CAPITAL UNIVERSITY OF SCIENCE AND TECHNOLOGY, ISLAMABAD

Determinants of Financial Inclusion in High Income and Low Income Countries

by

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This work is dedicated to my beloved parents who have encourage me to achieve this milestone and to my respected supervisor Dr. Ahmad Fraz, who has been a constant source of inspiration.

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Abstract

Financial inclusion is considered a critical determinant for the economic development of a country. Keeping in view this study analyzes the determinants of financial inclusion for the forty-eight countries. In this study, countries are divided into two panels. One panel consists of low income whereas the other has high income countries. Both panels, the determinants of financial inclusion are studies for the period of 12 years i.e. 2004 to 2015. GDP per-capita, age dependency ratio, urbanization, information and communication, and rule of law are considered as determinants of financial inclusion in our study. In this study panel data is used for estimation to carry out the empirical analysis. First findings of five determinants included in our study, only GDP per-capita does not affect financial inclusion at the global level. Second findings of a study financial inclusion is determined by all the determinants included in our study in case of low income countries and thirdly in case of high income countries, GDP per-capita and rule of law are statistically insignificant whereas age dependency ratio, information and communication and urbanization affect financial inclusion significantly. In the light of above-stated findings, policymakers should encourage such policies which can increase per-capita income, improve the rule of law conditions under the good governance to stimulate the financial inclusion, especially in developing countries. Moreover, infrastructure regarding the information and telecommunication should be improved along with the latest and modern technology for financial inclusion in all countries.

Key Words: Financial Inclusion, Panel Data, Low Income and High Income Countries.

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Abbreviations

(UNDP)	**United Nations Development Program**
(HDI)	**Human Development Index**
(IMF)	**International Monetary Fund**
(WDI)	**World Development Indicators**
(WGI)	**Worldwide Governance Indicators**
(GFD)	**Global Financial Development**
(PCA)	**Principal Component Analysis**
(GDP)	**Gross Domestic Product**
(ICT)	**Information And Communication Technology**
(FII)	**Financial Inclusion Index**
(ATM)	**Automated Teller Machine**
(NPA)	**Non-Performing Assets**
(CAR)	**Capital Adequacy Ratio**
(RBI)	**Reserve Bank Of India**

Chapter 1

Introduction

1.1 Introduction

Financial inclusion is a wider term in its scope and functionality. It establishes the affordable access, provision, facilitation and handling of a formal financial system to the stakeholders participating in economic activities of the country (Sarma, 2008). In modern times, this sort of comprehensive financial system is crucial on account of different factors, reasons, and trends of the modern economy. A comprehensive earmarking of the productive resources is the first and topmost hallmark of this financial system. Secondly, easy access to financial services for stakeholders may uplift the running financial management. An inclusive financial system is a prerequisite for a healthy economy on account of different factors. The last but not the least, it may bring embarrassment and challenges for those who are involved in money lending while violating the formal financial system, Therefore, this type of strong financial system gives boost to the potential being utilized and ensures the welfare of the stakeholders for sound saving trends through the provision of avenues and outstanding financial services. An inclusive financial system has gained vital importance and first preference in financial policy engineering in many countries. The realization of formal financial inclusion system has earned the attention of economic planners and think tanks and is considered an integral part of the economy throughout the world. The governments, banking sector and financial

policy-makers take a step in launching this system as finance is a backbone in the determination of economic growth and development (Roubini and Bilodeau, 2008). The financial inclusion has also caused the reduction in poverty at household level through the uplift of growth indirectly. At other levels, it ensured the provision of saving and the credit services to the haves-not directly. Keeping in view the importance of the financial inclusive system, many governments across the world are taking legislative steps in order to launch this system. Of the governments, the government of United States took a legislative step through the Community Reinvestment Act (1997) that advocated the banking sector to initiate the credit at a level of its operation and impeded the banking sector from picking/hitting the only rich classes at the same time. Other than the United States, the law on exclusion (1998) strongly pronounces the jurisdiction of a citizen to open an account with the bank. Similarly, the United Kingdom established the Financial Inclusion Task Force so as to watch the development of financial inclusion.

When banking industry started booming, the financial inclusion moved forward; for example, a lot of steps like no-frills accounts and General Credit Cards for deposit and credit were taken by Reserve Bank of India (RBI). A voluntary code was initiated by the German Banker Association in 1996 that pronounced the basic banking transaction through a current banking account for everyone. The South African Banking Association introduced a low-cost bank account called Mzansi in 2004 for financially excluded people. Some countries have established micro-finance institutions and Self-Help Groups as alternative financial institutions so as to facilitate the excluded ones with the financial services.

The debarment of a specific portion of the society in term of financial exclusion has been widely explicated by the literature penned down on the concept of financial exclusion. Leyshon and Thrift (1995), advocated that the financial exclusion unfolds the factors and processes that restrains the access to specific portions of the society to the formal financial system. Whereas, the studies of (Carbo et al., 2005), claimed that it is the failure on the part of some strata of the society to reach the financial system though it might be a matter of rare occasion. The studies of Conroy et al. (2005), delineate the financial exclusion as a processor system

that deprives the have-nots to access the formal financial systems in the countries. Mohan (2006), explores that the depravity of some portions of the society to reliable and sound financial products and services from the major facilitators signifies the extreme financial exclusion. In India, financial inclusion has been referred as a process that guarantees an easy approach to financial facilities and in time availability of credit at affordable cost whenever placed by the disadvantaged portion of the society (Rangarajan et al., 2008).

Sustainable development is subjected to the financial inclusion at global level policy making now but the discussion, research, and deliberation on its literature are still at a nascent stage. Therefore, a lot of deliberation and studies have attempted to explore the most suitable avenues of financial inclusion with reference to household level and macro level. Consequent upon the ongoing studies, the policymakers have established grounds in this area and come up with major policy guidance with reference to the annexation of financial inclusion and sustainable development. Despite that, further efficient steps with regard to financial inclusion is sought to inculcate all dynamics of financial inclusion. However, it is pertinent to incorporate the entire global governments for taking more steps for financial inclusion at a global level. This study will investigate the determinant of financial inclusion.

1.2 Theoretical Background

The exchange of money among borrowers, lenders, investors and other transactions are handled by a financial system.. A financial system can be elucidated at the firm-specific level, regional or global level (O'sullivan and Sheffrin, 2003). The financial system ensures the relationship between depositors and investors through complicated services available with the financial system. It facilitates the individuals with the money that is likely to invest within the business sector or shift to the new avenues of business sectors (Gurusamy, 2008). The complex but refined operations of banking sector encourage the business players to share the challenges coming on their way of business. (Allen and Gale, 2000).

The financial system of a firm owns a set of applicable procedures that streamline the financial operations going on in the firm such as it would establish wages and balance sheet verification, revenue and expense schedule and other accounting measures necessary for financial operations. On the regional level, well-organized financial systems ensure the provision of funds and other financial services. The global financial system is a wider concept than that of the regional one but does the same function at an international level wherein all financial institutions participate in the provision of the services across the globe. The international financial institution that can be named is the International Monetary Fund, Central Banks that execute the lending operation throughout the world.

At a country level, the financial system of the state incorporated market infrastructures, pension and mutual funds, securities and the central bank of the state is normally linked with the government but unleashes the rules and regulations for the commercial banks in accordance with law. The commercial bank provides financial services to the businessmen in terms of transactions, credit facility, savings in the shape of investment in banks and supports the economic growth of the country. The issues emerging in banking and finance badly affects the economic growth and monetary policy and cause the flight of capital, investments, and business out of the country. Moreover, this disruption creates huge fiscal cost in protecting the linkage among the countries which are associated with the development and growth of the county. Therefore, a reliable and strong financial system is required in to prevent the former mentioned losses and disruption. The tight relationship among the countries with regard to financial linkage and investment ties will leave the positive effects on local financial sectors as well as across the country that ultimately will bring economic stability, a downfall of poverty and push up the growth level of the country. The International Monetary Fund organization witnessed a pertinent relationship among financial inclusion, financial depth and financial stability (IMF 2018).

The financial system normally deals with credit, finance, and money as a medium of exchange. Through these three mediums, goods and services can be hired. Basically, this has replaced the barter system(Asmundson and Oner, 2012). In the

history of the financial system, all sort of money was termed as commodity money like gold and silver coins but in modern time of financial times, modern systems rely on fiat money and bank money. With the development of economies from past to present, commodity money was changed with the representative money. Fiat money is handled by the government order and does not have any derived or intrinsic value and not replaced with any commodity like gold. Fiat money is valued, assessed and maintained by the government whereas the bank money is generated by the commercial banks through the provision of loans and digital money is electronic money that is served to the individuals via mobile phones, computers or internet cards(Manyika et al., 2016).

Theoretically, the linkage between financial inclusion and digital finance has been found critical. In the society, a huge portion of the society is using mobile, therefore, provision of finance through mobile could uplift the level of financial inclusion the rate of exclusion be reduced (World Bank, 2014). It is necessary to have a mobile phone with the excluded population then this idea could be materialized. The provision of digital finance normally adds good effect when the question of financial inclusion comes under question. Therefore, the application and implementation of digital finance on the deprived population, low-level bread earners and the neglected ones and provision of other financial services can improve financial inclusion in rural areas. Secondly, the provision of digital finance and another financial service to the people living in far-flung area where the branches of banks are not located and to the banks is costly on account of far distance will not only minimize the volume of customers in the banks but also marginalize the cost that would be incurred upon the management of bank branches in rural areas. All that will bring stability, convenience for the banks and individuals and improve the financial inclusion(Ozili, 2018).

Economic growth tends to improve the financial inclusion in two different channels. Firstly people are in need of more financial services to deposit the incomes or to invest their services when the income level of people rises. Secondly, the increase in the aggregate income level of the economy enlarges the market, which attracts new investor in all the fields. These new investors increase the credit requirements.

New banking firm enters the market to fulfill these requirements. The competition among the banking firm improves the financial inclusion.

Law and order facilitate everyone in the country to do their work peacefully and securely. The peaceful situation of law and order enables all the members of the society and the stakeholders of the investments to fare in the society positively and peacefully. It also boosts up the economic growth of the state provided that there are accountability and a corruption-free environment. A transparent system is also necessary for the implementation and of the fiscal agreements. Financial inclusion should also increase due to better rule of law as it improves enforcement of a financial contract.

There are two opposing channels in which age dependency ratio affects the financial inclusion.

The society with a major portion of children(less than 15) and old aged (more than 64) people diminishes financial inclusion because they are not the active earners. Those people who are active earner suffer the burden of children and old aged people who are not active earner then have less savings or insufficient amount to deposit or invest any financial institution, it increases the financial exclusion.

The inhabitants of the villages have many difficulties including no outreach to suitable finance. This limitation causes a bad effect on the productivity resulting in economic failure (Marsh, MacAulay and Ah, 2004). Most of the low income countries have insufficient infrastructure especially in rural areas that ultimately reduces the access to financial services. Hence the countries with more rural population tend to have low financial inclusion and vice versa.

There are different channels to enhance the financial inclusion is making use of the up-to-date information technology devices in cheap ways. In this area, the banks can be very helpful if they make mobile applications to facilitate the village customers which do not much money and are easily approachable to all remote and distance areas. If there are more cash exchange points, the growth in financial inclusion will also be more.

1.3 Research Gap

The literature about financial inclusion is still insufficient for its complete understanding yet it is considered the most integral part in policy making for sustainable development across the world. In the light of available literature, the countries did painstaking work at national and international fronts on financial inclusion. The banking and financial policies have widely been influenced by the studies done in the field of financial inclusion and its relationship with sustainable development. Most studies looked into the proper measures of financial inclusion at household and country levels. However, some better measure with regard to financial inclusion be required, that may grasp all the dynamics related to financial inclusion. Using that measure a broad study is essential that encompass all the countries of the sample. This study will shed light on the determinant of financial inclusion.

1.4 Problem Statement

Financial inclusion ensures the individuals and businesses the most suitable approach to beneficial and convenient financial services and products which could fulfill their requirements like insurance, credit, savings, payments and transactions. According to a reliable survey, about 2 billion people are unable to utilize formal financial services. Further, the survey unfolds that more than 50% of adults of disadvantaged households dont have a bank account with them. This study is going to explore the determinants that could address this issue involved in financial inclusion.

1.5 Research Question

In past some studies have tried to find the determinants of financial inclusion, in doing so, they have used primary data. The question regarding the determinants of financial inclusion will be answered using macro-level data across the globe.

- What are the determinants of financial inclusion?

- Is there any difference in the determinants of financial inclusion in case of low income and high income countries?

1.6 Objective of the Study

- To explore the impact of determinants on financial inclusion.
- To investigate the determinants of financial inclusion is different in two different groups the countries.

1.7 Significance of the Study

From the very beginning, the development of an economy is conditioned with the finance; the classical thinker like Adam Smith has endorsed this inevitable fact. Further, the most convenient approach to finance has also been the center of attention for the development of an economy. Of the dimensions of financial inclusion, the most important is in time provision of financial service to everybody interested in finance at the affordable cost.

If a proper inclusion formal financial system is not available, the haves-not individuals and small businessmen will be bound to depend on other than formal sources in order to invest in the business on account of it's in time and convenient provision of finance in exchange of heavy interest rates. These constraints will not only be eclipsed in the presence of proper financial inclusion but also minimized inequality and poverty. Proper financial resources will make sure to the disadvantaged group to get benefit through credit, savings and insurance facilities. Moreover, it helps them out in establishing finance for investing in business dynamics or streamlining their consumption (Bank, 2000; Gersovitz, 1988; Bank, 2008). Take an example, in the agriculture field, the individuals can launch their investment in the uplifting of land, irrigation level, high-productive seeds and mineral fertilizers. At the same time, the individual out of the agriculture field can give a boost to their businesses. In the wake of the downfall of incomes of the households for the time being on

account of low output of harvest or other agricultural crisis within the season, the financial back-up or loan on short-term is engaged to sustain the unavoidable consumption or expenses. This sort of financial backup or loan on short-term is also utilized in the other areas of human development like education, housing, and health.

