The Nexus between Financial Inclusion and Economic Growth in Developing countries: Some Panel and Spatial Evidence

A thesis submitted during the year 2020 to the University of Hyderabad in partial fulfillment of the award of a Ph.D. degree in Economics.

by

Erra Kamal Sai Sadharma

School of Economics

University of Hyderabad

(P.O.) Central University, Gachibowli,

Hyderabad – 500 046

Telangana

India

CERTIFICATE

This is to certify that the thesis entitled “The Nexus between Financial Inclusion and Economic Growth in Developing countries: Some Panel and Spatial Evidence” submitted by Erra Kamal Sai Sadharma bearing Reg. No 15SEPH06 in partial fulfillment of the requirements for the award of Doctor of Philosophy in Economics is a bonafide work carried out by him under my supervision and guidance.

The thesis has not been submitted previously in part or in full to this or any other University or Institution for the award of any degree or diploma.

Signature of the Supervisor/s

//Countersigned//

Head of the Department/Centre

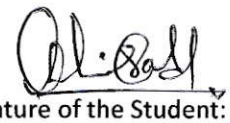
Dean of the School

DECLARATION

I Erra Kamal Sai Sadharma hereby Declare that this thesis entitled "The Nexus between Financial Inclusion and Economic Growth in Developing countries: Some Panel and Spatial Evidence" submitted by me under the guidance and supervision of Professor Debashis Acharya is a bonafide research work. I also declare that it has not been submitted previously in part or in full to this University or any other University or Institution for the award of any degree or diploma.

Date : 26th December 2020

Name : Erra Kamal Sai Sadharma



Signature of the Student:

Regd. No. 15SEPH06

CERTIFICATE

This is to certify that the thesis entitled "The Nexus Between Financial Inclusion and Economic Growth in Developing Countries: Some Panel and Spatial Evidence" submitted by Erra Kamal Sai Sadharma bearing registration number 15SEPH06 in partial fulfilment of the requirements for award of Doctor of Philosophy in the School of Economics is a bonafide work carried out by him under my supervision and guidance.

This thesis is free from plagiarism and has not been submitted previously in part or in full to this or any other University or Institution for award of any degree or diploma.

Parts of this thesis have been:

A. Published in the following publications:
    1. International Journal of Social Economics (ISSN: 0306-8293), Research paper: Financial Inclusion Across Major Indian States: Some Spatial Panel Econometric Evidence (*In Press*),
    2. The Microfinance Review (ISSN: 2229-3329), Research paper: Does Financial Inclusion Reduce Poverty and Unemployment: Some Evidences from Indian States.
B. Presented in the following conferences:
    1. 53rd Annual Conference of The Indian Econometric Society, NISER, Bhubaneshwar, Odisha (National)
    2. International Conference on Economics and Finance, BITS-PILANI, Goa (International)

Further, the student has passed the following courses towards fulfillment of coursework requirement for Ph.D.

	Course Code	Name	Credits	Pass/Fail
1.	EC-701	Advanced Economic Theory	4	Pass
2.	EC-702	Social Accounting Database	4	Pass
3.	EC-703	Research Methodology	4	Pass

Supervisor Dean of School

ACKNOWLEDMENTS

First of all, my gratitude from deep within to the ever-loving God, for without His blessings this thesis would not have been possible.

I would like to express my heartfelt gratitude to my research supervisor, Prof. Debashis Acharya, who guided me in developing a research outlook. Prof. Acharya has been a constant source of inspiration, encouragement and support throughout the period of my study here. I cannot overemphasize the role of his guidance in the completion of my research.

I would like to thank Prof. Naresh Kumar Sharma and Prof. B. Kamaiah, both of whom have supported me with material help during my research.

I would like to thank Prof. G. Omkarnath, Dean, School of Economics, University of Hyderabad for providing atmosphere conducive to my research.

