IMPACT OF FINANCIAL INCLUSION ON ECONOMIC GROWTH FOR EMERGING ASIAN ECONOMIES

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Impact of Financial Inclusion on Economic Growth for Emerging Asian Economies:

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ABSTRACT

This study is an attempt to empirically evaluate the role of financial inclusion in economic growth of emerging Asian economies. For this purpose, 10 emerging Asian economies selected over the time period of fifteen years from 2005 to 2019 on the basis of the their GDP growth rate of last one and half decade. To examine the impact of financial inclusion an Index for financial services is constructed for above mentioned economies. This index is based on two major categories of financial services (Usage and Access). Financial access is based on accessibility of financial/banking services and it is on the footing of most widely used and acceptable banking sector indicators like ATM per 100,000 adults, and commercial bank branches per 100,000 adults. Usage of financial services is decided on the basis of outstanding loan from commercial banks as a percentage of GDP and outstanding deposits of commercial banks as a percentage of GDP. Inverse Euclidian distance technique is adopted for measurement of Index of Financial Inclusion as suggested by M. Sarma and Pais (2012). IFI along with other control variables (Physical Capital, Human Capital, FDI, Labour Force and Trade) used as independent variables in suggested model and GDP per Capita as dependent variable. Selection of variables and models is based on economic theory whereas estimation of the models is done through Generalized Method of Moment (GMM) and fixed/random effect model used to deal with Hetrosekdasticity and Autocorrelation issues. Under this methodology causal relationship between GDP per capita and IFI with other control variables is analysed through Granger causality test. Findings of this study concluded that financial inclusion effects positively and significantly to economic growth process in emerging Asian economies. Moreover, all those countries

who possess higher level of financial inclusion on index also share a greater extent of income and economies with lower level of financial inclusion have lower level of income and lies under lower middle or lower income group as described by World Bank. After that, selected emerging economies were categorized as low, medium and high financial included economies on the basis of index to check the effect of IFI on above mentioned economies. In accordance with the results obtained from this study there is a need to boost up the magnitude of financial services to achieve a higher level of economic growth, such as encouraging youth to open bank account or account compulsion for all financial transactions, making banking sector friendlier and formalities regarding financial services must be eradicated or minimized.

JEL Codes: B22, C33, C43, G28, O47

Key Words: Financial Inclusion; Index of Financial Inclusion; Panel Data; Economic Growth

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LIST OF ABBREVIATIONS

IFI:	Index of Financial Inclusion
HDI:	Human Development Index
UNDP:	United Nations Development Programs
HPI:	Human Physical Index
IMF:	International Monetary Fund
FAS:	Financial Access Survey
GFDD:	Global foundation for Democracy and Development
GMM:	Generalized Method Moment
ADF:	Augmented Dickey Fuller
FDI:	Foreign Direct Investment
ADB:	Asian Development Bank
PCA:	Principle Component Analysis
NCBB:	Number of Commercial Bank Branches
NATM:	Number of Automated Teller Machines
ODCB:	Outstanding Deposits with Commercial Banks
OLCB:	Outstanding Loans with Commercial Banks
SD:	Standard Deviation
ARDL:	Auto Regressive Distributed Lag

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DEDICATION

This thesis is dedicated to my first ever teacher and that is my Mother. Thank you so much dear Ammi Jaan for your love, endless support and encouragement.

CHAPTER 1

INTRODUCTION

Economic growth remains one of the most frequently discussed areas in every paradigm in economics literature along with its determinants and outcomes. It endowed with eventually bringing human wellbeing with a surge of prosperity and enhancing standards of living. Diverse economic policies are devised to achieve general as well as particular objectives which may be referred as policy goals. These goals comprise of controlling inflation, lessening unemployment, achieving economic growth and economic development along with financial stability.

Like other macroeconomic factors in the economy, financial inclusion also has impact on quality of life of individuals by creating ease in attaining financial services. This enables the formal economic sector to play its role in enabling the deprived sections of the society by making available diverse financial products to them as per their affordability and abilities. Financial inclusion ensures provision of financial services provided by formal financial sector with diversity of financial products along with their affordable usage. It is expected that financial inclusion will enhance people's livelihood, mitigate indigence and emphasize economic growth and thus ultimately development. "Statistics have illustrated that many nations have recorded to set financial inclusion implementation as a formal goal to support their economic growth and development (Sahay et al., 2015)". Similarly, Leyshon and Thrift (1995) "defined financial exclusions as referring to those processes that serve to prevent certain social groups and individual from gaining access to the formal financial system". As per Sinclair (2001) "financial exclusion means the inability to access necessary financial services in an appropriate form". Allien et.al (2016) defined financial inclusion as "Financial inclusion is the process of ensuring that individual especially poor people have access to basic financial services in the formal financial sector"

Financial inclusion as described earlier is the availability of financial services to the individuals and businesses whereas financial development is the outcome of financial inclusion. When people are familiar with availability and usage of financial services they utilize them and get served with the benefits associated with financial inclusion and thus

financial development arises as an output and growth. Law et.al (2013) analyzed the role of financial inclusion in financial development as international evidence. Their research found that financial inclusion contributes positively to financial development.

It is relevant here to differentiate between financial exclusion and inclusion. Financial exclusion covers all those aspects which restraint oneself voluntarily or involuntarily to access economic sector, whereas financial inclusion assures delivery of financial services through several financial products in formal financial sector. Many researchers conducted theoretical as well as empirical studies to address this agenda and explored different dimensions in which financial inclusion is transmitted into economy. These dimensions include various indices of financial inclusion and variety of financial services products through financial inclusion transmission mechanism works in the economy. Generally, emerging economies means all those developing nations who are becoming more engaged with global market in form of trade and increasing production at cheaper cost. Kimberly Amadeo defined emerging economies as "Emerging markets are the markets of developing countries that are rapidly growing and industrializing". World Bank defined it as "The emerging economy is defined as an economy with low to middle per capita income". Bwalya and Zulu (2012) comprised a list of 27 emerging economies for all over the world but this study incorporates only emerging economies of Asian region who are performing numerously well in industrial and trade sector since last one and half decade.

As far as this study is concerned the basic purpose of this study to analyse the influence of financial incorporation in economic growth of emerging Asian economies. Economic growth in current study measured through GDP per capita and taken as responding variable and index for financial inclusion is constructed to evaluate the impact of financial services. There are various other macroeconomic variables like; human capital, FDI, physical capital, international trade, used as control variables along with financial inclusion on independent side of the model. Index of Financial Inclusion commonly known as IFI assessed through generally financial sector indicators and specifically banking sector variables to evaluate the magnitude of financial incorporation in selected economies of the Asian territory.

1.1 OBJECTIVES OF THE STUDY

- ♣ To formulate the Index of Financial Inclusion for all the countries in the sample.
- ♣ To empirically investigate the association between financial inclusion and economic growth by using panel data analysis.
- ♣ To identify the ranking of selected economies with respect to financial inclusion in accordance with the proposed Index for Financial Inclusion.

1.2 RESEARCH GAP & SIGNIFICANCE OF THE STUDY

The inducement for this study is unfolding of ongoing discussion in the literature about dearth of empirical studies about financial inclusion and economic growth. The motivations behind this study to fill the research gap regarding role of financial inclusion in promoting economic growth generally at international level and specifically in developing Asian economies. With the passage of time financial inclusion becomes an important determinant of economic growth and many policy makers and researcher around the globe put their valuable efforts to examine the role of financial services on different economies of the world. Most of the studies were conducted in developed nations with country specific agenda that put limits on the regional studies and thus these studies lack with cross countries comparison and regional analysis in general and in developing nations particular. In a recent study carried out by Van and Vo (2019) analyzed the impact factors of financial incorporation on growth and found that financial inclusion is significantly linked with economic growth but this study compromised the financial indicators and missing data by taking average in five tiers for index measurement. The first section of this study enumerate the index of financial inclusion as suggested in the objectives of research agenda for further employment as independent variable in concerned equation. Many researchers adopted several methods for indices computation, Sarma (2008) took an initiative by employing banking sector indicators to construct index for financial inclusion. Later on Sarma and Pais (2012) modified the existing criteria for Index and introduced weights on the basis of importance of the dimensions in their study. There is another method used in literature for index calculation is known as parametric approach and non-parametric approach that assign weights endogenously on the basis of willingness of researcher and exogenously with respect

to pre-assigned weights (Tuesta and Camara 2014). As far as this study is concerned, it employed Sarma and Pais (2012) method of Inverse Euclidian distance technique to estimate the financial inclusion index in developing economies of Asian region. There are several other studies carried out earlier about financial inclusion that expresses its importance for economic growth but they lack cross countries analysis. This study employed panel data along with appropriate econometric techniques to investigate the behavior of financial inclusion in emerging Asian economies. There are very few studies that comprehend developing nations and specifically Asian countries in their evaluation of financial sector contributions. Moreover, the transformation of emerging Asian economies in industry, agriculture, innovation in information technology, capital formation and specifically in trade lead the way to evaluate the repercussions of financial inclusion. The presence of all above mentioned elements and absence of cross countries analysis in panel data setting in developing Asian region led this study to strengthen the literature about financial inclusion for future studies. Kim, Yu & Hassan (2018) documented a study about Organization of Islamic Cooperation (OIC) countries and found that availability of financial services influence economic growth. Before this, one more study that analyzed impact of financial inclusion via income inequality by employing cross sectional data in OECD countries presented that high income countries are more influenced by financial inclusion (Kim 2016). Earlier, Mehrotra & Yetmen (2015) mentioned that access to financial services for all individuals and specifically for poor people leads to more options for contribution in education and better level of living by reducing income inequality and enhancing economic growth. Bruhn and Love (2014) published a study about an experiment carried out at Mexican economy regarding increased opportunities to financial services. Formation of consumer banks and increased accessed and availability of loans to low income individuals leads to improvement in growth, employment rate and financial awareness in Mexico. Sarma & Pais (2011) constructed an Index for financial inclusion and based on this IFI the concluded that several economic factors like literacy rate, income inequality, human wellbeing, banking sector indicators and economic growth are influenced by financial inclusion.

1.3 ORGANIZATION OF THE STUDY

The road map of this study is organized in a manner that chapter 2 explains the theoretical and empirical review of studies conducted earlier. Chapter 3 Analyse the role of financial inclusion in Pakistan economy. Chapter 4 enlightens the analytical framework and estimation methodology. Chapter 4 elaborates data analysis along with mentioning data sources and variables employed in this study. Chapter 5, consist of results of estimations and their explanation. Finally, concluding comments, policy recommendation and recommendations for future studies are given in final chapter.

1.4 Conclusion

In chapter one objectives of the study along with importance and research gap of the study summarized. First section of the study included the introduction of the financial incorporation and economic growth. Second section mentioned the core objectives of the study, which includes measuring financial inclusion and its role in economic growth. Construction of index of financial inclusion is another objective of the study. Third sections consist of research gap and need of this research study. Last and fourth objective concluded the organization of the study.

CHAPTER 2

LITERATURE REVIEW

Economic growth remains as one of the main elements of human wellbeing and prosperity in this world. Economic growth is the basic reason of survival on this planet and innovation process is the key factor for sustainable economic growth. Several economic growth theories evolve overtime with the efforts of researchers regarding that raised the living standard of human being. There are various impact factors that affect the expansion of any economy. In this part of the literature financial inclusion and different macro-economic factors that affects the economic growth are discussed in details. Nguyen & Van (2019) analysed the impact on growth imposed by financial inclusion and other macro-economic variables. Financial inclusion was measured through Sarma's (2008) index while remaining variables were used as control variables. GDP per capita was taken as measure of economic growth while different proxies were employed for various macro-economic variables i.e. school enrolment as literacy rate, labour force participation rate as human capital, gross capital formation as physical capital measure etc. In our study, GDP per capita is incorporated as dependent side variable to indicate the effects of economic growth caused by financial inclusion and other concerned variables. Researchers mostly use GDP as a measure of growth, but in current study GDP per capita is employed as it provides deep analysis of population size across countries and different regions of the world. Moreover, GDP per capita includes the details of each section of the population and provide us with an overall health standard of an economy and living standard of the people as compare to Gross domestic product. It reduces the expected issue of heterogeneity as well, there are various authors such as: Hajilee and Stringer (2017), Kim Yu and Hassan (2018), Vo et al. (2019) used GDP per capita as a standard to indicate the economic growth over time in their studies.

Researchers have produced abundant articles to identify the transmission mechanism of financial inclusion. This chapter covers the preexisting theoretical and empirical studies of financial inclusion and it is divided into two sections. First section of the literature review in this study consists of theoretical literature and analysis of financial inclusion including impact of macroeconomic variables on growth of financial inclusion and economic growth. It

involves all those growth theories and research studies of financial inclusion that evolved over time and contributed in economics literature. It also includes and summarizes the international financial inclusion index and its method of development and how various authors employed different banking/financial sector indicators/dimensions to create efficient IFI index. Second part of this chapter includes empirical framework and model building regarding this study. It also includes the hypothesis for this study which is formulated in accordance with the theoretical model and preexisting literature regarding financial inclusion.

2.1 THEORETICAL LITERATURE

Financial inclusion/exclusion is a wider concept in economic literature. As it is defined by Sarma (2008) "financial inclusion is the process that ensures the ease of access, usage and availability of financial services for all the members of the economy". Inclusive financial system regularizes the economy and it is considered as more important and secures means of providing financial services. It helps in controlling the expansion of informal financial sector that often found exploitative to the economy. Informal financial sector varies country to countries and it is often based on domestic traditions and customs, moreover, in informal sector credit conditions are even more swear and lack with rules and regulations governed by any central authority. Even more, informal sectors terms are not challengeable in any institute or court. In economics there are number of theories that explain relationship between economic growth and factors of production. Sharipov (2005) summarizes various pre-existing growth theories in one study and mentioned about Harrod -Domar growth theory (1946). Harrod-Domar (1946) presented that economic growth depends on growth of investment and marginal propensity to save that determines the pace of growth and level of production. This model was one of the most successful explanations of 1930 post war economic conditions of the world. Harrod-Domar was in favor of purposeful state intervention to maintain full employment in the economy. Later, availability of technology changed the whole scenario of the world and new methods of production were developed. A Neoclassical American economist Robert Solow (1956) along with others opposed the state intervention in the economy. In Solow-Sawan (1956) model capital and labor were taken in physical number of units. Solow's theory mentioned that equilibrium in the economy is decided by equating aggregate demand and aggregate supply. In their study determinants of

output function were described in the model. They mentioned that output (Y) is a function of labor (L) and capital (K). Aggregate supply is determined by Cobb-Douglas production function. Investment, workforce and technological development are the key factors that determine growth in the economy. Technological progress doesn't mean use of machines but a change in quality of labor such as increase in education level, improvement in working environment and growth of production. Later, a new era of development of theories regarding economic growth started in 1980-90's. The American economists P.Romer and R.Lucas first time presented the hypothesis of technological innovation based on investment in innovative technology development and in human capital. P.Romer advised politicians that economic growth is possible only when saving impact is greater in economy. In Endogenous growth theories not only technology but investment in human capital, state owned science and technology programs, favorable environment for investment and establishment of all prerequisites for the protection of property rights. Above mentioned studies describes the growth prospective of various theories discovered in different time periods. These studies provided a base for literature of financial inclusion, as financial inclusion started in late 1990's when technological change brought a major change in production process and agenda of financial inclusion emerged as a policy priority for most of the countries (Leyshon and Thrift 1993). These early studies defined the financial inclusion/exclusion process and features of financially excluded economies and individuals (Sinclair 1995). There are various other research studies incorporated the initial aspects of financial inclusion and recommended basic banking services like bank accounts and other financial services for financially excluded people (Kempson and Whyley 1999). In early 2000's the research paradigm shifted from defining financial inclusion to construction of financial inclusion and association of financial incorporation with economic growth and other macro-economic variables. Several authors presented their methods and research studies regarding measurement of index for financial inclusion to measure the real effects of financial inclusion. Few of them are as follows.

Honohan (2007) initiated this process of measuring index of financial inclusion through banking penetration and employed survey data along with secondary data on number of accounts as a solo indicator to evaluate the access dimension for 160 countries of the world. In this study financial inclusion index is measured through single dimension known as

"Access to financial services". This approach of index calculation provides a comprehensive and valuable set of information about a particular dimension/aspect of the financial inclusion. There are still some flaws that limits it usage as an index of financial inclusion. Only a single dimension is not an enough set of data to decide about financial services of any economy, moreover, it does not predict true results of financial inclusion when there are multiple dimensions and indicators available in data bank.

Later, Sarma (2008) took an opportunity to address all those shortcomings existing in previous studies like Honohan (2008) and others. Sarma try to measure financial inclusion through various banking sector indicators by creating different dimensions of financial inclusion. This research study is one of the major contributions in development of index of financial inclusion and it is consider as one of the base study. First phase of the research paper defines financial inclusion and in next phase method for development of an index of financial inclusion was presented. Sarma based this study on well-known indexes like HDI, HPI and GDI. Several banking sector indicators like Number of ATMs, Bank Accounts, Bank Branches and private sector credit to GDP ratio were categorized on the basis of three dimensions usage, access and availability. Access defines the geographical outreach of financial services; availability indicates the provision of financial services like number of ATM, bank accounts and bank branches etc. while, on the other hand usage dimension shows the demand for financial services like private sector credit to GDP ratio. This well-known index is completed by compiling data of 55 countries for the year 2004 for above mentioned dimensions. On empirical evidence countries were categorized as high, medium and low financially included economies. After that Sarma & Pais (2012) modified this study on index of financial inclusion by making it more efficient and valuable through assigning different weights depending on the importance of the dimensions. The purpose of that study was to develop more efficient index to measure IFI values in Asian region. Sarma attempted to measure index of financial inclusion via three dimensions usage, access and availability with various indicators as a proxy measure for each dimension. He further mentioned that each indicator varies over economies and time and single indicators is not an enough aspect to measure financial inclusion, there should be a multidimensional index that must cover more than one dimension. Methodology of this study for formulation of index for financial inclusion is alike HDI and HPI employed by UNDP in their studies. After that, Tuesta (2014)

conducted a remarkable study by constructing a multi-component index for financial inclusion consisting of eight two (82) countries for year 2011.

