group wise, the result shows that the average cost efficiency of SBI group's ranges from 82.1% to 98.1% and of nationalized banks ranges

from 61.7% to 85.8 %. The study uses Kruskal Wallis test to measure the difference in cost efficiency between sub periods and bank group wise. The result shows that there is significant improvement in the average efficiency in sub periods and there is significant decline in cost efficiency of SBI group and improvement in nationalized bank group. It also measures the σ and β convergence in cost efficiency with regression model with three condition variables size, profitability and intermediation cost. The result shows there is insignificant effect of size and intermediation cost on efficiency and positive effect of profitability. It study concludes that there is strong presence of σ and β convergence.

Joshi and Bhalerao (2011) have measured technical efficiency of selected commercial banks of India by using Data Envelopment Analysis for the period of three years, that is, 2008, 2009 and 2010. The study is based on five public and five private sector banks. The input variables of the study are deposits, interest expenses, operating expenses, asset, while output variables are advances, investments, interest and non-interest income. The result of analysis states that banks namely Canara bank, Punjab National Bank, Jammu and Kashmir bank and Bank of Baroda are more efficient banks and consistent in their performance throughout the study period, with their efficiency scores lying between the range of 0.82 to 1.02. HDFC Bank, Bank of India, Federal Bank, and Axis Bank exhibited satisfactory score, while ICICI Bank and SBI were found to be least efficient banks with score ranging from 0.2 to 0.6.

Rajan and Reddy (2011) have measured productivity and efficiency of Schedule commercial banks of India for the period from 1979 to 2008 by using semi parametric analytical model. The study tries to compare the efficiency scores of different bank groups and studies about the problems related to the selection of Inputs and Outputs. The asset approaches of Intermediation approach were used for selection of input and output. The inputs used are namely, deposits, borrowing, no of employees and cost of capital services, and output selected are, such as loan and investment. The empirical analysis shows that on an average Indian Schedule Commercial banks are 83% efficient in generating revenue. The nationalized banks are more technically efficient banks followed by State bank of India and its associates and foreign banks, private sector banks are least efficient banks. The result of total productivity growth shows that two major policies that is nationalization in 1969 and other reforms states by Narasimham Committee in 1991 for Indian banks were having significant impact on productivity and efficiency of banks.

Baidya and Mitra (2012) have measured technical efficiency of 26 select public sector banks of India for the financial years 2009-10. The study uses Data Envelopment Analysis model – CCR model and Andersen and Petersen super efficiency model. The selected inputs are namely, number of employees, non-labour operating cost, loanable fund and output used are net-interest income and non-interest income. The result shows that out of 26 banks only 7 banks are full efficient banks with mean average efficiency score of 86.5%. It suggests that public sector banks can reduce input resources by 13.5% for producing current level of output.

Bapat (2012) has examined the efficiency of Indian banks, and also tried to study the effect of global financial crisis on the efficiency of Indian banks. The study has covered 49 banks which include 27 public sector banks and 22 private sector banks. It has used Data Envelopment Analysis to measure the productive efficiency of banks for the financial year 2007-08 to 2009-10. The study has used the two inputs, namely interest and non-interest expenses, and two outputs, interest and non-interest income, to measure efficiency. The average efficiency for all the banks in the year 2007-08 was 0.88%, 2008-09 was 0.81% and in 2009-10 was 0.89%. The result of analysis shows that the score of efficiency had fallen from 0.88% to 0.81% in the year 2008-09 which was due to global financial crises and then regained a higher score in the subsequent year. The study has also compared the efficiency of public sector and private sector banks and the findings show that public sector banks have better efficiency as their values lies between 0.79 to 1 compared to private sector banks whose values lies between 0.72 to 1.

Nandi (2013) have measure technical efficiency on selected banks of India for the period of 2011-12. The study uses different methods of Data Envelopement Analysis namely, constant returns to scale (CRS), variable return to scale (VRS), and scale efficiency (SE). It has selected 20 tops banks of India, 10 public sector banks and 10 private sector banks. The inputs uses are Interest and operating cost and output used are Interest and other income. The analysis reveals that under CRS seven banks, under VRS 11 banks and under SE method eight banks are technically efficient. It concludes that most of the public sector banks are efficient compare to private sector banks.

Kaur and Gupta (2015) have measure performance of selected 57 banks of India by using Data Envelopment Analysis for the period of five years from 2009 to 2013. The selected banks are eight State banks and its subsidiaries, 19 other public sector banks, 30 old and new private sector banks. The study uses intermediation approach to select inputs and output. The inputs selected are labour, capital and funds; outputs selected are value of advances, deposits,

investment and gross incomes. The analysis shows that there is improvement in the average efficiency by almost 2.4% in last five years. The individual efficiency scores of bank shows that state bank of Indore, Jammu and Kashmir bank, UTI bank, HDFC bank. Indusind banks are most efficient banks. Operating profit has significant on efficiency, bank efficiency is independent of size, and number of employees has no significant effect on productive efficiency. The capital adequacy ratio was insignificant in 2009 and found positive and significant to efficiency in 2013. The study concludes that SBI banks are more efficient followed by private bank and other nationalized banks. It also states that more profitable banks are more efficient.

Filzah Mohammad et al. (2016) have studied the review of literature related to measuring efficiency of banks using Data Envelopment Analysis. In the literature the efficiency is generally classified into four components, namely, technical efficiency, scale efficiency, price efficiency and allocative efficiency. Other than general classification there is one more classification that is X- efficiency which is divided into two components such as cost efficiency and profit efficiency. The paper studies about the models of DEA, there are two models namely Charnes Cooper Rhodes model (CCR) with constant returns to scale assumption and Banker Charnes Cooper model (BCC) with variable returns to scale assumption. It has considered DEA as measuring tools of efficiency, it also includes two approaches for measuring banks efficiency namely production and intermediation approach. The paper states that in future to measure bank efficiency DEA, CCR model can be used for those banks whose decision making units are operating at optimal scale and BCC model can be used where banks decision making units are operating with same input and output variables.

Anantharaman and Geetha (2017) have measured financial efficiency of Schedule Commercial Banks of India. The study is divided into two stages; in the first stage, technical efficiency of 89 sample banks was measured using Data Envelopment Analysis and in the second stage the obtained efficiency scores were regressed on external environment factors using Tobit regression model. In DEA the input variables used are labour, fixed capital, customer and short term funds and output variable used are total loans and other earning assets. The efficiency scores are then regressed on some external environment factors, such as fiscal deficit as percentage of GDP, foreign investment as percentage of GDP and the shares of foreign banks in total credit and dummy period 1997, 2002 and 2006 to measure efficiency at different time period. The analysis shows that there is significant effect of foreign investment and foreign banks' share in total credit on the efficiency of commercial banks, and insignificant effect of

fiscal deficit. It shows that there is improvement in efficiency of commercial banks in the year 2002 compared to 1997 and 2006. The study concludes that varying market conditions and the presence of foreign banks have positive effect on economic growth.

Madhvi and Shrivastava (2017) have measured the operating efficiency by of 41 commercial banks of India for the time period of 12 years from 2001 to 2014. The study uses Data Envelopment Analysis with two input variables namely number of employees and deposits, and output variables namely advances and interest income. The result of study states that a bank generating more profit is not mandatory to be the reason for banks to be more efficient, efficiency means measuring how banks are able to convert inputs to outputs. It concludes that among public banks the state bank of Mysore, among nationalized bank IDBI bank and Punjab national bank, in private banks ICICI, Kotak Mahindra, and HDFC bank was most efficient banks.

Bhatia and Mahendru (2019) have studied the financial efficiency of all scheduled commercial banks in India by using three parameters, namely, cost efficiency, revenue efficiency, and profit efficiency. The study has covered the period of 22 years from 1991-92 to 2012-13. It has divided the time period into two parts that is, reformatory era from 1991-92 to 2001-02 and post reformatory era from 2002-03 to 2012-13. The study has used data envelopment analysis (DEA) to measure banks performance. The analysis shows that the average profit, revenue and cost for reformatory period was, 81.5%, 74.4%, and 66.7% and for the post reformatory period it was 76.7%, 66%, and 61.6% respectively. This shows that SCBs were efficient in generating profit and revenues and inefficient in using their resources. It shows that SCBs have attained higher efficiency values in reformatory period compared to post reformatory period. The result shows that revenue efficiency plays an important role in improving profit efficiency than to cost efficiency. It also shows that none of the efficiency score have attained full efficiency value that is one in any of the reform period. The study concludes that cost inefficiency is the major problem in achieving higher profit efficiency.