I am deeply thankful to my Doctoral Research Committee members, Prof. Phanindra Goyari and Dr. Ch. Krishna Reddy, for sharing their ideas and providing valuable insights on the topic. I am also extremely grateful to all the faculty members of the School of Economics.

I am ever thankful to Prof. Ganti Subrahmanyam, GITAM University for encouraging me to carry out research on financial inclusion, and for sharing his views on the subject during the initial days of my PhD.

I am grateful to Prof. Vidyavati, former Vice-Chancellor, Kakatiya University, Prof. Lingamurthy, former Vice-Chancellor, Kakatiya University and Prof. S. Indrakanth, visiting professor, CESS, Hyderabad for encouraging me to develop an orientation towards research.

I am thankful to Dr. Swayamprava Mishra, Utkal University and Dr. N. Usha, Institute of Public Enterprise for their helpful suggestions during the initial stages of my research.

My special thanks to the staff members of the School of Economics, especially Mr. V. Adinarayana, Mr. Nagarajan and Mr. Venkateshwara Rao and all others for their extended support on all occasions.

My thanks are due to all my seniors, juniors and friends. My special thanks to Dr. T. K. Venkatachalapathy Anna, Central University of Tamil Nadu for his constant encouragement throughout. I also thank T. Kaladhar and Y.N Raju for their wishes and support.

Finally, I express my love and gratitude to my parents, E. Anil Kumar and E. Vani, for their unending love, support and positivism during every stage of my life.

-Erra Kamal Sai Sadharma

Contents

CHAPTER 1
INTRODUCTION

1. Introduction

The term financial inclusion has gained traction in the policy circles since the early 2000s both the world over and in India. Recognizing the importance of expanding the outreach of financial products to the unbanked in enhancing welfare, governments have been initiating policies conducive to the alleviation of the distressful conditions that these segments are most often found to be living in. While the formal financial sectors in developed countries are largely inclusive, those in the developing world, especially in Asia and Africa, can at best be called 'moderately inclusive'. The World Bank's Global Findex (2018) database supports this argument when it estimates that only 63 percent of population in the developing countries held a bank account or a mobile money account in 2017, while the corresponding figure for advanced economies was 94 percent. While considerable research has been made to examine the causation between financial development and economic growth, the impact of greater access and usage of financial services on growth in *Afro-Asian countries in particular* has not been sufficiently investigated in literature.

In the case of the Indian economy, the Global Findex (2018) estimates that close to 80 percent of adults in the country maintain an account. This impressive leap registered by the country from 35 percent in 2011 and 53 percent in 2014 has been attributed by the same report to the success of the Pradhan Mantri Jan Dhan Yojna (PMJDY). While recent trends in financial inclusion in developing countries, particularly in India, have been encouraging, the financial needs in rural areas where access to financial services is scarce compared to urban regions, can result in differential welfare effects. Furthermore, it needs to be studied if rural areas stand to benefit more from utilizing these services since they begin with a lower economic base.

Given the potential of inclusion in effecting greater welfare, both at the micro and macro levels, analysing whether the extents of inclusion achieved by various sub-national administrative divisions (states) tend to converge over time could reveal information about patterns of welfare effects of inclusion.

These areas highlighted above merit additional research. In the light of the above discussion, the present study seeks to investigate the developmental impacts of financial inclusion in developing Afro-Asian economies, with particular reference to India, besides exploring the possibility of spatial convergence of inclusion levels in major Indian states.

2. Financial inclusion: Definitions

With financial inclusion gathering attention among academic and policy circles, mainly due to the welfare effects arising from the potential it holds to promote welfare effects among the poor, the usage of the term in the literature has been rather nuanced. A brief review of various notable definitions might be necessary to appreciate the usage of the concept.

Sarma defines financial inclusion as "a process that ensures the ease of access, availability and usage of the formal financial system for all members of an economy" (Sarma, 2008).

The RBI committee on Financial Inclusion in India refers to financial inclusion as "the process of ensuring access to financial services and timely and adequate credit where needed by vulnerable groups such as the weaker sections and low income groups at an affordable cost" (Rangarajan, 2008).