The provision of finance has been admitted as a central key to empowering the society so as to shift its potential in business activities and to ward off the poverty. (Aghion and Bolton, 1997; Banerjee and Newman, 1993; Burgess and Pande, 2005). In development economics, getting rid of the poverty has been the focus of the government and policy-makers. Financial exclusion means the absence of financial services for specific strata. The financial exclusion incorporated different dimensions of exclusion of the people from the finance area like self-exclusion, marketing exclusion, price-exclusion, condition-exclusion or access-exclusion. These financial exclusions are caused by different socio-economic forces. Of those reasons, the absence of saving, credit facility with unaffordable interest, lack of insurance back-up, poor incomes and zero savings are the major ones (Carbo et al., 2005).

Availability of financial inclusion empowers the businessmen and individuals to utilize the finance in entrepreneurs plans, production as well as face the untoward downfall of business and other critical situation. For all that, it is pertinent for policy engineers to comprehend the determinants of financial inclusion so that a comprehensive policy with implementation procedures widening its scope with reference to the availability of finance that could ultimately give the boost to growth and minimize the poverty. The extension of present literature on financial inclusion across the world will be the center of attention in our study.

1.8 Plan of Study

In chapter 1 this chapter starts with the introduction of the financial inclusion, research gap, problem statement, significance, research objectives and identifying the gap in the previous studies. In chapter 2 will discuss the previous work which has been done by the researchers in their studies on financial inclusion (Literature

review).Develop the hypothesis and expected result of the study.in Chapter 3 After talking about the literature review, in this chapter include the methodology of the data population, sample, timeline of the study and describe the source where the data has been collected. Describe the variables which are used in our study. In Chapter 4 discussion and interpretations of the results include in this chapter. In Chapter 5 Conclusion, policy recommendation, and future research recommendations have been discussed in this chapter.

Chapter 2

Literature Review

2.1 Literature Review:

An immense number of economists and related researchers took a great in the field of financial inclusion and come up with different understandings of this concept. Same is with the idea of financial exclusion. Financial exclusion restricts to approach necessary financial services in an appropriate form. Exclusion can come about as a result of problems with access, conditions, prices, marketing or self-exclusion in response to negative experiences or perceptions (Sinclair, 2001; Sarma, 2008).

Financial exclusion turns into grimness becomes as it affects low-income strata and those in financial adversity (Chant Link and Associates, Australia, 2004).

The deprived portion of the society feels hindrances in enjoying the key financial services such as bank accounts, home insurance and the like (Meadows et al., 2004 as cited in RBI, 2008).

Financial inclusion is distributed very seriously. One is the most serious case who is bound to be eliminated from the financial sector because it will be a vital factor in engineering the policies and programs with regard to financial inclusion. It is not a matter of wonder that the people enjoying almost every luxury of life have an easy approach to financial service and banking sector (Heimann and Mylenko, 2011).

It is gauged that about 02 billion people are not part of the financial inclusion. While there are many problems in low income countries. However, huge inaccessibility to the financial institution is a key difference in low income and high income countries. (Bank, 2008).

In Indian context, RBI has come up with a definition of financial exclusion which states that financial exclusion means hurdles in using the financial services, whether the impediments are price or non- price barriers to finance (RBI, 2008).

Financial exclusion has been much sanitized in the global economy when Prof. Md. Yunus and his Grameen Bank were awarded Nobel Prized for the downfall of financial exclusion by Norwegian Nobel Committee (Sinha, 2006).

Similarly, a financial sector providing a facility of finance to all the people, businesses have been stressed and focused by The United Nations (UN). The element of savings and insurance have also been focused the International Agency. Financial inclusion is not a compulsion for all but it is should be available so it could be utilized by the population when needed. (Fund, 2006).

The small vendors, marginal farmers, landless laborers, people engaged in self-employment and unorganized sectors, urban slum inhabitants, migrants, tribal minorities, socially excluded groups, senior citizens, physically challenged people and women are normally financially excluded segments. There are different dynamics of financial exclusion which are found in different countries in different ways. Therefore, different techniques were brought into action to confront this problem. While finding out the foundations of this problem, multi-factors were surfaced in expediting and sustaining this menace such as lack of identity proof, illiteracy, distance from bank branches, lack of banking habits, high transaction costs, lack of banking knowledge or not complete knowledge on banking products and attitude of bankers. (Ramji, 2009)

National Sample Survey Organization (NSSO) highlighted a very adverse case of farmers and households with regard to the credit facility and other financial facilities. In another survey, it is shocked to note that only 27% farmers and households earn the credit facility whereas the rest population of the same block that is 51%

is bound to get credit via informal resources hence financially excluded from the mainstream of the economy. Region wise exclusion data further came up with grim results with respect to financial exclusion; it is a very serious situation in Central, Eastern and North-Eastern regions 64% of farmers are out of financial inclusion Cumulatively, only 20% population of the regions is attached with financial inclusion system (MoSPI, NSS 59th Round, 2003).

Financial inclusion can play main role reduction of poverty from the country, inclusive growth and social inclusion of the underprivileged sections of the society. Financial inclusion has received increased attention in view of the international initiatives towards an inclusive growth of the emerging economies. Financial inclusion is viewed as a device for the new vision of inclusive growth (Mehrotra et al., 2009)

Leyshon and Thrift (1995), pronounced the depravity of individuals or specific segment from the provision of finance is financial exclusion whereas Sinclair (2001), reported the lack of reliable and suitable financial services for the people is financial exclusion. Contrary to the aforementioned economic thinkers, Mialou et al. (2017); Sarma (2008), voiced about the financial inclusion. Mialou et al. (2017) took financial inclusion as an unchecked provision of financial services to the people from top to bottom. Sarma (2008), defined the financial inclusion in terms of procedure making sure the easy approach to financial services and its provision for all the stakeholders of the society. Contrary to the views given on financial inclusion floated by Mialou et al. (2017), Sarma (2008), point of view about financial inclusion gives an opening to many aspects such as convenient approach to financial services, provision of finance and its utilization; these aspects could be deliberated one by one.

The economies of the world more or less are speedily booming and the element of modernization is taking its pace forcefully yet it is sad to note that the downfall of financial exclusion still remains a dream as around two and half billion adults eighty-eight percent of whom live in Asia, Africa, Middle East countries and Latin America, are still out of the net of financial inclusion (McKinsey and Company, 2010).

Another shocking survey conducted by the World Bank surfaced that fifty percent of adults in the global population is out of financial inclusion as they dont have any linkage with the formal financial industry and banking. It is painstaking fact that 71% adult is financially excluded from the economy in low income countries (Beck et al., 2009).

Microcredit financing facility is being utilized by only 15 million people in India out of 110 million poor people. Further, only 2% or 3% population from a low-income group is facilitated with health insurance-related financial services. (McKinsey and company, 2008).

Arunachalam, 2008 argues that, in India, the poverty factor still grasps about 30-35% of the total population and at international level, about 400 million people are suffering from this menace. About sixty percent of people living in the region of BIMARU states have a lesser amount than 50 cents (a half dollar) per day.

India has been put below in terms of financial access in the statistics of the World Bank when the International Financial Agency looked in the case of OECD countries. The access to bank branches and ATMs is lower than Malaysia and Thailand but higher than China and Indonesia as the number of branches and ATMs per 1,00,000 persons in India were 7.13 and 5.07 in 2010 (RBI, 2010).

Curbing the difficulties of the neglected ones via the formal financial system, developing a strong savings culture among the poor, eliminating the high-cost interest regime, transforming money lender dependent rural poor into a highly bankable group, and stopping the resource drain from the poor is the major target of financial inclusion. At a macro level, it facilitates with the huge capacity of financial convenience for growth and development of the country. The main aim of financial inclusion is to create such an environment where everybody ranging from common man to the business community at large could earn benefit from the financial and banking sector. (McKinsey and company, 2010).

Securing a better life for the neglected and deprived communities is the hallmark of financial inclusion. Moreover, it enables the poor to ensure sustainable improvements in their quality of life at the community level that could ultimately reduce

poverty and cause the growth of the economy at the greater speed at the national level (ASSOCHAM and Ernst and Young, 2010).

An easy access to bank account combined with deposit, insurance, easy access to credit at an affordable cost and higher level of financial penetration of the banking system is demanded by Financial inclusion (Thorat, 2007).

Before undertaking any financial liberalization program in order to accelerate economic growth, an efficient and well-functioning financial system is the prerequisite. Credit inclusion could be achieved through the up gradation of formal and innovative credit delivery mechanism for the middle and lower middle-class group for that a thorough study of the system and introducing new models of finance via technology such as mobile banking and branchless banking; in that way, the financial industry and banking sector would approach the far-flung areas of the country. (Ramakrishnan, 2007).

Regardless of the education standard of the people, the basic financial services such as savings, credit, insurance, transfer, and remittance as well as financial consultancy services as and when desired at a reasonable cost in a trouble-free manner are ensured by a well reputed financial sector. Micro-credit schemes are viewed as an integral part of nancial inclusion as they bring saving and borrowing opportunities to marginalized groups, there is an aspect of nancial inclusion that they do not cover (Conroy et al., 2005).

Micro-credit schemes are based on a group of neighbors, usually women, who keep each other honest regarding saving and repaying loans. Financial inclusion, however, is mostly geared to the individual household level and does not imply peer relationships. While micro-credit focuses on loans and saving, nancial inclusion includes all banking products along side saving and loans. The Committee for Financial Sector Reforms (Government of India, 2008).

What is financial inclusion and factors involved in it has been much discussed by the economic thinkers but how it can be measured and what would be the method of measurement has been not deliberated in detail yet. However, the recent studies have come up with the varied modes of measurement of financial inclusion. Honohan (2007, 2008), took a specific proportion of adult from the society based on

the household survey data and established financial access indicator along with financial agents within the specific economy; where household survey data were not available regarding the approaching of finance, the indicator was earned through bank details of the adult and GDP per capita. Utilizing the present record of the specific year, a cross-section series was established based on the dataset. Moreover, an overview of financial inclusion has been offered by Honohan (2007, 2008), measure. It is possible that sort of measure remains failed to capture the shifts in future economies.

Mialou et al. (2017) kept in mind the flaw of the previous indicator and changing aspects of finance, covering the whole area and population shift or increase, utilization of finance in terms of submission and provision, cost of utilization of financial resources and solution of financial rifts and offered a financial indicator as a composite indicator. Statistical weights are used to form every measure after settling down the measure through the identification of it statistically. The weighted geometric mean is followed by the aggregation technique. This approach picks factor analysis method to fix the variables involved in each aspect that is considered the flaw of this approach because fully usage of all present data for each economy is not possible through this approach. Moreover, applying several weights for each dimension signifies the value of one measure against the other.

Sarma (2008), introduced a contrary approach in constructing the indicator. A dimension index for every aspect of financial inclusion was calculated. Thereafter, taking every index as a common inverse of Euclidean distance, each index is aggregated. A reference ideal point is utilized to calculate the Euclidean distance. Thereafter, it is set to a standard condition in the aggregate index via the number of aspects of financial inclusion.

2.1.1 Determinants of Financial Inclusion

Honohan (2008)'s indicator was applied by Rojas-Suarez (2010), in order to examine the worth of multi macroeconomic features in low income and high income economies. Application of that indicator came up with the following offshoots:

the poor application of a law hurdles in the provision of finance, a wide chasm in income, biased social development and unpredictability and instability of the economy. For all that outcomes, Rojas-Suarez (2010), applied weighted least squares in their sample.

Smith (1776), experienced the much attention of Scottish economy towards the banking sector that took inevitable shape in the development of the economy in the early years of the 18th century.

Keeping in view the track record of banking in economic development,Schumpeter (2017) learned that the advancement in the world of technology was taken into consideration and applied in the banking industry in order to refine the banking systems on the advent of the 20th century. Further, he declared Establishment of credit financing in banking pertinent for hunting business opportunities and development of the economy.

Similarly, Sir John Hicks (1969: 14345), claims that the poor updating and establishment of a financial system put technological improvement and its application on the back burner. In order to decree his claim, he gave the reference of Englands capital market development wherein liquidity risk was reduced that resulted into revolution in the industry.

The neo-classical stand on financial inclusion was empirically experienced by Levine (1997). He viewed that the economies bearing a huge banking sector and sustainable stock markets experience faster growth for many years. The countries having poor financial system face poor economic growth as compared to those economies with reliance on foreign funding but have strong financial systems and equal provision of finance across the land boost faster (Levine, 1997; Burgess and Pande, 2005).

The finance has a vital impact on the mitigation of poverty level of the people and an updated financial system in all respects lowers the cost incurred upon the transactions, gives the boost to the saving level, sustainable growth rates and ensures better business planning (Beck et al., 2009). Binswanger and Khandker (1995); Burgess and Pande (2005), contended that extension in Indian countryside

with regard to financial provision and accessibility reduced the poverty there and expedited other than agrarian employment.

The firm-level data was applied by Eastwood and Kohli (1999), and supported the direct financing policy into the extension of the countryside that came up with a reliable micro industrial output. Therefore, how to alleviate the poverty from the country would be a prime target of development economics.

Micro-financing has been taken into consideration the most suitable way in order to ensure the easy approach to finance. This mode has successfully been derived from Yunus model of micro-credit that was applied in low income and high income countries such as Malaysia, Philippines, South Africa, India, Nepal, China, Finland, Norway and the United States. The Grameen Bank in Bangladesh ensured the extension of credit financing to the needy that would assist them to get rid of poverty.