Rout, Swain, & Dash (2019) have measured the bank efficiency of district central co-operative banks of Odisha. The study have used input oriented model BCC of data envelopment analysis. It covers 17 districts of Odisha for the period of five years from 2012-13 to 2016-17. The inputs used are deposits and borrowings; outputs used are namely loan and advances, investments. The result of analysis shows that out of 17 district central co-operative banks only 9 banks are efficient as they scores full one and all other banks are inefficient. The study concludes that

there is moderate level of efficiency in Odisha. To make inefficient banks more efficient the study suggests that there should be more focus on fund utilization and credit disbursement.

Hassan and Mathur (2020) have measured technical efficiency and scale efficiency of Indian bank. The study analysis efficiency score to evaluate the recent policy shift towards privatization and merger of nationalized banks. It uses CCR and BCC model of Data Envelopment Analysis for the period from 2014 to 2019. The input variables used are borrowings, labour, fixed asset, equity and output variables are investments, loans, non-interest income. The empirical analysis states that the overall median and mean efficiency scores of public sector banks was 0.8495 and 0.828 and that of private sector banks was 1.0 and 0.883. The result shows that private sector banks are performing higher by 5.5%. It concludes that private sector banks are 15% highly efficient and performing well than public sector banks in India.

Kumar, Anand and Batra (2020) have measured financial efficiency of selected 18 private banks in India for the period of 2005 to 2017. The study uses Data Envelopment Window Analysis and breakdown the time period into 11 windows each of three sizes. The input variables used are number of employees, fixed asset; loanable fund and output selected are interest and non-interest income. It uses 4 * 4 matrix based on the values of efficiency score and standard deviation to measure the consistency in efficiency. The study concludes that 59.9% banks are having 0.9 efficiency score which shows an appreciable performance of banks and only three banks are working with a range of 0.6 to 0.8 score. The result of matrix shows that South Indian bank and Laxmi Vilas bank both are having lowest efficiency score and standard deviation, which means the banks are at deficient efficiency score and less variability. Tamil Nadu Mercantile Bank, Nainital Bank, ICICI Bank and Yes Bank are having highest efficiency score.

2.3.3: Studies on Financial Efficiency with Reference to India Using Financial Ratios

Several other studies in the context of the Indian banking sector using ratios, have focussed on trends in interest rates, credit deposit ratio, ratio of contingent liability to asset, ratio of investment in securities to asset, ratio of term loans to asset, return on asset and return on equity, net interest margin, operating profit, reserve ratios, capital adequacy, etc., post banking reforms, or the expansionary effects of the banking sector post reforms and on the trends in profitability and efficiency, NPAs, These include Das (2010), Bhanavat and Kothari (2013),

Kumar (2013), Arumugam and Selvalakshmi (2014), Shivagami and Prasad (2016), Balayya (2017), and Chadha (2017), Mehta and Bansal (2018), Agarwal (2019).

Mohan (2005) has examined various indicators of performance of financial sector and finds improvement in efficiency, competitiveness and strength of various segments of the financial sector. In another study, Mohan and Ray (2017) have examined the impact of financial sector reforms on each segment of the financial sector including banking sector and how it has impacted policy rates, reserve requirements and expansion in banking activities. A Discussion Paper, (RBI, 2013) underlines the need for re-orientation of the Indian banking sector in view of the expansion and structural changes of the real economy. It suggests dilution government ownership in Public Sector Banks so as to attract private capital infusion, and allowing more private sector banks so as to increase the size of the banking sector.

Das (2010) has analyzed the performance and growth of Indian banking sector in the post liberalization period. To measure the growth in banks the study uses many variables, such as, total asset, total deposit, total credit, and net profit. The result shows that there is significant growth in all variables after liberalization. To analyze the performance, it uses variables, namely, credit deposit ratio, ratio of contingent liability to asset, ratio of investment in securities to asset, ratio of term loans to asset, return on asset and return on equity. The result shows that there is decline in concentration and increase in competition with increase in the share of foreign banks. Foreign banks are more profitable than public and domestic banks. The study uses X-efficiency score to measure the change in the level of efficiency of banks in post liberalization period. The result of X- efficiency shows that the overall mean efficiency score of Indian banks is 0.9 which means there is no significant change in the efficiency of banks in the post reform period. The study concludes that public sector banks are more efficient and foreign banks are least efficient in India.

Singh and Tandon (2012) have tried to measure and compare the financial performance of ICICI bank and SBI bank for the period of five years that is from 2007-08 to 2011-12. The indicators used to measure financial performance are, namely, credit-deposit ratio, interest expense to total expense, interest income to total income, other income to total income, net profit margin, net worth ratio, percentage change in net profit, percentage change in total income, percentage change in total expenditure, percentage change in deposits, percentage change in advances, etc. The analysis shows that credit deposit ratio is higher for ICICI bank which says that bank has created more loan assets from its deposits. The proportion of interest

expense to total expense is higher for ICICI bank and the proportion of interest income to total income is higher for SBI bank which means that public prefer to save more in ICICI bank and take loans and advances from SBI banks. The ratio of other income to total income and net profit margin is higher for ICICI bank compare to SBI bank which shows that ICICI bank has better operational efficiency. The share of total income, net worth ratio and total expenditure was higher for SBI bank. In comparison to ICICI bank there is improvement in the deposits, loans and advances of SBI banks. The study concludes that SBI bank is better having better financial performance and financial sound system compare to ICICI bank.

Kumar (2013) have measured the pre-merger and post-merger efficiency of Bharat overseas bank and Indian Overseas Bank by comparing different parameter. The parameters used are, namely; profit per employee, business per employee, investment, advance, interest income, return on advances, non-performing assets, etc. To measure the significance of difference of mean of different parameter of bank pre and post-merger the study uses t-test of significance of difference of means. The result shows there is significant improvement in business per employee, investment; advances, interest and other income after the merger; but there is insignificant improvement in some parameters like, profit per employee, return on advances and non-performing assets. The study also measures the significance of size of banks on its profitability. It uses t-test to measure the significance correlation between asset size and profitability. The result states that there is linear relationship between asset size and operating profits and they are highly significant. The study concludes that there is improvement in banks efficiency after the merger of Bharat Overseas bank and Indian overseas bank.

Limbore amd Mane (2014) state that economic slowdown in India has had a negative impact on the performance of banks, driving banks to re-orient and re-adjust their operations so as to safeguard their profit margins. The authors have focussed on top ten banks on the basis of market capitalization which includes both public sector banks as well as private sector banks. Their study is based on the examination of Net Interest Margin (NIM) in a period characterized by high rates of inflation and interest rates and rupee depreciation, in the backdrop of global recession and policy paralysis in India. The researchers report decline in NIM for 80 percent of the banks examined.

Narwal and Pathneja (2015) have analyzed the productivity and profitability of public sector banks and private sector banks for the period of ten years sub-divided into two time period 2004 to 2008 and 2009 to 2014. The study also assesses the effect of different determinants on

productivity and profitability of banks through regression. The determinants are namely, size of the banks, spread, return on average asset (ROAA), diversification in terms of traditional and non-traditional activities, and share of banks in terms of deposit, and two dummy variables are, ownership of banks (public sector banks in terms of state bank of India and nationalized banks, private sector in terms of old and new private banks) and sub period The result of regression states that there is no significant difference between productivity of banking sector in both ownership of banks and sub period of the study. It also shows that ROAA, size and diversification are significantly positively correlated with profitability. Moreover, diversification is positively associated with productivity and size is negatively associated. The study concludes that private sector banks are more productive than public sector as it makes better utilization of technology. It suggests public sector banks to form policies to increase the use of technology.

Thabignanadhayalan and Rajanbabu (2015) have measured profitability of selected private sector banks of India for a period of ten years from 2004-05 to 2013-14. The study has selected three leading private sector banks namely, Axis bank, ICICI bank and HDFC banks. It analyzes the trends of net profit, and profitability in terms of some selected ratios. The variables used are namely total income, total deposit, working fund and total assets and it also calculates the ratio of net profit with all the variables. The analysis results show that the growth rate of net profit, total income, working fund and total assets was high for Axis bank followed by HDFC banks and was lowest for ICICI bank and growth rate of total deposit was high for HDFC bank. In ratios of net profit to working fund and on return to asset HDFC bank performed well, for net profit to total income Axis bank performed well and for net profit to total deposit ICICI bank performed well. The study also measures the relationship between net profit and all variable through correlation and result shows that there is significantly positive relationship of all selected banks.

Mehta and Bansal (2018) have made comparative analysis of the performance of three selected new private sector banks. The selected banks are HDFC bank, ICICI bank and Axis bank. The study has used many different ratios to measure liquidity, profitability, and solvency of the banks for the period of five years from 2013 to 2018. The ratios used are, current ratio, liquid ratio, net operating profit per share, total asset turnover ratio, net profit, cash deposit ratio, credit deposit ratio, and earnings per share. The ICICI bank has higher current ratio, cash deposit ratio and credit deposit ratio compare to other two banks. It shows ICICI bank has enough reserves to pay off its short term obligation and payments to customers on demand, and

it is making efficient use of its resources to create more loan assets. The HDFC bank has higher total asset turnover ratio and net profit which states that it has sound financial position and working efficiently by earning more from fewer investments. Liquid ratio, net operating profit per share, and net profit ratio is high in Axis bank, which state that it has better liquidity, higher efficiency in management and profitability which attracts more investors.