The ADB defines microfinance as "the provision of a broad range of financial services such as deposits, loans, payment services, money transfers, and insurance to poor and low-income households and, their microenterprises" (Asian Development Bank, 2000).

While the Alliance for Financial Inclusion (2010) identifies financial four key aspects of financial inclusion, namely access, quality, usage and welfare, Aynsley (2010) approaches financial inclusion through the threefold lens of access to financial services, financial capability and financial literacy.

CGAP (2013) notes that there is a need for a world where everyone can have appropriate access to financial services needed to improve their lives, without any need for separate financial markets for the poor.

Atkinson & Messy (2013) define it as the process of providing access to affordable, relevant and regulated financial services even while promoting their use by all segments of the society through innovative approaches with an aim to promote economic well-being and social inclusion.

While the definitions reviewed above focus on the *potential* availability and usage of financial services, the definition given by World Bank (2014) that it refers to the "proportion of individuals and firms" using those services emphasizes the *actual* usage dimension.

Some researchers have also opted to approach the topic by first defining financial exclusion. Leyshon and Thrift (1995) discuss financial exclusion in the context of mechanisms which prevent certain social groups, usually the lower strata of the society, from acquiring access to formal financial services. Rakesh Mohan (2006) opines that financial exclusion is the lack of access by the lower sections of the community to safe & affordable financial services provided by the mainstream financial intermediaries.

Having reviewed the above notable definitions from the literature, we may define financial inclusion as "the access and usage of appropriate financial products and services by all individuals and firms in the economy."

3. Evolution of financial inclusion policy in India

Although microcredit, which later on popularized the financial inclusion drive the world over, traces its roots to the mid-1970s when Muhammad Yunus made modest loans to women weavers in Bangladesh, the Government of India (GoI) had begun its financial inclusion efforts in 1969 with the nationalization of 14 private banks. This move by the GoI was aimed at supporting the backward sectors of the economy by ensuring that sufficient funds are channelized for their development. In the same year, the Lead Bank Scheme was introduced, wherein each district in the country was allotted to a particular commercial bank. The bank would take the lead in coordinating the credit flow within the district for agricultural and priority sector purposes and SME lending. In 1976, the GoI began establishing the Co-operative banks as well as the Regional Rural Banks (RRBs).

The next watershed moment in the history of financial inclusion in India was the inception of the National Bank for Agricultural and Rural Development (NABARD) in 1982. The bank operates with a purpose to provide and regulate credit for "agriculture … other allied economic activities in rural areas" in order to ensure integrated rural development (NABARD, 2020).

In 1989, the Service Area Approach was initiated for lending under the Lead Bank Scheme, under which each commercial bank or RRB is mandated to serve around 20 villages in order to ensure planned development of the surrounding semi-urban or rural area.

The Self-help Group Bank Linkage Program (SBLP) was commissioned as a pilot scheme with an objective to provide financial services to the unbanked and financially underserved households in a cost-effective manner. Having started out as a program meant to initially link 500 SHGs to formal financial institutions during 1992, SBLP has now become the largest microfinance programme in the world, in terms of outreach as well as client base (NABARD,

2020a). By 2014, there were nearly 75 lakh saving-linked SHGs and 42 lakh credit-linked SHGs with savings to the tune of Rs. 9897 crores (Shivaprasad, 2020). In 1998, the NABARD followed up with another scheme – Kisan Credit Card (KCC) – in an attempt to provide farmers with timely access to short-term formal credit.

While the efforts mentioned above have played a crucial role in providing the underprivileged sections with access to financial services, the term 'financial inclusion' was explicitly incorporated as a policy objective in the year 2005, after which, India has made rapid progress in expanding the outreach of formal financial services to the unbanked.

The 'no frills' bank accounts made available to the unbanked at no cost (charges) and without the need to maintain minimum balance, were followed up with simplified KYC norms to open bank accounts in general. Between 2006 and 2009, the RBI liberalized the eligibility criteria and operational norms with respect to Business Correspondents (BCs).