Microcredit financing does not end the menace of poverty in one swoop. Instead, Yunus (1999), contends that it helps people in bringing to an end the menace of poverty sooner or later, The micro-finance is not restricted to the provision of loans rather it grants financial assistance to the public. The absence of such sort of financing and its easy availability at all levels gives birth to the concept of financial exclusion that may occur in the shape of self-exclusion, marketing-exclusion, price exclusion or access exclusion (Carbo et al., 2005).

Report of the Committee on Financial Inclusion in India (Government of India 2008: 33), explains the concept of financial inclusion as such strong financial procedures that grants permission to financial services and in time credit facility to the needy at the most convenient cost whenever they intended. The World Bank (2008:2), defines financial inclusion as an easy approach to financial services without any likely hurdle. If a proper financial inclusion system is not available, the disadvantaged people and normal businessmen are bound to attain finance for investment through informal finance on account of in time provision in an easy way on huge interest rates. A well-established financial inclusion ensures the low-interest rate-based provision of finance, easy credit facility, insurance of the investment that could mitigate their poverty. This system not only streamlines

their consumption but also help in accumulating finance for new business chances (Bank, 2000; Gersovitz, 1988; Bank, 2008). Take an example, in the agriculture field, the individuals can launch their investment in uplifting the land, irrigation level, high-productive seeds and mineral fertilizers. At the same time, the individual out of the agriculture field can give a boost to their businesses. In the wake of the downfall of incomes of the households for the time being on account of low output of harvest or other agricultural crisis within the season, the financial back-up or loan on short-term is engaged to sustain the unavoidable consumption or expenses. This sort of financial backup or loan on short-term is also utilized in the other areas of human development like education, housing, and health.

On the advent of the 21st century, financial inclusion shaped itself as a public policy relevance. Across the globe, the concept of financial inclusion has got a lot of attention notably the United Kingdom (UK) (2006) India (Government of India 2008), and global organizations such as the World Bank (2008, 2009) the United Nations (2006), have established proper economic forums to comprehend financial inclusion and widen its range in their respective economies. As the economies vary in their nature worldwide so it is essential to know for the policy engineers how to measure the financial inclusion. The measurement of financial inclusion gauges the evaluation of the level of convenience of the financial facility, insurance services, access to financial inclusion, and other financial services. Of the scholars, Honohan (2004), hired the information about the specific group of adult from the population through banking agents and MFI account from more than 60 countries in order to gauge some dimensions of the financial inclusion and then correlated with inequality (Gini Coefficient) and poverty.

Applying aggregate banking variables like a number of accounts, a number of bank branches and total credit and deposit a proportion of GDP for 55 countries, Sarma (2008), has come up with an Index for financial inclusion.

Mehrotra et al. (2009), applied the same type of aggregate in order to establish an index for financial inclusion. He has opted the following variables of an index such as credit from banking data for sixteen major states of India a number of rural offices, a volume of rural deposit and number of rural deposit accounts.

Further, a composite measure of approach to financial facilities, that is, the percentage of adult population that has an account with a bank for 51 countries was unveiled by the World Bank (2008). The procedures involved in financial inclusion through banking industry such as transactions executed on the part of bank, rules, and regulations floated by the economic authority of the countries and the requirement of banking sector from the individuals will leave impact on banking access. World Bank (2009), in Banking the Poor gauged all those factors in its research for 45 countries.

A considerable date on several dimensions of the financial system has been deliberated by Beck and Katz (2001) yet the detailed and continuous indicators regarding the financial system are elapsed.

Sarma (2008) contended that financial inclusion and the multi-level human development are linked with each other in the economy and financial industry of any country. Of the socio-economic indicators, income is considered as a close indicator that shows the level of financial inclusion of any group in the society. The other factors apart from income are urbanization, literacy, and inequality which are taken into consideration with regard to financial inclusion. The proper financial inclusion is strongly conditioned with outstanding physical infrastructure in order to ensure the smooth linkage connectivity and information. The NPA and CAR are negatively linked with financial inclusion among the banking sector indicators. If governments own banking system, the financial inclusion will not be significantly materialized with low-interest rate whereas the foreign or private banking system will negatively be associated with the financial inclusion.

The financial exclusion appears when the disadvantaged segments of the society, the ethnic minorities, and the old people are put on the back burner of an economy. In the modern financial system, the issue of financial exclusion of the low-income group has been widened. This financial exclusion is associated with the poor financial policies (Kempson and Whyley, 1998; Connolly and Hajaj, 2001).

The issue of financial exclusion has commonly occurred where people are residing in the far-flung area and strange localities where even the banking set-up has not been established (Leyshon and Thrift, 1995; Kempson and Whyley, 2001).

Moreover, the meager income-oriented societies of the country are bound to be victimized to financial exclusion (Buckland et al., 2011; Kempson and Whyley, 1998).

The individuals who are irregular in their earnings are normally out of the financial system. Automatic cash transfer (CAT) with regards to payments and wages is said to the main reason of financial inclusion in the UK. The financial exclusion is also closely linked with the state pension in cash and constant payment of social security benefits to the people (Kempson and Whyley, 1999).

The banking sector and other financial departments play an imminent role in uplifting the level of financial inclusion. The role of capital market agents along with other financial hubs can despite the attempts of the government in the promotion of financial inclusion. Across the globe, the international and national forums are holding seminars in order to encourage the financial agents in devising the policies so as to avoid the issue of financial exclusion. (Massey, 2010).

A well reputed financial system is required for the development of the economy and for the achievement of national aims set by the governments. The financial systems give a boost to the competition in the economy at the domestic and national level. Apart from this, a sturdy financial system backs up the huge investment and growth in the economy. It is pertinent to have strong and well-organized banking system for the country if it desires to participate in the contemporary world of an economy because banking sector and its network are very important for a business transaction at national and international level. These two factors are the prime agents in the development and expansion of economic activity in the country. (Feldstein and Horioka, 1979; Brunetti et al., 1998; Ford and Poret, 1991).

The provision of finance in the easiest way will ensure the reduction in poverty and constant economic prosperity of a country. This issue gained attention when the financial exclusion emerged in the world. About 3 billion people are deprived of the financial services in the world (Kempson et al., 2004).

It is pertinent to mention that the availability of finance to the small businessmen, the poor and the deprived is very much compulsory for over development of the

economy. In India, this factor has got the attention of the legislature who launch the first ever policy that shifts the focus of banking to mass banking. Regional Rural Banks have been established to serve the poor and the needy ones. The volume of commercial and the PRBs has been enhanced from 8321 in the year 1969 to 84,504 branches as at the end of March 2010. Consequently, the pressure on banks has been decreased and the individual were facilitated in a more convenient way (Thorat, 2007).

The enhancement of productivity is a condition with the provision of finance. A lot of authors argue if the finance is accessible to the poor, the level of poverty will be reduced on account of the increased volume of productivity (Banerjee and Newman, 1993) as it is evidenced that the Indian Rural Expansion Program considerable mitigated the level of poverty and undoubtedly offered extension in other than the agriculture sector (Binswanger and Khandker, 1995).

The micro level of industrial high turnout has been associated with the Branch expansion program and credit facilities to the individuals. That is why, the expansion of informal financial channels, which is commonly based on exploitation, could be wiped out with the establishment of a strong and reliable financial system (Eastwood and Kohli, 1999).

It is empirically proved that the financial agents of Indian government have really affected its economic performance (Rousseau, 2001).

It is also proved that a sound financial system ensures the reduction in cost incurred upon the transaction, better saving rates, long rung growth rates, investment decisions and technological innovations (Beck et al., 2009).

Banking services are being taken universal services that will be enjoyed by every segment of the society of the regardless of the location and financial status (Frost and Sullivan Report, 2009).

The role of the financial system has been positively witnessed on the economy, therefore, it has become a policy objective in the eyes of policy agents. About 2.9 billion is out of the net of financial system globally (World Bank, United Nations 2006).

Similarly, it was found in the National Sample Survey Organization, (2003, 59th round) that the credit facility and other financial services from formal or informal financial agencies are not available for about 45.9 million farmer households in the country (51.4%), out of a total of 89.3 million households. Moreover, it is fact the banking sector has a wide and broad network despite that 27% of the total agriculture sector is only being benefited from formal financial channels. This ratio is higher in the North Eastern, Eastern and Central Regions North that is 95.91%, 81.26%, and 77.59% respectively.

The Committee on Financial Inclusion in India reported 73% of farmer households are deprived of a provision of finance on credit through formal financial channels (Rangarajan et al., 2008). It is sad to note that about 560 million people are out of the financial inclusion net that establishes the fact 41.6 percent of the population is bound to live below poverty line i.e.US $ 1.25/day (NCR Whitepaper on Financial Inclusion, 2009). The role of financial inclusion is not only recognized as the key factor in bringing to an end the poverty but also uplifts the growth of an economy. One of these two realities of financial inclusion, it has come at radar screen at the beginning of 2000 and earned priority in policy objectives.

Rangarajan, Ex-Governor RBI, and Chairman, Committee on Financial Inclusion, Government of India contended that the Indian economy is experiencing higher growth route and we should try to incorporate the disadvantaged people in the net of financial inclusion so as to expedite the growth rate. The fruits of inclusive growth are not being shared equally among the stakeholders that is why it raised many questions to the policy agents(Chakraborty, 2010).

The United Nations set the following objectives of financial inclusion (2003): a. easy approach to finance of all segments of the society and provision of financial services such as credit for long and short periods, insurance, mortgages, leasing, local money transfers, international remittances, and other payments and b. a well reputed and strongly organized financial system at an internal and external level so as to gauge the industrial performance, monitor the market and introduce rules and regulation where necessary immediately c. Institutional stability refers to the provision of finance any time d. more than one financial agencies granting

financial facilities in order to facilitate the households and businessmen at the affordable cost (2003).

The incorporation of the deprived, and disadvantaged people in the financial system is the objective of financial agents for that, the financial agencies establish a conducive environment with reference to financial access, credit facilities, and other social facilities at the lowest rates so the haves-not could be included in the system. In the presence of a strong financial system, the economic avenues will invite development, investment, updated infrastructure, better growth and chances of employment for the people. All these factors have been learned in different studies on financial literature (Feldstein and Horioka, 1979; Ford and Poret, 1991; Brunetti et al., 1998).

The banking industry has got the expansion for the last decades that shows its importance in the economies. In spite of this fact, the banking sector could not incorporate the considerable volume of disadvantaged people in its net; although the reasons of financial exclusion are being deliberated at global level so that reasons could be erased in order to include the poor one in financial system yet the reasons of financial exclusion change with change of a country (Leeladhar, 2006).

In India, after studying the different factors or determinants of financial inclusion, it has learned that the expansion of the factory with reference to the number of levels proportionally are termed as the most important key in promoting the interest of the people about the banking system. Their income is automatically transacted and saved through the banking system and the inclusion level of people in the banking sector is consequently increasing (Kumar, 2013).

Index of Financial Inclusion has been used to assess the linkage between financial inclusion and development and highlighted the factors which took participation in financial inclusion via Regression Analysis. The research also explored that literacy rate, employment rate, and sex-ratio does not matter with regard to financial inclusion but per capita NSDP and urbanization play vital role in the expansion of financial inclusion (Singh and Singh Kondan, 2011).

While studying the dynamics of financial inclusion, the breadth of financial services is taken into consideration at priority level because this factor ensures the access of finance in the economy from top to bottom with regard to population. The expansion of bank account and a number of bank accounts are considered the yardstick in determining the breadth of financial services (Beck, 2001).

The banking agencies facilitate the people regarding their money management through their bank accounts. The people who are with the bank account can easily save their money, take credit facility, make premium payments, transfers and other loans (Mohan, 2006). Keeping in view the bank account factor, the banking sector can easily gauge the potential, smoothness, and level of financial services to the population(del Ninno, 2006).

There is trio linkage among poverty, economic growth and financial system that has to be kept under consideration by the policy engineers. Whether a well reputed financial system grants benefits to the needy ones and ends the menace of poverty or not has been answered by a lot of theoretical and empirical outcomes and references. The population has to bear the extra cost while running their businesses in the presence of poorly organized banking sector. A lot of flaws such as poor financial awareness, improper credit facility, lack of collateral and other bound costs likely to be shared by the business community in the absence of poor financial system. A strong financial system would eliminate these burdens and cause smoothness in growth and development (Galor and Zeira, 1993).

A well-managed banking sector and other financial sources efficiently earmark the funds and other financial services to the deserved people. The studies witnessed that the access to finance to the small entrepreneurs give a boost to the growth rate of (Beck, 2001).

Moreover, the availability of finance on easy terms and conditions create competition within the already running business and encourage the small entrepreneurs to gain the finance from the proper channel while eliminating the non-formal financial channels. The poorly managed financial sector will only cause lake of interest of the people in business and slow growth rate of the economy (Rajan and Zingales, 2003).

There is a strong relationship among the elimination of poverty, growth and financial depth. The financial depth reduces the level of discrimination and gives a boost to the income of 80% of the population (Li et al., 1998).

Financial depth along with the linkage of poverty also affects the Child labor found in the country (Dehejia and Gatti, 2002; Honohan, 2004).

Rutherford highlights another benefit of the financial systems, he contends that little savings of the people could be utilized through banking services apart from boosting the level of income and expansion of new business (1996). It is assumed that the credit facility and other financial services are enjoyed and grasped by the rich portion of the society in a government-owned banking system that has weakened the attempts of financial expansion in countryside development. The Rural Bank Expansion program was launched in Indian Government in 1977-1990. The influential studies Burgess and Pande (2003) witnessed the downfall of poverty from 61% in 1967to 31% in 2000. Moreover, this program was expanded to other than the agriculture sector which brought a lot of people into a financial net when they intended to have financial service of the banking sector for their small businesses. Later on, the number of branches of rural banking has been expanded so to serve the poor as much as possible. The studies evidenced that this program has caused the reduction in poverty, improvement in saving, and higher rate of growth (Beck and de la Torre, 2006).