Agarwal (2019) has measured profitability of public sector banks and private sector banks on the basis of four ratios. The study has made comparisons amongst the profitability of public sector banks and private sector banks by using T-test. The ratios used are namely, return on asset, and return on equity, net interest margin, and operating profit. The results of the study states that private sector banks have shown low coefficient value in all the four ratios and more growth over the study period than public sector banks. The result of T-test shows that there is no significant difference between profitability of public sector and private sector banks in terms of return on equity and operating profit; while there is significant difference in measurement of return of asset and net interest margin. The study concludes that private sector banks are more profitable than public sector banks, the main reason being that public sector is having an increasingly heavy burden of non-performing assets, which leads to negative returns.

2.3.4: Studies on Efficiency of Financial Markets with Reference to India

Studies which examine stock market efficiency include Misra (2009), Bhunia (2012), Kalsie and Kaur (2015) Das, Nayak and Kumar (2019). Misra (2009) has studied the stock market efficiency in context of global financial crisis in its weak form. The study uses different methods to measure the trends, randomness, and stationarity of time series data. It uses unit root test, Philips Perron test, the Kwiatkowski, Phillips, Schmidt, and Shin (KPSS) test to test the hypothesis. The empirical result shows those stock market is inefficient in its weak form. The study also states reason of inefficient market, they are share price do not reflect the true value, returns vary due to use of mean reversion, and excess price volatility.

Bhunia (2012) have measured the stock market efficiency in India by using Capital Asset Pricing Model based on 20 select companies for the period of January 2010 to July 2011. The study measures the overall progress in stock market by using S&P and CNX Nifty index as proxy. The study also traces the growth in capital market after establishment of National Stock Exchange and the relationship between risk and expected returns of a security. The study has tested the hypotheses of linear relationship between expected returns and risk. The empirical analysis shows that there is positive and non-linear relationship between risk and expected

returns of some companies. There is drastic improvement in both market capitalization and turnover after liberalization. It concludes that Indian stock market is not strongly efficient.

Kalsie and Kaur (2015) have measured efficiency in Indian equity market in its weak form. The study uses daily index returns for the period of ten years covering six major sectoral indices from January 2, 2001 to December 30, 2011. It proposes null hypothesis as price changes are random. The study has used continuous compounding returns for analysis, unit root test to measure stationary, autocorrelation to measure correlation between current and lagged observation and Run/ Geary Test for Randomness. The analysis shows that the data is negatively skewed and distribution is leptokurtic. The unit root test and autocorrelation function proves that data is stationary. The result of Run test states that 2001 and 2005 year shows random walk and all other years show non randomness. The study concludes that Indian equity market is not efficient and is not a weak form efficient. It suggests policy makers to pay more attention to which should be helpful in deepening the market and makes it more efficient.

Das, Nayak and Kumar (2019) have measured stock market efficiency by using Capital Asset Pricing Model of 30 selected Sensex companies for the period of 10 years from 2009 to 2018. The study uses ordinary least square method to analyze the impact of systematic risk on market inefficiency. The study concludes that stock market is inefficient and the result shows that systematic risk had positive impact on market inefficiency. There is no significant difference between expected and actual returns.

2.4: STUDIES RELATED TO FINANCIAL STABILITY

Financial stability is the ability of the financial system to "absorb shocks without causing a collapse of the financial institutions, financial markets and payment systems" (Motelle and Biekpe, 2015; Nelson & Perli, 2007)

The issue of financial stability has evolved over the years in the backdrop of macroeconomic and global developments owing to the repercussions of the Great Depression, and World Wars and other banking and currency crisis. Banking and financial stability emerged as crucial functions of the Central Bank even as it primary functions lied in maintaining stability of the monetary system implying primarily the maintenance of price stability along with operational independence from the Government. This is because monetary stability cannot be achieved in the absence of banking and financial stability. It is the central bank that can inject liquidity into the system in the event of any financial crisis affecting the banking sector.

With the gradual emergence of movements of liberalization and deregulation in the real and financial sector, financial institutions started venturing into business avenues not open to them earlier due to direct controls and restrictions. The British bank crisis in 1973-74 led to pressures for greater autonomy to banks and to relieve them from direct controls. The macroeconomic volatility of those times also spilled over to the banking sector. Ultimately, this established the supervisory role of central banks with an operational role in the maintaining systemic stability, making it imperative to formulate regulations for banks to abide by. A clear line of demarcation between regulatory and supervisory function emerged with the former being handled by the central bank while the latter may be dealt with by a separate institution.

In the 1970s central banks had an international forum of central bank governors at the Bank for International Settlements in Basel. Their role has increased further because of international nature of crisis management that has become more relevant in the context of the global financial crisis. Basel Norms I was the first such institutionalized financial regulations that brought financial oversight in the purview of central banks. Adoption of inflation targeting for macroeconomic stability also provided operational independence to the central banks to maintain a certain level of interest rate structure, thereby, further establishing the central bank role in overseeing the issue of financial stability. Macro-prudential norms thus evolved since the 1970s, although, not in a very obvious manner.

Macro-prudential norms for financial stability go beyond the stability idea involved in any macroeconomic policy such fiscal or monetary policies. Rather, it is particularly relevant on two counts. One, from the perspective of financial institutions which are systemically very important. And two, the long term perspective of built up of system-wide risk over a period of time which can lead to a possible crisis. Also, even if in the individual capacity the financial institutions may not appear to be important in the system, but because of their interlinkages, they may create impacts that have serious implications on the stability of the financial system as a whole.

Financial stability as understood in terms of macro-prudential approach involves system-wide perspective of financial sector risk rather than focusing only on individual institutional level soundness. It entails the idea that the forces behind risk are the collective behaviour of financial institutions which makes financial instability an endogenous issue. The global financial crises of 2008, particularly, underlined the significance of keeping an eye on systemic financial risk

so as to maintain financial stability. Along with micro prudential norms, macro prudential norms also became more important in the context.

The European Central Bank (2012) has defined financial stability as the level of resilience of the financial system to withstand stress and shocks so that it can facilitate smooth functioning of the financial intermediation process which can get severely impaired on account of systemic instability. This makes financial stability essentially related to other aspects of the financial system, such as, efficient and smooth transfer of financial resources from savers to investors, and assessment, pricing and management of financial risks. It also requires that the financial system has the ability to absorb shocks emanating from financial upheavals or from the real economy. This may involve having sufficient capital provisioning against credit, maintaining reasonable gap between the value of assets that have collateralized and the loan value, or moderating asset price built-up, etc.

Goodhart and Tsomocos (2007) have discussed the evolution of the role of central bank as a regulatory and supervisory authority over the banking sector since the last three decades in the backdrop of the repercussions of the Great Depression, and World Wars and other banking and currency crisis that countries have been through in a historical perspective. They assert that banking and financial stability have emerged as crucial functions of the Central Bank even as its primary functions may lie in maintaining stability of the monetary system implying primarily the maintenance of price stability along with operational independence from the Government. They point out the significance of the Central Banks for global financial stability, particularly, that of the Bank of International Settlement (BIS).

The Committee on Global Financial Stability (CGFS, 2010) avers that the possibilities of financial instability can cause systemic risks that can lead to serious disruptions in the smooth functioning of the financial system which can further percolate to the real economy. Boris (2011) has identified two dimensions of risk associated with the financial system, namely, time dimension and cross-sectional dimension. Time dimension approach focuses on analysing how the aggregate risk in the financial sector evolves over a period of time.

Time dimension of the systemic risk of the financial system refers to the cyclical reinforcement between the real sector and the financial sector due to the positive interactive impacts of the two factors working through complex mix of channels. For instance, reduction in bank capital would constraint banks from lending which in turn would adversely affect the real economy and lead to further decline in capital with the banking sector evolving financial risk at the macro

economy level over time. Similarly, loss in the value of collateral assets with the banks reduces the scope for banks to lend which can further compromise the value of the assets.

Other channels through which the pro-cyclicality between the financial sector and the real economy can exert influence are when decline in exchange rates reduce the net assets of firms having exposure to foreign sector borrowing. The situation can get accentuated if the unfavourable change in the exchange rates adversely affects economic growth leading to further weakening of the domestic currency. These apart, liquidity risks arising out of maturity mismatches, and credit risks arising out of increase in interest rates can lead to further deterioration in the situation if it affects large number of firms and institutions, adversely impacting public confidence in the financial system and increasing the risk premium on borrowings. Weaker economic fundamentals lead to further weakening of the financial system reducing its ability to perform its intermediation function. Time dimension of financial risks entails building up sufficient cushion during conducive times so that it can be drawn on during times of crisis to establish stability.