Keeping up with the advances in Information and Communication Technology (ICT), the RBI in 2009 directed the banks to ensure door step delivery of financial products through services over the satellite, or through mobile phones or via BCs. Further, advisories were sent out by the central bank to the banks to encourage 'no frills' account holders actively operate their accounts by engaging them with overdraft facilities. Over the recent years, there has also been an additional emphasis placed on financial education through FLCCs.

The no frills accounts were later merged with the Basic Savings Bank Deposit Accounts (BSBDA) in 2012, while the Swavalamban scheme, initially introduced in 2011 to promote the habit of saving for retirement was merged with the broader Atal Pension Yojna in 2015. In 2014, the Pradhan Mantri Jan Dhan Yojna (PMJDY) was launched as the flagship programme to promote usage of banking services that also provide overdraft and insurance facilities. Usage of insurance services are also sought to be expanded under the Pradhan Mantri Suraksha Bima

Yojna. The PMGDISHA has been initiated in 2017 to promote financial literacy, especially in rural areas.

Given the long history of financial inclusion in India, it is expected that there would be an improvement in access and usage of finance in the country. The numbers confirm that 40.98 crore bank accounts have been opened under PMJDY so far, while 1.26 lakh banking correspondents (BCs) are delivering services (Ministry of Finance, 2020).

Over the last 15 years, the GoI has constituted three important committees on financial inclusion, namely (year in which report was submitted in parentheses):

i. The Committee on Financial Inclusion headed by Dr. C. Rangarajan (2008)
ii. The Committee on Financial Sector Reforms headed by Dr. Raghuram Rajan (2009)
iii. The Committee on Comprehensive Financial Services for Small Businesses and Low Income Households headed by Dr. Nachiket Mor (2014).

With the introduction of Direct Benefit Transfer (DBT) mode of payments to beneficiaries, where in their bank accounts are linked with their unique UID number, the bank accounts are expected to be operated more actively, besides ensuring that there are minimal leakages in the system.

The Government has also introduced a Unified Payments Interface (UPI) in 2016 to promote digital payment systems as part of the financial inclusion drive. The platform is designed to promote online payments for e-commerce, payments for utility bills and micropayments. The decision by the GoI to demonetize high denomination currency in November 2016 also has had the impact of an overall increase in usage of digital modes of finance.

4. Literature Review

a) Relationship between financial inclusion & economic growth

Makina & Walle (2019) perform a macroeconomic study to analyse the relationship between financial inclusion and economic growth. The study focuses on countries in the African continent only. The study measures financial inclusion only from the access dimension. The authors find that financial inclusion has a positive and significant effect on economic growth in Africa, and therefore recommend pursing the agenda of financial inclusion to achieve the end of inclusive growth. Cnaan, Moodithaya & Handi (2012) target four sites in southern India, which were claimed to have been fully financially included by banks. In three out of the four villages surveyed, the authors find that about seventy-five percent of households are financially included, while one village in the state of Tamil Nadu exhibited inclusivity only up to forty-six percent. From the findings, the authors conclude that though holding a bank account is becoming a more common trend in most villages in south India, villages with higher incidence of poverty are yet to catch up with other villages in this respect (i.e., in being more financially included with time). Raza, Rubab & Wen (2019) assess the relationship between greater financial inclusion through banks and economic development in Pakistan. The authors find a positive association between the density of bank accounts and density of bank branches on the one hand and the human development index (HDI) on the other. In contrast, the density of ATMs in Pakistan bears a negative association with HDI. From their findings, the authors conclude that pursuing the objective of financial inclusion through expansion of bank branches and deposit facilities could be an effective means of fighting poverty. Iqbal & Sami (2017) note that financial inclusion being an important priority for furthering economic growth and advancement of economic growth, it also helps lower inequality. They examine how financial inclusion impacts economic growth in India. From their results, the authors find that bank branches and expansion of credit have a positive impact on GDP.