2.1.1 Financial Inclusion and Economic Growth

Economic growth as mentioned earlier is one of the most discussed factor in any country to raise the living standard of the people as it is directly proportional to the health of any economy. Financial inclusion is an emerging agenda for policy makers and institutes and its importance is rising with time due to technological improvement and inventions of new methods of production. Different researchers contributed their work to evaluate the association between financial inclusion and economic growth. Kim (2017) analyzed the connection between financial inclusion and economic growth for 55 OIC (Organization of Islamic Cooperation) countries from 1990 to 2013. There are 57 countries in OIC block but data of Somalia is throughout not available and Palestine is not considered by IMF and GFDD. The data set for this study is compiled from IMF's Financial Access Survey (FAS), World Development Indicators (WDI) and World's Global foundation for Democracy and Development (GFDD). IFI for this study is constructed on the basis of four banking sector indicators, number of ATM's per 100,000 adults, bank branches per 100,000 adults, deposit with commercial banks per 1000 adults and borrower from commercial banks per 1000 adults. They employed dynamic panel estimation, GMM and Panel VAR methodology to estimate the given model. They also utilized IRF's Impulse Response Function to capture the complete dynamic set of interaction between financial inclusion and economic growth. On empirical evidence they concluded that financial inclusion is positively associated with economic growth in OIC countries except those countries that are willingly financially excluded. Later, Hong and Van (2019) analyzed another study to inquire the impression of financial inclusion on economic expansion. This is a recent study which carried a cross sectional effects with panel data setting. In this study, index of financial inclusion was constructed in compliance with two dimensions and three indicators named as: number of bank branches, number of bank accounts and credit to GDP ratio. They collected data from two sources Financial Access Survey sponsored by IMF and Financial Global Findex supported by World Bank. They implemented Generalized Method of Moment (GMM) technique to estimate the model and result predicted that financial inclusion and GDP per

Capita is positively associated. They have taken data in average of three years slabs to counter missing data issues.

2.1.2 Human Capital, Financial Inclusion and Economic Growth

Arora (2011) analyzed the role of human capital in financial inclusion for developing Asian economies. In this study twenty one Asian economies were included as per developing economies classified by IMF. Human capital generally includes health, Education and on job and off job training expenditures along with internal migration. Arora (2011) found that mean years of schooling measured as human capital was positively and significantly associated with financial inclusion. Only one financial inclusion parameter was adopted in this study known as access to banks and measured as visitors to banks. Another research study conducted by Kuri and Laha (2011) examined the linkage between human development and financial inclusion. They mentioned that it's a two way process, as financial inclusion causes human development and human development as well effect the financial inclusion. They found that financial incorporation and human development was prominently related in various states of India. Boldeanu et al. (2015) revealed the basic four factors that contribute in economic growth in their article. As the market aggregate demand and aggregate supply both determines the worth of any commodity same as the value of production resources is established. This article is a step forward to deal with the supply side factors named as: human Resource, capital goods, technological development and natural resources which determines the pace of economic growth. Human development leads to efficient utilization of resources and contribute positively in growth of any economy and capital goods boost up production capabilities multiple time. Natural resources are one of the basic requirements for development and these cannot be created through efforts and they play vital role in economic growth. Technology is last but most important element of growth, as new ideas improvise living standard and open new doors of prosperity and human wellbeing. After that, Audi (2019) contributed one regional study of Pakistan, India, China, Sri-Lanka, Bangladesh and Malaysia regarding financial inclusion, Human wellbeing and economic growth. They collected data from 1990 to 2018 of several macroeconomic variables like income inequality, number of bank branches, foreign direct investment, money supply and credit to GDP ratio. This is a twofold study one discusses the financial incorporation and economic expansion

while seconds one consider the financial inclusion and human wellbeing. They concluded that financial development is negatively associated with above mentioned countries. It means that financial development is not up to the mark and banking sector is not contributing significantly in promoting financial inclusion. Second model of the study consist of human development as dependent variable and financial inclusion as independent variable as well negatively related but insignificantly. Furthermore, count of bank branches, loan to rural/urban areas, monetary contributions and FDI is positively linked with human wellbeing.

2.1.3 Labour force, Financial Inclusion and Economic Growth

Labour force plays a key role to determine the growth of any economy. Labour and capital are the basic factors to determine the level of output along with other factors like technology (Solow-Sawan 1956). Financial awareness and quality educational institutes enhance the capabilities of labour force and make them more useful. Moreover, on job and off job trainings and refresher courses increases their production capacity. In one of the recent study Banerjee et al. (2020) investigated the effects of financial inclusion on development outcomes; a case study for ASEAN and East Asian Countries. For this research study 20 economies were analysed for 12 years from 2004 to 2015. They employed labour force, education, health and income inequality at an aggregate level to analyse their impact on financial inclusion. System GMM estimation technique was employed by authors to regress the concerned equation of the model. They found that Life expectancy, Trade openness, average year of schooling and labour force participation were positively and significantly related with financial inclusion in chosen economies of the region. On the other hand population growth and initial per capita income were negatively associated with financial inclusion in East Asian and ASEAN countries. Another study conducted by Rasheed (2017) evaluated the determinants of financial inclusion and their impact on income equality and poverty. This was a multipurpose study to examine the impact of various variables on financial inclusion. Firstly, the role of cultural and gender gap was analysed with regard to financial inclusion. Second and third objectives were to investigate the impact of remittances on financial inclusion and role of institutional progress on financial inclusion respectively. In this study system Generalized method of moment (GMM) was employed as an estimation technique to regress the model equations. Data sample of this study consist of

ninety four (94) countries for the period of nine years (2004 – 2013). He found that cultural have positive and significant contribution in financial sector, while remittances and financial inclusion was negatively associated with each other. In last objective of the study author concluded that institutional quality effects positively and significantly to financial inclusion and reduces poverty. Rehman (2017) analysed the contribution of labour force in economic expansion of South Asian economies. Labour force, GCF and terms of trade adjustment were included as explanatory variable. This study included data set for twenty seven years from 1990 to 2017. Hausman test was conducted to differentiate between random effect and fixed effect models. Several other tests for hetrosekdasticity and autocorrelation were adopted to deal with these issues. The result of the study concluded that labour force participation in positively related with economic growth of panel economies. Before this, Shahid (2014) investigated the short run and long run impact of labour force participation on economic growth of Pakistan. Data is being collected for thirty two years from 1980-2012 and data source for this study was State Bank of Pakistan and Bureau of Statistics and world data bank. Construction of model included GDP as dependent variables, whereas Labour force participation rate and gross fixed capital formation as independent variable. Moreover, this study employed Cobb-Douglas production function form of model specification. ADF and Unit root test were adopted to check stationary process of data and Johnson co-integration test implied to measure long run relationship between variables. This study concluded that gross domestic product had a positive relation with gross capital formation and labour force participation rate.

2.1.4 Foreign Direct Investment, Financial Inclusion and Economic Growth

FDI includes all form of direct investment such as; equity, machinery, technology, copy rights etc that a foreign country invests for profit purpose in domestic country. Foreign direct investment is one of the important macro-economic factors that contribute positively in economic growth. Andiansyah (2021) examined the linkage among financial inclusion, macroeconomic and FDI in Organization of Islamic Cooperation (OIC) countries. In this study, random effect models (REM) and fixed effect models (FEM) employed for regression analysis. Moreover, A set of macroeconomic variable such as; economic growth, interest rate, exchange rate, inflation were examined to measure their effect on FDI. Sample of the

study consist of 8 Oki countries for the period of seven years 2012 to 2018.this study found that financial inclusion was significantly and positively associated with growth of foreign direct investment. As any rise in financial inclusion enhances the incentives for financial sector and increases the availability of funds for future investments. While, exchange rate and inflation was negatively related with FDI. In another study Qamaruzzaman and Wei (2019) investigated the impact of financial inclusion and stock market on FDI in developing economies. They analysed fifty eight developing economies for the time span of twenty five years from 1993 to 2017. They employed dynamic panel system GMM to analyse the effect of financial incorporation and stock market on foreign capital inflow. Findings of the study mentioned that a well develop and managed stock market encourages an inward moment of foreign capital portfolio, while positive shock in financial inclusion effects positively to foreign direct investment and cross border movement of funds. Following under mentioned studies describes the linkage between FDI and economic growth, Azam et al. (2014) contributed a study regarding role of FDI in economic growth of Asian region. Developing economies normally bridge up saving investment gap through FDI. This study examined the effects of FDI in Bangladesh, Pakistan, Malaysia, Philippines, Singapore, Thailand and Vietnam. These countries are as well part of our study regarding of emerging economies except Vietnam. Data is being taken from 1990 to 2012 from world investment report and World's Bank world development indicators. Several proxy measures were employed for different variables such as; secondary school enrolment as human capital and corruption index on the basis of political and administrative unrest. In this research analysis, FDI, human capital, gross domestic investment was taken as explanatory variables and GDP as a response variable. The results of this study mentioned that foreign direct investment in positively related with economic growth along with human capital and worker's remittances. Whereas, corruption is negatively and significantly associated with economic progress in selected Asian economies. In early studies, Eduardo et al. (1994) investigated the effects of FDI in economic growth of 69 developing economies from 1970 to 1989. Inflows of technology inform of foreign direct investment significantly affect the economy of host country. Multinational corporations play pivotal role to bring latest technology in developing economies from developed nations due to availability of larger budget size and effective human capital. In this study, the impact of FDI along with human capital, initial level of

GDP and other control variables was observed on economic growth and data for these variables was collected from OECD and IMF. The results showed that inflow of FDI positively affects the growth factor of receiving nations. Whereas, outflow of FDI in source countries was not negatively affected.

2.1.5 Trade, Financial Inclusion and Economic Growth

Trade remains as most discussed agenda in economics literature. Different studies conducted by authors to address the linkages among trade, financial inclusion and economic growth, few of them are listed under this heading to support arguments in favour of this topic. Le et al. (2019) investigated the financial inclusion's role in financial stability and financial efficiency in Asian countries. Sample of the study included thirty one Asian economies for the time period of thirteen years 2004 to 2016. In this study three similar indices were combined into one index by using Principle component Analysis (PCA) technique for further usage in concerned model. They pointed out that financial inclusion and trade positively related but financial efficiency was negatively associated with financial inclusion, whereas financial stability positively effects financial inclusion. Moreover, these findings stand still across sub samples of the economies with different level of income. Rasheed et al. (2016) analysed that how financial inclusion contribute in financial development. They included ninety seven countries in study sample for the time span of nine years (2004 – 2012).System GMM employed as estimation technique to measure the determinants of financial development. They found that financial inclusion was positively associated with financial development; any rise in financial inclusion brings positive change in financial sector development. Moreover, under developed stock markets negatively influence the financial development in various regions of the world. Bajwa & Siddique (2008) incorporated the impact of trade openness on economic expansion in sample of South Asian economies. The basic agenda of this study was to examine the pre and post effects of SAARC establishment. This analysis included Bangladesh, Pakistan, India and Sri-Lanka as a sample of study and data is divided into two tier. Tier one lies from 1972 to 1985 and tier two begins from 1986 and ends up at 2007. Division of data into tier is based on SAARC implication. In this study model was built on neoclassical production function and log form of the model was adopted to convert the simple form into growth. Panel unit root test and co-

integration test was employed to check stationarity and relationship respectively among selected variables. This investigation concluded that results were different in both sample. Pre-SAARC sample concluded that trade openness was negatively related with economic growth, whereas after implication of SAARC the linkage between economic progress and trade openness changed to positive but remains insignificant. On the basis of pre and post establishment sample of SAARC this study concluded that overall economic conditions moved to better position in selected four economies of south Asian region. After that, Bakari (2019) contributed this study regarding the influence of trade openness, FDI, domestic investment on economic uplift in Asian developing economies. Data is collected for twenty four Asian economies over the time period of 1992 to 2017. In this study, random effects and fixed effects regression model were employed. As per random effects model domestic investment and consumption expenditures were positively related with economic growth. FDI and exports were negatively associated with economic growth of selected countries. Remaining variables (population and imports) were not having any significant effect on growth. Fixed effects regression model concluded that domestic investment positively influence the growth factor, whereas, exports and FDI were negatively associated. Other variables like imports and population were not having any significant effect on growth in developing Asian economies. On the basis of these results, this research recommended that inflow of FDI and trade openness contributes positively and effectively in developing economies.

2.1.6 Capital Formation, Financial Inclusion and Economic Growth

Capital is one of the most important elements of production process and basic input factor. Capital formation means that part of current output which is neither consumed nor exported but set aside for future production and it carries production process in upcoming years. It includes new investments and depreciation expenditures to maintain the existing capital stock in running position. Sajeewani & Perera (2019) examined the role of financial development on economic growth in south Asian region. In this study, several variables regarding financial development were employed such as; broad money, domestic credit to private sector, banks deposits, real interest margin, GCF and net interest margin to measure the impact of these variables on economic growth. Panel data set for selected Asian

economies was taken for thirty years (1989-2019). Ordinary Least Square (OLS) method was used to estimate the model. Findings of the research mentioned that monetary deposits, bank deposits, real interest margin and GCF were significantly effecting the growth of selected south Asian economies. Moreover, internal loan to private sector and total debt service were not having any influence on growth of these economies which is usually unexpected in this region.

2.2 EMPIRICAL LITERATURE

This section of the study consists of empirical studies already carried out by different authors regarding financial inclusion in various countries of the world. These studies analysed the impact of various macro-economic variables on financial incorporation and economic expansion. In several regions of the world the behaviour of financial inclusion remains different, in some area of the world the impact of financial inclusion is positive but whereas, it's negative as well in some countries. Role of financial inclusion varies in developing economies as compare to developed nations; developing economies are more financially excluded and have less availability of financial services as compare to developed economies. Audi (2019) contributed this regional study of Pakistan, India, China, Sri-Lanka, Bangladesh and Malaysia regarding financial inclusion, economic growth and human wellbeing. They collected data from 1990 to 2018 of several macroeconomic variables like income inequality, number of bank branches, foreign direct investment, money supply and credit to GDP ratio. This is a twofold study, one discusses the financial inclusion and economic growth while second one considers the financial inclusion and economic wellbeing. It means that financial development is not up to the mark and banking sector is not contributing significantly in promoting financial inclusion. Second model of the study consist of human development as dependent variable and financial inclusion as independent variable as well negatively related but insignificantly. Furthermore, count of bank branches, loan to rural/urban regions, money supply and FDI is positively linked with human wellbeing. Banerjee et al. (2020) contributed a research study that analyzed the effect of financial inclusion on development outcomes in ASEAN and East Asian countries. They employed system GMM method to regress the organized model. Different control variables along with lagged values were included to measure the true impact on development

outcomes. In another study Van and Hong (2019) conducted an international study to examine the influence of financial inclusion on economic progress with data sample of 11 years divided into 5 sub samples. They utilized dynamic panel GMM method for regression analysis with random effect and fixed effect models. But, lack of data availability for all international economies for concerned dimensions and variables makes this study compromising and incomplete. Morgan and Pontines (2014) addressed a report to Asian Development Bank Institute regarding financial inclusion and financial stability. They employed dynamic panel system GMM technique to evaluate the objective model of the study and found that financial inclusion was negatively associated with bank credits and bank reputational risk and regulations of institutions. While the relationship between financial inclusions and bank assets were significant and positive. They employed various instrumental variables along with their lagged values in system of equations for regression analysis, same sort of technique is adopted in our study to regress the model equation. Rasheed (2017) presented a comprehensive analysis of financial inclusion and its influence of income inequality and Indigence. This study as well employed system GMM technique for regression analysis for the group of ninety four countries. It was a threefold study that incorporated cultural effects, gender gap, unequal distribution of income and indigence in the research analysis. He concluded that culture and religion of various regions of world behave differently with financial inclusion and income inequality was negatively associated with financial incorporation. Higher income countries usually possess higher level of financial inclusion and lower level of income inequality while this scenario is worse in lower income countries with lower level of financial services and higher level of income inequality. Moreover, Rehman (2015) analysed the exposure of financial inclusion in growing economies. In this study Pakistan and Chinese economies were analysed on the basis of primary data regarding financial sector indicators. Pakistan is far behind from china in financial inclusion as shown by data collected by Gallup survey. There are different barriers like lack of documentation; lower trust level, religious factors, lack of money and one account for complete family restrict the financial inclusion process in both countries. Binary logistic regression technique was employed to regress the objective model. They found that gender and age is significantly linked with financial sector. These results are in line with the literature (Demirguc-kunt & Klapper 2013). Before that, Beck (2009) investigated this study

about financial services that how access to financial institutions and availability of financial services affects the livelihood. In many evolving economies less than fifty percent of the inhabitants has access to formal economic sector but the circumstances in African region circumstances are worse than others as only one of five households has access to financial services. This research article is splinted into three parts, first phase of the study analyze that how we can measure the access to financial services like there are various indicators dimensions and indicators created by financial analyst like number of bank branches, bank accounts and ATM's etc. Second phase covers the dimension of access that how household behavior varies when financial services are easily accessible as some of the region is voluntarily financially excluded. Third and last phase concluded that Government/State policies may help to build inclusive financial system that would be useful for household and firms growth. Atkinson (2010) stressed that financial inclusion should be a priority for the world and initiatives to enhance financial education and awareness about financial inclusion. This study is a step forward to recognize the importance of financial intensity and how it can be promoted. This study was conducted with the sponsorship of Russian trust fund for financial education and literacy. On the basis of empirical evidence authors of this research concluded that financial inclusion is associated with financial literacy, a lower level of financial inclusion means a lower level of financial awareness and whereas higher level of financial inclusion is positively associated higher level of financial education. In this report the mentioned the challenges or problems linked lower level of inclusion like cultural barrier, lack of technology, absence of financial awareness and low level of income etc. They further argued that how these hindrances can be overcome and financial literacy can be promoted. . Kim, Yu and Hassan (2015) analyzed the impact of financial inclusion on economic growth in organization of Islamic countries (OIC). They mentioned that Islamic world is voluntarily disengaged themselves from financial inclusion. The basic reason was mentioned that current financial system of the world is against the Islamic economic system called Shari'a. On the basis of flexible interpretation of Shari'a rules various financial instruments were developed by Islamic countries like PLS (profit and Loss) Accounts, Islamic insurance (Takaful), Modarba, Musharika, Murahiba etc. This Study concluded that financial promotion has significant effect on economic promotion in OIC bloc. After analyzing above mentioned studies it's been closely observed that most of studies applied Dynamic Panel System GMM

as a method of measurement impact factors of financial inclusion on other macroeconomic variables. Moreover, our study is related with past studies and it makes easier for us to compare results of this study with pre-existing studies and withdraw a valuable conclusion and worthy contribution in literature of economics.