Systemic risk of the financial sector also works through the cross-sectional dimension which entails how risk spreads within the financial system across various institutions on account of related exposures to assets that may have been securitized or indirect exposures to counter-party risks. Cross sectional risks also arise due to other interlinkages like shared ownership, exposure to financial institutions that are systemically important and the level of financial development. Financial risks may also arise from breakdown of payments and settlement infrastructure. Where exposures are shared among institutions, the norms of financial prudence can be adjusted as per the contribution of each institution to acceptable level of system-wide risk. This ensures accountability and responsibility.

With this background, a review of literature related to financial stability has been carried out which cover a range of aspects. Many studies relate financial stability with other dimensions of financial sector development, such as, financial access and inclusion. The literature related to financial stability is divided on how it is impacted by increased financial inclusion of the population in the formal financial sector. Adasme, Majnoni, and Uribe (2006), for instance, examined the relationship between financial access, as measured by bank loan share of small and medium firms, and financial stability measured in terms of non-performing loans (NPL), for banks in Chile. They found that non-performing small loans exhibited large losses with

irregular pattern implying that simplification of the loan process and increase in loans to SMEs could help improve the NPL situation for banks.

Hannig and Jansen (2010) contend that since small savers and low income group population are less affected by economic cycles, their financial inclusion would have favourable effect on the stability of bank deposits and loans. They believe that when financial institutions have exposure to small savers and small borrowers they are better able to withstand economy-wide crisis as they help in sustaining local economic activity. This belief, however, needs to be examined against empirical evidence. Prasad (2010) relates financial inclusion positively with financial stability by putting forth the argument that improved access to bank credit for small and medium scale businesses improved employment situation and thereby lends to financial stability, as they contribute much to employment generation.

Vives (2010) discusses the experience of banking sectors spanning countries like Japan, the US, Spain, European Union where occurrence of financial crisis is found to be correlated to the liberalization of the banking sector, making it more fragile and unstable. Regulatory failures and contagion are found to be the major reasons behind this. At the same time, financial liberalization has been found to increase competition, enhance financial development and thereby economic growth. However, the author points out that competition imposes pressure on banks to take more risks, often, by compromising on the coordination between assets and liabilities and thereby enhances the potential for instability and the probability of crisis. These possibilities need to be reigned by appropriate regulations and strong institutions.

Khan (2011) relates financial inclusion to financial stability and suggests that increased levels of the former promotes higher levels of the latter. He accounts for several reasons for this to happen. Increase in financial inclusion implies that bank assets are better diversified towards smaller firms and weaker sections of the society, reducing the aggregate risk of bank assets. Better spread reduces the relative size of concentrated credit to small number of borrowers and thereby reduces volatility. It also reduces risks that would arise due to inter-connectedness of financial institutions and the real economy. Small savers also add up to the size and stability of the deposit base of the banking sector reducing their need to rely on other sources of financing which become more volatile during times of crisis. This, according to the researcher, reduces pro-cyclical risks. The study also considers increased financial inclusion to improve the transmission of monetary policy thereby leading to greater financial stability, as also endorsed by Thai-Ha Le, Anh & Taghizadeh (2019).

Han and Melecky (2013) postulated that a wider base of bank accounts would lend greater stability to the deposits of the banking sector during times of crisis when bank liquidity is at stake. They have analysed the stability issue in the context of the global financial crisis of 2008. They support their hypothesis by measuring the drop in deposit growth during crises in the background of a ten percent increase in the number of adults with bank accounts. Calculating pair-wise correlation of variables, the study finds significant negative relation between bank z score and drop in deposit growth. Their results find support for positive effect of financial inclusion on financial stability.

Morgan and Pontines (2014) have addressed the question regarding substitutability versus complementarity between financial stability and financial inclusion in the case of developing economies. The inquiry arises from the backdrop of the fact the developing economies are making conscious efforts to improve financial access of low-income households and small firms which can have significant implications for financial stability. The study examines the effect of alternative measures of financial inclusion on select indicators of financial stability such as non-performing assets of banks and bank Z scores. The findings reveal that increased proportion of loans to MSMEs is correlated to higher financial stability by reducing bad debts of the banking sector.

Sysoyeva (2020) has undertaken an empirical analysis of EU countries over the period 2004 to 2014, to examine if large and complex financial sector had negative impact on financial stability in these countries as measured by their z score in the context of the crises of 2008. It examines the impact of other factors of financial stability such as bank credit to bank deposits, NPA to gross loans, cost to income ratio, non-interest income ratio, bank overhead cost to total income, net interest margin, ROA, ROE, level of bank concentration, etc., on the bank z scores using pair-wise correlation analysis. The study finds variability in the z scores of the countries depending on the factors that influenced their banking activities.

Khan (2011) also contend that financial inclusion may add to financial instability for different reasons. These include compromise in lending standards as the number of borrowers increases as experienced in the sub-prime crisis of the United States. The study also contends that lending institutions get exposed to reputational risk when they outsource some of the functions like credit assessment to external parties in order to reach out larger number of small borrowers. Another reason for adverse impact on financial stability on account of increased financial

inclusion could result out of inadequate regulation of microfinance institutions even as they increase their lending. This could cause financial system risks.

Likewise, Čihák, Mare, and Melecky (2016) find negative relation between financial inclusion and financial stability for the reason that increased usage of financial services such as loans tends to increase risk during crisis situations and lead to unanticipated losses for the financial sector as more number of borrowers would be affected. However, the study also proposes that during normal times, the positive reinforcement between financial inclusion and financial sustainability are equally likely, particularly, as it improves credit information.

2.5: STUDIES ON INTERLINKAGES BETWEEN THE DIMENSIONS OF FINANCIAL DEVELOPMENT

The four dimensions of financial development have a bearing on each other. While financial access and inclusion have been matter of great focus, particularly, in the under-developed and developing countries, often it comes at an expense of efficiency. This is especially so for public sector banks which are historically oriented towards social banking. However, financial inclusion is an important imperative for financial deepening which in turn is essential for inclusive and faster economic growth (Chakraborty, 2014; Ndebbio, 2004; Ghildiyal, Pokhriyal and Mohan, 2015). Further, financial efficiency also lends to financial stability as it makes the banking sector more resilient to financial crisis.

The interconnection between financial inclusion and other dimensions of financial development is well established in the literature (De la Torre, Ize, and Schmukler, 2011; Mehrotra and Yetman, 2015; García and Jose, 2016; Neaime and Gaysset, 2018). Mehrotra and Yetman (2015) assert that as financial inclusion expands, it makes possible for the households to smoothen savings and borrowing and thus helps in reducing price fluctuations. Rather, it assists in maintaining price stability and improves the monetary transmission mechanism. They contend that a broad base of depositors and diversified lending as financial inclusion expands lends to financial stability.

Thai-Ha Le, Anh and Taghizadeh (2019) have focused on the trends of Financial Inclusion and its effect on financial efficiency and financial stability. The study is on 31 Asian countries for the period of 2004 to 2016. It uses principal component analysis to construct composite indicators and Feasible Generalised Least Squares (FGLS) method to analyse the impact of financial inclusion on financial efficiency and financial stability. The result of analysis shows

that financial inclusions have significantly negative effect on financial efficiency and positive effect on financial stability. The financial inefficiency is explained as the result of increased costs of intermediation arising on account of low income customers and increased difficulty and cost of information. The positive relationship between financial stability and financial inclusion, on the other hand, is supported on the reasoning of wider base of deposits, diversification of bank assets and improved liquidity.

The study employs Feasible Generalized Least Squares to examine two models, one that regresses financial efficiency on the other two dimensions, and second, which regresses financial sustainability on the first two dimensions of financial development. GDP per capita has been used as the control variable. The results are consistent whether the entire sample of Asian countries is examined or whether sub-samples as per differing levels of income are considered. An important implication of the findings is that while inclusion and stability related policies are creating synergies, there is no for addressing the efficiency costs in achieving the former two.

One of the technique found in the literature to consolidate the multi-dimensional nature of financial sector development is the structural equation modelling (SEM) approach. SEM is a combination of measurement, path analysis, regression analysis and factor analysis; "The structural model defines the causal relationships and associations between latent variables" (Kang and Ahn, 2021). SEM is a part of Confirmatory research. It allows fitting a model to explain the association of observed measures and indicators with the latent variable which is existing but not measurable. In the present context, the concepts of financial access, depth, efficiency and stability, which are the four dimensions of financial development, and also the concept of financial development itself are abstract constructs that exist but are latent in nature. Therefore, each of the four dimensions as well as financial sector development can be quantified by testing for the association of the measureable indicators of each built into the SEM and can be statistically evaluated for their significance.