Sethi & Acharya (2018) examine the effect of financial inclusion on economic growth in a dynamic panel data setting of several developed and developing countries. Like Kim, Yu and Hassan (2018) the authors find a long cointegrating run relationship between financial inclusion and growth, along with a causality that runs in both directions. Sethi & Sethy (2018) also assess if financial inclusion is related to economic growth in India. Employing the cointegration approach on a time series data, the authors also test for causality between financial inclusion and economic growth. They find that greater economic growth in India can be achieved by expanding the access and usage of financial services. However, they do not find any evidence in favour of the presence of asymmetric effects of financial inclusion on economic growth. In a similar study on the Indian economy, Sharma (2016) finds that financial inclusion in India is positively related to economic growth, where as there is evidence of bidirectional causality between financial access and economic development. Based on her findings, the author recommends that the banking system in the country be deepened, besides initiating carefully calibrated social banking experiments.

While noting that large parts of Asia and Africa are running the risk of losing their demographic dividend", Ssewamala (2014) argues for financial inclusion programs to be run with a youth-focused objective, so that poverty, illiteracy and low-skill levels of these youth may be addressed. Alhassan, Li, Reddy & Duppati (2019) investigate the financial inclusion through formal financial intermediaries on informal financial intermediation in Africa. They find that instead of a trade-off between formal and informal financial intermediation, there exists a complementary relationship between the two. Going by these findings, the authors conclude that informal finance plays a crucial role in financial systems of major African countries. Their another finding that facilitating better infrastructure has the potential to channelize financial resources available in the informal economy has positive implications for growth and development of African nations.

b) Welfare effects of financial inclusion

The need for financial inclusion has been realized at the policy level in most developed as well as developing countries. Most central banks are now taking efforts to make available bank accounts, insurance/line of credit & pension schemes to the poor. Without access to any or some of these services, the poor have to rely on informal sources for funding their needs. With financial inclusion, the unbanked tend to save more safely, and smoothly manage cash flows, even while raising their consumption levels. Financial inclusion can lead to greater investment in education, health and female empowerment (Ashraf, Karlan & Yin, 2010). Besides, greater financial inclusion minimizes the exploitation of the downtrodden by the moneylenders by enabling the unbanked to access credit at lower interest rates.

Lack of financial inclusion has many untoward costs both at the individual and aggregate levels. Individuals lacking access to mainstream financial services incur higher transaction fees and are usually unable to tide over unforeseen shocks to cashflows or to finance investments. They experience difficulties in realizing cheques and often may have to visit informal sources for loans, where interest rates may be higher. Without access to formal finance, running a household or business can be costly. This process becomes self-confirming and could possibly lead to social exclusion (Rakesh Mohan, 2006). At the macro level, lack of financial inclusion could lead to untoward effects on socioeconomic equity as well as on efficiency, owing to reduced access to credit; moreover, it starves the economy of the opportunity to capture the savings of the unbanked.

A financially included economy offers greater opportunities for the unbanked to involve in formal saving and investment activities. Rural women who are housewives, self-employed involved in petty trade, marginal farmers etc., stand chance to benefit most (Onaolapo A.R, 2015). Levine (2005) argues that improved institutional infrastructure of a financial system

reduces information asymmetry, there by contributing to greater economic growth. Rakesh Mohan (2006) argues that financial development accelerates growth by both supply-leading and demand-following mechanisms.

Demirguc-Kunt & Levine (2008) point out that greater financial inclusion reduces poverty and income inequality besides promoting economic growth. Burgess & Pande (2004) show that branch expansion post bank-nationalization in India has resulted in decline in the levels of rural poverty.

Subrahmanyam & Acharya (2017) note that financial inclusion fosters faster growth by increasing financial saving as a fraction of macro-saving and by maintaining a high level of productivity of financial investment. They employ three different models, viz., a multiplier model, the "AK" growth model and the Harbinger little triangle and rectangle to analytically demonstrate that financial inclusion contributes significantly to creating faster growth. Further to this, the authors observe that financial development enhances financial inclusion through the dual frameworks of financial tripod and policy tripod.