2.2.1 Index of Financial Inclusion

Honohan (2007) initiated this process of measuring index for financial inclusion, that study incorporated only one dimension which put limits on results but opened up further dimensions for next studies. After that, Sarma (2008) presented a comprehensive paper on measuring index of financial inclusion by incorporating more than one indicator. In this study Sarma employed three dimensions and develop a comprehensive index for formulation of financial inclusion and this index was used for 148 countries to analyze the state of financial sector and its impact. Later, Pais, (2012) along with Sarma unveiled the cross country analysis in conformity with findings of index of financial inclusion of Sarma's (2008) excluding overseas financial center (OFC) countries. The objective of this study was to formulate the cross countries effects of financial incorporation on their development. There are forty nine (49) countries were observed for this research analysis. They regressed Index of financial Inclusion on socio economic variables presented in the equation including GDP per Capita, Adult literacy rate, rural population, unemployment and Gini coefficient as a proxy measure for unequal distribution of income. The results of the estimation presented that GDP per capita is highly and significantly associated with financial inclusion. Adult literacy rate and rural population is positively linked with financial development whereas Gini coefficient is negatively affecting the financial inclusion. "All those economies who possess a higher magnitude of industrial share along with well-organized formal financial sector also have a higher level of financial inclusion, whereas, financial exclusion in these nations is caused by lower level of income, ethnic minorities and aged group of people (Barr, 2004; Kempson and Whyley, 1998; Connoly and Hajaj, 2001)". As mentioned earlier Gini coefficient is a measure of income inequality, due to negative relation with financial inclusion it shows that high income inequality leads to lower level of financial inclusion and low income inequality promote financial stability. They introduced different weights for various indicators as per importance assigned in empirical literature of financial inclusion.

Supply side and demand side dimensions of financial inclusion were introduced to measure the true impacts of financial services, whether its availability or usage of financial services that make difference on index points and ranking of the country. In this study, they observed that higher magnitude of income economies are generally possessed with higher level of financial inclusion and countries with lower level of income usually possess lower scores of index that indicates lower level of financial inclusion in those economies. After that, Tuesta (2014) examined a remarkable research regarding financial inclusion. They employed PCA (Principle Component Analysis) technique to build a multidimensional financial inclusion index. . There are two broad approaches parametric and non-parametric are adopted by authors for measurement of index of financial inclusion. Non parametric approach usually assigns a pre decided or exogenous weight based on researcher's willingness. There is empirical corroboration that indices are sensitive to assigned weights, since a minor change in weight can alter the results instantaneously (Lockwood 2004). Parametric approach assign weight endogenously and it shows that there is strong correlation between indices exist. They used PCA (Principle Component Analysis) approach for their research to construct multidimensional index of financial inclusion. As we know that from prevailing literature that PCA is biased towards the weights of indicators which are highly correlated with each other (Mishra 2007). We minimized this issue by employing two stages PCA; in first stage we estimated the three sub-indices usage, barriers, and access. In second stage we regressed the dimensions weights and overall financial inclusion index by incorporating as independent variable. The correlation matrix for the prepration of financial inclusion is employed for casual variables. They concluded that the degree of financial intensity is significantly correlated with GDP per capita, education, effectivness of financial institutions and other macroeconomic variables. (Cyn-Young Park and Rogelio V. Mercado, 2015) Conducted a study and enhance the literature regarding financial inclusion. They observe two behavior of financial inclusion in eliminating indigence and inequality in 37 Asian economies. They measured the financial inclusion index through method suggested by Sarma (2008) and normalized the values to lie between 0 and 1. Whereas 1 shows a highest level of financial inclusion while zero indicate lowest level of financial inclusion. Their findings concluded that financial inclusion is prominently and negatively associated with lower level of indigence in developing Asian countries. Moreover, financial access and poverty possess a

strong correlation, means more access to financial services leads to lower level of poverty. They further mentioned that good governance and effective institution remarkably boost financial inclusion. Finally, an empirically evidence provided by author that growth in financial inclusion reduces income inequality in developing Asian region. Above mentioned studies concluded the development of Index of financial inclusion over the years. After conducting a detailed discussion about indices and their pros and cons this study adopted a combination of two approaches for measuring index of financial inclusion. Sarma and Pais (2012) study regarding development of financial inclusion index made many changes and try to incorporate all concerned indicators and dimensions and later studies as well adopted same technique with smaller changes as per requirement of their research studies. After analyzing a comprehensive group of studies system GMM method is adopted along with index of financial inclusion built in conformity with Sarma's studies as research technique for our study.

2.2.2 Measurement issues in Index of Financial Inclusion

Construction of Index of financial inclusion is one of the prime objectives of this study to find out the magnitude of financial services in selected economies. There are various methods for calculation of index is mentioned earlier in literature. Construction of index requires a very careful and deep understanding of prevailing situations in different economies all over the world. Selection of variable is one of the basic issues in measurement of index, there are number of indicators available for this purpose but only limited indicators serve the purpose. Second problem regarding IFI is availability of chosen indicators for all selected economies, as data bank for financial inclusion is in its developing phase and some of the indicators are not available for chosen countries. Third issue in construction of index is time frame that put limits on tenure of study, as few of the variables are unavailable for chosen time period of the study for emerging Asian economies. Fourth, Specification or determination of index's measurement technique requires understanding of various methods for construction of IFI. Honohan, Sarma, Pais and many other presented their techniques to calculate the index, but Sarma's method is one of the best methods to construct the index. In this study, various demand side and supply side indicators were analyzed to choose the best possible indicators among all available.

2.3 CONCLUSION

As we have seen from above literature review although financial inclusion recently received more importance and attracted policy originator and research scholars but studies in this field is at early stages. Different proxy measures are used for research purpose as data bundle is not large enough to cover all the research aspects independently. This study examines the impact of financial inclusion on economic growth for emerging Asian economies of the world. In first section of the chapter a historical and theoretical importance of the study was analyzed and discussed in details. Second section summarized the index regarding measuring financial inclusion and various control variables relevant to our study and linkage among control variables with financial inclusion and economic growth. As per historic reviews Asian region is getting more value till the middle of this century due to technological change, human resource development, availability of raw material, trade openness. All these factors contribute positively toward financial inclusion and economic growth. . These developing economies are emerging in industrial sector and achieving high growth and mass production with decreasing cost due to cheap labour and underutilization of resources. Moreover, technological advancement and availability of capital boosting up production and thus trade as well. In last section of the chapter empirical literature mentioned and discussed about various techniques employed in pre-existing studies and system GMM is chosen as research method for current study with Index of financial inclusion, Sarma and Pais (2012).

CHAPTER 3
FINANCIAL INCLUSION: REGIONL AND DOMESTIC ANALYSIS

Financial inclusion remains as one of the most discussed agenda since late 1990's (Sarma 2008). Policy makers, researchers and economists conducted various studies about impact and determinants of financial inclusion and implemented as a priority policy to achieve desire objectives of economic growth around the globe. Global Findex database mentioned in one of its reported conducted in 2015 that there are 38% adults are unbanked in the world. There are two main sections of this chapter, first, discussed the regional studies of the world including almost each region and compared it with panel countries selected for this study. Second section contains the research studies carried out in Pakistan about financial inclusion and summarizes the progress of financial institutions along with various policy measures taken to improve financial services in Pakistan.

3.1 REGIONALANALYSIS OF FINACNIAL INCLUSION

This section of the study incorporates different regions of the worlds and discusses the circumstances of financial inclusion among various countries. In this part of the study, following regions of the world included in details.

3.1.1 European Region

Financial inclusion in European region is promoted through providing financial services particularly credit services, enhancing number of buyers and firmness in financial sector. Several studies regarding financial inclusion was conducted in this region of the world, As Sinclair (2013) investigated British economy about financial inclusion with respect to European region. The basic purpose of this study was to enhance the lower and middle income group of people in United Kingdom. Further, this study explored the determinants those effect negatively to the financial sector and specifically the lower middle income group of people i.e. such group of people is not properly served with financial services, lack of credit services etc. Later on, in the same region Infelise (2014) conducted research about increasing availability of credit in five richest nation of the European region name as Italy, France, Spain, Germany and Britain. This study analysed that State intervention in financial sector

particularly subsidized credit provision to Small and Medium Enterprises (SME's), promotion of economic growth and thus financial inclusion in concerned economies. After that, Corrado & Corrado (2015) observed the elements of financial inclusion in European region. This study examined the five western European and eighteen eastern European economies of the region. Primary data including survey of 25000 households was initiated for year 2007 and 2008. They found that economic shocks contributed negatively by increasing unemployment and decreasing living standard in these economies of the European region.

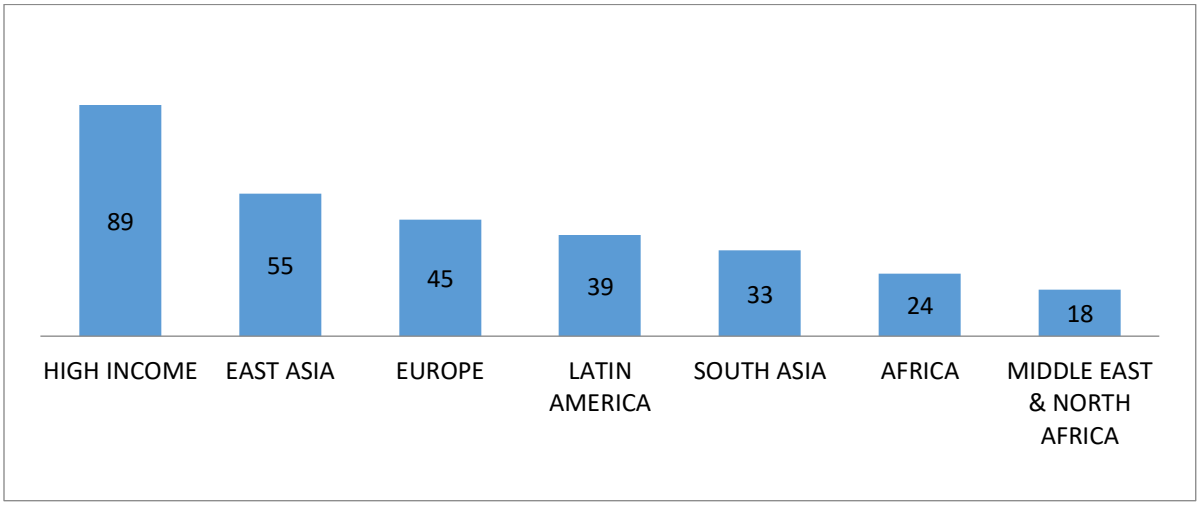
3.1.2 Middle East and North African (MENA) Region

Many economies of this region are Islamic and developing or under-developed. The main focus of financial inclusion in this region remains targeting lower income group, eliminating poverty, trade openness and higher level of inflation. Pearce & Akhter (2010) discussed the main factors that enhanced financial inclusion in Middle East and North African economies. Several factors such as: micro finance schemes of Islamic banks, insurance services, mobile banking, account opening services etc. contributed positively and significantly in the economies of MENA region. The second cause of this study was to mention the hindrances faced by this region regarding financial inclusion like non-availability of financial regulatory authorities, weaker financial infrastructure, political and administrative incapability, and lack of NGO's to work in this area of the world contributed negatively in MENA countries. Naceur et al. (2017) conducted a study in the same region about the influence of Islamic banking in financial sector. Different Islamic banking products were examined in details to find out the linkage between financial inclusion and Islamic banking in MENA economies. The findings of this study concluded that the influence of Islamic banking in promoting financial inclusion was not as much greater as it was expected. Pearce (2011) on the basis of group study already carried by Pearce and Akhter (2010) mentioned the determinants of financial services in Middle East and North African Countries. In this study, Pearce recommended the various measures to improve financial deepening in this region such as: establishment of financial sector supervisory institutions, promoting competition among services of financial sector specifically in banking industry, creation of microfinance schemes to improve the root cause of financial disability, improvement in the services of leasing companies and removal of obstacles causing a sluggish growth in Islamic banking and other financial institutions. Provision of these basic elements of financial inclusion may improve the

state of MENA economies. Later, Neaime and Gaysset (2018) further inspected the impact of financial inclusion in reducing poverty and income inequality from 2002 to 2015 in the same region of the world. The results obtained from this study were quite different than expected, as they observed that financial inclusion decreases income inequality but no effects were observed on poverty in MENA region. Further, several other factors were as well discussed like effects of larger population size, higher inflation, economic sluggishness, and root cause of higher level of poverty in the region. Same like other regions of the world, African countries as well witnessed the robust effects of financial inclusion and it becomes the policy priority for the most of the countries. Naceur and Ghazounai (2007) conducted a study for Middle East and North African (MENA) countries and analyzed that financial inclusion and banking sector development. They found a negative effect on economic growth. They did not use the term "Financial inclusion" but the instrument used by them was relevant to financial inclusion. This study concluded that non availability of financial services is one of the main causes of lower development in MENA countries. Later, Allen et al. (2014) analysed the role of innovative financial services in African region. Several financial products contributed significantly in financial inclusion. This study contributed that innovation in technological framework regarding financial inclusion reduced the infrastructure related problems and enhanced the availability of financial services in many African countries. Another study conducted in the same region by Beck et al. (2016) mentioned the main determinants of financial inclusion in African region. The role of foreign banks and other financial institution were closely observed in contributing towards the financial services in this region of the world. The results obtained from this study concluded that the role of foreign banks from emerging markets were significant and positive in growth of these countries. They served with better financial products and services to this region and promoted financial inclusion, whereas the contribution of banks from US and UK was not as much significant as expected from developed banks. One more study investigated by Chikalipah (2017) related to the main factors of financial inclusion in Sub-Saharan Africa. There were many factors mentioned in this study those were affecting negatively to this region but illiteracy and lack of financial awareness were the biggest reasons for lower level of financial inclusion in Sub-Saharan African economies. Williams (2017) contributed in analyzing the impact of financial inclusion in economic growth and poverty reduction in Nigeria. They utilized panel data analysis from

year 2006 to 2015 with log linear model specification. On the basis of empirical evidence the mentioned that number of ATM's and bank branches significantly affect Gross domestic product in Nigeria, credit to GDP ratio for private sector effects positively to GDP as well. They concluded that financial inclusion is positively associated with economic growth in Nigeria. They further recommended that improvement in infrastructure and efficiency in utilization of resources at government end may boost up financial inclusion in country.

Figure 3.1 Accounts penetration across various regions of the world.



Source: Demirguc- Kunt & Klapper (2012).

Above mentioned diagram described the accounts penetration across various regions of the world, as 89% of the adults are having formal bank accounts in high income countries, whereas this ratio is 55%, 45%, 39% in East Asia, Europe and Latin America respectively. MENA economies are having lowest ratio of accounts penetration in the world.

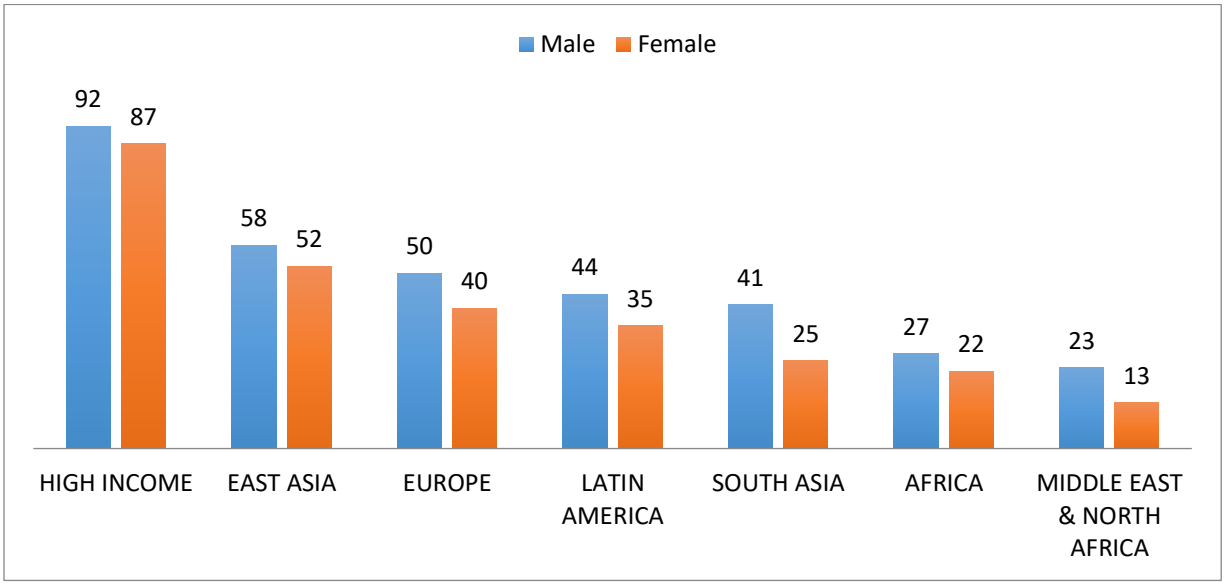
3.1.3 Asian region

Asian region consist of most of the developing economies which are growing with greater pace and moving toward high mass production. This region include maximum share of world's population around 80% in 2005. As other region of the world there are various country specific and regional studies carried out to examine the impact of financial inclusion in these economies. Fungacova and Weill (2015) investigated the role of financial inclusion in chines economy. This study observed that the level of financial inclusion in china is much higher as compare to BRICS economies. Moreover, in chines economy people are voluntarily

financially excluded, as people avoid taking loans or credit from formal financial sector and prefer family and friends for such needs of finance in shorter time period. Further, the level of financial inclusion in china is higher than other Asian states. Tsai (2017) analysed the role of financial innovation in china to capture the tremendous effects of technology in financial inclusion. This study briefly discussed the five years (2016-2020) plan of chines economy about digital innovation, technological improvement and web development. Before this, Pal and Chakarvarty (2013) examined the Indian states in details to analyse the role of financial institutions specifically banking sector. The basic purpose of this study was to determine the factors of financial inclusion those effects the Indian economy and find that social and people friendly banking policies enhanced the impact of financial inclusion in various Indian states from 1977 to 1990. In the same year, Kumar (2013) investigated the factors of financial inclusion that significantly affected the several states of India. These determinants were number of banks and branches, industrial network, credit facilities and other financial services contributed positively and significantly regarding financial inclusion. Hong and Vo (2020) world has witnessed a robust economic growth and economic transformation in Asian region among all over the world since 1970. GDP growth rate of Asian region remains more than double of industrial nation from few decades (Nayyer 2019). This study analyzed the linkage between financial market and financial incorporation by employing data of 3071 banks of Asian region from year 2006 to 2017. Hong et al. (2019) used Generalized Method of Moment (GMM) to estimate model which is parallel to technique employed by our research study. Their results concluded that financial inclusion and financial stability is positively related in Asian region. They employed demand side and supply side financial inclusion dimensions to construct index for financial inclusion for said region and data was collected through IMF data set known as financial access survey (FAS). Ghosh and March (2013) studied a specific country case for Indian states to observe the behavior of financial inclusion for inclusive growth of India. They mentioned that India is one the fast growing economy but growth is uneven all over the States and sectors. Unequal distribution if economy causes unequal distribution of wealth and resources which leads to unemployment and other economic evils. This study is an attempt to obtain the progress of financial intensity in all over the Indian states. Ghosh et al. mentioned that financial inclusion requires equitable distribution of wealth and resources for its robust effects on inclusive growth. As economic

growth over states varies it requires financial inclusion to behave differently in various states as Kerala, Maharashtra, and Karnataka having high growth of financial inclusion as compare to Gujrat, Bihar, Madhya Pardish and Asaam. There are few challenges mentioned in the article were like geographical and demographic outreach, low level of literacy that limits the financial inclusion process in India.