Kang and Ahn (2021) have given an insightful understanding of model setting and interpretation of results of the SEM approach. Baistaman, et al. (2020) in their study has first used Exploratory Factor Analysis to search for instruments to measure financial literacy for a limited sample pilot study, and thereafter, having developed the instruments, they have used Confirmatory Factor Analysis method to validate the measures. Ahmad Shah and Mishra (2018) have used SEM technique to study confirmatory factor analysis in order to determine

important factors of financial service availability, access, and usage. Similarly, Pandey, Kiran and Sharma (2022) have also used SEM technique to examine the important factors within financial inclusion, financial literacy and financial initiatives for their impact on sustainable growth.

2.6: STUDIES ON LINKAGES BETWEEN FINANCIAL DEVELOPMENT AND ECONOMIC GROWTH

Economic literature is replete with several studies that have established the positive impact of financial development on the growth of the real economy. The neo-classical growth models did not leave much scope for the role of financial sector of a country in determining its growth, given its assumptions of zero transactions costs and exogeneity of technical progress. The framework of endogenous growth models, however, opened the scope for incorporating institutional arrangements within a country as factors exerting influence on its growth prospects. While traditionally, endogenous growth models predominantly consider institutional factors that improve human capital and knowledge, and innovation as causing growth, financial institutions of the country can also exert positive impact on economic growth through various channels.

The financial sector performs several important functions ranging from providing information for valuation of assets and, therefore, allocation of capital; facilitating the pooling and diversification of investible resources; enabling trading of assets for profitability and liquidity; providing the mechanisms for risk management; and instituting regulatory powers to regulate, guide and monitor the working of various stakeholders so as to maintain stability of the financial sector. When these roles are performed well they help in the process of capital formation and technological progress that are essential ingredients for economic growth. Thus, the financial sector by identifying and financing viable and growth-enhancing projects, accelerates the pace of growth. Likewise, given the uncertainty of high-yielding projects, the financial sector provides the mechanism to pool resources and diversify risks, as also, the means to exit from an investment, in other words, liquidity. These channels through which the financial sector influences the real economy form an interesting area of inquiry, although not within the scope of this study.

The positive linkages between relatively developed financial sector and faster economic growth rates have been well reported by several studies, establishing the causal nature of financial

development. Generation of higher levels of income comes about as, among other things, financial development entails broadening of the access to finance to all sections of the society as well as to businesses, particularly, the micro, small and medium enterprises. It is not for nothing that a lot of stress is put on financial inclusion by the governments of various countries, including India. While financial development, therefore, becomes utmost important in accelerating the pace of economic growth, it also implies that instability in the financial sector or an ill-functioning financial sector can equally cause a lot of harm to the real economy.

2.6.1: Early Studies on the Finance and Growth Linkages

The studies found in the area of finance-growth link include cross-country comparisons at a given point of time, cross-sectional and time series analysis of countries, single country studies and studies carried out at microeconomic level which inquire into the particular channel through which finance affects economic growth based on firm level or industry level data.

Earliest theoretical studies on finance-growth linkages can be traced as far as back as Bagehot (1873), Schumpeter (1912), and Hicks (1969) as cited in Kotaro (2000). Schumpeter (1912) while primarily discussing the forces of innovations and business profits, demonstrates the important role played by the financial sector in ensuring the flow of credit to potentially successful businesses. He held that well developed financial systems by providing the means to identify and finance businesses, essentially encourage technological progress that may cause "creative destruction" and thereby promote economic growth.

Bagehot (1873) and Hicks (1969) have contextualized the role of financial development in the industrialization process of England basically in providing much needed finance. Another early theoretical as well as empirical study particularly focused on the finance-growth linkage and considered as monumental work in the field is found in the work of Goldsmith (1969) who demonstrated that financial deepening as measured by the ratio of assets of financial institutions to GDP has a positive impact on per capita GDP. He also found that periods of faster economic growth were correlated to above-average development of the financial sector. He attributed the acceleration of economic growth and the improvement in the economic performance to the "financial super-structure" that facilitated transfer of funds to the uses that generates the highest social returns.

However, in the building of the financial superstructure, Goldsmith borrows the Kuznets (1955) hypothesis that relates economic growth and income inequality. Accordingly, in the

early stages of development, the financial sector is underdeveloped or rather non-existent, but as the economy grows and matures, the financial sector also begins to develop into an "extensive structure of financial intermediation."

Shaw (1973) discussed the role of financial development in the context of two opposing situations, financial repression and financial liberalization. He considered financial markets as playing key role in enhancing economic activities via the magnitude of the sector and its quality of service in terms of volume of savings and investment and the quality of investment. However, the examination did not show consistent results. Similar study is found in Gupta (1984), who in an attempt to establish that financial repression was a major deterrent to economic growth examined the role of financial liberalization in India and found that it positively affected financial development and economic growth. Likewise, Demetriades and Luintel (1996) in their study of the financial sector of India, found that banking sector controls such administered interest rates and directed credit coupled with reserve requirements and such other controls had negative effect on its financial development.

McKinnon (1973) emphasized the role of financial liberalization to unleash its benefits for the economy. He hypothesized that in developing countries, the demand for broad money was complementary to the demand for physical capital. His inquiry into the role of finance in growth starts with the premise of lack or insufficiency of external finance which severely constrained firms to self-finance themselves leading to indivisibility of investments, failure to adopt new technology and thereby restricting growth. He argued that if the governments in less developed countries followed fiscal discipline, it could break inflationary expectations. This in turn would encourage flow of money in form of bank deposits, expand the banking sector, increase the money stock and credit, and thereby lead the economy on a path of growth. This would ultimately help in removing the fragmentations and discontinuities in the less developed economies, foster economic growth and raise the level of savings available for capital formation.

Both, Goldsmith (1969) and McKinnon (1973) posit financial development in terms of financial intermediation or deepening. While they found strong correlation between financial development and the rate of economic growth, they do not provide the mechanism via which this link gets established. Also, their study does not throw light on the direction of causality, which could operate either way and also change depending on the level of economic growth. Thus, these studies on the finance-growth link fail to provide a theoretical background. This

could be attributed to the fact that neo-classical growth models were given in the premise of absence of transactions costs, that is to say, information on the future prospects of firms or investment opportunities were immaterial for growth.

However, the existence of financial sector implies that specialized services of financial institutions are important for identifying growth accelerating capital. Moreover, neo-classical growth models also considered improvement in productivity via technological progress that was caused by external factors. The financial sector fails to fit in much into such theoretical considerations. These limitations in the earlier studies have been addressed by subsequent studies, which look beyond the confines of neoclassical premises. The framework of endogenous growth models for instance, opens scope for institutional factors within the country to exert influence on growth, of which, the financial system, apart from investment in human capital formation and innovation, can play important role.

2.6.2: Studies with Alternative Channels of Positive Finance-Growth Link

Endogenous growth models allow financial development to be integrated into their framework in some form or the other which highlight the alternative channels by which financial development affects growth. Most literature of the 1990s relate to those that attempt to explain the link or channel by which finance could influence growth. The alternative channels through which finance affects growth as found in literature include efficient allocation of capital, efficient transformation of savings into investment, and effect on the rate of savings.

An important channel that makes for a positive link between finance and growth is that is enables the allocation of capital in a more efficient manner than it would have been otherwise in the absence of the financial sector. By screening alternative projects for their prospective returns, the financial system facilitates better allocation of capital. It also allows investors to share risks because of the pooling of resources, which again aids efficient use of resources to generate maximum returns. Studies that incorporate this channel of the finance-growth link include Diamond and Dybvig (1983), Greenwood, J and B. Jovanovic (1990), Bencivenga and Smith (1991), Levine (1991), and Saint-Paul (1992).

Diamond and Dybvig (1983) have focussed on the intermediation function performed by banks and thereby the liquidity they lend to illiquid assets. They hold that compared to exchange markets, banks are able to lend liquidity to illiquid assets by being able to offer liabilities “with a different and smoother pattern of returns over time”. Financial intermediaries, as they operate

on a larger scale, are able to better calculate the average demand for early withdrawal, and accordingly, adjust their portfolio to suit the withdrawal demands, than would be possible for individual savers. This encourages investors to invest in high-returns generating assets which helps in efficient resource allocation.

Greenwood and Jovanovic (1990) discuss the role of the financial sector in the form of financial intermediation by providing information about the valuation of assets and thereby directing the flow of funds to high profit generating investments. They emphasize on the close links between growth and financial structure. While growth enables the gradual development of the financial intermediation structure, the latter reinforces economic growth by improving the efficiency of investment. They hold that financial intermediation leads to higher rates of return on capital invested and thereby promotes growth. They postulate that not only are financial intermediaries in a position to remove project-specific risks by managing their portfolio, they are also well equipped to identify occurrence of overall systemic risks that affect all projects. Such attributes cannot be ascribed to individual investors. The researchers also assert that not only would this support economic growth but would further reinforce the development of costly financial structures.