Evidence from research around the world suggests that financial inclusion plays a vital role in alleviating poverty, reducing inequality and tackling unemployment.

One of the major objectives of economic growth is poverty reduction. However, economic growth alone is not sufficient to achieve poverty alleviation. Complementary social policies viz., access to basic healthcare, sanitation, education and employment opportunities are must if the economy is to make satisfactory progress in eradicating poverty. To resolve the complex issue of poverty, it is necessary for all the socio-economic policies to be worked in synergy, so that the results produced are feasible as well as sustainable.

Park & Mercado Jr. (2015) argue that as financial inclusion increases, poverty rates tend to decline, since more people will now have access to formal financial services in order that they

may smooth their consumption, besides engaging in productive activities. In their study, the authors found that financial inclusion is negatively and significantly associated with poverty levels across a set of thirty-seven developing Asian economies.

Providing access to finance is a step towards empowering the poor. In India, access to financial services such as loans, savings, insurance etc., by the population living in rural and remote areas has been limited. This has been a major deterrent of economic growth in these areas. Ensuring that the underprivileged gain access to these services raises their standard of living, besides having favourable effects on health & hygiene (Murari & Didwania, 2010).

Financial inclusion enables low-income households, micro- and small-enterprises to participate in "inclusive and sustainable development" by providing them with an opportunity to make financial transactions, earn income, build assets and manage risks (Mugo & Kilonzo, 2017). Bruhn & Love (2013) find evidence that bank branch expansion alleviates poverty by decreasing unemployment; financial inclusion enables existing business owners to sustain their operations rather than becoming unemployed, or seek job elsewhere. Besides, new startups and expansions of existing firms enabled by financial inclusion help generate employment opportunities for many individuals, both in rural as well as urban areas.

c) Determinants of financial inclusion

While literature on financial inclusion has documented – both theoretically and empirically – its importance for poverty reduction, its contribution to economic growth, financial stability and employment generation (Bruhn & Love, 2013; Mugo & Kilonzo, 2017), research has also focused on the factors that influence whether an individual or household is financially included, as well as the macroeconomic determinants. The insights that research on these factors provided are helpful in better understanding requirements for policies that seek to promote inclusion at an individual-level as well as throughout the economy.

Fungacova & Weill, (2015); Sahoo et al, (2017); Chitra & Selvam (2013); Dar & Ahmed (2020); Martinez et al, (2013); Wang & Guan (2017); Zins & Weill (2016) are among those studies that present empirical evidence on factors influencing financial inclusion at an individual level.

Park & Mercado (2015); Bozkurt et al, (2017); Chitra & Selvam (2013); Kumar (2013); Martinez et al, (2013); Camara et al, (2014) & Tuesta et al, (2015) analyse the factors influencing financial inclusion at a macroeconomic level.

d) Multidimensional measures of financial inclusion

Various studies have developed numerous multidimensional measures of financial inclusion, of which, Sarma (2008, 2012), Arora (2014), Chattopadhyay, (2011), Wang & Guan (2017), Chakravarty & Pal (2013) and CRISIL (2018) are the notable ones. The World Bank Global Findex (2018) documents summary financial inclusion characteristics of over 140 countries.

5. Research gap

It can be surmised from the brief review of literature presented above that the focus of previous studies on financial inclusion has been threefold. First, studying the growth and developmental effects of financial inclusion; second, analysing the determinants that influence financial inclusion; third, measuring the level of financial inclusion achieved by an economy by developing multidimensional indices. However, the effects of financial inclusion on economic growth, poverty and unemployment with respect to Afro-Asian developing countries, particularly in Indian states, have not been sufficiently investigated. Furthermore, there is no existing study that examines the disparities in inclusion levels across Indian states. This gap in literature merits additional research.