Ramesh and Sahai (2007: 70)it is estimated that on the basis of on an all-India, 41 percent of the adult population has no access to the financial services but on the other hand, 59 percent of the adult population have a bank account.

There are four key functions of finance in any financial institution or banking sector: earmarking funds, check and balance in the utilization of credit funds by the business community, managing the risk of business dynamics through the transformation of collecting and repacking and utilization of savings in terms of its mobility. There four functions should be efficiently correlated, linked and properly governed by rules and regulations so that the financial system could be strengthened (Honohan, 2004).

Achieving the goal of nancial inclusion, the bankers have made a policy to reach out to the poor, some are moving very fast to implement the policy, even few declared the achievement of 100 percent financial inclusion before the deadline through the route of no frill account in the selected districts. (Thingalaya, 2009).

Park and Mercado (2015) contended that financial inclusion is strongly influenced by population rise and shift, education level, rules and regulations and income in term of per capita in Asian low income countries. They claimed that the presence of rules and regulation, and access of finance to the deserved people regardless of their age and social status and implementation of a financial contract will widen the net of financial inclusion where in the menace of poverty and inequality found income be minimized.

In the light of literature review, it is concluded that financial inclusion/exclusion is an essential factor for low income and high income economies. Financial inclusion requires a strong financial system to facilitates the society especially for low-class income group of the country. This facility provides an access to the basic need of the lower income class people e.g. savings, credit, remittances, as well as insurance. Due to lack of educated community are not linked with the formal financial system, which provides cost-free or reasonable charges to utilize the formal financial services. A country with a strong financial system leads to a higher economic growth as compared to those having poor financial system face low economic growth. Macro financing has considered a most useful way to easy access to finance if every person of society approach to finance that would assist to reduce the poverty from the society.

Availability of financial services to poor or disadvantage social group of society through with formal financial institution which helps achieves the sustainable development of the country. Physical infrastructure such as a telephone, television and road network, access to information with help of cable TV, newspapers, radio, computer, and internet can play an important role increasing financial inclusion by facilitating easy mobility and information about financial services.

Banking sector and financial institutions play an important role in boosting the financial inclusion, a well establishes financial system play the main role for the

achievement of the national goal set by the government and development of the economy. Holding seminars in order to encourage the financial inclusion at international and national forums across the globe. There are many other determinants that higher the financial inclusion in the counties such as per capita income, rule of law, urbanization will lead the financial inclusion.

2.2 Hypothesis and Expected Results of the Study

H_1 : higher per capita income will lead to more financial inclusion i.e. $\beta 1 > 0$.

H_2 : better the rule of law will lead to more financial inclusion i.e. $\beta 2 > 0$.

H_3 : financial inclusion will be high in more urbanized countries i.e. $\beta 3 > 0$.

H_4 : more age dependency ratio will lead to less financial inclusion i.e. $\beta 4 < 0$.

H_5: better infrastructure will lead to more financial inclusion i.e. $\beta 5 > 0$.

H_6 :there is a difference in the determinants of low income and high income countries.

Chapter 3

Data and Methodology

3.1 Data and Methodology

3.1.1 Population, Sample and Time Line of the Study

The study seeks to explore the index of financial inclusion and its determinants both in-cases of low income and high income countries. The study intends to incorporate all the countries across the globe, but due to data availability constraints it is not possible. The sample is contain on the countries on which data is available. The selected sampled data divided into two sub samples i.e. low income and high income countries. There are three international organizations that make the classification of the countries.

- United Nations Development Program (UNDP)

UNDP classify the countries based on Human Development Index (HDI). This index is mainly depends on three things 1) GNI per capita 2) Education 3) life expectancy

- International Monetary Fund (IMF)

IMF categorizes the countries based on development and it is based on three things. 1) export diversification 2) per capita income level 3) degree of integration into the global financial system.

- World Development Indicators (WDI)

WDI categorizes the countries based on GDP per capita. We have used the data collected by World Bank, so we are using the criteria of WDI.

The time frame of the study consists of 12 years (i.e. 2004 to 2015). Data on 48 countries is retrieved from following three sources;

- World Development Indicators (WDI)
- Worldwide Governance Indicators (WGI)
- Global Financial Development (GFD)

The list of the countries is as follows;

Table 3.1: List of Countries

Low Income Countries				**High Income Countries**
Algeria	Cape Verde	Lebanon	Swaziland	Kuwait
Angola	Comoros	Lesotho	Tanzania	Latvia
Argentina	Costa Rica	Madagascar	Thailand	Norway
Azerbaijan	Djibouti	Maldives	Timor-Leste	Qatar
Bangladesh	Ecuador	Moldova	Tunisia	Saudi Arabia
Belize	Georgia	Namibia	Turkey	Seychelles
Botswana	Ghana	Pakistan	Uganda	Singapore
Brazil	Kazakhstan	Peru	Ukraine	Uruguay
Burundi	Kenya	Philippines	Venezuela, RB	
Cameroon	Kyrgyz Republic	Rwanda	Yemen, Rep.	

3.1.2 Description of the Dependent Variables

3.1.2.1 Financial Inclusion Indicator

The measurement of inclusiveness of the financial sector of a country is realized by the financial inclusion indicator. This indicator is established as a multidimensional index that is used to grasp the information with regard to multi-factors of

financial inclusion like provision of backing services availability, usage, and banking penetrations of the banking sector.

3.1.2.2 Components of Financial Inclusion

A financial system will be inclusive in its all terms if it has more and more people involved in banking operations. Banking penetration is realized through the number of people using accounts in the bank. It means the population involved in banking would fall under the concept of banking penetration. So, if every person in an economy has a bank account, then the value of this measure would be 1. It is notable fact that the data of banked individuals is not immediately available therefore we utilized the number of bank accounts as a proportion of the total adult population. A well-organized banking system ensures the provision of banking services to the banked individuals or likely to be the part of the banked population. Banking outlets like offices, branches, banking personnel and so on are the indicators of services availability. Thus, availability of services can be signified by the number of bank outlets (per 100,000 population) and/or by the number of ATM per 100,000 people.

Kempson et al. (2004) contend that it is insufficient to have an account with the bank only if they do not utilize the services of the banking system on offer, they will be fallen under the concept of underbanked population. For an inclusive financial system, it is necessary for the individuals, having an account with the bank, to utilize the financial services offered by the financial agency. Amongst the financial services, the level of credit facility and deposit facility is and the proportion of the countrys GDP. By using Principal Component Analysis (PCA), the financial inclusion indicator will be engineered and for the purpose of comparison, it is also established by Sarmas (2008) approach.

3.1.2.3 Principal Component Analysis

The general technique, to merge many associated variables under the one variable or fewer variables known as a principal component, known as Principal Component

Analysis employs complicated mathematical rule and principles. In a majority of cases, the PCA technique is employed in multivariate data analysis to reduce the number of a variable by transforming them into prime variables; on the other hand, PCA technique is also used in many purposes.

Generally, the functioning of PCA is based on a vector space transform to reduce the dimensionality of large data sets. The primary unprocessed data set usually has too many dimensions or variables. This original multivariate data may provide fewer, similar and overlapping information or it is possible that there would be many proxies for a single concept; in all these scenarios it is possible that these variables could be transformed into a lesser number of variables knows as principal components. It is therefore often the case that an examination of the reduced dimension data set will allow the user to spot trends, patterns and outliers in the data, far more easily than would have been possible without performing the principal component analysis.

It is a statistical procedure that uses an orthogonal transformation to convert a set of observations of possibly correlated variables into a set of values of linearly uncorrelated variables called principal components. If there are n variables, then the number of distinct principal components is n-1. This transformation is defined in such a way that the first principal component has the largest possible explanation of the variances in the variables (that is, it accounts for as much of the variability in the data as possible), and each succeeding component, in turn, has the highest variance possible under the constraint that it is orthogonal to the preceding components. The resulting vectors are an uncorrelated orthogonal basis set. PCA is sensitive to the relative scaling of the original variables.

3.1.2.4 Sarmas Approach

The Sarmas financial inclusion index makes use of the dimensions expressing them in one dimension. It uses 0 as a total exclusion of finance in an economy and 1 as vice versa. Sarma (2008) devised a methodology of calculating FII for knowing multiple aspects of the phenomenon of financial inclusion. Sarma (2008) used this

method in attaining FII results for 49 countries with the use of fundamental principles of financial inclusion: accessibility, availability, and utilization of banking facility.

A dimension index for each of these dimensions has been first computed by the following formula:

$$d_i = \frac{(A_i - m_i)}{(M_i - m_i)} \tag{3.1}$$

where

A_i = Actual value of dimension i

m_i = lower limit for dimension i, given by the observed minimum for dimension i

M_i = upper limit for dimension i, given by the observed maximum for dimension i

In this paper, Sarmas (2008) dimension formula is changed a little bit. Sarma (2008) used the 94th percentile for the maximum value (Mi). she argued that maximum value will most probably the extreme value, so it will depress the index value. To normalize the index value she had taken the 94th percentile for the maximum value and values greater than the 94th percentile are set equal to the 94th percentile. If we keenly observe the working of the index, it calculates the index value by measuring the current value with optimal value. When we alter the values of a dimension, it will ultimately disturb the countrys ranking. In a single dimension, 6% values (greater than 94th percentile) are altered, and there are five dimensions so ultimately there are chances that the ranking of top 30% countries will be affected. To avoid this biases, this paper takes maximum observed value for the upper limit.

There are two factors for calculating the dimension of availability. One of them is the availability of a bank branch and the other one is a provision of ATMs. Both of them are apportioned in weighting as 2/3rd and 1/3rd respectively. Credits

and deposits of a bank are the two factors or dimensions that are taken into consideration for understanding the usage. Both of them carry equal weight is 0.5. The accessibility takes heed of the ration between the total adults in a society and the number of bank accounts in it.

Accessibility gains 1 weight after the complete calculation takes place whereas availability and usage get half each as the analysts marked a lack of authentic data in these two fields and there are other factors also that affect these two variables like the emergence of the internet banking has affected many banks and they have closed their conventional branches shifting to the virtual substitutes of the physical compounds. The data dealing only with the conventional branches can misguide the analysts and their results. In the same way, the data which accounts for only credits and deposits are not compatible as there are other types of transactions and remittances as well which affects the visage of the factors. The shape of FII becomes as under when these factors are involved:

$$FII = \sqrt{\frac{(1-p_i)^2 + (0.5-a_i)^2 + (0.5-u_i)^2}{1.5}} \tag{3.2}$$

where pi, ai and ui denote respectively the weighted dimension indexes for the dimensions accessibility (or penetration), availability and usage.

3.1.2.5 Comparison of PCA based and Sarmas (2008) Financial Inclusion Index

PCA technique is superior to Sarmas (2008) technique in many ways. Firstly it is based on weights that are specified by the author whereas our technique is independent of these weights. PCA technique calculates the index by considering the variation in the given set of variables and develops the index in such a way that it can explain the maximum variation in the given set of variables. Secondly, Sarmas technique could be applied in cross-sectional data only (Sarma and Pais, 2008). If one has panel data with t number of years, then one has to apply Sarmas technique t times separately, which is much laborious work. Hence large time series panel data increases the fatigue in the case of Sarmas technique, whereas it

increases the efficiency and degree of freedom in case of PCA technique. Thirdly, Sarmas technique calculates the index by comparing a current country with the countries having the smallest and largest dimension value. And the reference country changes over the period, so Sarmas index value cant be used for time series or growth dynamics analysis. Finally, even for one time period, Sarmas technique is difficult to apply, whereas PCA technique is built-in in all software and produces results on a single click.

3.1.3 Description of Independent Variables

3.1.3.1 GDP per Capita (GDPP)

GDP per capita is calculated by dividing the gross domestic product of the country by midyear population. This GDP is basically a total of all the indigenous production that added to the economy. It also includes taxes imposed on those productions and it excludes reliefs and subsidies on these products. It does not carry the fall in prices of depreciation of fabricated assets and nor does it caters to the decline and falling values of the resources present in nature. Data are in constant 2010 U.S. dollars.

3.1.3.2 Age Dependency Ratio (AGE)

The laboring span of age in most of the societies is between 15 and 64 years. The people younger than the lower and older than the upper limit are dependents on the working age population. They are expressed in a ratio of dependents per 100 laboring aged people.

3.1.3.3 Urbanization (URBAN)

The number of people residing in city areas reflects the concentration of urbanization in that country. This data is officially given by the census department and the statistical offices of the country. UNPD gathers and makes this record for everyone.

3.1.3.4 Information and Communication Technology (ICT)

The usage of modern and up to date gadgets like telephone, cell phones, and the internet have boosted up financial inclusion as they have made the approach to finance conveniently for everyone. The PCA based index infrastructure indicator of earlier mentioned variables related to infrastructure can be used as an explanatory variable.

3.1.3.5 Rule of Law

To see how much and how far do the inhabitants of a society comply with and abide by the limits laid by the law and order of the society, we observe the situation of law and order in that society. There are many factors involved in it including crime ratio, judicial infrastructure, state of the business contracts enforcement, the laws regarding property and their implementation.