Levine (1991) has emphasized on the risk management and diversification function played by the stock market which provides an enabling environment for long run economic growth. As the stock market offers the mechanism to manage liquidity and productivity risks, it leads to economic growth by facilitating the flow of funds to firms without the constraints of ownership issues. It enhances firm efficiency by ensuring that capital remains invested even as ownership is traded, and thus, promotes development of human capital, leads to technological progress and increases in per capita output. The focus of the author is on the cost effective liquidity benefits of the stock markets which help in overcoming the deterrents for long term investments.

Bencivenga and Smith (1991) have also highlighted the role financial intermediation in reducing liquidity risks, thereby, encouraging the flow of unproductive savings into capital formation leading to economic growth. They also point out that by doing away with the need for “socially unnecessary capital liquidation”, financial intermediation supports further economic growth.

Saint-Paul (1992) has also underlined the role of capital markets in providing the mechanism for diversification of investment risk which further encourages technological diversification.

Technological diversification, according to the researcher, essentially entails specialization by businesses leading to productivity gains with the resultant promotion of economic growth.

Another important channel through which the positive link between finance and growth works is that it transforms savings into investment in an efficient manner. Mobilization of savings and its conversion into productive investment entails information costs. Greater these costs, greater would be the difference between the interest rates charged for lending and those paid to depositors. The more efficient the financial system, lower will be such interest rate spreads. However, when the financial system is repressed, with regulated interest rates for private lending, while governments finance their expenditures at lower interest rates, it imposes costs on the public in terms of inflation tax, discouraging savings from flowing into organized financial sector. From such a state of affairs, when policies move towards financial liberalization, it leads to greater efficiency as reflected in lower interest rate spreads. Through these effects, savings are expected to flow into productive investments more easily as financial development reduces the need to hold money, and thereby, have positive impact on economic growth. Roubini and Sala-I-Martin (1995) have developed a model which shows that financial repression leads to high rates of inflation, tax evasion and low rates of growth.

Another study, Harrison, Sussman and Zeira (1999) highlights the two-way relation between economic growth and finance. Their model focusses on the economies achieved by the banking sector in the costs of information about borrowers on account of growth of the sector. They postulate that economic growth stimulates banking activities, induces entry of new banks along with better regional specialization and thus, reduces the cost of financial intermediation. Banks replace individual investors in monitoring investments and by doing so the financial system is able to avoid duplication of monitoring costs. Banking specialization, both in functions performed and geographical coverage, reduces the cost of information on risks and profitability and thereby, promotes economic growth.

Financial system affects the rate of growth by influencing the rate of savings. However, this effect on the rate of savings occurs through different routes such as reduction and diversification of risks of investment, reduction in liquidity constraints, and changes in interest rates (Kotaro, 2000). These different channels have differing effects on the rate of savings. Insurance services and financial markets, by reducing idiosyncratic risks and liquidity risks, encourage savers to hold less balances for precautionary purposes. This raises the savings rate and therefore the rate of economic growth, as found by Leland (1968), Sandmo (1970), Kimball

(1990) and Caballero (1990) as cited in Kotaro (2000) all of which discuss issues related to uncertainty and precautionary savings, cited in Kotaro (2000).

Devereux and Smith (1994) show that when risks are shared globally then at the aggregate level, that is, at the world level, there is no uncertainty. In such a case, full diversification of risks leads to lower growth rates across all countries as they transmit "country-specific endowment risks" and this reduces savings, assuming a constant risk aversion, and thereby affecting further growth. Both, Levhari and Srinivasan (1969) and Devereux and Smith (1994) show that diversification of risks related to rate of return lowers the rate of savings depending on the level of risk aversion. Thus, different risk reduction brought about by financial development affects the savings rate differently.

Another way in which financial development affects the rate of savings is through interest rate changes. If reduction in financial repression results into better interest rates for households, it may either increase the rate of savings or reduce it depending on the whether higher returns on savings encourage savings or whether it induces households to spend more. In other words, the relative strength of income and substitution effects would decide the impact on the rate of savings. Yet another channel by financial development affects the rate of savings is by affecting liquidity. Jappelli and Pagano (1994) show in that in overlapping generational model, when financial development improves liquidity by easy availability of retail credit, it reduces the rates of saving particularly among the younger generation.

There are several issues with the studies reviewed above. Most studies posit financial development in terms of its size, relative to the size of the real economy. This fails to represent other aspects of the financial sector such as the more sophisticated functions it performs or more suitable indicators of its depth. Also, the significance of some measures of financial development may not be robust in the presence of alternative control variables in the growth models. There are also contradictory findings in relation to the direction of causality between financial development and economic growth and whether the correlation between the two really implies causality.

Causality studies between financial development and economic growth are found in Jung (1986), Murinde and Eng (1994), Demetriades and Hussein (1996), etc. Jung (1986) found empirical support for two-way causality across 56 countries in the post-war period across both developed and developing countries. Murinde and Eng (1994) examine the causality by posing two types of financial developments, one that is demand-following, and the other that is supply-

leading. While they find bidirectional causality for Singapore, they also report that supply-led financial development in terms of financial restructuring strategies introduced by Singapore provided explanation for its economic growth, particularly, when broad money and a monetization variable were used as proxies for financial development.

Demetriades and Hussein (1996) too report two-way causality in the case of 16 developing countries. However, they contend that different economies being heterogeneous in nature, the causality patterns are found to differ. For instance, they do find some support to the causality running from economic growth to financial development for some countries.

2.6.3: Studies on the Finance-Growth Link with a Broader Perspective of Financial Development

In response to the above issues, we find development in this field of inquiry with subsequent studies attempting to resolve the same. These studies have not only attempted to incorporate a larger number of countries to examine the finance-growth link, they do so with better indicators of financial development that relate of the functioning of the financial sector. Other improvements in the subsequent studies are that they better identify the control variables that affect long run economic growth and also look into the direction of causality between growth and financial development. These studies have also tested the impact of financial development, alternatively, by examining the effect on economic growth indirectly through increased capital accumulation and improved productivity.

Prominent among these studies is King and Levine (1993), who, drawing on Schumpeter (1911) underline the crucial role played by financial systems in identifying and supporting productivity growth (as against the rate of physical capital accumulation), through the mobilization of savings, which lead to economic growth. They attribute two basic functions to the financial sector, selection of entrepreneurs and provision of external finance. This entails services of the financial system, namely, evaluation of prospectively successful projects, mobilization and pooling of resources of scattered investors, providing means to diversify risks given uncertainties and valuing expected returns from innovations, as the mechanism in the finance-growth link.

These functions involve large costs that necessitate specialized institutions to undertake them. While the first three services are postulated to be provided by financial intermediaries, the fourth function is performed by the stock market. Thus, while they consider innovations as the

primary factor causing growth, they consider the financial sector as a facilitator that helps in expanding the scope and efficiency of innovative activities and thereby increases the pace of economic growth. This can be better appreciated by the fact that financial repression has just the opposite effect of impeding innovations and growth. The researchers consider that all these functions performed by the financial sector can be considered as bundled together in the form of financial intermediation. In this context, McKinnon (1991) has emphasized on the need for financial liberalization prior to economic liberalization. He argued that financial reforms would increase the volume of savings as well as investments which are essential for economic growth.

Barro (1991) and King and Levine (1993) have tested for the impact of financial development on economic growth by including various financial variables in the regression of growth for cross section of countries. They find significantly positive impact of [initial] given financial conditions on economic growth. Accordingly, their model includes four different measures of financial development, namely, depth of the financial system, significance of commercial banks in relation to the central bank, proportion of credit going to the private sector, and ratio of private sector credit to GDP. The ratio of liquid liabilities to GDP has been used as a measure of the size of the financial sector with the understanding that a larger size of the financial sector implies a higher level of financial services provided by the sector. This size dimension is then sought to be sharpened by focussing on the relative role of commercial banks as against that of the central bank, and likewise, on private as against government credit to represent greater availability of the financial services to private enterprises. They have also tested the strength of the relation for alternative measures of growth as well, such as economic growth, capital accumulation and productivity growth. The study reports strong and significant relationship for all models developed by them for a cross-section of 77 countries. With empirical support for their hypotheses, they suggest that government policies towards the creating conducive financial systems would have favourable impact on long run economic growth. However, it may be noted that the study is focused primarily of financial development with reference to the banking sector and does not account for the role of financial markets.