Figure 3.2 Adults with an account at a formal financial Institution (As a % of Adult population).



Source: Demirguc- Kunt & Klapper (2012).

Figure 3.2 incorporated the accounts penetration as a percentage of adult population. This figure described the gender wise division of population; it is being observed that male accounts penetration is higher than female accounts penetration across various regions of the world.

3.1.4 American and Australian region.

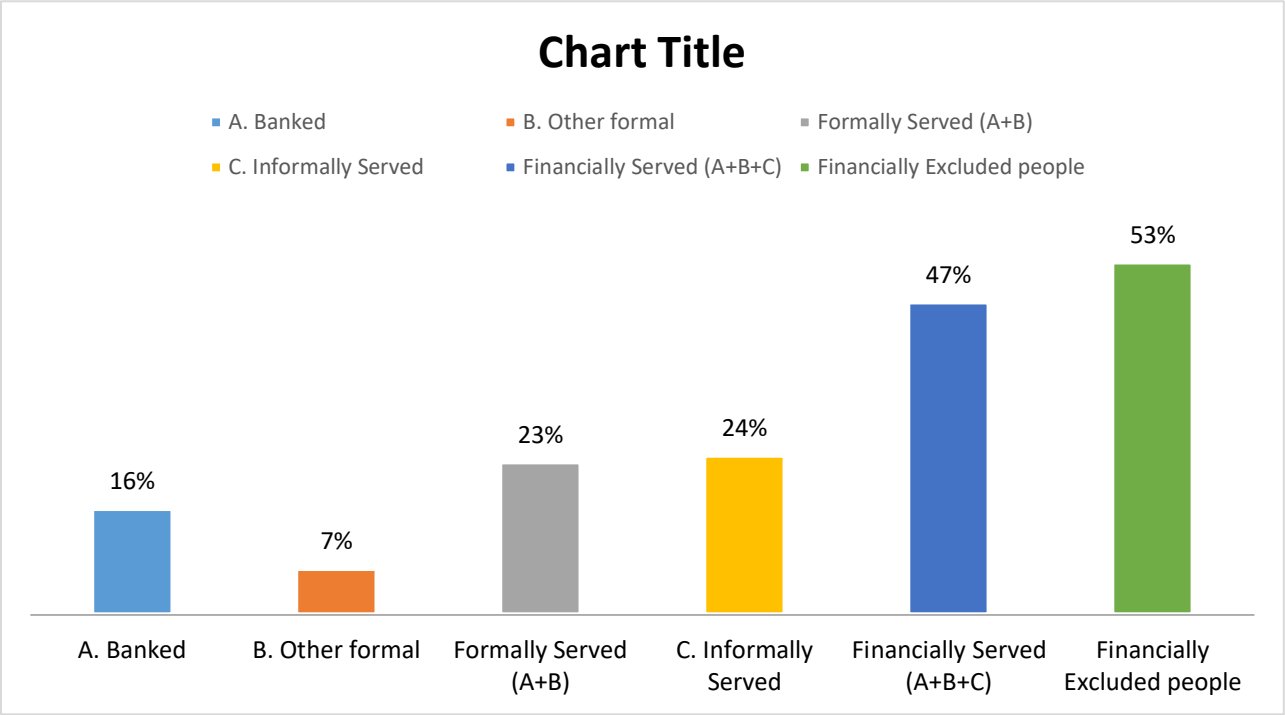
Marshall (2004) analysed the US policies of financial inclusion. The study examined that US treats financial inclusion as individual's phenomena, every individual has freedom of choice regarding financial inclusion and exclusion. Moreover, financial system is devised in such a way that supply side factors are well managed and controlled by regulatory authorities. Whereas, demand side factors are encouraged via different incentives and laws. In the same

region Fonte (2012) investigated the role of mobile payment system to enhance financial inclusion. The outcomes of this study mentioned that there must be proper regulatory authorities and legal framework to channelize such financial transactions mechanism. Mobile payment system in American region enabled the public to take advantage of financial services from home. Moreover, pro-financial inclusion services in US led a greater impact on financial inclusion. In Australia, Singh and Godin (2013) analysed the remote areas to investigate about access and availability of financial inclusion. They mentioned that people in rural areas are more financially excluded and financially unaware. Moreover, there are a lot more people with mobile phones including smart phones but mobile banking services and digital financial services are not common in this community.

3.2 Pakistan Economy and Financial Inclusion.

Pakistan is one of the developing country with an overall economy size of 280 Billion dollar (2019) located in Asian region with neighbouring countries India, Iran, China and Afghanistan. Pakistan is seventh largest populated country with 207 million people in the world with fast growing population growth rate. Financial inclusion means availability, access and usage of financial services by the resident of any country. In Pakistan private financial sector along with public sector contribute positively in financial inclusion. As privatization process started in late 1990's and licence for opening new commercial banks brought technology in Pakistan and created healthy competition among banks and DFI's. Financial inclusion in Pakistan is at its initial stage with limited availability of financial opportunities and uneven distribution of financial services across its Stats/Provinces. Pakistan is among of all those countries where financial landscape presents a grim picture of financial inclusion. There are various reasons that causes depressed level of financial inclusion like low literacy rate, lack of financial awareness, a strong background of informal financial sector, lower level of income, religious factors and restricted availability of Sharia's compliance products as interest is prohibited in Islam consumption based economies etc. Technological changes play vital role in enhancing production efficiency. In Pakistan production in agriculture and Industrial sector is still carried out through traditional measures but now a days due to technological enhancement these sector is moving toward better and efficient use of resources. Financial inclusion provides financial services to support these sectors and thus boost up their efficiency.

Figure 3.3 Analyses of Financial Inclusion and Exclusion in Pakistan.



Source: State Bank of Pakistan report (2018).x`

Above mentioned diagram give an abstract of the state of financial exclusion and inclusion in Pakistan. Data is collected and analysed on the basis of surveys conducted by State Bank of Pakistan regarding usage and availability of financial services. It can be analysed that a major portion of public in Pakistan as mentioned 53% are financially excluded. There are only 16% people connected with banking sector and just 23% are served with formal financial services including banking sector. In Pakistan 24% of the public is served through informal source of financial inclusion which includes friends, relatives and other informal societies. Zulfiqar (2016) conducted a research regarding financial inclusion determinants and barriers in Pakistan. They mentioned that low level of income, lack of educational facilities, gender gap and lack of credit facilities are the main hindrances in Pakistan's low level of financial inclusion. Their study concluded that removal of these barriers may lead to increase in financial inclusion and availability along with accessibility of financial services equally among all areas of Pakistan would increase financial statistics and more public will be served through formal financial sector. Nasir Ali (2017) made a valuable addition in literature of financial inclusion for Pakistan, as they investigated the effects of financial inclusion on

economic expansion for Pakistan. Data was congregated from 1985 to 2017 and several proxy measures were employed to compute financial index through PCA method. ARDL (Autoregressive Distributed Lag) bound test approach were utilized on the basis of unit root test to estimate the given model. Their results presented co-integration between financial inclusion and economic growth for Pakistan. They concluded that economic growth is positively associated with financial inclusion in short run as well as long run with one year lag. In this scenario Awan et. al. (2020) analysed the impact of trade openness and financial inclusion on economic growth in Pakistan. Financial inclusion can be used to eliminate poverty by increasing awareness level and opportunities in financial sector (Aghion and Bolton 1997). They collected data from 1967 to 2020 regarding trade openness, financial inclusion, FDI, Broad money, Credit Market and gross capital formation. They employed ARDL bound test to analyse the relationship of economic growth and financial inclusion. ADF test was used to check stationery. They concluded that there is positive relationship among macroeconomic variables and financial inclusion except broad money. They further mentioned that as a policy recommendation that Pakistan should have strong check on supply of money to increase exports and boost up trade impact. Khan (2020) investigated the determinants of financial inclusion in Pakistan. They collected the concerned data from (2008 to 2018) regarding financial sector indicators of Pakistan. They measure it via access, availability and usage of financial services indicators. Johnson co-integration technique was engaged to evaluate the model and they found that financial inclusion significantly and positively effects economic growth in Pakistan. Policy implication of the study focused on awareness programs in rural and urban areas to enhance the impact of financial inclusion across the country. Furthermore, Public-private partnership must be established to promote financial services in Pakistan. After that, Adil (2020) carried out this study very recently about determining financial inclusion output of banking sector of Pakistan a supply side Analysis. This study utilized two dimensions of financial inclusion, availability and accessibility which is similar to our study. Availability is determined through various variables like size of financial industry, institutional network and accessability. The accessibility aspect of access dimension is given by credit portfolio and advances size. Autoregressive distributed lag (ARDL) is an estimation technique presented by Pesran et al. (2001) this technique was used to estimate the model. Data was collected ranging from 1973 to 2017 from State Bank of

Pakistan (SBP). They concluded in their empirical findings that the higher level of financial/ banking sector and geographical outreach implies more financial inclusion in country. In the context of Pakistan, there is only sixteen per cent (16%) of the adult population is financially incorporated (SBP A2F 2015).

3.3 Recent Development in Financial Inclusion with respect to Pakistan.

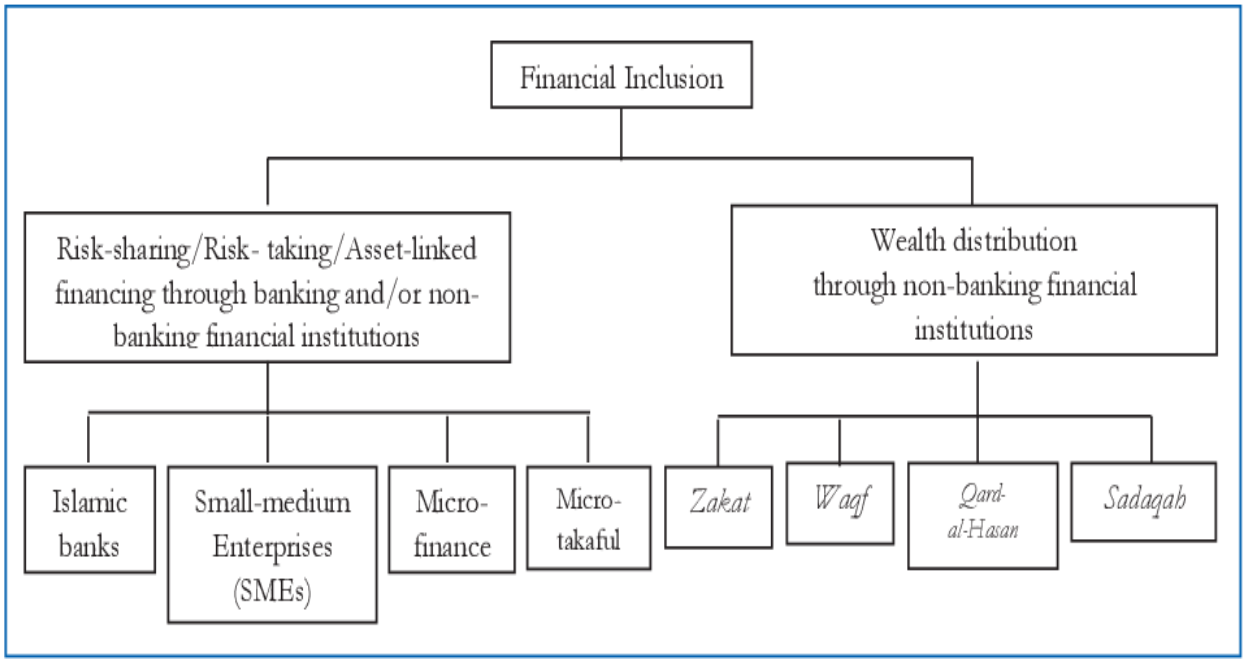
Financial inclusion is primarily linked with innovation process and latest technology. State Bank of Pakistan (SBP) which is a central bank of Pakistan has taken the core responsibility for development of financial sector. One pager account known as ASAN account was introduced by SBP to avoid documentation and formal formalities for opening account that provided ease to public. Moreover introduction of ASAN mobile account linked the financial services with mobile phone and now financial services are accessible at door step. Branchless banking (BB) is another initiative to save time and traveling cost of customers. SBP regularized the Banking Mohtasib to deal with the complaints launched by financial sector consumers and time frame for each complaint is pre-decided and conveyed properly to customers. RAAST Id is a latest technique to increase the impact of formal financial sector and linked the public with banks and other financial institutions. RAAST id linked the mobile number with bank account and simply sharing a contact number one can receive amount in bank account. AML (Anti Money Laundering) and CDD (Customer Due Diligence) is as well initiative of SBP to filter the fraudulent and black money transactions and stop entrance of wrong persons in financial sector to keep up trust with financial institutions.

3.4 Role of Islamic Banking in financial Inclusion

Akhtar (2020) deeply analysed the importance of Islamic banking industry toward financial inclusion development, specifically the role of Islamic banking in Pakistan. Islamic banks follow Islamic laws based on Sharia compliance to organize the financial transactions.it can be observed that there are hardly few studies regarding role of Islamic banking in promoting financial inclusion but it is growing overtime (Naceur et al. 2015). This study is a step forward toward the development of linkage between Islamic banking and financial incorporation and data is being taken from 2007 to 2016 from State bank of Pakistan (SBP).

They structured an index of financial inclusion on the footing of three dimensions, first, usage of financial services, second access to financial services, third quality of product and services. These dimensions were explained through several indicators. They employed the same formula presented by Sarma (2008) with smaller modification to calculate financial inclusion index for given study. Two models were formed; first one shows the impression of Islamic banking on financial inclusion and second one study the influence of technical efficiency on financial inclusion. ARDL estimation technique was used to regress the models and they found that there is significant and positive connection between financial inclusion and Islamic modes of financing.

Figure 3.2 Financial Inclusion, Risk Sharing and Wealth Distribution.



Source: Modes of Financial Inclusion: Demirguc-Kunt and Kalapper (2012)

Above mentioned diagrame explained the wealth distribution and risk sharing through banking and Non banking financial institutions. Islamic Banking modes of financing includes SME's micro finance, micro takaful and islamic banks. Non-banking financial modes includes zakat, waqf, Qard-e-Hasana and sadaqat. These non - banking financial institutions provides funds without any markup and facilitate wealth distribution and reduces income inequlity. Islamic bnking modes include financing for small medium and enterprises (SME's), micro

finance and micro takaful as a substiute for islamic insurance. Syed Kumail Abbas Rizvi (2017) examined this research study based on Mobile Banking: Pakistan's economy is badly lacking in financial inclusion numbers when compared with regional and global standards. However, mobile banking emerges as a wider market along with other telephony services in the world and specifically in Pakistan. Mobile Banking penetration contributed positively towards economic growth via offering various financial products and services. Mobile banking started in 2005 06 and spread overtime in a speedy way in Pakistan. Transaction growth was tremendously increased over time from 15Million in 2011 to 118.7Million in 2016. State Bank of Pakistan Asaan Account and other financial facilities contributed positively towards financial inclusion. Despite all this, several aspect of financial market in Pakistan limit the sector's growth, First, lack of innovation, second large disparity between loan disbursement and loan repayment, third gender gap or inequality. Women are still lack behind in financial inclusion, they are more financially excluded.

CHAPTER 4

ANALYTICAL FRAMEWORK AND ESTIMATION METHODOLOGY

Comprehensive Inclusive financial system helps in promoting financial services in the economy and it is a useful technique to boost up formal financial sector. Effectiveness of financial sector depends on the trust level and service quality of the products provided by financial institutions. After analysing various estimation techniques used in different studies in literature review under empirical literature, now on-going study is evaluated and estimated in this chapter. This chapter is based on three sections. First section explains the theoretical framework of the model i.e. assessing effects of financial inclusion in economic progress for the emerging Asian economies. It consists of various studies conducted earlier to explain the role of financial incorporation in economic expansion and link this study with them. Theoretical model for this study is built on the basis of this analysis. After framing the theoretical boundaries in preceding section, this section will through a light on the different aspects of data along with data sources and variables which are used in this study. The framework includes analysing behaviour of various macro-economic variables i.e. foreign direct investment, human capital, labour force, Trade and physical capital and our main/concerned variable Index of financial inclusion etc. and there impact on economic growth. All these include cross sections (emerging Asian economies), time span and time series, sources of data, construction of different variables and data statistics. In the last section, in keeping pace with theoretical framework and estimation technique, the model is specified to menstruate the impingement of financial inclusion on economic progress along with other macro-economic variables. It includes the strategy to construct Index for financial inclusion through various dimensions of financial services provided by banks and other financial institution and incorporate relevant dimensions and their indicators on the basis of availability of data set. This section as well reveals various pre and post estimation techniques and diagnostic tests to deal with panel data i.e. Hausman test, data stationarity, co-integration, comparison of fixed and random effects etc. along with research method i.e. Generalized Method of Moment (GMM).

4.1 THEORETICAL MODEL

Analytical framework provides an overview about the depth of the study and all those aspects which are covered in research analysis. Methodology specifically deals with the techniques and methods applied for data analysis in accordance with the requirement of the study. In accordance with the pre-existing studies that emerge overtime describing the alliance between financial inclusion and economic progress in different prospects such as: Hannig and Jansen (2010); Audi and Ahmed (2019); Zulfiqar and Chaudhary (2016), and; Mohan (2006). Alike all these studies there are several other theories mentioned in earlier chapters that narrate emergence of financial intensity and correlation with economic growth. As far as this study is concerned it is based on a well-known growth model of the economic literature known as Solow and Swan (1956) growth model. Solow and Swan (1956) embraced the economic literature that describes economic growth and its impact factors. They mentioned that growth is influenced by capital, labour and technology. Technology is taken as exogenous as it incorporates a constant growth in productivity.

$$Y = A\ f(K, L) \qquad \ldots \text{Eq } 4.1$$

As stated earlier in the objectives the basic agenda of this study to analyse the influence of financial inclusion in promoting economic growth. The above mentioned model is further enhanced as capital is divided into two further parts known as physical capital measured through gross capital formation and financial capital that is based on index of financial inclusion (measured separately).

$$Y = f\ (IFI, K, L) \qquad \ldots \text{Eq } 4.2$$

Along with index of financial inclusion that is measured via incorporating various banking sector indicators there are different macroeconomic variables as well added in the model as control variables. After incorporating these macroeconomic variables the model is as follow:

$$Y = f\ (IFI, K, L, T, FDI, HC) \qquad \ldots \text{Eq } 4.3$$

Equation 4.3 represents our theoretical model including all control variables along with financial inclusion variable IFI. In this equation Y represents GDP per capita and control

variables are Gross capital formation (K), Labour force participation rate (L), Trade (T), Foreign Direct Investment (FDI), Human Capital (HC) are mentioned respectively.