3.1.4 Measurement of Variables

Table 3.2: Measurement of Variables

Variables	Proxies of Variables
GDP per capita	GDP per capita (constant 2010 US$)
Urban population	Urban population (% of total)
Fixed broadband subscriptions	Fixed broadband subscriptions (per 100 people)
Mobile cellular subscriptions	Mobile cellular subscriptions (per 100 people)
Individuals using the Internet	Individuals using the Internet (% of population)
Rule of Law	Index ofvoice and accountability; political stability and absence of violence government effectiveness; regulatory quality; rule of law; and control of corruption.
Age dependency ratio	Age dependency ratio (% of working-age population)
ATM	ATMs per 100,000 adults
Bank Branches	Bank branches per 100,000 adults
Bank account	Bank accounts per 1,000 adults
Bank Deposit	Bank deposits to GDP (%)
Bank Credit	Domestic credit to private sector (% of GDP)

3.2 Methodology

3.2.1 Econometric Model and Estimation Technique

In empirical literature, there are many determinants of financial inclusion. On the basis of proposed determinants, the econometric model becomes as follows:

$$FII = \beta_0 + \beta_1 GDPP_{it} + \beta_2 LAW_{it} + \beta_3 URBAN_{it} + \beta_4 AGE_{it} + \beta_5 ICT_{it} + \epsilon_{it} \quad (3.3)$$

Where i is used for cross-sections (i.e. countries) and t denotes the time. FII_{it} represents financial inclusion indicator.

$GDPP_{it}$ represents GDP per capita.

LAW_{it} represents rule of law.

$URBAN_{it}$ represents urbanization.

AGE_{it} represents age dependency ratio.

ICT_{it} represents information and communication technology .

This econometric model will be estimated twice i.e. for low income and high income countries separately. We may apply Pooled Least Square, Fixed Effect Model or Random Effect Model as per the conditions reveals.

3.2.2 Econometric Techniques

The data of variables is collected or observed of a single cross-section over the time period in time series analysis (e.g., level of financial inclusion in a specified country for several years). On the other hand, if we collect or observe the data in a single time period of many cross-sections, entities or sampling units then it is called cross-sectional data (e.g., level of financial inclusion of many countries for a single time period i.e. 2015). Finally, if we observe the data of many cross sections or sampling units (i.e. countries, firms or households) over a period of time then

it is termed as Panel dataset. In other words, panel data has both time and space dimensions.

$$FII_{it} = \beta_0 + \beta_1 GDPP_{it} + \beta_2 LAW_{it} + \beta_3 URBAN_{it} + \beta_4 AGE_{it} + \beta_5 ICT_{it} + \epsilon_{it} \quad (3.4)$$

There are many perks and advantages of Panel data analysis over time-series or cross-sectional data analysis:

The cross-sectional or time series data sets are the sunsets or special cases of panel data sets. For example, in panel data with n*t observations, if we restrict t=1 then it becomes cross-sectional data (with n observations); on the other hand, if we restrict n=1 then it becomes times series dataset with t observations. In each case number of observations reduces a lot, so both of these data sets have a lower degree of freedom. When a degree of freedom reduces the reliability of estimates of parameters reduces. Concluding remark is that estimates derived from panel data sets are most reliable (Hsiao et al., 1995).

Sophisticated economic of financial behaviors could be more accurately captured in panel data than time series or cross-sectional data sets. Consider the case of assessment of the effectiveness of state policies or social programs (Hsiao et al., 2005; Heckman and Vytlacil, 1998; Rosenbaum and Rubin, 1984). Assessment of the usefulness of a policy by analyzing cross-sectional data naturally endures from the fact that the cross-sections undergone through the policy are dissimilar from those without. By analyzing cross-sectional data researcher is unable to observe at the same time what outcome occurs when a policy is implemented or when it is not implemented. A country can be analyzed as either implementing the policy or not implementing it. Using cross-sectional data, a policy can be assessed only by taking the difference between groups who implement the policy and those who do not. But this method experiences biases i.e. difference in the characteristics of selected groups. On the other hand, If a researcher uses panel data, he would be able to analyze the characteristics of the cross-sectional units before and after the implementation of a policy of both groups (who implement the policy and those

who do not). In this way, he would be able to isolate the effects of policy from the effects that occur due to i) characteristics differences among the cross-sectional units and ii) passage of time.

Panel data analysis is somewhat able to control the biases of omitted variables. Econometricians usually argue that the missing variables generate biases in estimated parameters. An underlying reason is that one behavior or one outcome is a result of the joint struggle of a lot of factors. In an econometric model, it is not possible to include all of these factors may be due to data limitation, theoretical limitation or econometric limitation. Biases in the estimated parameter occur when an omitted variable is associated with the variables that have been included in the model. Panel data contain information on both the inter-temporal dynamics and the individuality of the entities may allow one to control the effects of missing or unobserved variables (Hsiao et al., 1989, 1993).Panel data analysis provides micro foundations for aggregate data analysis. Time series analysis is usually done by taking the assumption of representative agent (i.e. all the cross-sectional units are similar, so analyze one and generalize the results; or aggregate the data and then analyze them jointly). On the contrary, if micro or cross-sectional units are different i.e. are heterogeneous; then what will be the reliability of the estimates of the time series analysis or what will be the implication of findings of aggregate data analysis (Hsiao et al., 2005; Pesaran, 2003; Lewbel, 1994; Granger, 1990).

An investigation, of the issue of heterogeneity versus homogeneity, can be well performed using Panel data having data on many cross-sections over a vast period of time. There are two dimensions in the panel data analysis i.e. time series and cross-sectional. Usually, the estimation of parameters and their inference in the panel data would be more complicated as compared to time series or cross-sectional data. Though, there are some circumstances under which the estimation or inference in panel data is simpler than the rest of the two. For example: When time series data are not stationary, the large sample approximation of the distributions of the least-squares or maximum likelihood estimators are no longer normally distributed, (Phillips and Durlauf, 1986; Dickey and Fuller, 1979, 1981; Anderson, 1959). But if panel data are available, and observations among cross-sectional

units are independent, then one can invoke the central limit theorem across cross-sectional units to show that the limiting distributions of many estimators remain asymptotically normal (Binder et al., 2005; Im et al., 2003; Levin et al., 2002; Phillips and Moon, 1999). The econometric models could be under-identification because of measurement errors (Aigner et al., 1984). The availability of multiple observations for a given cross-section or at a given time may allow a researcher to make different transformations to induce difference and deductible changes in the estimators, hence to identify an otherwise unidentified model (Wansbeek and Koning, 1991; Griliches and Hausman, 1986; Biørn, 1992). The problem of unobserved heterogeneity comes about with the introduction of panel data. The term heterogeneity implies that the average value of a dependent variable will change from cross-section to cross-section due to unobserved causes. In panel data analysis, unobserved heterogeneity ought to be handled. Explanatory variables may explain a fraction of the heterogeneity; however, there will always be some residual, which must be addressed while estimating the panel data models.

3.2.3 Methodologies for Estimation in Panel Data

Three general avenues are available for treating unobserved heterogeneity.

3.2.3.1 Pooling Approach

The first approach completely pools the entire data, and assumes that data is homogenous and thus ignores unobserved heterogeneity.

$$FII_{it} = \beta_0 + \beta_1 GDPP1_{it} + \beta_2 LAW_{it} + \beta_3 URBAN_{it} + \beta_4 AGE_{it} + \beta_5 ICT_{it} + \epsilon_{it} \quad (3.5)$$

While doing so, this technique forgets the distinction of both dimension i.e. space and time; and assumes that both slope and intercept coefficients are constant over space and time. The simplicity is the main advantage of the current approach. There are many drawbacks to this approach. The omitted variable bias could occur

by paying no attention to unobserved heterogeneity (Rabe-Hesketh and Skrondal, 2004; Hsiao, 2003). Furthermore, there is no interpretation of the estimates of the pooling approach, as it assumes that the between and within cross-sectional characteristics are same. Consequently, the researcher is unable to identify the results (individual versus aggregate or panel versus cross-sectional) the relationship, in fact, takes place.

3.2.3.2 Fixed Effects Model

Fixed effects model permits each cross-section to have its own intercept. The FE model assumes that slope coefficients are constant over time and space but intercepts varies over space but is time irrelevant.

$$FII_{it} = \beta_{0i} + \beta_1 GDPP1_{it} + \beta_2 LAW_{it} + \beta_3 URBAN_{it} + \beta_4 AGE_{it} + \beta_5 ICT_{it} + \epsilon_{it} \quad (3.6)$$

The intercept is allowed to vary over space by introducing the dummy variables for each cross-section. The major drawback of this model is that it consumes a lot of degrees of freedom, that ultimately reduces the reliability of estimated parameters (Beck and Katz, 2001; Beck, 2001). The introduction of cross-section specific dummies absolves all the between cross-sectional variation (i.e. heterogeneity) in the FE model. Hence, the explanatory variables capture only the within cross-sectional effects. These within cross-sectional effects have the following interpretation: for a given country, as GDP per capita increases one dollar over the time, Financial inclusion raises or declines by β_1 units. Cross-section specific explanatory variables cannot be induced due to the presence of cross-section-specific dummies, so the between-cross-sectional hypothesis cannot be tested in FE models. Joint F-test of cross-sectional dummies is performed to check the adequacy of the FE models. In this test, the null hypothesis is that the impact of the cross-sectional dummy is jointly zero. If the test is able to reject the null hypothesis then FE specification is preferred over a pooled approach.

3.2.3.3 Random Effects Model

In cases of panel data with a lot of cross-sections and relatively shorter time span (i.e. n is large and t is small), the application of FE model is much expensive (as it will consume too many degrees of freedom). As cross-sectional dummies capture the unobserved heterogeneity, so these are actually a symbol of deficiency of our knowledge about the true model. Hence, it would be better to address this deficiency by incorporating this heterogeneity in residual term ϵ_{it}.

$$FII_{it} = \beta_{0i} + \beta_1 GDPP1_{it} + \beta_2 LAW_{it} + \beta_3 URBAN_{it} + \beta_4 AGE_{it} + \beta_5 ICT_{it} + \epsilon_{it} \quad (3.7)$$

Where

$$\beta_{0i} = \beta_0 + \mu_i$$

Where μ_i is a residual term having zero mean and a constant variance. By the incorporation of heterogeneity in a residual term, we meant that the selected cross-sections are drawn from a larger universe and that they have a common mean value for the intercept (0) and the individual differences in the intercept values reflected in the error term μ_i. The back substitution results in

$$FII_{it} = \beta_0 + \beta_1 GDPP1_{it} + \beta_2 LAW_{it} + \beta_3 URBAN_{it} + \beta_4 AGE_{it} + \beta_5 ICT_{it} + \mu_{it} + \epsilon_{it} \quad (3.8)$$

$$FII_{it} = \beta_0 + \beta_1 GDPP1_{it} + \beta_2 LAW_{it} + \beta_3 URBAN_{it} + \beta_4 AGE_{it} + \beta_5 ICT_{it} + \phi_{it} \quad (3.9)$$

The composite error term ϕ_{it} consists of two components, μ_i, which is the cross-section, or individual-specic, error component, and ϵ_{it} which is the combined time series and cross-section error component.

For an application of RE model one strong assumption should hold i.e. μ_i (cross-section, individual-specific, error term) must not be correlated with explanatory variable. Otherwise, RE model will face a problem of endogeneity and the estimates will become biased.

$$COV(X_{it}, \mu_i) = 0 \tag{3.10}$$

Since explanatory variables are allowed to vary both between and within cross-sections, several econometricians argue that the assumption of no correlation between the error term and explanatory variables is the unrealistic one. They argue that unobserved heterogeneity is due to cross-section specific characteristics, so more probably it would be associated with the explanatory variables. The FE model does not make such a controversial assumption, so it is regarded as a superior model than the RE model (Wilson and Butler, 2007; Kristensen and Wawro, 2003; Beck et al., 2009). Hausman (1978) is often applied to evaluate the competence of this contentious assumption. Furthermore, several econometricians have a point of view that the RE model will be appropriate if cross-sections are selected at random from a large normal population.

On the contrary, in case of panel data of countries FE model is superior to RE model because selected countries are not drawn randomly and also the population is not so large (Kristensen and Wawro, 2003; Beck and Katz, 2001). Another drawback of the RE model is that its estimated coefficients have the similar problem as was with the coefficients of the pooling approach. However, in case of RE model the coefficients are pooled partially, contrasting to completely pooled, still, the estimation procedure assumes that the between and within cross-sectional effects are same, consequently causing the interpretation of the estimated to be imprecise. The main benefit of the RE model is that the researchers are able to incorporate explanatory variables specific to cross-sections (the panel data variables that do not change over time i.e. area of a country). Hence the researcher is able to test the hypotheses related to the between-cross-sections effects. Another advantage of the RE model is that it does not consume a lot of degrees of freedom as was the case of FE models.

3.3 Comparison of the Fixed and Random Effects Model

Both of these techniques have contradictory advantages i.e. the advantages of one technique are the disadvantages of other. The choice between these two models is made on the basis of the Hausman (1978) test. This test states that if the FE estimator is consistent whether β_{0i} is fixed or random and the commonly used RE estimator is consistent and efficient only if β_{0i} is indeed uncorrelated with X_{it} and is inconsistent if β_{0i} is correlated with X_{it}. Hence, the test proposes asymptotically chi-square distributed Wald statistic. The null hypothesis is that the RE estimates are consistent and efficient. If the test rejects the null hypothesis then FE modeling is appropriate. It is researchers decisive decision regarding the choice of model, and application of Hausman test neither necessary nor sufficient for the selection of models (Clark and Linzer, 2015).

3.4 Parameters Estimation

As it is Panel data analysis, so it becomes important which of the models of the panel analysis is be used in this study. There are two different model, Constant Coeffcient model, Fixed effect model. Each of these have different assumption in relation to the nature of the data with respect to time and cross section. For opting one of these models the Redundant Fixed effect test is used to identify either the constant coeffcient model or the fixed model is to be used for the study.If the results are significant then Fixed effect model is used but if the results are insignificant then constant coeffcient model is used. As the test results are significant so Fixed effect model is opted between these two in all models.