In this context, Jappelli and Pagano (1994) have examined household credit as a ratio to GDP for its relationship with savings and growth rates. They hold that imperfect credit markets tend to create credit constraints which compels households to hold higher levels of savings than they would if markets were perfect, and are among the important factors that explain country-wise difference in savings rates. Higher growth is hypothesized on the base of higher savings rates induced by imperfect credit markets, which contradicts with the view that imperfect capital

markets tend to adversely affect growth. They find that empirical data examined for a range of OECD countries upholds their hypotheses.

Jappelli and Pagano (1994) and Obstfled (1994) extends the finance-growth linkages to global integration of financial systems. Opening up the domestic financial sector to global financial systems would allow access to funds which would lead to global diversification, that is, it would enable international risk sharing and thereby would be conducive for a shift in preferences from low return investments to high-yielding investments. This in turn creates welfare effects in terms of increased consumption that boosts businesses as well as the economy in the long run.

Obstfled (1994) undertakes an examination of various dimensions of the stock market, such as, its size, liquidity, volatility and level of integration with global capital markets for their impact on economic growth, productivity and capital accumulation on the lines of King and Levine (1993) for a cross section of 49 countries. The study measures stock market liquidity in terms of the ratio of volume of stock trading to market capitalization as well as to GDP. The findings reveal significant independent impact of these factors even in the midst of banking development measures. The study asserts that banks and stock market provide different set of services and therefore can simultaneously be incorporated in the regression models. Other dimensions of stock market were not found to be significant. The findings of this study substantiates those of an earlier study by Atje and Jovanovic (1993) that support the evidence of a positive and significant correlation between stock market size and economic growth for a fewer number of countries over a shorter period of examination.

Bencivenga, Smith and Starr (1995) sought to investigate the relation between the technical efficiency of an economy's financial system and the rate of economic growth. They assert that low cost financial markets that facilitate liquidity to investors form important elements in enabling businesses to adopt heavy technologies as they typically become viable only in the long run. For transaction costs to fall in the financial sector, financial development is an essential prerequisite. The researchers considered liquidity of investment to be inversely related to transaction costs in financial markets. Thus, financial transaction costs play an important role in the choice of technology which embodies productive efficiency and thereby has important implications for growth. However, they also contend that reduction in transaction costs while leading to increase in real returns on savings, may not necessarily cause increase in real growth rates. This could happen if increased liquidity in financial markets induces

investors to stay invested in existing investments rather than being available for new capital investment.

Bencivenga, et al. (1996) assert that stock markets have positive impact of the economy as they afford liquidity to the investors, in absence of which they would shy away from locking their funds for a long period. Greater liquidity reduces risk for investors while providing long term capital to business. The ultimate effect of these characteristics of the stock market is to improve allocative efficiency of the economy and thereby enable faster economic growth.

Rajan and Zingales (1998) show that the link between financial development and economic growth works through the reduction in financial transaction costs. They inquired into whether countries with well-developed financial markets experience faster growth of industrial sectors that depend on external finance, and find that this was true for a large number of the 43 countries, including India, examined by them for the period 1980s. They consider the transaction cost mechanism as a stronger test of causality between finance and growth. In other words, they propose the theory that "financial markets and institutions reduce the cost of external funds for firms", particularly, as international financial markets were not frictionless. They have used stock market capitalization as a ratio to GDP, domestic credit to GDP ratio and private sector credit to total domestic credit as alternative measures of financial development. In particular, they use the total of domestic credit and stock market capitalization to GDP to represent the financial market development of a country.

Likewise, Levine and Zervos (1998) and Rousseau and Wachtel (2000), have tested the impact of a broader concept of financial sector involving measures related to the stock market (stock market size, trading, and turnover) on economic growth, and report significant positive relationship between these variables. They test whether stock market parameters such as liquidity, size (market capitalization ratio to GDP) and integration with world capital markets are significant in predicting economic growth, capital accumulation and productivity improvements and private savings. Examining the data for 49 countries, they find that stock market liquidity measured by the stock market trading as a ratio to stock market size (turnover ratio) and as a ratio to the economy (value traded ratio = total value of domestic shares traded divided GDP) have significant positive effect on the first three variables. They also report the development of banking sector measured in terms of private sector bank loans to GDP ratio also had positive impact when regressed together with stock market liquidity. With, both, stock market liquidity and banking development found to have robust impact on economic growth,

accumulation of capital and growth in productivity even after controlling for various factors determining long run economic growth, it particularly supports their hypothesis that different services are rendered by banks and the stock market in influencing growth. Size of stock market and integration with global capital markets were, however, not found to be significant, and savings rate is not found to be influenced by either stock market or banking variables.

Rousseau and Wachtel (1998) have examined the links between the intensity of financial intermediation in five currently developed countries and their economic performance in the past over the period 1870 to 1929. They find that the intensity of financial intermediation has been crucial factor for the rapid industrialization of these countries. Levine, Loazya and Beck (2000) also support the hypothesis that financial intermediary development had positive impact on economic growth.

Demirguc-Kunt and Levine (1999) have examined the relationship between financial structure and economic development for a cross section of 150 countries over 1990s, using correlation and regression analysis. In particular, they have examined economic development vis-à-vis bank based and market based financial systems. The financial structure has been analysed on three aspects, namely, size, activity and efficiency, constructing an index based on them. Size dimensions include ratios such as liquid liabilities to GDP, bank assets to GDP, market capitalization to GDP. Activity dimension is captured by bank and non-bank credit to private sector to GDP, total value traded to GDP while efficiency is measured by bank net interest margin, overhead costs to total assets of banks ratio, and turnover ratio.

These measures for banking sector and stock market are taken as ratios to classify countries as either bank based or market based economies. Correlation of these measures across banks, non-banks and stock market is done with per capita GDP for each country which is found to be statistically significant. While for the size and activity dimensions, the study reports positive correlation for both banking sector and stock market, overhead costs and bank NIM are found to be negatively related with GDP per capita. Bank concentration, however, though negatively related with GDP per capita, is not found to be statistically significant. The researchers find that richer countries tend to have developed and efficient banking and non-banking sectors and stock markets; financial sector of richer countries also tend to become more market oriented. The study also examines overall efficiency of the financial system by aggregating the size and efficiency measures for banks and markets. The more developed the country, the more the financial sector is tilted towards financial markets rather compared to being bank-based.

Institutional and regulatory and legal infrastructure is also found to positively impact financial development.

Levine, Loayza and Beck (2000) too have examined the finance-growth relationship for 74 countries. Apart from the growth and financial development variables they also use instrumental variable regression to account for its impact on financial development. For instance, legal origin is used as instrument on the premise that this has an influence on national policies related to the efficiency of the financial sector. Their results suggest significant impact of measures of financial development on growth even in the presence of the instrumental variable which implies that the finance-growth link is truly robust and is not on account of any kind of likely bias that could enter on account of any variable that is either omitted or having simultaneous impact.

Sinha and Macri (2001) have undertaken an examination of the finance-growth link for select Asian countries, including India, and reports positive relationship between the two, along with a two-way causality between finance and growth for the period of 1950-94. The study regressed the growth rate of real GDP on alternative measures of financial development along with growth rate of population and growth rate of real investment as ratio to GDP. The money supply variable, which incorporates the most liquid form of money, namely, currency and demand deposits, was found to significant. Quasi money variables which has been taken to include time, saving and currency deposits of domestic sector other than central government is also found to be significant at five percent. However, the domestic credit to GDP was not found to be significant although it bore the expected sign. Real investment to GDP ratio too was not found to be significant. Population has a mixed result in different models. The causality test for India supports two-way causality between growth and finance. However, the study finds mixed results for most countries ranging from zero causality, one-way causality as well as two-way causality.

Wacabaca (2004) has examined the trends in the size of the central bank, banks and non-bank financial institutional in relation to each other and to GDP and range of activities of the financial institutions. The trends suggest that the financial sector of Fiji has evolved over time in terms of size and activity. The study also analyses the efficiency and structure of the commercial banking sector. Efficiency of the banking sector has been measured in terms of net interest margin and overhead costs as a ratio to total assets. The study has also posited financial development in terms of level of competition. Findings reveal that the level of concentration in

the banking sector of Fiji has declined over time with greater penetration of foreign banks and private sector banks. Another component of financial sector examined is the stock market size, activity and efficiency, measured in terms of market capitalization to GDP ratio, stock market traded volume to GDP, and stock market turnover ratio, respectively. The study has also analysed the relationship between financial development and growth in Fiji over the 30-year period from 1970 to 2000 using a wide spread of financial indicators. The researcher reports a positive relationship between the two variables and finds that the causality runs from economic growth to financial development, converging with results for countries with less developed financial systems.