4.2 DATA AND VARIABLE CONSTRUCTION

The present study is for selected emerging economies of the Asian region, where financial inclusion is at its initial stage because of slender role of financial institution and limited availability of financial instruments. Moreover, these selected economies are growing with good pace and steady progress. To analyse the role of financial inclusion on economic expansion we have selected ten (10) emerging developing economies of the Asian region. As mentioned earlier that research on financial inclusion is being initiated in late 90's that's why data set is in building process which put limits on selection of the sample of the study Different studies have taken different time periods for the purpose of analysing the financial inclusion index and its impacts on economic growth and other macro-economic variables. Most of the studies are conducted for developed countries where data of financial inclusion variables and other macro-economic variables are available easily through different databases which are maintained in respective country.

Table 4.1 List of selected Countries

Sr. No	Countries	Average GDP Growth rate
1	Bangladesh	6.5
2	China	9.0
3	Indonesia	5.5
4	India	6.8
5	Malaysia	5.0
6	Philippines	5.8
7	Singapore	5.4
8	Thailand	3.6
9	Pakistan	4.3
10	Korea, Rep.	3.6

As far as developing countries are concerned, data on different variables is not easily available due to weak institutional arrangement. So for the purpose of analysing the transmission mechanism of financial inclusion for above these countries this study employed the annual data for fifteen years i.e. 2005 – 2019 for banking sector indicators and macroeconomic variables.

4.2.1 Construction of Index for Financial Inclusion (IFI)

Financial inclusion is our main impact variable that is used to see the changes in growth factor. Financial inclusion is basically a provision of financial services for each and every resident of the country. Different authors and researchers tried to formulate the financial inclusion by including various financial services indicators. These indicators provide a brief view about accessibility, availability and usage of financial services by members of any economy. In this section of the research various measures of financial inclusion are analyzed and one measure is selected for current study. Honohan (2007) started this process of construction of index for financial inclusion by conducting a survey of 160 countries. In that study only one dimension named as "access to financial services" was employed to measure the banking sector provision of financial services. There were still some flaws that put limits on usage of this method as an index of financial inclusion. Moreover, this method could not predicting true results of financial inclusion when there were multiple dimensions and indicators available in data bank. There are two broad approaches parametric and non-parametric are adopted by authors for measurement of index of financial inclusion. Non parametric approach usually assign a pre decided or exogenous weight based on researcher's willingness and intuition. There is empirical evidence that indices are sensitive to subjective weight assignments, since a slight change in weight can alter the results dramatically (Lockwood 2004). Parametric approach assign weight endogenously and it shows that there is strong correlation between indices exist. They used PCA (Principle Component Analysis) approach for their research to construct multidimensional index of financial inclusion. After that, Sarma (2008) examined the shortcomings that exist in previous studies like Honohan (2007) and others. Sarma try to measure financial inclusion through various banking sector indicators by creating different dimensions of financial inclusion. This research study is one of the major contributions in

development of index of financial inclusion. Later on all other studies like Honohan (2009), Pais and Sarma (2012), Park and Mercedo (2014) and Gung and Van (2017) based their index of financial inclusion on this study. First paper defines financial inclusion and method for development of an index of financial inclusion presented. Sarma based his study on well-known indexes like HDI, HPI and GDI. Several banking sector indicators like Number of ATM, Bank Accounts, Bank Branches and private sector loan to GDP ratio were categorized in accordance with three dimensions usage, access and availability. Access defines the geographical outreach of financial services; availability indicates the provision of financial services and usage dimension shows the demand for financial services like private sector credit to GDP ratio. This well-known index is completed by compiling data of 55 countries for the year 2004 for above mentioned dimensions. On empirical evidence countries were categorized as high, medium and low financially included economies. After that (Sarma, July 2012) modified her study on index of financial inclusion by making it more efficient and valuable through assigning different weights depending on the importance of the dimensions. The purpose of this study was to develop more efficient index to measure IFI values in Asian region. Sarma attempted to measure index of financial inclusion via three dimensions "usage, access, availability" with various indicators as a proxy measure for each dimension. He further mentioned that each indicator varies over economies and time and single indicators is not an enough aspect to measure financial inclusion, there should be a multidimensional index that must cover more than one dimension. Methodology of this study for constructing index of financial inclusion is similar to HDI and HPI employed by UNDP in their studies.

On the basis of above discussion, this study employed a combination of two approaches named as Sarma & Pais (2011) & Park & Mercedo (2015) for index of financial inclusion. This technique makes it comparatively more useful and effective as it covers maximum possible economies of the Asian region. In developing countries, financial inclusion is at initial stages and evolving our time that put constraints on selection of dimensions. Moreover, data sources are not well developed in these economies except few countries in the region. There is a bundle of indicators in each dimensions are available at Financial Access Survey (FAS) supported by IMF and Financial Global Findex sponsored by World Bank, But data for all economies against each indicator is not available which put limits on selection process of indicators. Moreover, In developing economies and particularly

in Asian developing region large data banks are unavailable because there are significant number of hurdles in data collection such; funds shortage, storage issues, lack of interest, lack of basic necessities and security issues etc. After analyzing all these issues this study adopted only those indicators which are most commonly used by researchers for measuring financial inclusion and data for selected time period and nominated economies of the Asian region available. This study employed these two dimensions (availability and usage) and four indicators; as two indicators for each dimension.

1. Number of commercial bank branches per 100,000 adults.

2. Number of ATM per 100,000 adults.

3. Outstanding loans from commercial banks (% of GDP)

4. Outstanding deposits with commercial banks (% of GDP)

Above mentioned financial indicators were used to develop index of financial inclusion, first two indicators indicates the disposal of financial services while last two shows the usage of financial services. These dimensions are chosen in conformity with the financial theories discussed in literature to formulate the IFI and availability of dataset of banking sector indicators for concerned years (see Kim 2016). IFI is our mainstream explanatory variable to analyze the influence of financial inclusion on GDP per capita. Supply side financial sector indicators incorporated in present study are explained as under:

4.2.1.1 Number of Commercial Bank Branches per 100,000 adults (NCBB)

There are many indicators available to represent the supply of financial services but we are concerned with only most widely used and easily accessible indicators for selected economies. Number of commercial bank branches per 100,000 adults is one of the most demanded variables that are easily available for concerned years.

Sarma (2008) employed number of commercial bank branches per 100,000 adults as a supply side indicator to measure the penetration of banking sector in financial inclusion.

4.2.1.2 Number of ATM's per 100,000 adults (NATM)

Numbers of ATM's consider being very important part of overall supply side of financial inclusion. ATM cards or debit cards are an easiest way to withdraw your money from banks and it save cost and time as well for both stakeholders. Number of ATM's provides us a brief view of availability of financial services by formal financial sector and moreover, it is accessible in remote areas where branches are not located to meat financial needs of the people. Automated Teller Machines removes the time limit of money withdrawal and increase liquidity in the economy. Nguyen (2020) employed this indicator to formulize the financial inclusion index for growing countries. In earlier literature, Pais et.al (2012) utilized same indicator for measuring banking sector penetration in various developing economies of the world.

Demand side indicators that influence financial inclusion are explained as follow:

4.2.1.3 Outstanding deposits with commercial banks (% of GDP) (ODCB)

This variable is used as indicator to measure the demand side effects of financial services. Outstanding deposit through lights on the usage of financial services and it depicts the level of trust for financial institutions. More deposits are encouraged when there is high level of trust of public on formal financial sector. Outstanding deposits with commercial bank (ODCB) as a percentage of GDP ensures that if there is high percentage of outstanding deposits exist it means there would be a higher proportion of financial services and thus a greater extent of economic growth as well. Camara and Tuesta (2014) adopted same variables in their PCA (Principal Component Analyses) method as a usage dimension to estimate the index of financial inclusion. Demirguc-kunt et al. (2014) employed ODCB as a ratio to GDP as demand side indicator in constructing multidimensional index with different name in his working paper of World Bank research group.

4.2.1.4 Outstanding loans from commercial banks (% of GDP) (OLCB)

This variable is one of the basic components to assess the true picture of usage of financial services. Outstanding loan with commercial banks as a percentage of GDP explain that how much amount is owned by private and public sector from commercial banks. These two indicators indicate the usage dimension of financial services, other indicators like number

of debit cards, credit cards, ATM transaction also indicate the usage/demand of financial services but all these indicators require a basic need of bank account which is related with outstanding deposit and outstanding loan that serves the objective of measuring demand for financial services. Moreover, pre-existing studies as well utilized these indicators for demand side indication which makes comparative analysis of this study easier and effective. There are several other indicators and dimensions that can be employed to determine the deep analyses of financial inclusion but due to limited availability of data set for selected economies and concerned years we have to confine our study up to above mentioned indicators and dimensions. First step in index calculation is construction of dimensions; Sarma (2008) presented a formula on the basis of Inverse Euclidian distance technique to measure financial inclusion.

$$d_i = \frac{A_i - m_i}{M_i - m_i}, \quad i = 1,2,3$$

Ai = Actual value of dimension

mi = Minimum value of the Dimension

Mi = Maximum value of the dimension

After analyzing framework for Dimension index (di) as per above mentioned formula, this section provide details concerning computation of Index for financial inclusion. In this analysis only two commonly used dimensions are incorporated. Availability dimension covers supply side of financial services which is measured through various indicators i.e. ATM per 100,000 adults, number of deposit account per 100,000 adults, number of mobile accounts per 100,000 adults, number of bank branches per 1000Km square area, credit/debit cards issued per 1000 accounts/adults, etc but this study incorporates only two indicators mentioned earlier as data availability put limitations on selection of indicators for selected Asian economies. Whereas, usage dimensions is expound via two indicators named as OLCB (% of GDP) and ODCB (% of GDP) which encompasses demand side of the financial inclusion. As number of dimensions and indicators are increased there is less number of Asian countries left on the board to engage the diversity of financial inclusion, which is one of the reason for selecting

only two dimensions. As per formula there are only two dimensions so, (di = d1, d2) if there are n number of dimension in the model than di varies from 1 to n (di = d1, d2, d3… dn).

$$IFI_i = 1 - \frac{\sqrt{(1-d_1)^2+(1-d_2)^2\,(1-d_3)^2+(1-d4)^2}}{\sqrt{4}} \quad \text{…Eq 4.4}$$

IFI values lies between zero and one, if it is zero or near zero it shows lower level of financial inclusion for that specific country. If IFI value is lies near 1 it indicates a higher level of financial inclusion for that particular country. Lower value of IFI index means high level of exclusion and higher value of IFI means lower level of financial exclusion. After computing index for financial inclusion next section deals with all variables in details included in the model.

4.2.2 Variables

In order to assess the link between financial inclusion and economic progress along with other macroeconomic variables many studies have used different variables with different time periods. Some studies have primary data or survey based studies and other employed existing data or secondary data sources to examine the impact of financial inclusion. As far as this study is concerned, it has used the later type of data by taking GDP per Capita on dependent side and index of financial inclusion (calculated separately) along with all other concerned macroeconomic variables on independent side.

4.2.2.1 Gross Domestic Product per Capita (GDPPC)

GDP growth rate is commonly used for projection of economic growth but our study employed per capita GDP instead of GDP growth rate as it depicts a different population size across countries selected for research agenda and reduce an expected issue of heterogeneity. GDP per Capita general derived from GDP and Population, Total GDP divided by total population indicates the true value of GDP per Capita. GDP per capita gives a specific information about population size and quality of living standard, as it gives an average share of each resident in national income. However, it does not include depreciation over time and depletion in fixed assets. Kim, Yu, and Hassan (2018) employed same variable as a dependent variable in their study and before this in earlier literature Hajilee, Stringer and Metghalchi

(2017) adopted per Capita GDP as explained side variable to formulize the role of financial inclusion.

4.2.3 Macro-economic Control variables

There are several macroeconomic variables that affect the economic growth and thus enhance economic development. It's not possible for this study to discuss each and every macroeconomic variable but only most effected and widely used variables will be included to present their impact on per capita GDP because our main objective is to check relationship between financial inclusion and economic growth. Control variables are chosen on the basis of pre-existing studies conducting by various authors on the basis of their importance and influence on financial inclusion and economic growth. Details regarding selected control macro-economic variables are given in theoretical literature in previous chapter. Macro-economic variables which are incorporated in this study are explained below.

4.2.3.1 Net Trade in Goods and Services (NT)

International trade includes imports and exports of goods and services. In this study net trade is taken as independent variable. Net Trade is calculated by offsetting imports from exports. Exports are defined as an outward movement of goods and services from manufacturer or home country to ultimate user or value additive country. Whereas, Imports of goods and services include all inward movement of goods and services against a credit or cash payment for domestic use or value addition. The balance of exports and imports called balance of trade.

4.2.3.2 Gross Capital Formation (GCF)

Gross capital formation provides us a deep analysis about capital produced during a specific time period usually a year. It includes expenditures of an economy on fixed assets and net change in inventories. Fixed assets cover all sorts of outlays on infrastructure (railway, road, dams, commercial and public buildings etc.), plant and machinery, land improvements and equipment purchased. Inventories/stock consists of material or finished goods held by firms for unexpected demand and temporary shift in supply due to natural disasters. Gross capital formation consists of investments in long term or fixed assets such as; Infrastructure, Telecommunication, Motorways, Highways, Buildings, Dams and other established assets. It

also includes formation of new factories, plants, machinery and equipment for further exploration and production of goods and services. All sort of financial investment, stock/inventories and replacement cost/deprecation as well lies under the head of GCF. Finished goods or supply in hands and work in process supplies as well counted for capital goods. Gross capital formation for this research study is in accordance with the US dollars 2010. Hong van, Nguyen et al. (2019) employed Gross Capital Formation as a control variable in their study of "Financial Inclusion and Economic Growth: An International Evidence" to investigate its impact on economic growth.

4.2.3.3 Labor Force

Labor force is that part of population that is willing and able to work at current wage rate. In includes that portion of population that actively participate in production activities along with all those workers who are looking for job and willing to participate in production of goods and services. Labor force as well includes seasonally or naturally unemployed people who are seeking for paid tasks as per their acquired skills and expertise. The term workforce as well employed as labor force. Labor pool does not include people who are able to work but not interested in production activities as per ongoing incentives for their services. Banerjee et al. (2019) employed labor force as an indicator under development outcomes to find its relation with financial inclusion and economic growth.

4.2.3.4 Foreign Direct Investment (FDI)

Foreign Direct Investment includes all sort of cross boarder investments for profit motive along with controlling authority in firm's resident country. It introduces new technologies and technical knowledge in host countries along with work opportunities for domestic residents. Host countries get benefits inform of direct and indirect taxes along with contribution in exports and reduction in unemployment. On the other hand, originator economies of FDI enjoy a handsome profit and monopoly into some extent in over the borders. Net FDI is assessed through difference of outflow and inflow of FDI. It can be formulated in existing stock of capital in host country or it may be established as a new entry into the financial market. Data are in current U.S. dollars". This study has taken absolute amount of FDI inflows in US dollars to see its role in development. Audi and Khalil et al.

(2019) utilized FDI as a percentage of GDP in their study of cross countries analyses for south Asian to measure the human wellbeing and economic expansion in these economies.

4.2.3.5 Human Capital (HC)

There are various variables available which are used as a proxy to human capital like adults literacy rate, average years of schooling, secondary school enrolment etc. In this study we employed secondary school enrolment as a proxy measure to human Capital employed as control variable in regression estimation. SSE includes the population above age of 16 years with working capabilities. Generally human capital consists of technical knowledge, professional skills, job expertise, trainings etc possessed by any individual working in any organization or firm. Drazen (1990) and Romar (1990) used adult literacy rate as a proxy to human capital in their studies respectively. Later on Mankiw et al. (1992) and Barro (1991) used various school enrolment ratios in their studies as a human capital measure. Hong van and Nguyen et al. (2019) used human capital in their study along with other macroeconomic variables.

Table 4.2: Brief Description of all variables

Name of Variable	Abbreviation	Definition	Data Source
Dependent variable			
GDP Per Capita	Y	GDP per capita includes the share of each resident of any country in GDP. GDP per capita is obtained by dividing the population to GDP.	WDI
Independent Variable			
Index of Financial Inclusion	IFI	Index of financial inclusion is an indicator to assess the magnitude of financial services in an economy. It is derived from a combination of banking sector indicators.	FAS
Physical Capital	K	Physical capital means all those capital goods which are used to make further goods, it consist of machinery, buildings, and other infrastructure.	WDI
Labor force	L	Labor force consists of individuals who are able to work at and interested to work at current wage rate.	WDI
Trade	T	Trade indicates all imports and exports of visible and non-visible goods and services.	WDI
Foreign Direct Investment	FDI	FDI includes all sort of direct investment into business projects at cross border for profit motive	WDI
Human Capital	HC	Human Capital consists of professional knowledge, technical skills, and trainings obtained by Individuals of any country.	WDI

4.3 ANALYTICAL FRAMEWORK

For the empirical analysis, researchers have developed various estimation methodologies and techniques to analyse the correlation among macro-economic variables in panel data setting. In this section of the study we are interested to evaluate the analytical framework of financial incorporation along with other macro-economic variables of selected emerging Asian economies.

4.3.1 Diagnostic Tests for Panel Time Series Data

The study used different diagnostic tests to check stationarity, co-integration and other effects of the data. As far as, this study is concerned it employed following series of diagnostic tests for estimation.

4.3.1.1 Stationarity of Panel Series

Stationarity plays pivotal role in forecasting process and it is considered as prime notion in time series analysis. Stationarity of data assumes that mean, variance and autocorrelation remains constant overtime (Phillips & Shin 1992). Non-stationarity of data makes results spurious and forecasting process shaky. There is possibility that some panel series is stationary at level and others are at first difference and some may go beyond it. To checking whether data is stationary, one can apply unit root tests.

4.3.1.1.1 Panel Unit Root Tests

There are number of unit root tests available to incorporate the stationarity of a panel series. Panel unit root tests are categorized in two broad classifications, first generation and second generation tests. First Generation tests were formulized by Levin and Lin (1992), Im *et al.* (1997), Maddala and Wu (1999), Choi (2001) and Hadri (2000). These tests are also known as LL (later it became LLC after the combination of Levin, Lin and Choi), IPS (Im, Pesaran and Shin), MW (Maddala and Wu), Choi and Hadri tests respectively. Moreover, according to Asteriou and Hall (2015), these tests are in accordance with the assumption that cross sections are independent of each other. However, in this study under unit root test Levin Lin and Chu (LLC) along with PP Fisher Chi-Square and IM, Pesaran and Shin (IPS) tests are

employed. Augmented dickey fuller (ADF) test is one of the basic and commonly adopted test to check stationarity in time series data. It belongs to a series of unit root test. This test is mostly used for large sample size and it involved null and alternate hypothesis testing. Here, p-value is observed to check significance that a given data series is stationary or not. ADF is an extended version of dickey fuller test, it incorporates basic equation along with differences to check stationarity in the data.