TABLE 3.3: Fixed Effect Test

High Income Countries			
Redundant Fixed Effects Tests			
Effects Test	Statistic	d.f.	Prob.
Cross-section F	6.979717	(7,83)	0
Cross-section Chi-square	44.43697	7	0
Low Income Countries			
Redundant Fixed Effects Tests			
Effects Test	Statistic	d.f.	Prob.
Cross-section F	105.8547	-39,435	0
Cross-section Chi-square	1128.222	39	0
All Selected Samples			
Redundant Fixed Effects Tests			
Effects Test	Statistic	d.f.	Prob.
Cross-section F	99.85411	-47,523	0
Cross-section Chi-square	1324.761	47	0

Chapter 4

Results and Discussion

4.1 Descriptive Analysis

Financial inclusion indicator calculated based on the PCA technique and Sarma technique for the year 2004 and 2015 are presented in Appendix 1 and 2. Several facts can be observed. Firstly, a ranking of the countries based on both PCA approach and Sarmas approach is approximately similar. Financial inclusion indicator based on the PCA approach has the similar dynamics as the Sarmas approach has. Figure 1 implies that the countries for PCA approach calculate a low (high) financial inclusion level, Sarmas approach also computes a low (high) financial inclusion index. And both of them are highly correlated as can be observed in figure 1. Secondly, in 2004, advanced (high-income countries) countries tend to have higher financial inclusion than low-income countries countries. yet there are some exceptions i.e. Uruguay and Saudi Arabia have rank 16th and 18th respectively in 2004. The distribution of the countries among the low income countries is relatively mixed. Surprisingly, some low income countries performance in financial inclusion is extraordinary i.e. Lebanon (1st) Thailand (4th) and Brazil (5th). Underline reasons of these astonishing performances are that Lebanon is very good in Bank deposit and Bank credit to GDP ratios, Brazil is very good in the number of ATM and Bank branches and Thailand is relatively good in all fields. In the class of lower income countries, some economies have higher financial

inclusion than the higher-income economies i.e. Ukraine (10th) Cape Verde (12th) Tunisia (14th) and Philippines (17th). Some lower-income economies have very distressing performance i.e. Cameroon (47th) and Angola (48th last). In short, the distribution of countries based on financial inclusion indicator was not in line with the distribution based on economic development. Thirdly, in 2015 relative position for high income countries is worsened.

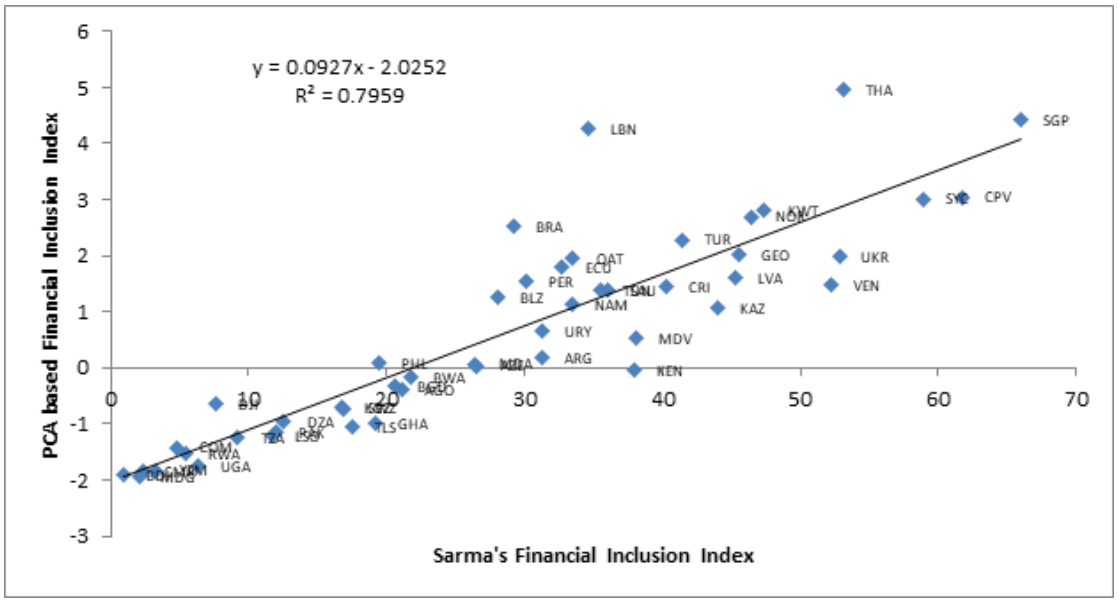

FIGURE 4.1: Relationship Between PCA and Sarmas Financial inclusion indicator

The ranking of countries based on both approaches are quite similar. In addition, Financial inclusion indexes based on these methods are highly correlated.

4.1.1 Growth Dynamics

Growth dynamics in all the 48 countries, during the period of 2004 to 2015, are presented in appendix # 3. Results reveal that the highest growth is taken place among the low-income economies. There are eighteen and two, lower and high-income economies respectively among the top twenty highest financial growing economies. Highest growth is observed in Georgia, its ranking was 36th in 2004 and it reached 10th in 2015. Growth analysis reveals that improvement in financial inclusion is not much dependent upon income level, as some low-income economies

have greater financial inclusion growth than the high-income economies. Contrary to that, growth in financial inclusion among the low income economies much depends upon the income level of the economies. By ignoring some exception, on average growth in financial inclusion is highest in lower economies than the rest of low income economies.

4.1.2 Descriptive Statistics

In the following section of the descriptive analysis, the calculations are made three times on the same topic i.e. for selected samples, low income countries data and for high income countries data. All this laborious exercise is done only to show that the characteristics of low income countries are different from high income countries and all samples . That implies that the studies which are conducted on a selected sample level, these cant provide policy implications for low income countries.

Following table exhibits the descriptive statistical manners and correlations of the series having a period of 2004-2015 (12 years). In the following tables, FII represents different Financial inclusion indicators i.e. FII represents Financial inclusion indicator calculated by using PCA technique on five components of financial inclusion, FIISARMA represents Financial inclusion indicator calculated by applying Sarma technique on three dimensions (i.e. availability, penetrations and usage) of financial, ICT represents the Information and communication technology and it is also generated by using PCA technique. GDPP represents Real Gross Domestic Product Per Capita, AGE represents Age dependency ratio, LAW represents the Rule of Law and finally, URBAN represents Urbanization.

At a global level, financial inclusion is moderately positively skewed, which indicate that majority of values of financial inclusion are below the average and that is zero. This implies that the majority of values are negative and their magnitude is small. This similar thing can be observed from the minimum and maximum values that are -2.248 (for Angola 2004) and 4.952 (Thailand 2015). All the variables constructed on the basis of PCA have zero average because PCA centralize the

TABLE 4.1: Descriptive Statistics in all Selected Samples

	Mean	Median	Maximum	Minimum	Std. Dev.	Skewness	Kurtosis
FII	0	-0.417	4.952	-2.248	1.701	0.708	2.617
FIISARMA	21.06	18.55	66.91	0.549	16.01	0.681	2.689
ICT	0	-0.461	5.142	-1.87	1.571	1.001	3.331
GDPP	9482	4057	91617	219	17101	3.241	13.42
AGE	61.6	56.9	109.5	16.5	19.4	0.428	2.538
LAW	41.2	40.3	100	0.5	22.9	0.391	2.513
URBAN	54.8	52.8	100	9.1	24.4	0.191	1.99

data prior to construct the principal component (in our case, we call it indicator) and it is independent of origin and scale. The average financial inclusion based on sarma(2008) method is 21.06 and the standard deviation is 16.01. Lowest financial inclusion is 0.5% (for Angola) and the highest financial inclusion is 66.9 (for Singapore). GDP per capita is very highly positively skewed, so there is a huge income inequality. In our sample of 48 countries, the average GDP per capita is 9482 and the standard deviation is 17101. Minimum GDP per capita is 219 (for Burundi 2005) and the maximum GDP per capita is 91617 (for Norway 2007). The average ranking in Rule of Law is 41.2% and the standard deviation is 22.9%. Lowest rank in Rule of Law is 0.5% (for Venezuela) and the highest rank in Rule of Law is 100% (for Norway). The average Urbanization is 54.8% and the standard deviation is 24.4%. Minimum Urbanization is 9.1% (for Burundi 2004) and the maximum Urbanization is 100% (for Singapore).

TABLE 4.2: Descriptive Statistics of Low income Countries

	Mean	Median	Maximum	Minimum	Std. Dev.	Skewness	Kurtosis
FII	0	0.058	4.613	-4.481	2.001	-0.009	1.949
FIISARMA	18.08	13.77	61.7	0.55	14.66	0.841	2.997
ICT	0	-0.526	5.434	-1.835	1.59	1.067	3.446
GDPP	3884	3157	14652	219	3482	1.11	3.47
AGE	65.3	60	109.5	35	18.5	0.46	2.175
LAW	34.8	32.2	74.5	0.5	18.4	0.194	1.957
URBAN	48.9	45.9	91.8	9.1	21.4	0.272	2.124

The average Financial inclusion in low income countries is -4.17E-12, which is much less than that of high income countries i.e. 1.04E-11. In low income countries, the minimum Financial inclusion is -4.481 (for Angola 2004) and maximum Financial inclusion is 4.613 (Thailand 2015). On the other hand, in high income countries, the minimum Financial inclusion is -0.705 (for Saudi Arabia 2004) and maximum Financial inclusion is 4.466 (Singapore 2015). The average Information and communication technology in low income countries is -0.412, which is much less than that of high income countries i.e. 2.062.

The average Financial inclusion on the basis of the Sarma (2008) method, in low income countries is 18.08, which is much less than that of high income countries i.e. 35.96. In low income countries, the minimum Financial inclusion is 0.55 (for Angola) and maximum Financial inclusion is 61.70 (Cape Verde). On the other hand, in high income countries, the minimum Financial inclusion is 15.04 (for Uruguay) and maximum Financial inclusion is 66.91 (Singapore). In low income countries, the minimum ICT is -1.870 (for Burundi 2004) and maximum ICT is 5.434.On the other hand, in high income countries, the minimum ICT is -3.046 and maximum ICT is 2.480 becauae some low income countries use more techonology then the high income countries like Pakistan use more techonology then Saudi arabia.

The average GDP per capita in low income countries is 3884, which is much less than that of high income countries i.e. 37470. In low income countries, the minimum GDP per capita is 219 (for Burundi 2005) and maximum GDP per capita is 14652 (Venezuela 2015). On the other hand, in high income countries, the minimum GDP per capita is 8443 (for Uruguay 2004) and maximum GDP per capita is 91617 (Norway 2007).

The average Age Dependency Ratio in low income countries is 65.3%, which is much higher than that of high income countries i.e. 43%. In low income countries, the minimum Age Dependency Ratio is 35% (for Moldova 2014) and highest Age Dependency Ratio is 110% (Uganda 2004). On the other hand, in high income countries, the minimum Age Dependency Ratio is 16.5% (Qatar 2010) and highest Age Dependency Ratio is 60.3% (Saudi Arabia 2004). The average ranking in

Table 4.3: Descriptive Statistics of High Income Countries

	Mean	Median	Maximum	Minimum	Std. Dev.	Skewness	Kurtosis
FII	0	-0.071	4.64	-3.417	1.899	0.352	2.484
FIISARMA	35.96	36.05	66.91	15.04	14.08	0.419	2.275
ICT	0	0.181	2.48	-3.046	1.435	-0.317	2.171
GDPP	37470	28281	91617	8443	27550	0.665	2.083
AGE	43	45.7	60.3	16.5	11.7	-0.704	2.829
LAW	73.2	68.9	100	53.1	14.9	0.58	2.032
URBAN	84	88.1	100	50.8	16.2	-0.755	2.317

Rule of law in low income countries is 34.8%, which is much lower than that of high income countries i.e. 73.2%. In low income countries, the lowest ranking in Rule of law is 0.5% (for Venezuela 2004) and the highest ranking in Rule of law is 74.5% (Cabo Verde 2014). On the other hand, in high income countries, the lowest rank in Rule of law is 53.1% (Saudi Arabia 2004) and the highest rank in Rule of law is 100% (Norway). The average Urbanization in low income countries is 48.9%, which is much lower than that of high income countries i.e. 84%. In low income countries, the minimum Urbanization is 9.1% (for Burundi 2004) and highest Urbanization is 91.8% (Argentina 2015). On the other hand, in high income countries, the minimum Urbanization is 50.8% (Seychelles 2004) and highest Urbanization is 100% (Singapore 2015).

4.1.3 Correlation Analysis

Following correlation matrixes are constructed to shed light on the relationships between financial inclusion and the independent variables.

The correlation between financial inclusion index (FII) generated by PCA technique and financial inclusion index (FIISARMA) generated by Sarma (2008) technique is very strong in all two cases i.e. at all selected sample level, in low income and high income countries; and the strength of association is 92%, 89%, and 89% respectively.