Demirguc-Kunt and Levine (2008) have also highlighted the functions of the financial system in facilitating quality and quantity of information generation and diffusion and transactions at reduced costs which in turn make efficient allocation of resources feasible even as it enables risks to be managed, traded and diversified by allowing pooling of resources with easy entry and exit options. They divide the studies on finance-growth linkages into four types. (i) pure cross-country growth regressions, (ii) panel techniques that make use of both the cross-country and time-series dimensions of the data, (iii) microeconomic studies that explore the various channels through which finance may affect economic growth, and (iv) individual country case studies.

Ahmad and Malik (2009) have carried out a study on the role of financial development in the economic growth of 35 developing countries over the period 1970 to 2003. They find that financial development was significant in its impact on per capita GDP by making resource allocation efficient.

Estrada, Park and Ramayandi (2010) in a cross-country comparison including India, go beyond economic growth as being affected by financial development. They also test for the impact of the latter on total factor productivity (TFP) growth. They use five-year average of non-overlapping series of per capita GDP represent economic growth. Control variables employed by the study are Labour, represented by average years of schooling to represent human capital accumulation, and stock of capital. In alternative models they also include trade openness (+), inflation (-) and government consumption expenditure (-) as control variables, all averaged for five-year period. They have used three measures of financial development, namely, liquid liabilities to GDP ratio for financial depth, bank credit to private sector as a ratio to GDP and stock market capitalization as a ratio to GDP. Additionally, they also account for the degree of

financial openness of the economy by incorporating capital inflows to GDP ratio which includes both foreign direct investment and foreign portfolio investment. [years with crisis were dropped – Asian crises, initial per capita GDP is used as control variable taken as t-5 observation).

The findings of the study support significant impact of financial development on economic growth (per capita GDP growth). The structure of financial sector in terms of weightage of banking sector vis-à-vis stock market is not found to be significant. Likewise, financial development measures were not found to affect total factor productivity growth which suggests that while the financial sector is more effective its function of mobilizing savings for the purpose of investment and in capital accumulation it is not found to improve efficiency of the factors of production unless more appropriate indicator of financial development is used. This is also further substantiated by the fact that financial openness is found to have significant positive effect on TFP growth which is as expected given that capital investments brings along new technology and learning that also brush upon domestic firms through increased competition. They further report positive effects of both financial development and financial openness for economic growth.

Bordo and Rousseau (2011) report a persistent positive link of financial development with long run economic growth over a 125-year period since 1880 for 17 countries which are now developed, based on the ratio of broad money to GDP, a measure of the countries' banking sector. The positive impact is found even in the presence of foreign trade as another explanatory variable in the model. Rjumohan (2019), has analysed the impact of various indicators of financial development on economic growth for India, using size and turnover of the stock market as ratio to GDP as the proxy variables. Based on the conventional Johansen-Juselius cointegration test and the modern ARDL-based bounds test and the conventional Granger-causality tests, the study finds that "there does exist a long-run relationship between the economic and financial variables in the face of the external sector indicators."

Puatwoe and Piabuo (2017) has investigated into the development of financial sector of Cameroon using the usual depth dimensions of the sector. The technique used by them is auto-regressive distributive lag model, the results of which reveal that financial deepening of the economy had significant short run impact on economic growth along with control variables like government expenditure and economic growth. However, there was found to be negative relationship between bank deposits and economic growth in the short run. The study finds that

for the long run, all measures of financial development had positive impact on economic growth. This, they argue is reason enough for increased efforts to improve the functioning of the financial sector. Private investment and government expenditure have been used as control variables in the regression models.

2.6.4: Studies that do not Support Positive Linkages Between Finance and Growth

Scepticism on the finance-growth linkages have been echoed in Robinson (1952), as cited in Kotaro (2000) who opines that it is the real sector that leads rather than the financial sector, and Lucas (1988) who finds an unwarranted emphasis on the role of finance in economic growth. Robinson (1952) ascribed a passive role to the financial sector which she considered as only responding to the lead provided by other sectors, that is, that the financial intermediaries only originated from rapid industrialization.

Critics of the finance-growth links argue that propensity of households to save may be the common factor that affects both and thereby produces the positive correlation. They contend that financial development may be a proxy variable for a large number of other causal factors behind growth, which if identified may provide a more robust theory of growth rather than what its dependence of finance suggests.

Another reason behind the scepticism is because of the role of expectations which is crucial in financial interventions. When the financial institutions anticipate good prospects for growth it tends to lend more just as the stock market capitalization reflects future earnings prospects of projects. Owing to this, the financial development measures may be a manifestation of the future growth as an indicator rather than having causal effects on growth. Financial development when typically measured in terms of level of credit and the size of the stock market, may appear to cause economic growth not because of the dependence of the latter on the former but rather because anticipation of good growth prospects induces the financial sector to provide more funds for productive use and the stock market value represents the present value of growth prospects. Unless the mechanism by which financial development influences economic growth is identified, tested and proven, a causal relation between the two cannot be established.

Wachtel (2003) and Manning (2003) have also expressed doubts on whether finance can lead to growth. Some studies while examining the relationship between finance and growth find that there is considerable degree of variability in the said relation and factors like the range of the

rate of inflation, the level of economic development, and the level of financial development are important qualifications that define the finance-growth link (Demetriades and Hussein, 1996; Arestis, Demetriades, and Luintel, 2001; Rousseau and Wachtel, 2002; Rioja and Valev, 2004).

Rousseau and Wachtel (2007) contend that the linkages between financial deepening and economic growth is not consistent and has been weaker particularly coinciding with the period of rapid financial liberalization across countries ranging over the period of 1980s and 1990s to more recent times. Their contention arises from the fact that quick pace of financial deepening causes more harm to the economy by causing inflation and weakening the banking sector. The researchers lament the excessive financial deepening in absence of necessary regulatory infrastructure. While they support the finance-growth linkages, they assert that boom in credit tends to cause financial crises and thereby weakens the linkages. They, particularly, contend 'premature' financial development carried out in absence of sufficient development of legal infrastructure. Their analysis is based on a cross sectional and panel data of 84 countries for which they examine the impact of a range of financial and macroeconomic data on the growth rate of real per capita GDP. They primarily include measures of liquid liabilities (M3 to GDP) and ratio of private sector credit to GDP. The macroeconomic variables examined by them include measures of human capital, foreign trade to GDP ratio, government expenditure ratio to GDP.

2.7: SUMMARY OF OBSERVATIONS ON THE REVIEW OF LITERATURE

In the area of financial development, majority of the studies found in the literature are centred around one primary dimension of financial development, and that is, financial access. Fewer studies are found on other dimensions of financial development which include financial depth, efficiency and stability. Further, studies which combine all these four dimensions to form a composite study are not to be found, particularly in the context of India.

The review of literature on financial access and financial inclusion brings out some common observations. Most of the studies found in the literature have made country comparisons and state comparisons by using some specific ratio such as number of bank accounts per 1000 adults, number of branches per 100,000 populations etc. Moreover, the studies have covered a very short period for measuring financial access which only manifests the level of access or inclusion reached at certain point of time.

Most studies that have attempted to gauge the extent of financial development in India are country studies which focus on a single year of comparison or very limited number of years for vast array of country comparisons. These studies are centered around limited dimensions of financial development such as access, inclusion and depth. There is no study found that examines the financial sector development in India in its entirety and for a long period of time. Since practically all studies are with reference to a single or a few years, they only show the level of financial access and inclusion with reference to those years. Very few studies are found that undertake a long period assessment of the state of financial inclusion in the context of India, which can throw light on *extent* of change that has occurred in financial access over time. Such an approach helps to gauge the growth path of financial inclusion and also to relate it to particular policy measures taken by the government to improve inclusion.

One crucial observation that emerges from the examination of various studies on financial access and inclusion that have been examined is that, there is a wide variety of measures used to represent dimensions like bank penetration or availability or usage, and studies are found to use the alternative measures in different combination without clear reasoning why these measures are used alternating between the dimensions. Also, studies which have constructed demand side and supply side financial inclusion indices do not offer clear line of reasoning behind why some measures were considered under demand side factors while some as supply side factors. In fact, a few studies are found to use the concepts just in the opposite sense. The measures which are used as supply side factors in one study (Kumar and Mishra, 2011) are found to be applied as demand side factors in another study (Sethy, 2016)

The major gap in most studies related to different dimensions of financial development is that most studies have undertaken cross-sectional examination for large number of countries where in missing data on several dimensions of financial inclusion, for instance, severely limit the number of observations available for study. Most studies use the database of the World Bank's Global Financial Development which does not always have data on all variables related financial development for all countries. No study is found in the literature that undertakes such an in-depth examination of the financial sector development of any country, covering all four dimensions across financial institutions and markets, and also relates it to economic growth.

With reference to the empirical study of the relationship between financial development and economic growth, no study is found which incorporates a composite variable like the index of financial development as an explanatory variable. The present study is an attempt to look into

long run changes in various dimensions of financial development for India, in particular, as the cross-country study is dependent on limited observations on fewer dimensions.