4.3.1.1.2 Levin Lin and Chu (LLC) (2002) Unit Root Test

This panel unit root test is developed by Levin, Lin and Chu in 2002 to measure the stationarity process in a given series of variable. This test adopts AR (1) process along with trend and same coefficients. It is based on Cross Sectional independent series of test to check the stationarity process in the data.

4.3.1.1.3 Im, Pesaran and Shin (IPS) Unit Root Test

This test was developed by Im, Pesaran and Shin (1997). It is implied for common time effects, individual effects and time trends. It is based on mean of Augmented Dickey Fuller ADF t statistics of each unit in panel. IPS test assumes complete series as non-stationary. This test introduces lag of dependent variables to deal with the serial correlation. Later, same test was reintroduced with some changes as second generation test in 2007 CIPS.

4.3.1.2 Co-Integration

Co-integration is an approach employed to examine the long term correlation between time series processes for a specified period of time. Previously linear regression approach was used to find out relationship among various times series, but Granger & Newbold (1986) argued that this process of identifying relationship in time series data produce spurious correlation. A spurious correlation may cause misleading results in econometric literature as time series processes may be correlated due to any other factor or coincidently. Later on, R. Engle & C. Granger (1987) presented the concept of co-integration to check the association among time series data. In panel data setting Pedroni (Engle Granger Based) co-integration test, Kao (Engle Granger) co-integration test and Fisher (Combined Johansen) test are commonly used panel co-integration test. In our study following co-integration test is implied.

4.3.1.2.1 Pedroni Co-integration test

Pedroni presented this test in 1999. It is based on Engle Granger co-integration test to check long run connection among variables. Null hypothesis (H_0) presents the non-existence of co-integration in the selected series, whereas alternate hypothesis ($H_{1)}$ presents an existence of co-integration in the model. If there is long run association in the series of variable then we can successfully reject the null hypothesis ($H_{0)}$ by concluding that there is co-integration in the model.

H_0 = No Co-integration exist Null Hypothesis

H_1 = Co-integration exists Alternate Hypothesis

4.4 Random effect and Fixed effect Models

Hausman test was introduced by Hausman (1978) to identify the true form of the model and avoid misspecification in regression analysis. This test is adopted to identify the model specification between random effect and fixed effect models. Random effect model is employed under the null hypothesis while alternate hypothesis defines the fixed effect model. In this test p-value is a basic determinant for deciding between fixed effect and random effect models, if p-value is significant than reject null hypothesis and if p-value is insignificant than reject alternate hypothesis. But in some cases like Chmelarova (2007) null hypothesis stipulate the fixed effect model and alternate hypothesis shows random effects.

4.5 Estimation Methodology

After analysing various diagnostic tests for panel data setting in pervious section, this section will discuss the estimation technique employed to regress the equation of the suggested model. Using panel data has some advantage over other type of data usage as explained by Hsiao (2007). Panel data make inferences precise and give significant results by using more degrees of freedom as compare to cross section data or time series data. As compared to other data series here problem of multi-collinearity is very less. Panel data resolves many econometric problems by default like heterogeneity among cross sections and incorporation of the impact of omitted variables. These also help to explore the dynamics

which are present in the data and to compare different cross sectional units. Complex calculations are done easily with the panel data. Here determination of normality and stationary of data is easy and also identification of model. There are number of estimation methodologies formulized over time for panel data series which have been incorporated in pre-existing literature for financial analysis such as; pooled regression, fixed effect and random effect models. The limitations of these approaches have provoked researchers to evolve and use other relevant and reliable econometric techniques of estimation. S. Hansen (1982) introduced Generalized method of moment technique to find out long term relationship among macroeconomic variables. It deals with hetrosekdasticity and autocorrelation issues in a better way. Later, Blundell & Bond (1998) evolved Generalized Method of Moment (GMM) approach with modifications in econometric models, for time series data, in macro econometrics literature. H.Von & T.Nugyan (2019) employed system GMM techniques for their analysis along with fixed effect estimator and correct its small T bias through Pozzi (2007) approach which is an extended technique of Nickell (1981). F.Adil & A.Jalil (2020) adopted ARDL approach introduced by Pesaran et al. (2001) for their study on supply side literature of financial inclusion. Moreover, comparative analysis across various studies carried out earlier and this study is easier and effective as pre-existing studies carried a GMM technique to establish a relation between financial inclusion and economic growth. Van and Vo (2019) estimated the model regarding financial inclusion with system GMM to analyse the relationship between financial inclusion and economic growth.

As mentioned earlier, theoretical model for this study is based on Solow-Swan growth theory introduced in 1956. This study enhanced the Solow's work on economic growth by employing financial capital along with physical capital and other macroeconomic variables as discussed earlier in equation (3) of theoretical modelling. Cobb-Douglas production function was adopted to solve it for aggregate supply.

$$Y = Af\ (K, L) \qquad \text{...Eq 4.5}$$

We take Cobb Douglas form to solve it further to withdraw the final estimated equation.

$$Y = Af(\ K^{\alpha}L^{1-\alpha}) \qquad \text{... Eq 4.6}$$

$$ln\ y = lnA + \ \propto lnK + (1-\propto)lnL \qquad \text{... Eq 4.7}$$

$$\frac{d(lnY)}{dt} = \frac{\mathrm{d}(lnA)}{dt} + \frac{\mathrm{d}(\alpha lnK)}{dt} + \frac{\mathrm{d}(1\text{-}\alpha) lnL}{dt} \quad \text{... Eq 4.8}$$

$$\frac{1}{y}.\frac{dy}{dt} = \frac{1}{A}.\frac{dA}{dt} + \frac{\alpha}{K}.\frac{dk}{dt} + \frac{1\text{-}\alpha}{L}.\frac{dl}{dt} \quad \text{... Eq 4.9}$$

$$\frac{y^{\cdot}}{y} = \frac{A^{\cdot}}{A} + \frac{\alpha k^{\cdot}}{k} + \frac{(1\text{-}\alpha) l^{\cdot}}{l} \quad \text{...Eq 4.10}$$

After solving these equations we get the growth rates of the variables which are further employed in the subsequent equations as under.

$$\boldsymbol{Y = A\ f\ (k,\ l)} \quad \text{...Eq 4.11}$$

To find out the outcomes of financial inclusion in economic growth for emerging Asian economies of the world, following econometric form of the model is suggested.

$$\boldsymbol{y = \alpha + \beta_1 IFI_{it} + \beta_2 K_{it} + \beta_3 L_{it} + \beta_4 T_{it} + \beta_5 FDI_{it} + \beta_6 HC_{it} + Eit} \quad \text{...Eq 4.12}$$

While incorporating all properties of data with interpretation this model employed log form of the equation which is mentioned below:

$$\boldsymbol{lnY = \alpha + \beta_1 lnIFI_{it} + \beta_2 lnK_{it} + \beta_3 lnL_{it} + \beta_4 lnT_{it} + \beta_5 lnFDI_{it} + \beta_6 lnHC_{it} + Eit} \text{ ...Eq 4.13}$$

Equation 4.13 is our concerned equation to estimate the impact of financial inclusion on economic growth in emerging Asian economies. In above equation t represents time which varies from 2005 – 2019 and i shows cross sections (10 emerging developing Asian countries). There are various instrumental variables included in the estimation methodology required by GMM technique. Lag of independent variables along with first lag of dependent variable included as instrumental variable in the estimation process to deal with the dynamic effects of the model.

4.6 CONCLUSION

This chapter of the study analyzed the detailed version of research methodology being adopted for this research study. There were various tests for data stationarity like unit root and others were employed along with co-integration tests to measure the long term and short term relationships. Moreover nominated variables for this study were discussed in details along with time period selected for regression analysis. In last section of the study suitable econometric techniques were discussed for evaluation of the data and generalized method of moment was taken as measure to regress the data for emerging Asian economies.

CHAPTER 5

EMPIRICAL FINDINGS AND RESULT DISCUSSION

Empirical findings include the results of various stationarity test applied along with co-integration and regression analysis. It also includes a comprehensive discussion about Index findings regarding financial inclusion and classification of selected economies on the basis of financial services. In first phase of this chapter diagnostic of different stationarity tests are discussed and their results are summarized in tables. Second phase consist of findings of Index of financial inclusion and remarks about level of financial independence in selected economies of Asian region. In this phase concerned economies are categorized on the basis of financial inclusion index. Moreover, it consist of country wise discussion of index along with values of indicators employed in construction of index for financial inclusion and summarizes the casual relationship among selected economies regarding level of financial inclusion and comparison of these economies on the basis of Index of financial inclusion. Third and last phase deals with the estimation results of this study. In this study Generalized Method of Moment used as an estimation methodology to deal with panel data. System Generalized Method of Moment employed to deal with the panel analysis for fifteen years of data and ten economies.

5.1 Results of Panel Unit Root Test

In continuation of previous chapters, this chapter deals with the empirical findings of panel GMM estimation technique and also interpretation of results obtained by employing unit root test to check stationarity in data and casual relation among variables as mentioned earlier in research methodology chapter. To verify that whether data is non – stationary and following the assumption of cross sectional independence Im, Pesaran Shin (IPS) unit root test applied which belongs to first Generation panel unit root tests. Just for the sake of comparison and testing the above assertion, Levin, Lin and Chu (LLC) unit test, and PP Fisher Chi-Square unit root test as well applied which belongs to First Generation panel unit root tests and is based on the assumption of cross – sectional independence. These tests are sensitive to lag

length selection and results may vary with respect to lags. So due to this reason results with different lags are presented in table below.

Table 5.1 Levin, Lin and Chu (LLC) Unit Root test

Variables	Levin, Lin and Chu Unit Root test Probability Values	
	Level*	**1st Diff****
Index of Financial Inclusion	0.000	0.360
Labor Force	0.0138	0.009
Secondary School Enrollment	0.000	0.000
Trade	0.084	0.000
Foreign Direct Investment	0.001	0.000
Gross Capital Formation	0.068	0.000

*****Represents Lag (0) and ** Represents Lag (1)

Table 5.1 contains results of first panel unit root test (p-values), applied on selected variables for regression analysis. Levin, Lin and Chu summarized that Index of Financial Inclusion and Secondary School Enrolment are stationary at level (Lag 0), whereas Labour Force, Trade, FDI and Gross Capital Formation are integrated at lag (1) for stationarity purpose.

Table 5.2 Im, Pesaran and Shin (IPS) Unit Root test

Variables	Im, Pesaran and Shin Unit Root test Probability Values	
	Level*	**1st Diff****
Index of Financial Inclusion	0.278	0.073
Labor Force	0.884	0.171
Secondary School Enrollment	0.227	0.000
Trade	0.597	0.000
Foreign Direct Investment	0.007	0.000
Gross Capital Formation	0.349	0.000

*****Represents Lag (0) and ** Represents Lag (1)

Table 5.2 summarized the results of seconds unit root test applied on chosen variables for current research study. Im, Pesaran and Shin (IPS) test indicated that IFI and Labor force

are not stationary at level, than they are integrated at Lag (1) but still remains non stationary. SSE, Trade and GCF are non-stationary at level (Lag 0), whereas, these all are stationary at first difference. Foreign Direct Investment (FDI) is stationary at level and at first difference.

Table 5.3 PP Fisher Chi-Square Unit Root test

Variables	PP Fisher Chi-Square Unit Root test Probability Values	
	Level*	**1st Diff****
Index of Financial Inclusion	0.429	0.000
Labor Force	0.000	0.007
Secondary School Enrollment	0.007	0.000
Trade	0.504	0.000
Foreign Direct Investment	0.000	0.000
Gross Capital Formation	0.371	0.000

***Represents Lag (0) and ** Represents Lag (1)

Table 5.3 included the results of PP Fisher Chi Square unit root test implemented on independent variables of this study. PPF – test mentioned that IFI, Trade and GCF are non-stationary at level (Lag 0), whereas Labour Force, FDI and SSE are stationary at level. On the other hand, PPF Chi-Square concluded that all these variables are stationary at first difference.

5.2 Results of Random Effect and Fixed Effect Models

Hausman test is employed to analyse the fixed effect and random effect models to avoid misspecification in the model. It detects endogenous variables in the regression analysis. Hausman test is utilized to choose between fixed effect and random effect model. Null hypothesis means preferred model is random effect model while alternate hypothesis means chosen model is fixed effects. Following table includes the results of random effect and fixed effect model along with chi-square and probability values.

Table 5.4 Results of Hausman Test

Dependent Variable: GDP Per Capita			
Independent Variables	**Fixed Effect Models**	**Random Effect Models**	
Index of Financial Inclusion	0.3818	0.4196	
Labor Force	0.8844	-0.0429	
Secondary School Enrolment	1.4458	1.7958	
Trade	0.0009	0.0008	
Foreign Direct Investment	0.0553	0.0731	
Gross Capital Formation	0.1858	0.3285	
Diagnostics			
X^2 Statistics	32.63	**Probability**	0.0000

5.3 Co-Integration

There are various co-integration tests available for time series and panel data series as few of them are mentioned in the chapter of research methodology. In this study, Pedroni co-integration test is adopted to check long run association among variables.

Table 5.5 Pedroni Co-Integration Test

Pedroni Co-Integration Test				
	Statistic	**Probability**	**Weighted Statistic**	**Probability**
Panel v-Statistic	0.047914	0.4809	-2.368404	0.9911
Panel rho-Statistic	4.286979	1.0000	4.649395	1.0000
Panel PP-Statistic	-4.518163	0.0000	-3.455781	0.0003
Panel ADF-Statistic	-3.684051	0.0001	-2.521617	0.0058
Group rho-Statistic	5.585527	1.0000		
Group PP-Statistic	-7.528297	0.0000		
Group ADF-Statistic	-5.878226	0.0000		

Table 5.5 summarized the results of Pedroni (Engle Granger) based co-integration test applied on the series of variables employed in the regression analysis. In our study, Pedroni co-integration test is applied to check co-integration. It can observe that six out of eleven (6/11) probability values are significant which indicates that there is co-integration in the series and null hypothesis ($H_{0)}$ can be rejected successfully. These outcomes concluded that there is long run relationship among variables.

Table 5.6 Data Statistics Description

Variables	Mean	Median	Maximum	Minimum	S.Dev	Observation
Index of Financial Inclusion	0.52	0.57	0.76	0.21	0.17	150
Labor Force	17.82	17.66	20.48	14.65	1.53	150
Secondary School Enrolment	4.32	4.4	4.79	3.244	0.32	150
Trade	24.08	24.03	26.6	20.59	1.14	150
Foreign Direct Investment	23.11	22.96	26.39	18.55	0.16	150
Gross Capital Formation	3.3	3.31	3.84	2.64	0.28	150

Table 5.6 depicts all data statistics that includes the mean, median, minimum and maximum values along with standard deviation and number of observations in each and every independent variable included in regression analysis. IFI consist of an index that represents financial inclusion and derived from combination of banking sector financial indicators while remaining macro-economic variables were used as control variables in the analysis. This study employed fifteen years data for ten emerging Asian economies.

5.4 Financial inclusion and Economic Growth

In this section of the study, results of core findings of the study is discussed .For this purpose, in this study Generalized method of moment is used as an estimation methodology in panel data setting. There are ten cross section and fifteen years of data considered for this research analysis. The influence of financial inclusion is observed through newly built index of financial inclusion on economic growth. Various other variables like; Foreign direct investment, Gross Capital formation, Trade, Labor Force, Human capital included as a control variables to check their impact on GDP Per capita along with financial inclusion. Following table summarizes the results of regression analysis in details.

Result of Regression analysis

Variables	Coefficient	t-statistics	Probability
Index of Financial Inclusion	0.455	2.74**	0.006
Labor Force	-0.603	-11.45*	0.000
Secondary School Enrolment	0.890	4.45	0.000
Trade	0.494	5.44	0.000
Gross Capital Formation	0.622	1.65***	0.099
Foreign Direct Investment	0.072	0.74	0.460
R – Squared	0.845		
Adjusted – R^2	0.839		

*, **, *** In the table indicates significance at 1%, 5% and 10% level of significance respectively.

The index values computed from financial sector indicators of financial inclusion indicated that IFI effects positively and prominently to economic growth measured in GDP per capita. As mentioned earlier all these variables are in log form which indicates a percent change in one variable's impact on other variable. Financial inclusion is positively related with economic growth as one percent rise in financial inclusion brings about 0.45% increase in GDP per capita and t values are greater than 2 which represents that it is significant at 5%

level of significance, same as probability value as well indicate the significance level. Thus it can be concluded that a rise in availability of financial services provided by banking sector in terms of bank accounts, bank branches, deposit services, credit services etc. has positive effects on growth of any economy and enhance the level of living standards for common man. These results are similar to research study of Van and Vo (2019) who found that financial inclusion positively and significantly effects the economic growth. In another study, Williams (2017) measured the role of financial inclusion in economic growth and found the similar results of financial inclusion that different indicators of financial sector positively affect the economic growth in developing economies. Whereas, Sulong et.al (2018) analyzed the elements of financial inclusion and concluded that it's not always necessary that financial inclusion positively effects the economic growth. There are multiple factors such as; poor economic policies, Bad governance, instable economies, ineffective institutions negatively affect the economic growth. Coefficient of labor force is significant but negative, that indicates that any rise in labor force has negative effects on GDP per capita in selected developing economies. In this study, emerging economies those are most likely developing economies are discussed which consists of labor abundant countries. In these economies any rise in labor causes increase in unemployment thus negative effect on GDP per capita. Moreover, the magnitude of population in selected economies is almost half of the world's population that as well contributes negatively to the GDP per capita, even more lack of professional skills, and lack of familiarity with latest technology as compare to developed world as well affect inversely to economic growth. If a rise in population is greater than rise in national income it contributes adversely to the living standard and GDP per capita. Banerjee et.al (2020) analyzed the development outcomes and financial inclusion. They found a positive relationship of labor force participation with economic development and financial inclusion. Secondary School Education (SSE) used as proxy for Human capital in the model which has positive and significant effects on GDP per capita, a one percent rise in secondary level of school education contributes 0.9% rise in GDP per capita. Our results for Human capital coincide with Arora(2015) who found a positive association between Human capital and economic growth, while Kuri and Laha (2017) analyzed linkage between human development and economic development and concluded that it's a two way process and both these variables mutually determine the each other. Trade is one of the most pivotal elements

that contribute in growth of any country but it depends on the share of exports and imports in balance of payment. In this research analysis, net trade of goods and services used as a variable to measure impact on GDP per capita. Trade in this come up with significant and positive role in the model, a one percent rise in the trade of selected economies gives 0.5% rise in the economic growth. Our results are similar to Bajwa and Siddique (2008), in that study effect of trade openness is determined on economic countries for south Asian economies. They found that trade contributes positively and significantly in growth of south Asian economies. In another study, Bakari (2019) analyzed the role of trade openness, domestic investment and FDI on economic growth. The results obtained from this study concluded that exports and FDI were negatively effecting the economic growth, whereas imports were not having any significant effects on growth. Gross capital formation (GCF) includes capital products like all sort of fixed assets and change in investment inventories. In this model, GCF has positive and favorable impact on economic growth measured in GDP per capita. A 1% increase in gross capital formation effect economic growth by 0.6% means that every 3% rise in capital stock brings almost 2% upward movement in economic growth of emerging Asian economies. As mentioned earlier, in this study capital is divided into two categories financial capital and physical capital. Financial capital measured inform of financial inclusion while gross capital formation consist of physical stock of capital. Our results regarding GCF are similar to Shahid (2014) findings, which concluded a positive linkage among economic growth, gross capital formation and labor force. Sajeewani & Perera (2019) determined the impact of various factors such as; interest margin, credit facilities, total debt services, broad money on economic growth. They found that interest margin and broad money were positively influencing the growth whereas, credit facilities to domestic sector and total debt service were not having any influence on economic growth. FDI has insignificant and positive effects on GDP per capita in this model, but magnitude of coefficient for FDI is insignificant. Moreover t statistic and probability values as well insignificant. Bakari (2019) investigated the effect of FDI, Trade openness and domestic investment on economic growth. The results of this study concluded that FDI and exports were negatively related with economic growth in south Asian economies. R – Square indicates the goodness of fit of model, in our study R square and Adjusted R – Square are significant which explains that a greater extent of changes in dependent variable is incorporated through independent variables.