Table 4.4: Correlation in all Selected Samples

	FII	**FIISARMA**	**GDPP**	**AGE**	**LAW**	**URBAN**	**ICT**
FII	1						
FIISARMA	0.915	1					
GDPP	0.47	0.451	1				
AGE	-0.683	-0.674	-0.469	1			
LAW	0.491	0.468	0.539	-0.393	1		
URBAN	0.615	0.588	0.57	-0.696	0.349	1	
ICT	0.707	0.701	0.636	-0.643	0.502	0.616	1

Table 4.5: Correlation in Low Income Countries

	FII	**FIISARMA**	**GDPP**	**AGE**	**LAW**	**URBAN**	**ICT**
FII	1						
FIISARMA	0.89	1					
GDPP	0.574	0.576	1				
AGE	-0.65	-0.658	-0.564	1			
LAW	0.349	0.34	0.172	-0.212	1		
URBAN	0.568	0.545	0.67	-0.676	0.128	1	
ICT	0.64	0.65	0.637	-0.646	0.188	0.534	1

Table 4.6: Correlation in High Income Countries

	FII	**FIISARMA**	**GDPP**	**AGE**	**LAW**	**URBAN**	**ICT**
FII	1						
FIISARMA	0.891	1					
GDPP	0.467	0.242	1				
AGE	-0.285	-0.197	-0.398	1			
LAW	0.054	0.009	0.328	0.171	1		
URBAN	0.282	0.067	0.391	-0.403	-0.597	1	
ICT	0.687	0.52	0.44	-0.07	0.289	0.07	1

There is a huge difference between the level of GDP per capita for both low income and high income countries. Low income countries have a low level of GDP per capita, whereas high income countries have higher levels of GDP per capita. The correlation coefficient between FII and GDP per capita is different in all three cases i.e. at all selected samples, in low income and high income countries. At all selected sample correlation between GDP per capita and FII is positive and moderate i.e. 0. 47, hence both variables are only 47% associated. In the case of low income countries correlation between GDP per capita and FII is positive and a little bit strong i.e. 0. 57, hence both variables are only 57% associated. The GDP per capita is a far better determinant of financial inclusion in low income countries than that of high income, as in case of low income countries correlation between GDP per capita and FII is positive and moderate i.e. 0. 47, hence both variables are only 47% associated.

At all selected samples level correlation between Age dependency ratio and FII is negative and strong i.e. 0.68, hence both variables are only 68% associated. In the case of low income countries correlation between Age dependency ratio and FII is negative and a little bit strong i.e. 0.65, hence both variables are only 65% associated. The Age dependency ratio is a far better determinant of financial inclusion in low income countries than that of high income , as in case of low income countries correlation between Age dependency ratio and FII is negative and weak i.e. 0. 28, hence both variables are only 28% associated.

The correlation coefficient between FII and Rule of law is different in all three cases i.e. at all selected samples level, in low income and high income countries. At the all selected sample level correlation between Rule of law and FII is positive and moderate i.e. 0. 49, hence both variables are only 49% associated. In the case of low income countries correlation between Rule of law and FII is positive and moderate i.e. 0.35, hence both variables are only 35% associated. The Rule of law is a far better determinant of financial inclusion in low income countries than that of high income, as in case of high income countries correlation between Rule of law and FII is positive and weak i.e. 0.05, hence both variables are only 5% associated.

At the all selected samples level correlation between Urbanization and FII is positive and moderate i.e. 0.61, hence both variables are only 61% associated. In the case of low income countries correlation between Urbanization and FII is positive and a little bit strong i.e. 0.57, hence both variables are only 57% associated. The Urbanization is a far better determinant of financial inclusion in low income countries than that of high income, as in case of high income countries correlation between Urbanization and FII is positive and weak i.e. 0.28, hence both variables are only 28% associated.

At the all selected samples level correlation between Information and communication technology and FII is positive and strong i.e. 0.7, hence both variables are only 70% associated. In the case of low income countries correlation between Information and communication technology and FII is positive and a little bit strong i.e. 0.64, hence both variables are only 64% associated. The Information and communication technology is a better determinant of financial inclusion in high income countries than that low income, as in case of high income countries correlation between Information and communication technology and FII is positive and strong i.e. 0.68, hence both variables are only 68% associated.

4.2 Empirical Results

The empirical results are explained in four subsections; in the first subsection order of integration of data series is investigated; in the second subsection analysis for the determinants of financial inclusion is done in all selected samples (combine low income and high income countries); in the third subsection analysis is done for low income countries and in the fourth subsection analysis is done for high income countries.

Prior to present empirical results, I would like to mention that in this study PCA technique is applied in three different ways. Firstly it is applied to five components of the financial indicator for each country separately. It means that PCA technique is applied for forty-eight times (applying on the data of each country individually). Secondly, it is applied to five components of the financial indicator

for the whole panel combined. It means that PCA technique is applied for just one time (applying on the data of all the country at the same time). Prior to applying PCA technique for the third time, the five components of a financial indicator are converted into three dimensions as was done by the Sarma (2008); and then the PCA technique is applied on these three dimensions.

4.2.1 Stationarity Conditions of Series

All the econometric techniques have some assumptions prerequisite conditions under which they provide unbiased and efficient results. Involvement of the time elements, in the data, increases the chance that the data is non-stationary. Fixed effects and random effects models produce biased results when the data is non-stationary. So the prerequisite condition for the application of the fixed effects and random effects models is that the data must be stationary. So first of all this study investigates the order of integration of data series. Unit root analysis reveals

Table 4.7: Unit Root Tests

	Levin, Lin & Chu		**ADF - Fisher Chi-square**		**PP - Fisher Chi-square**	
VARIABLES	**Stats**	**Prob.**	**Stats**	**Prob.**	**Stats**	**Prob.**
FII	-38.29*	0	238.6*	0	265.8*	0
FIITHREE	-37.31*	0	98.5	0.41	63.36	0.995
GDPP	4.14	1	122.5**	0.04	207.3*	0
AGE	-223.1*	0	220.8*	0	378.04	0
LAW	-53.9*	0	142.02*	0	111.7	0.13
URBAN	-13.7*	0	93.99*	0.01	280.8*	0
ICT	-27.98*	0	217.1*	0	343.5*	0

**, ** represents significant at 1% and 5% respectively*
Levin, Lin and Chu assumes common unit root, whereas rest of two assume individual unit root process

that all the variables are stationary at level, and none of the series has unit root process.

The results of table 4.8 show that financial inclusion doesnt determine by GDP per capita, whereas, Age dependency ratio, rule of law (Park and Mercado, 2015),

TABLE 4.8: All Selected Samples Analysis

	FII		FIISARMA	
VARIABLES	**Stats**	**Prob.**	**Stats**	**Prob.**
GDPP	1.85E-05	0.6047	0.0002	0.206
AGE	-0.124***	0.0000	0.03	0.694
LAW	0.015*	0.0690	0.177***	0.0000
URBAN	0.302***	0.0000	0.798***	0.0000
ICT	1.153***	0.0000	2.623***	0.0000
CONSTANT	-9.70***	0.0000	-33.62***	0.0010
Diagnostics				
Observations	576.0000		576.0000	
Adj-R2	0.7600		0.9240	
Redundant test	0.0000		0.0000	
Hausman test	0.0000		0.0000	
Normality test	0.0170		0.0000	

, ** and * represents significant at 10%, 5% and 1% respectively. Only probability values are provided for all three tests. If probability value is low for Redundant fixed effects test then Fixed effects model is preferred over pooled approach. If probability value is low for Hausman test then Fixed effects model is preferred over random effects model. If probability value is low for Normality test then chosen model is normally distributed*

urbanization and information and communication technologies affect the financial inclusion. The only variable that reduces the financial inclusion is the age dependency ration. However, due to increase in urbanization, enforcement of rule of law and the greater use of information and communication technology lead to increased financial inclusion in all selected samples level.

Further, the findings show that GDP per capita is statistically insignificant in explaining the financial inclusion and has no effect on dependent variable in all selected samples level. The results are against our first hypothesis. Age dependency ratio is statistically significant and has the negative impact on financial inclusion i.e. one percent increase in age dependency ratio decreases the financial inclusion indicator by 0.124 units. The results are in accordance with our second hypothesis. This shows that an increase in the number of dependent people reduces the need for financial services, as they dont have income. However, rule of law is statistically significant and has a positive impact on financial inclusion i.e. one percent increase

in rule of law increases the financial inclusion indicator by 0.015 units. The results are in accordance with our third hypothesis. This shows that improvement in law enforcement increases the confidence level among the contractors and they feels secure, so they engage in more and more financial contracts. Urbanization is also statistically significant and has a positive impact on financial inclusion i.e. one percent increase in urbanization increases the financial inclusion indicator by 0.302 units. The results are in accordance with our fourth hypothesis. This shows that, when people migrate from rural to urban areas, financial inclusion increases. The underline reason is that in urban areas, the financial services are readily available at the disposal and then they take benefits from these services. So the financial exclusion due to ruralization is the involuntary exclusion. Information and communication technology is also statistically significant and has a positive impact on financial inclusion i.e. one unit increase in the use of information and communication technology increases the financial inclusion indicator by 1.153 units. The results are in accordance with our fifth hypothesis. This shows that the use of information and communication technology reduces the cost of financial services and it also improves the access to the financial services; both of these leads toward more financial inclusion. Finally, our model of financial inclusion, in all selected samples level, explains the 76% of the variation in the financial inclusion indicator. The diagnostic test reveals that the statistical inferences are valid as the residuals of our model are normally distributed. Redundant fixed effect model shows that the dependent variable i.e. financial inclusion indicator has the unobserved heterogeneity, thats why pooled OLS cannot be applied; hence the fixed effects model is preferred over Pooled OLS. On the other hand, the Hausman test reveals that the random effects model is suffering from the problem of endogeneity, and the coefficients of the random effects model will be biased. Under these circumstances, the fixed effects model is preferred over the rest ones. In the case of low income countries, all the independent variables included in our study significantly affecting the financial inclusion.

Further, the findings show that GDP per capita is statistically significant and has the positive impact on financial inclusion i.e. one dollar increase in GDP per capita

TABLE 4.9: Low Income Economies

	FII		**FIISARMA**	
VARIABLES	**Stats**	**Prob.**	**Stats**	**Prob.**
GDPP	0.0001***	0.0000	0.001*	0.0740
AGE	-0.167***	0.0000	-0.061	0.4160
LAW	0.026***	0.0010	0.205***	0.0000
URBAN	0.291***	0.0000	0.669***	0.0000
ICT	0.906***	0.0000	1.816***	0.0000
CONSTANT	-3.58***	0.0000	-21.32**	0.0180
Diagnostics				
Observations	480		480	
Adj-R2	0.7850		0.9240	
Redundant test	0.0000		0.0000	
Hausman test	0.0000		0.0000	
Normality test	0.0410		0.0000	

***, ** and *** represents significant at 10%, 5% and 1% respectively. Only probability values are provided for all three tests. If probability value is low for Redundant fixed effects test then Fixed effects model is preferred over pooled approach. If probability value is low for Hausman test then Fixed effects model is preferred over random effects model. If probability value is low for Normality test then chosen model is normally distributed*

increases the financial inclusion indicator by 0.0001 units. The increase in GDP per capita leads to an increase in financial inclusion. This shows that economic development has caused the financial inclusion to increases, so the boost in the income levels of people increases the needs of financial services and the completion among the banking firms. The alternate reason for inclusion would be that, as GDP per capita increases, saving increases due to which individuals move to the financial institution to earn the return against their surplus funds. Age dependency ratio is statistically significant and has the negative impact on financial inclusion i.e. one percent increase in age dependency ratio decreases the financial inclusion indicator by 0.167 units. The age dependency ratio affects negatively the financial inclusion. Because, as the number of dependents in a household increases, per person income of the household reduces significantly; they are less likely to save. When savings are negligible, people dont even think about financial inclusion. However, rule of law is statistically significant and has the positive impact on financial inclusion i.e.

one percent increase in rule of law increases the financial inclusion indicator by 0.026 units. Rule of law affects the financial inclusion positively i.e. Enforceability of rule of law motivate the people for financial inclusion due to the protection of their funds and their use in more productive manner. Urbanization is also statistically significant and has the positive impact on financial inclusion i.e. one percent increase in urbanization increases the financial inclusion indicator by 0.291 units. Urbanization is another variable which promotes the process of financial inclusion i.e. in the process of urbanization, people move to urban areas where they avail both financial services (As they are readily available) and the opportunities of employment thereby increase in income and savings, consequently, would be in financial inclusion periphery. Information & communication technology is also statistically significant and has the positive impact on financial inclusion i.e. one unit increase in the use of information & communication technology increases the financial inclusion indicator by 0.906 units. In the modern era, the information & communication technologies played an active role to fuel the financial inclusion. Now a day, financial institutions facilitate the people in their financial needs through Mobiles, E-mails without disturbing their daily life schedule. More & more financial facilitation through electronic media save the time of the people. So, efficient and massive use of information & telecommunication motivate the people for more financial inclusion.

Finally, our model of financial inclusion, in all selected samples level, explain the 78.6% of the variation in the financial inclusion indicator, so our model performs best in case of low income countries as compared to rest of ones. The diagnostic test reveals that the statistical inferences are valid as the residuals of our model are normally distributed. Redundant fixed effect model shows that the dependent variable i.e. financial inclusion indicator has the unobserved heterogeneity, thats why pooled OLS cannot be applied; hence the fixed effects model is preferred over Pooled OLS. On the other hand, the Hausman test reveals that the random effects model is suffering from the problem of endogeneity, and the coefficients of the random effects model will be biased. Under these circumstances, the fixed effects model is preferred over the rest ones.