In this study GDP per capita included instead of GDP to measure the economic growth. Most of the studies implied GDP as growth measure but GDP per capita provides great details about difference in population size and accommodate with real pictures of income distribution and living standard of the residents. Thus, it reduces the potential question of heterogeneity in the cross sections. Moreover, numerous authors implied GDP per capita as growth measure in their studies such as Kim, Yu and Hassan (2018) and Vo et al. (2019).

5.5 Index of Financial Inclusion

As mentioned in earlier chapters, Index of financial inclusion represents the comprehensive placement of financial services by incorporating multiple dimensions and indicators. There is various numbers of indicators available to compute the index, but data of all these indicators for concerned years of study and economies is nonexistent which makes it more challenging and allows only prime dimensions and foremost indicators to be incorporated. Sarma (2008) incorporated three dimensions (Banking Penetration, Usage, Accessibility) in her first and foremost study to deal with the financial inclusion index. Nguyen (2018) incorporated four different indicators to measure the index of financial inclusion by following footstep of Sarma's Index. Later on Van et al. (2019) included two dimensions (Usage and Availability) and three indicators on the basis of three years average data for eleven years from 2004 – 2015 in four equal sets were incorporated in research study. Second foremost objective of this study was to categorize the selected economies on the basis of index of financial inclusion to compare the standings of financial services in these countries. For this purpose, in this study four indicators were included to compute index of financial inclusion named as Bank Branches per 100,000 Adults, ATM per 100,000 Adults, ODCB as % GDP and OLCB as % GDP. The two former indicators indicate the availability of financial services and hence considered as supply side of financial inclusion while later two indicate the usage dimension of financial services and taken as demand side of financial inclusion. There are few other dimensions such as; banking penetration, accessibility and affordability, but availability of data for only few economies makes it difficult for researchers to incorporate them for research analysis.

5.5.1 Country wise Index Construction and Discussion

Following section of the study incorporates the country wise details of each indicator chosen for index construction along with values of index of financial inclusion for the fifteen years staring from 2005 and ended up at 2019.

Table 5.7 Index of Financial Inclusion for Bangladesh

Year	NBB*	NATM**	OSD***	OSL****	Index of Financial Inclusion
2005	1.9559	1.6013	3.6192	3.4240	0.2974
2006	1.9602	1.0375	3.6682	3.4664	0.2186
2007	1.9650	0.6698	3.6856	3.4384	0.2337
2008	1.9718	0.1703	3.7258	3.5019	0.2657
2009	2.0015	0.2514	3.7916	3.5420	0.2999
2010	2.0360	0.7482	3.8479	3.6662	0.3448
2011	2.0630	1.3108	3.9098	3.7242	0.3841
2012	2.0888	1.3962	3.9361	3.7257	0.3962
2013	2.1103	1.6005	3.9492	3.6580	0.4020
2014	2.1345	1.7529	3.9709	3.6958	0.4191
2015	2.1529	1.9592	3.9641	3.7022	0.4292
2016	2.1646	2.0830	3.9541	3.6982	0.4336
2017	2.1774	2.1234	3.9164	3.7539	0.4384
2018	2.1910	2.1847	3.8793	3.7564	0.4378
2019	2.1972	2.2398	3.8779	3.7342	0.4380

*****Number of bank Branches per 100,000 adults. ** Number of ATM per 100,000 adults ***Outstanding loans as a % GDP **** Outstanding deposit as a % GDP

After incorporating inverse Euclidean distance method suggested by Sarma (2008) for index construction values of index of financial (IFI) inclusion are mentioned in above table. Table 5.7 summarizes the results of index of financial inclusion for Bangladesh along with indicators employed for index measurement. First two indicators; number of bank branches

per 100,000 adults and number of ATM's per 100,000 adults incorporates the supply side effects of financial inclusion and indicates the availability dimension in the analysis. On the other hand OLCB as a percentage of GDP and ODCB as a percentage of GDP indicate the demand side effects of financial inclusion and show the usage dimension in the study. It can be observed in table 5.7 that with the passage of every year there is a rise in financial index for Bangladesh along with increase in values of the indicators which indicate a positive trend with time for financial inclusion. In 2005 the value of index was 0.29 and it lies under the lower middle income group classified by World Bank on the basis of income of each and every country, whereas in 2019 the value of IFI rose up to 0.43 which indicates a 0.14 points rise in last fifteen years consecutively. If we closely observe the values of outstanding loans as a percentage of GDP there is a decline in ratio in year 2013 and 2016 which put limits on employing single indicator for complete analysis but in our study three further indicators indicates a positive trend which makes values of index of financial inclusion healthy and significant.

Table 5.8 Index of Financial Inclusion for China

Year	NBB*	NATM**	OSD***	OSL****	Index of Financial Inclusion
2005	2.0490	2.2638	4.8320	4.3938	0.5565
2006	2.0490	2.2639	4.8155	4.3756	0.5546
2007	2.0490	2.4846	4.7341	4.3163	0.5544
2008	2.0490	2.7486	4.7437	4.2635	0.5593
2009	2.0490	2.9904	4.9140	4.4695	0.5884
2010	2.0490	3.2154	4.9220	4.4747	0.5956
2011	2.0490	3.4169	4.8787	4.4317	0.5971
2012	2.0490	3.6294	4.9071	4.4657	0.6057
2013	2.0581	3.8471	4.9212	4.4863	0.6157
2014	2.0868	4.0083	4.9110	4.5141	0.6310
2015	2.1438	4.3455	5.0402	4.5840	0.6647
2016	2.1764	4.4036	5.0540	4.6144	0.6796

2017	2.1761	4.4359	5.0104	4.6132	0.6798
2018	2.1834	4.5759	4.9718	4.6400	0.6860
2019	2.1817	4.5596	4.9817	4.6858	0.6878

*Number of Bank Branches per 100,000 adults ** Number of ATM per 100,000 adults ***Outstanding Deposit as a % of GDP ****Outstanding Loans as a % of GDP

In table 5.8 results of index are calculated and summarized for each year in one and half decade of Chines economy. One can easily observe that there is a positive and significant increase in financial services in china on both sides (demand and Supply) of the financial inclusion. ATM's indicates a large change in the values which makes the supply side of financial services more significant and enormous. Usually count of bank branches and ATM's varies closely but availability of advance technology made it possible for banks to operate remote ATM's to save travel cost and other hindrances. Our results of index correlate with Fungacova and Weill (2015) for Chines economy as they found that financial inclusion remain at higher level in China as compare to other regional nations. In table 5.8 relevant findings are obtained in our index of financial inclusion for China. China is classified as upper middle income group of World Bank's nominated list and same results are obtained from IFI as it lies at 0.68 in year 2019 under the upper middle income group stage created by Sarma (2008) and Sarma and Pais (2012) as compare to 0.55 in year 2005.

Table 5.9 Index of Financial Inclusion for India

Year	NBB*	NATM**	OSD***	OSL****	Index of Financial Inclusion
2005	2.1853	0.8266	3.8731	3.4573	0.3577
2006	2.1819	1.0046	3.8949	3.5718	0.3794
2007	2.1942	1.2141	3.9706	3.6825	0.4115
2008	2.2277	1.4524	4.0765	3.7804	0.4510
2009	2.2582	1.6662	4.1207	3.8007	0.4726
2010	2.3024	1.9797	4.0900	3.7800	0.4858
2011	2.3487	2.1768	4.1221	3.8427	0.5127

2012	2.4106	2.3933	4.1129	3.8775	0.5338
2013	2.4685	2.5507	4.1340	3.8956	0.5538
2014	2.5507	2.8750	4.1559	3.9197	0.5829
2015	2.6039	2.9776	4.1711	3.9109	0.5943
2016	2.6541	3.0525	4.1331	3.8893	0.5934
2017	2.6746	3.0909	4.1392	3.8353	0.5902
2018	2.6739	3.0752	4.0989	3.8332	0.5829
2019	2.6796	3.0422	4.1474	3.8827	0.5970

*Number of bank branches per 100,000 adults **Number of ATM per 100,000 adults ***Outstanding Deposits as a % of GDP ****Outstanding Loan as a % of GDP

Table 5.9 consists of IFI values for last fifteen years along with four banking indicators employed for Indian economy. IFI value in year 2005 was 0.35 for India that comes under the head of lower middle income group while in year 2019 it ended up with 0.59 which belongs to the upper middle income group. A significant rise in financial inclusion is observed in last one half decade in India, although India possess a major share of world's population but still a healthy rise in financial sector indicates a tremendous growth of Indian economy. Number of ATM increased notably from 0.82 to 3.04 which specify the role of technology in banking sector is rising with greater pace. Gosh (2013) analyzed the Indian states and found that 8/16 states demonstrated highly positive response to financial inclusion more than 0.3 and even some states were above 0.6 points, whereas 5/16 were at lowest level of financial inclusion below 0.2 points. Kumar (2013) investigated the factors of financial inclusion in Indian economy and obtained that credit facilities, quantity of banks, number of bank branches and industrial network were main factors of financial incorporation in India. In our study number of bank branches and credit to GDP ratio is employed which is similar to Kumar (2013) and derived similar results for both of these indicators. Moreover, remaining two indicators indicated pragmatic consequences and contributed a healthy impact for Indian economy.

Table 5.10 Index of Financial Inclusion for Indonesia

Year	NBB	NATM	OSD	OSL	Index of Financial Inclusion
2005	1.6626	2.2324	3.7052	3.2219	0.2321
2006	1.7435	2.3508	3.6518	3.1666	0.2416
2007	1.7862	2.4393	3.6439	3.2332	0.2606
2008	1.8839	2.5737	3.5675	3.2743	0.2802
2009	2.0333	2.6473	3.5609	3.2445	0.3092
2010	2.0931	2.5680	3.5285	3.2475	0.3145
2011	2.6883	2.8002	3.5712	3.3355	0.4166
2012	2.8256	3.5760	3.6226	3.4477	0.4644
2013	2.8702	3.7381	3.6476	3.5408	0.4861
2014	2.8809	3.8960	3.6617	3.5485	0.4928
2015	2.8702	3.9696	3.6451	3.5612	0.4924
2016	2.8483	3.9952	3.6636	3.5637	0.4964
2017	2.8182	4.0099	3.6615	3.5515	0.4937
2018	2.7811	3.9959	3.6361	3.5747	0.4903
2019	2.7501	3.9780	3.6345	3.5688	0.4874

*Number of bank branches per 100,000 adults **Number of ATM per 100,000 adults ***Outstanding Deposits as a % of GDP ****Outstanding Loan as a % of GDP

In table 5.10 values of index for financial inclusion and financial indicators employed are mentioned. There is a positive growth on demand side as well as supply side indicators. Starting from year 2005 Indonesian economy stood at 0.23 points which comes under the head of lower income group of countries, whereas in year 2019 it ended up with 0.48 points on the table which lies at the edge of lower middle income group. If we closely observe the supply side indicators than it can easily be analyzed that there is a wider increase in the ratio of ATM's as compare to quantity of bank branches. On the other hand demand side indicators remains almost stagnant or possess a little positive change in outstanding loans as a

percentage to GDP. On the basis of table 5.10 we can conclude that financial sector is positively related with supply side indicators in Indonesia, whereas demand side indicators need to be reorganized and motivated. Moreover, obstacles on the usage side of financial services should be minimized to increase the level of financial inclusion.

Table 5.11 Index of Financial Inclusion for Korean Republic

Year	NBB*	NATM**	OSD***	OSL****	Index of Financial Inclusion
2005	2.8526	5.3572	4.0723	4.1608	0.6756
2006	2.8805	5.3856	4.0766	4.2421	0.6874
2007	2.9073	5.4563	3.9970	4.3008	0.6766
2008	2.9283	5.4881	4.0690	4.3752	0.7014
2009	2.9010	5.5098	4.1324	4.3708	0.7156
2010	2.9003	5.5811	4.1908	4.3126	0.7222
2011	2.9026	5.6392	4.2230	4.3379	0.7325
2012	2.9076	5.6645	4.2307	4.3356	0.7340
2013	2.8915	5.6650	4.2088	4.3431	0.7298
2014	2.8447	5.6377	4.2361	4.3818	0.7391
2015	2.8185	5.6200	4.2512	4.3973	0.7429
2016	2.7873	5.6041	4.2667	4.4044	0.7449
2017	2.7367	5.6080	4.2644	4.4061	0.7397
2018	2.7265	5.5871	4.2996	4.4369	0.7495
2019	2.7152	5.5835	4.3718	4.4858	0.7688

*Number of bank branches per 100,000 adults **Number of ATM per 100,000 adults ***Outstanding Deposits as a % of GDP ****Outstanding Loan as a % of GDP

In table 5.11 index values for Korean Republic is discussed. At year end 2005 Korean economy secured 0.67 points on IFI table on the basis of chosen financial indicators and it comes under the head of upper middle income countries. Later, at the year-end 2019 it was at

0.76 points on table with growth of 0.1 in last fifteen years. Supply side indicators indicated a decline in ratio of number of bank branches per 100,000 adults, whereas there is a smaller rise in number of ATM's per 100,000 adults, but ratio of ATM's to per 100,000 adults is quite high for Korean economy as compare to other regional countries. On average it can be concluded that supply side indicators for financial inclusion remains stagnant over one and half decade. On the other hand, both demand side indicators (outstanding loans and outstanding deposits as a percentage of GDP) demonstrated a positive change in values. Values for the Index of financial inclusion lie between zero and one, each value near to one or equal to one indicates higher or perfect level of financial inclusion, whereas if any value lies at zero or near zero it shows a perfect financial exclusion or lower level of financial inclusion. In Korean case index value stood at 0.76 which indicates a greater extent of financial incorporation and it lie under the head of higher income countries.

Table 5.12 Index of Financial Inclusion for Malaysia

Year	NBB*	NATM**	OSD***	OSL***	Index of Financial Inclusion
2005	2.5349	3.3098	4.5853	4.5236	0.7224
2006	2.4624	3.3401	4.6287	4.5368	0.7125
2007	2.4391	3.6560	4.6185	4.5121	0.7147
2008	2.4228	3.7238	4.5831	4.4852	0.7062
2009	2.4096	3.9484	4.7388	4.6414	0.7374
2010	2.3906	3.9805	4.6657	4.6154	0.7240
2011	2.4202	3.9816	4.7059	4.6349	0.7383
2012	2.4115	3.9757	4.7196	4.6736	0.7394
2013	2.3948	4.0015	4.7022	4.7199	0.7361
2014	2.3804	3.9588	4.6737	4.7265	0.7279
2015	2.3693	3.9371	4.6467	4.7382	0.7217
2016	2.3454	3.8909	4.5963	4.7299	0.7071
2017	2.3252	3.8618	4.5503	4.6776	0.6922

2018	2.3264	3.8416	4.5634	4.6987	0.6946
2019	2.3104	3.8001	4.5475	4.6954	0.6866

*Number of bank branches per 100,000 adults **Number of ATM per 100,000 adults ***Outstanding Deposits as a % of GDP ****Outstanding Loan as a % of GDP

Table 5.12 summarized the results of index of financial inclusion and other financial indicators for last fifteen years in Malaysian economy. IFI values indicate a negative trend of financial inclusion with time in Malaysia, whereas if we observe the Number of ATM per 100,000 adults there is a positive change in the values with growth of 0.05 pints but Number of bank branches reduced over time which put limits on the growth of financial inclusion as a supply side dimension. On the other hand demand side indicators remained stagnant for one and half decade. Index value in year 2005 was 0.72 which reduced to 0.68 at year end of 2019, but Malaysia still lies under the head of upper middle income group of countries classifies by World Bank. Sulong et.al (2018) analyzed the role of financial inclusion on economic growth and mentioned that it's not always necessary that financial inclusion boost economic growth but they claimed that financial instability, poor policies of regulatory authorities and week financial institutions bring negative consequences on the economic growth. In another study Bhattarai (2015) analyzed the financial deepening in advance and emerging nations and mentioned that over financing was one of the biggest reasons for financial downfall of advance nations in 2008. Moreover, a rise in population size adversely affected the financial indicators and thus financial inclusion in Malaysian economy. Hannig and Jansen (2010) categorized the Malaysian economy under the group of higher financial inclusion (greater than 0.5) along with other south Asian economies which were categorized on the basis of index values.