TABLE 4.10: High Income Economies

	FII		**FIISARMA**	
VARIABLES	**Stats**	**Prob.**	**Stats**	**Prob.**
GDPP	5.70E-05	0.2130	0.0001	0.52100
AGE	-0.094*	0.0710	-0.547**	0.03800
LAW	0.0323	0.4500	0.129	0.55000
URBAN	0.741***	0.0050	5.504***	0.00000
ICT	1.309***	0.0000	1.627**	0.05900
CONSTANT	-66.02***	0.0040	-445.84	0.00000
Diagnostics				
Observations	96		96	
Adj-R2	0.6690		0.8460	
Redundant test	0.0000		0.0000	
Hausman test	0.0000		0.0000	
Normality test	0.0000		0.0000	

***, ** and *** represents significant at 10%, 5% and 1% respectively. Only probability values are provided for all three tests. If probability value is low for Redundant fixed effects test then Fixed effects model is preferred over pooled approach. If probability value is low for Hausman test then Fixed effects model is preferred over random effects model. If probability value is low for Normality test then chosen model is normally distributed*

In case of high income countries, our empirical evidence shows that majority of the variables except urbanization, age dependency ratio, information & communication technology is not significant for financial inclusion. These results are in accordance with our last hypothesis. It does not mean, these variables dont have any contribution to increasing the financial inclusion. Actually, these variables have reached their maximum role for financial inclusion in high income countries, so the increments in the variables dont further increase the financial inclusion.

Further, the findings show that GDP per capita is statistically insignificant in explaining the financial inclusion and has no effect on the dependent variable in the case of high income countries. The results show that an increase in GDP per capita doesnt further attract the new investors (credit channel dont work). As the high income countries already have healthy competition among the banking firms so further banking firms dont enter the market and dont intensify the competition

with an increase in GDP per capita. Age dependency ratio is statistically significant and has a negative impact on financial inclusion i.e. one percent increase in age dependency ratio decreases the financial inclusion indicator by 0.094 units. This shows that an increase in the number of dependent people reduces the need for financial services, as they dont have income. However, rule of law is also statistically insignificant in explaining the financial inclusion and has no effect on the dependent variable. The underline reason is that in high income countries there is no concept of violation of laws. And everyone can enforce their financial contracts easily. Thats why financial exclusion cannot be related to rule of law in these countries. Urbanization is statistically significant and has a positive impact on financial inclusion i.e. one percent increase in urbanization increases the financial inclusion indicator by 0.741 units. Information & communication technology is also statistically significant and has a positive impact on financial inclusion i.e. one unit increase in the use of information & communication technology increases the financial inclusion indicator by 1.309 units. However, excessive use and revolutions in electronic media via mobiles & E-mails still have contributing in financial inclusion even in high income countries too, as they reduce the cost of financial services and increases the opportunities for instantaneous use of financial services.

Finally, our model of financial inclusion, in all selected samples level, explains the 66.9% of the variation in the financial inclusion indicator. The diagnostic test reveals that the statistical inferences are valid as the residuals of our model are normally distributed. Redundant fixed effect model shows that the dependent variable i.e. financial inclusion indicator has the unobserved heterogeneity, thats why pooled OLS cannot be applied; hence the fixed effects model is preferred over Pooled OLS. On the other hand, the Hausman test reveals that the random effects model is suffering from the problem of endogeneity, and the coefficients of the random effects model will be biased. Under these circumstances, the fixed effects model is preferred over the rest ones.

Chapter 5

Conclusion and Recommendations

5.1 Conclusion

Financial exclusion has a display of social exclusion. Availability of financial inclusion empowers the businessmen and individuals to utilize the finance in entrepreneurs plans, production as well as face the untoward downfall of business and other critical situation. For all that, it is pertinent for policy engineers to comprehend the determinants of financial inclusion so that a comprehensive policy with implementation procedures widening its scope with reference to the availability of finances that could ultimately give the boost to growth and minimize the poverty. This study has launched a panel data study on factors associated with financial inclusion. Timeline of the study is 12 years i.e. 2004 to 2015, and the study investigates the data from 48 countries, among which there are 40 low income countries and 8 are high income. This study has come up with our own financial inclusion indicator using principal component analysis. This study has also constructed the index of financial inclusion keeping view Sarma methodology (2008). A similar pattern (in terms) of ranking as Sarma (2008) has been highlighted in our financial inclusion indicator. Thereafter, the factors significantly

affecting financial inclusion indicator in the low income and high income countries have been tested.

Income, as measured by per capita GDP, is an important factor in explaining the level of financial inclusion in low income countries has been confirmed by our empirical analysis. For the high income countries it is not an important determinant. We find that urbanization, rule of law and age dependency ratio are also important factors, especially for low income countries besides per capita GDP. Further, it has been witnessed that financial inclusion is boosted up in the presence of technology, telephone, mobile and internet usage throughout the world. These findings strengthen the assertion that financial exclusion is indeed a reflection of social exclusion, as countries having low GDP per capita, low urbanization, less enforcement of law, higher age dependency ratio and poor connectivity seem to be less financially inclusive.

5.2 Policy Recommendations

It is an obligation for the legislature and the cabinet to observe the financial inclusion and remove the hindrances in this process. The two factors that are highly vital in this phenomenon are the good governance and rule of law. Another very salient factor is the role of information technology as it makes people the active participants of the economic circle undertaking the financial inclusion for the sake of a better production. Financial inclusion is also influenced by the division of population divided into different geographical areas of a country. The countries where the dependents are more numerous and producers are less have a scarcity of financial services. There are huge effects of it in the countries where the upper age limit of life is higher. The post-retirement facilities to the passive members of the production cycle are crucial in this aspect. Financial inclusion is also increased by the healthy regulations, better functions of the state and by the positive role of service institutions. This is also supported by regulations and upholding the socio-economic accords. If a country wants a greater level of financial inclusion, it must show a greater rule of peace and harmony in every field.

5.3 Further Research Recommendations

As the current area of research is relatively new and only a few literate is available, so there is a lot of research gap. Better components of financial inclusion should be found out, so the data limitations could be resolved. This study points out only a few determinants of financial inclusion, and still, they are influencing the financial inclusion only in the case of low income countries. So there is a lot of work to be done to find out its determinants especially for the developed countries. There is almost no work done on the topic why financial inclusion is necessary. How it influences the economic growth, poverty, income inequality and other social indicators. Whether financial inclusion is essential for the government to control the black marketing, smuggling, and tax revenue collection?

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Appendix

TABLE 1: Appendix 1: Financial Inclusion Indicator for Time period 2004

S NO	Country Name	PCA Based Financial Inclusion Indicator	Country Name	Samras Financial Inclusion Index	S NO	Country Name	PCA Based Financial Inclusion Indicator	Country Name	Samras Financial Inclusion Index
1	Lebanon	3.431863	Singapore	41.1999	25	Bangladesh	-1.07536	Botswana	8.80176
2	Singapore	3.223932	Ukraine	35.0139	26	Botswana	-1.09147	Namibia	8.35057
3	Norway	2.161565	Lebanon	27.5543	27	Ecuador	-1.25431	Bangladesh	8.14935
4	Thailand	1.743933	Norway	26.4198	28	Pakistan	-1.26159	Peru	7.51901
5	Brazil	1.254099	Latvia	24.9899	29	Peru	-1.34605	Swaziland	7.27447
6	Latvia	1.232675	Kuwait	24.9185	30	Djibouti	-1.34787	Algeria	7.21152
7	Seychelles	1.09449	Turkey	24.8736	31	Kenya	-1.4133	Pakistan	6.42213
8	Kuwait	1.037831	Thailand	23.7499	32	Algeria	-1.41824	Georgia	5.1664
9	Belize	0.796369	Cape Verde	21.0216	33	Swaziland	-1.48679	Kenya	5.11436
10	Ukraine	0.794052	Qatar	19.9357	34	Azerbaijan	-1.73284	Lesotho	4.40126
11	Qatar	0.744448	Belize	19.7226	35	Ghana	-1.76996	Ghana	4.06354
12	Cape Verde	0.375641	Seychelles	16.9246	36	Georgia	-1.77692	Djibouti	4.01598
13	Turkey	0.256244	Tunisia	16.4337	37	Lesotho	-1.82009	Azerbaijan	3.69068
14	Tunisia	0.069142	Brazil	16.1132	38	Timor-Leste	-1.91592	Tanzania	2.63402
15	Costa Rica	-0.22971	Costa Rica	16.0536	39	Burundi	-1.9181	Timor-Leste	2.49434
16	Uruguay	-0.43233	Moldova	13.9814	40	Tanzania	-2.01675	Burundi	1.94309
17	Philippines	-0.66872	Maldives	13.687	41	Yemen, Rep.	-2.08671	Kyrgyz Republic	1.89161
18	Saudi Arabia	-0.70571	Kazakhstan	12.589	42	Uganda	-2.09405	Uganda	1.87881
19	Namibia	-0.74433	Uruguay	11.2035	43	Kyrgyz Republic	-2.11168	Yemen, Rep.	1.65004
20	Maldives	-0.77127	Argentina	11.1577	44	Madagascar	-2.11811	Comoros	1.49436
21	Moldova	-0.89131	Philippines	11.074	45	Comoros	-2.12844	Madagascar	1.14797
22	Argentina	-0.91936	Saudi Arabia	10.69	46	Rwanda	-2.15639	Rwanda	0.81573
23	Kazakhstan	-0.98322	Venezuela, RB	9.9937	47	Cameroon	-2.19055	Cameroon	0.60899
24	Venezuela, RB	-1.0208	Ecuador	8.938	48	Angola	-2.24794	Angola	0.54918

Table 2: Appendix 2: Financial Inclusion Indicator for Time period 2015

S NO	Country Name	PCA Based Financial Inclusion Indicator	Country Name	Samras Financial Inclusion Index	S NO	Country Name	PCA Based Financial Inclusion Indicator	Country Name	Samras Financial Inclusion Index
1	Thailand	4.952462	Singapore	66.015	25	Argentina	0.191556	Brazil	29.19767
2	Singapore	4.412572	Cape Verde	61.70708	26	Philippines	0.078362	Belize	28.02696
3	Lebanon	4.278003	Seychelles	58.89987	27	Moldova	0.070903	Azerbaijan	26.54718
4	Cape Verde	3.046173	Thailand	53.11984	28	Azerbaijan	0.038734	Moldova	26.4535
5	Seychelles	3.017269	Ukraine	52.87196	29	Kenya	-0.03996	Botswana	21.76252
6	Kuwait	2.821692	Venezuela, RB	52.20791	30	Botswana	-0.16182	Angola	21.14452
7	Norway	2.696813	Kuwait	47.39369	31	Bangladesh	-0.33106	Bangladesh	20.5798
8	Brazil	2.517887	Norway	46.49782	32	Angola	-0.39322	Philippines	19.42945
9	Turkey	2.287967	Georgia	45.59617	33	Djibouti	-0.64358	Ghana	19.14847
10	Georgia	2.013401	Latvia	45.32862	34	Kyrgyz Republic	-0.70324	Timor-Leste	17.5515
11	Ukraine	1.997353	Kazakhstan	43.9772	35	Swaziland	-0.7213	Swaziland	16.95142
12	Qatar	1.951995	Turkey	41.3986	36	Algeria	-0.94953	Kyrgyz Republic	16.76538
13	Ecuador	1.803675	Costa Rica	40.30495	37	Ghana	-0.97773	Algeria	12.57962
14	Latvia	1.593875	Maldives	38.13223	38	Timor-Leste	-1.04068	Pakistan	11.9481
15	Peru	1.54176	Kenya	37.96182	39	Pakistan	-1.15126	Lesotho	11.80066
16	Venezuela, RB	1.480835	Saudi Arabia	35.98787	40	Lesotho	-1.20768	Tanzania	9.165237
17	Costa Rica	1.457193	Tunisia	35.4932	41	Tanzania	-1.25523	Djibouti	7.622211
18	Saudi Arabia	1.397048	Lebanon	34.5717	42	Comoros	-1.41968	Uganda	6.28148
19	Tunisia	1.376277	Qatar	33.52094	43	Rwanda	-1.52177	Rwanda	5.493439
20	Belize	1.251837	Namibia	33.41486	44	Uganda	-1.7393	Comoros	4.758085
21	Namibia	1.139426	Ecuador	32.76741	45	Yemen	-1.82816	Yemen, Rep.	3.322335
22	Kazakhstan	1.074935	Argentina	31.30875	46	Cameroon	-1.84226	Cameroon	2.312578
23	Uruguay	0.658116	Uruguay	31.28029	47	Burundi	-1.91476	Madagascar	2.057922
24	Maldives	0.525311	Peru	30.18891	48	Madagascar	-1.92892	Burundi	0.943924

Table 3: Appendix 3: Growth Dynamics

Serial number	**Country Name**	**Annual Growth**	**Serial number**	**Country Name**	**Annual Growth**
1	Georgia	31.78136	25	Ukraine	8.747362
2	Ecuador	28.22535	26	Maldives	8.685
3	Turkey	22.02141	27	Brazil	6.541447
4	Kenya	21.04052	28	Djibouti	6.499489
5	Cape Verde	20.95802	29	Swaziland	6.364147
6	Peru	19.47781	30	Philippines	6.323709
7	Venezuela, RB	18.53421	31	Timor-Leste	5.397249
8	Namibia	17.51226	32	Ghana	5.252326
9	Botswana	15.93077	33	Tanzania	4.219048
10	Saudi Arabia	15.01479	34	Belize	4.19757
11	Angola	14.65696	35	Lesotho	3.660276
12	Costa Rica	14.63558	36	Comoros	3.614458
13	Kazakhstan	14.18148	37	Algeria	3.581612
14	Azerbaijan	13.77418	38	Rwanda	3.119057
15	Tunisia	12.35916	39	Singapore	2.89433
16	Moldova	11.33706	40	Latvia	2.363699
17	Bangladesh	10.15662	41	Norway	2.187252
18	Thailand	9.953311	42	Lebanon	2.023688
19	Argentina	9.891715	43	Uganda	1.673266
20	Uruguay	9.796673	44	Cameroon	1.561849
21	Seychelles	9.657056	45	Yemen, Rep.	1.195365
22	Kuwait	9.518973	46	Madagascar	0.846984
23	Kyrgyz Republic	9.512529	47	Pakistan	0.828512
24	Qatar	9.158762	48	Burundi	0.015815