Table 5.13 Index of Financial Inclusion for Pakistan

Year	NBB*	NATM**	OSD***	OSL****	Index of Financial Inclusion
2005	2.0370	0.1518	3.5217	3.2601	0.2366
2006	2.0538	0.6250	3.5043	3.2863	0.2557
2007	2.0822	0.9993	3.5671	3.3016	0.2837
2008	2.1196	1.2222	3.4675	3.3437	0.2868
2009	2.1250	1.3620	3.3868	3.1165	0.2521
2010	2.1264	1.4542	3.4039	3.0221	0.2457
2011	2.1434	1.5516	3.3316	2.8359	0.2154
2012	2.1691	1.6652	3.3976	2.8370	0.2326
2013	2.2032	1.8397	3.4258	2.7976	0.2408
2014	2.2308	1.9836	3.4141	2.7799	0.2439
2015	2.2669	2.1339	3.4048	2.7701	0.2496
2016	2.2976	2.2458	3.4777	2.8383	0.2775
2017	2.3208	2.3022	3.4343	2.8806	0.2811
2018	2.3300	2.3470	3.5376	3.0459	0.3233
2019	2.3426	2.3836	3.5921	3.0103	0.3293

*Number of bank branches per 100,000 adults **Number of ATM per 100,000 adults ***Outstanding Deposits as a % of GDP ****Outstanding Loan as a % of GDP

Pakistan is lagging behind in financial services as compare to other economies of the region, but last one and half decade indicated a significant growth in financial sector. There are multiple reasons for lower level of financial inclusion in Pakistan before 2005 such as; nationalization in 70's, excessive population pressure, stagnant economic growth and political unrest in 90'. As per value of index for year 2005 Pakistan stood at 0.23 which lies at lower income group but in 2019 the index number rose up to 0.32 and Pakistan's economy jumped up from lower income group to lower middle income group. Our findings of the IFI are similar to Khan (2020) which determined the effects of financial inclusion on economic

growth in Pakistan. He found that financial inclusion was positively associated with economic growth in Pakistan; same results are obtained in case of our constructed index which indicated a positive growth over time in financial sector. Adil (2020) analyzed the supply side determinants of financial inclusion in Pakistan. Our findings are alike to the outcomes of Adil's study of financial inclusion as supply side indicators are positively related with financial inclusion. Rise in the values of supply side indicators of financial inclusion enhance the effectiveness of financial sector for Pakistan's economy. In another study Awanet.al (2020) examined the effects of trade openness on financial inclusion and economic growth. They mentioned that selected sample of macroeconomic variables are positively related with financial inclusion except broad money. Hansen (2010) included the Pakistan under the head of lower financial inclusion (less than 0.3 points of Index of Financial Inclusion), which is similar to results obtained by this study for the value of IFI at year ended 2010. On the basis of these mentioned studies and constructed IFI it can be concluded that financial inclusion boost up living standard of individuals along with standard of financial services in Pakistan in last one and half decade. Moreover, IFI values and economic growth rate of Pakistan moves in a parallel way which indicates a positive relationship among them.

Table 5.14 Index of Financial Inclusion for Philippines

Year	NBB*	NATM**	OSD***	OSL****	Index of Financial Inclusion
2005	2.0795	2.4365	3.1870	3.0083	0.2232
2006	2.0535	2.5108	3.2989	2.9317	0.2291
2007	2.0193	2.5259	3.2928	2.8962	0.2176
2008	2.0238	2.5781	3.6104	2.7632	0.2485
2009	2.0131	2.6397	3.6836	2.7478	0.2553
2010	2.0211	2.7151	3.6726	2.7688	0.2599
2011	2.0357	2.8217	3.6167	2.9435	0.2818
2012	2.0711	2.9366	3.5959	2.9960	0.2950
2013	2.1091	3.0877	3.7635	3.0710	0.3396

2014	2.1537	3.1435	3.7818	3.1709	0.3658
2015	2.1706	3.2206	3.8090	3.2580	0.3866
2016	2.1790	3.2974	3.8877	3.3531	0.4140
2017	2.1966	3.3370	3.9002	3.4550	0.4338
2018	2.1995	3.3638	3.8656	3.4922	0.4347
2019	2.2191	3.3664	3.9002	3.5262	0.4483

*Number of bank branches per 100,000 adults **Number of ATM per 100,000 adults
***Outstanding Deposits as a % of GDP ****Outstanding Loan as a % of GDP

Results for Philippines economy regarding index of financial inclusion along with financial sector indicators employed in this study is summarized in table 5.14. Philippines lies under the head of lower middle income group as classified by World Bank and same results are obtained from the value of index at year ended 2019 with 0.44 points on the table of IFI. At the start of year 2005 IFI value was 0.22 and it got double in one and half decade, whereas only a significant change is noted in number of ATM's per 100,000 adults in last fifteen years on supply side indicators. Demand side indicators indicated a positive change in both indicators (outstanding loan and outstanding deposit as a percentage of GDP) with rise of 0.1 and 0.05 points in values respectively. It can be observed that there is a studious rise in values of IFI over time in last fifteen years for the Philippines economy.

Table 5.15 Index of Financial Inclusion for Singapore

Year	NBB*	NATM**	OSD***	OSL****	Index of Financial Inclusion
2005	2.4198	3.8612	4.6556	4.4553	0.7146
2006	2.3877	3.8724	4.7482	4.4116	0.7096
2007	2.3467	3.9217	4.7493	4.4495	0.7026
2008	2.3001	3.9261	4.8430	4.5987	0.7057
2009	2.2900	3.9675	4.9318	4.6013	0.7072
2010	2.2850	4.0794	4.8878	4.5921	0.7063
2011	2.2613	4.0893	4.9236	4.7847	0.7102

2012	2.2433	4.0813	4.9466	4.8908	0.7074
2013	2.2098	4.0640	4.9393	5.0054	0.6960
2014	2.1979	4.0518	4.9269	5.0252	0.6910
2015	2.1921	4.0612	4.8847	4.9533	0.6873
2016	2.1613	4.0220	4.9092	4.9433	0.6757
2017	2.1066	4.1448	4.8555	4.9280	0.6561
2018	2.0952	4.1681	4.8260	4.8937	0.6505
2019	2.0566	4.0738	4.9028	4.9157	0.6374

*Number of bank branches per 100,000 adults **Number of ATM per 100,000 adults ***Outstanding Deposits as a % of GDP ****Outstanding Loan as a % of GDP

Singapore is categorized as one of the fastest growing economy with an average economic growth of 5.15 percent in last fifteen years. On the other hand, index values are negatively related with time for Singapore in last fifteen years and each passing year indicates a decline in points of index on the above constructed table of IFI. Staring from year 2005 with 0.71 points on the table it ended up with 0.63 points of IFI with a decline of 0.08 points. Singapore is one of the top densely populated countries; Moreover growth of population is higher than growth in financial services which put a negative impact on financial indicators. Countries with higher intensity of financial inclusion have to maintain this level along with growth, just like developed countries have to maintain a specific level of growth to keep pace with development. Singapore already possesses a higher level of financial inclusion which brings a twofold responsibility of maintaining and growing of financial sector. Sarma (2016) analyzed the financial inclusion in south Asian economies and categorized the Singapore as highly financially included economy which is similar to index constructed in our study where it lies at upper middle income group of countries. Singapore and Korean republic are part of OECD and considered as highly financially included economies.

Table 5.16 Index of Financial Inclusion for Thailand

Year	NBB*	NATM**	OSD***	OSL***	Index of Financial Inclusion
2005	2.1125	3.4227	4.2610	4.2004	0.5489
2006	2.2056	3.7423	4.2344	4.1502	0.5733
2007	2.2716	3.8966	4.1509	4.1117	0.5772
2008	2.3335	4.1797	4.1646	4.1459	0.6030
2009	2.3791	4.2953	4.1638	4.1178	0.6121
2010	2.3983	4.4053	4.1025	4.0908	0.6046
2011	2.4280	4.4695	4.1261	4.1799	0.6257
2012	2.4583	4.5516	4.2680	4.2213	0.6622
2013	2.4923	4.6284	4.3048	4.2817	0.6837
2014	2.5270	4.7381	4.3232	4.2944	0.6972
2015	2.5279	4.7653	4.3331	4.3091	0.7012
2016	2.5138	4.7675	4.3128	4.2816	0.6916
2017	2.4732	4.7689	4.2943	4.2638	0.6778
2018	2.4596	4.7665	4.2916	4.2702	0.6750
2019	2.4193	4.7457	4.2966	4.2599	0.6652

*Number of bank branches per 100,000 adults **Number of ATM per 100,000 adults ***Outstanding Deposits as a % of GDP ****Outstanding Loan as a % of GDP

In table 5.16 values of index of financial inclusion are recapitulated along with financial indicators utilized in the analysis for Thailand in last one and half decade. There is a positive movement of supply side indicators over time, whereas number of ATM's per 100,000 adults increased with greater pace as compare to number of bank branches per 100,000 adults. On the other hand, demand side indicators remained static over time, starting with 0.42 points at year 2005 both indicators ended up with same points at year end of 2019. Value of index of financial inclusion increased with 0.12 points in last one and half decade in Thailand. Kanittha (2015) analyzed the economy of Thailand with the collaboration of ADB

institute and summarized that Thailand performed well regarding financial inclusion in last decade, but still required objectives of financial sector is not achieved. Credit facilities to individuals and SME's are lacking behind and they have to rely on informal sector with higher debt cost to meet their domestic and business financial needs. In another study, Lewis (2017) investigated the study regarding innovation and challenges in financial inclusion faced by economy of Thailand. High dispersion of ATM's and counters pay services contributed significantly in financial services and eased the life of millions in Thailand. This study recommended that insurance services along with proper saving facilities need to be improved for taking the required advantages of financial inclusion.

5.5.2 Comprehensive Index of Financial Inclusion

After incorporating a country wise discussion of index, a comprehensive IFI is constructed to analyze the selected economies in one table. By incorporating formula mentioned in earlier chapter regarding measurement of index of financial inclusion, here under IFI is calculated for ten countries and fifteen years of data. This study incorporated Sarma and Pais (2012) technique of index as a base study for index measurement but different indicators were employed on the basis of recent developed literature about financial inclusion

Table 5.17 Index of Financial Inclusion

Countries	2017	2018	2019	Average Value of Index
Bangladesh	0.44	0.44	0.44	0.36
China	0.68	0.69	0.69	0.62
India	0.59	0.58	0.60	0.51
Indonesia	0.49	0.49	0.49	0.40
Korea. Rep	0.74	0.75	0.77	0.72
Malaysia	0.71	0.69	0.69	0.72
Pakistan	0.28	0.32	0.33	0.26
Philippines	0.43	0.43	0.45	0.32
Singapore	0.66	0.65	0.64	0.69
Thailand	0.68	0.68	0.67	0.64

Values of this index of financial inclusion are calculated by Sarma's formula of inverse of Euclidean Distance method which satisfies the basic mathematical properties. Above mentioned table values lies between zero and one, all values near one show a higher level of financial inclusion while if any value lies near zero that shows lower level of financial inclusion. As per income criteria of World Bank economies are divided on the basis of lower, lower middle, upper middle and higher income countries, same criteria is used in this study to categorize the selected economies on the basis of index of financial inclusion. Higher income economies observed with higher level of financial inclusion as well while on the other hand lower income countries usually have lower level of financial inclusion. Moreover a detailed discussion regarding financial indicators is already mentioned in previous chapters.

Table 5.18 Categorizing Economies on the basis of Index Values

Countries	2019*	Income Group	Ranking**	Average IFI***
Bangladesh	0.44	LM	141	0.36
China	0.69	UM	60	0.62
India	0.60	LM	143	0.51
Indonesia	0.49	LM	113	0.40
Korea. Rep	0.77	H	27	0.72
Malaysia	0.69	UM	61	0.72
Pakistan	0.33	LM	154	0.26
Philippines	0.45	LM	121	0.32
Singapore	0.64	H	10	0.69
Thailand	0.67	UM	77	0.64

*Shows Values of Index of Financial Inclusion for year 2019.

**Ranking is based on GNI per capita for Year 2019.

**It shows average value of Index of financial inclusion calculated on the basis of average of fifteen years (2005 – 2019).

Table 5.19 Income Groups and Range of Index

Income Groups	Range of Index
Lower	0 – 0.25
Lower Middle	0.25 – 0.50
Upper Middle	0.50 – 0.75
Higher	0.75 – 1

Similarities can be observed among values of index calculated for selected countries and ranking of economies decided on the basis of World's bank data of GNI per capita for year 2019. All those economies which lie at Lower middle income group of World Bank are having lower level of financial inclusion. For instance the average value of index for China is 0.62 and it can be observed in upper middle income group of World Bank, same as Bangladesh, Pakistan, Philippines and Indonesia lies in lower middle income group and their values for IFI computed in accordance with financial sector indicators as well lies under lower middle income group. It can be observed that most of the emerging economies lies under lower middle and upper middle income group and index value is improving rapidly every year. Hence it's proved that higher magnitude of income leads to greater level of financial inclusion and better provision of financial services while lower level of income provides lower level of financial inclusion and thus it leads to lower level of living poor standards of financial services.

5.6 Financial Inclusion and Relationship among Emerging Economies

In this study, Index of financial inclusion computed as per Sarma's (2008) formula to measure financial inclusion. Van et al. (2019) used same formula to measure the index values before this Park & Mercedo (2014) as well calculated the index values with same formula but different indicators were implied. In our study, index of financial inclusion values mentioned in table 5.18 indicates the true picture of financial inclusion in these selected economies. In table 5.18 four major income groups were mentioned and table 5.19 indicates the range of index of financial inclusion. Ranking is decided on the basis of GNI per capita , higher values

of GNI per capita put the economies at top places in income group and same as lower level of GNI per capita means that country lies at somewhere in bottom. It can be observed that financial inclusion is positively related with income of the countries, all those economies who lie at higher level of GNI per capita also share a higher level of financial inclusion like Korean Republic's value of IFI for year 2019 was 0.77 and this country lies at higher income group which verifies that higher level of financial inclusion leads to higher level of income (GNI per Capita). If Pakistan is compared with Thailand they lie at lower middle and upper middle group of income respectively and same as their index values lie at lower middle income and upper middle income group as per range of index mentioned in table 5.19. It can be concluded that higher level of financial inclusion is associated with higher level of economic growth.

5.7 Conclusion

This chapter summarized the outcomes of research methodology with their repercussions on economic growth measured in GDP per capita. In first phase of the chapter stationarity process of selected variables summarized along with data statistics and found that some of the variables were stationary at level and remaining were at first difference. Data statistics analyzed the mean, median, maximum, minimum, standard deviation and number of observation in the selected variables. In second phase of the study country wise details of index of financial inclusion is summarized for last one and half decade. In next section a comprehensive index of financial inclusion was computed and summarized for all selected economies and categorical classification of all these countries were included. Higher income countries possess a prominent level of financial inclusion and lower level of income economies experienced a lower level of financial inclusion. Third phase ended up with casual relation among economies regarding financial inclusion and their standings in the table. Last and fourth phase of the chapter discussed the core findings of regression analysis and concluded that financial incorporation is positively associated with GDP per capita along with other variables except labor force and FDI which is insignificant in our study.

CHAPTER 6

CONCLUSION

This study is conducted to empirically explore that how Financial Inclusion transmission mechanism works and effects economic growth of emerging Asian economies. For this purpose, 10 developing economies are selected over a period of 2005 – 2019 and Generalized Method of Moment used as an estimation technique to regress the model. Financial incorporation ensure accessibility of financial services to the resident of any country, better standard of financial services provides better living status and enhance quality of life index. Whereas financial exclusion is opposite to financial exclusion, financial exclusion means unavailability of financial services where required.

The results obtained from estimation reveal that, financial inclusion is associated positively to economic growth in emerging economies. As, in this study IFI is computed with the help of banking sector indicators consist of number of ATM per 100,000 adults, quantity of bank branches per 100,000 adults, outstanding deposit with commercial banks as a percentage of GDP and last one outstanding loan with commercial banks as a percentage of GDP and remaining variables such as gross capital formation, Trade, FDI, Human Capital and Labour force were taken as control variables to estimate the model. On the other hand, nominated economies were categorized on the basis of financial inclusion, all those economies where magnitude of national income is at higher level they possess a higher extent of financial inclusion. In this study emerging economies were discussed which mostly lie under developing countries and growing with higher pace and economic growth.

Findings of the study concluded that financial inclusion needed to be promoted in Asian region as it effects economic growth significantly and raise the quality of life and living standard of the individuals residing in this region. There is a wider difference in quality of financial services in developed and developing economies. Countries with higher level of financial inclusion possess higher level of per capita income and thus contribute more in national income and economic growth, whereas developing countries are lacking in availability of financial services and contribute less in national income and share less portion of per capita income with population. Financial literacy and trust level of formal financial

institutions boost up the confidence of residents and lessens the impact of informal financial sector.

6.1 Policy Recommendations

This section of the study contains the core suggestions withdrawn from this research analysis. Financial inclusion should be promoted through providing different financial services to promote economic growth. Financial services can be enhanced through these mentioned measures. First and foremost is that there must be a bank account compulsion for adults to promote financial inclusion in the world as there is more than 50% of the adults of the world not having bank accounts (Beck et.al (2014). Second, Governments should take financial inclusion as priority policy and allocate proper funds for different financial projects like credit promotion schemes, subsidized interest margin and collaboration with private financial sector to promote digital innovation and financial inclusion. Third, Operating procedure for financial services must be made easier and user friendly that even any android phone user may get benefits from financial inclusion. Fourth, financial outreach specifically in rural areas must be accompanied with digital technology to promote financial inclusion in remote areas. Fifth, trust on formal financial sector need to be improved along with quick delivery of services to save public from exploitation of informal sector. Secondary school enrollment is positively related with economic growth along with gross capital formation and trade, there is need to boost up these sectors of the economy in emerging Asian economies to achieve higher economic growth objectives. Core findings of the study mentioned that financial services must be promoted with easier availability and access to boost up economic growth in concerned economies.

6.2 Future Research Studies

As discussed earlier financial inclusion remains one of the frequently discussed agenda after 90's, but it brings many challenges and limitations along with benefits. Invention process is a major predictor of financial inclusion but there are number of risks associated with usage of technology that may cause inversely to financial inclusion. There is a space for researchers to analyze the risks associated with financial inclusion and how it can be mitigated. Furthermore, economic literature needs contribution regarding political economy and

financial inclusion. Political economy means how governments contribute in financial inclusion via funds allocation, policy priorities, officials behavior about financial inclusion all such determinants need to be evaluated in future studies. Another aspect of financial inclusion for upcoming studies may be to decide the appropriate level of financial incorporation. Different studies contributed that financial inclusion positively effects economic growth, but Sulong et.al (2018) mentioned that it's not always necessary that financial inclusion contributes positively. That's why there must be an ideal magnitude of financial inclusion for each economy. One more aspect of future studies could be an evaluation of financial inclusion and economic blocks just as; OECD, OIC, ASEAN, BRICS, European Union etc. Therefore, the impact of financial services on above mentioned regional blocks need to be evaluated along with effects on individual's lives in these countries. Future studies may identify the regulatory framework for financial inclusion, that's why researcher may take into account that how regulations and standards about financial inclusion can be constructed and improved over time. Except all these, future studies may be carried to investigate the role of technology, financial literacy, subsidized credit programs, financial innovation and other ideas must be consider and policy makers and researchers may adopt them for their future research studies. Moreover, upcoming studies should explore new ideas to enhance the financial inclusion along with determining the optimal level of financial incorporation.

6.3 Conclusion

Financial inclusion remains one of the most discussed agenda in economic literature since last three decades. In our employed study the influence of financial inclusion on economic growth is investigated for emerging Asian economies of the world. On the basis of this research study, we concluded that IFI is positively and remarkably related with economic growth of Asian economies. Moreover, IFI is constructed for all relevant economies and these economies were categorical discussed on the basis of IFI. Different policy recommendations and future research options are included in final chapter.

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