6. Motivation

Financial inclusion is often conceptualized as a policy tool to help the poor and disadvantaged sections of the population to raise their standard of living by providing them access to financial services. Through its positive impact on investment in human and physical capital, greater access and usage of finance is seen to promote growth (Sharma, 2016; Kodan & Chhikara, 2013), while mitigating the effects of poverty on households (Chibba, 2009; Demirguc-Kunt & Levine, 2008). However, there is scanty evidence on the growth effects of financial inclusion in Afro-Asian developing economies. With particular reference to the Indian economy, to our knowledge, no study has investigated the impact of greater access to financial services on poverty and unemployment in rural *and* urban India. If greater access to finance does indeed improve growth and ameliorate poverty and unemployment, then a convergence in inclusion levels across Indian states could result in more even developmental impacts throughout the Indian economy.

It is from the above paragraph that we derive the motivation for the present study to first examine the developmental impacts of financial inclusion in developing Afro-Asian countries and then investigate the possibility of convergence in financial inclusion levels with particular reference to India.

7. Research objectives & hypotheses

The discussion above facilitates us to set up the following three specific objectives for our research:

- To examine the contribution of financial inclusion to economic growth in major Afro-Asian developing economies.
- To investigate the effect of financial inclusion on poverty and unemployment in Indian states.

- To assess the extent of convergence in financial inclusion levels across space and over time in major Indian states.

The objectives specified above naturally result in the following three testable hypotheses for the purposes of our present study:

H_{01}: Greater financial inclusion in major Afro-Asian developing countries does not have any statistical association with economic growth in these countries.

H_{02}: An increase in financial inclusion in major Indian states does not have any significant impact on poverty and unemployment in rural and urban India.

H_{03}: Financial inclusion levels across major Indian states do not exhibit either spatial or aspatial convergence over time.

8. Data & methodology

a) Nature and source of data

The data employed for the purpose of this study are all secondary in nature. The data employed for empirical analysis in Chapter 3 have been sourced from the World Governance Indicators and the World Development Indicators published by the World Bank and the Financial Access Survey published by the IMF (2017). Chapter 4 employs data sourced from the Status of Microfinance in India published by NABARD, Database on Indian Economy published by the RBI, Report of the Expert Group to Review the Methodology for Measurement of Poverty (Rangarajan, 2014), Report on Employment and Unemployment survey published by the Planning Commission, 66th, 68th and 70th National Sample Survey Reports and 2011 Census Report. Chapter 5 uses data from Reserve Bank of India (RBI)'s Database of Indian Economy and Handbook of Statistics on Indian States and Census data from Registrar General of India.

b) Methodology

The methods employed to test the hypotheses framed in section 7 above are briefly discussed below:

In order to investigate the effect of financial inclusion on economic growth in developing Afro-Asian economies, we first build an index of financial inclusion (IFI) for each country in the panel, which we in turn employ as an independent variable in a dynamic panel data regression model containing the economic growth of the respective countries as the dependent variable. Certain socio-economic variables introduced as control variables in the stepwise regressions.

While examining the impact of financial inclusion on poverty and unemployment, the study built two models, one each for poverty and unemployment. The study uses the percentage of population below the poverty line as a measure of poverty. Unemployment is measured by the unemployment rate for the year as indicated in the Report on Employment and Unemployment survey. In the first model, poverty indicator served as the dependent variable, while unemployment rate took its place in the second model. In order to achieve the objective set for Chapter 4, financial inclusion in each state is measured on three levels: Microfinance Financial Inclusion Index – MFIFII (covering only MFIs), Total Financial Inclusion Index – TOTFII (covering SHGs, MFIs and banks). We estimate both models for poverty and unemployment through the Blundell-Bond (1998) dynamic panel estimator.

To examine the convergence in financial inclusion across states using spatial panel regression techniques as well as the indices of convergence, an index of financial inclusion (IFI) is constructed for each state. Based on the index just built, we next perform a spatial analysis of the variance in IFI through a pair of exploratory spatial data analysis (ESDA) tools, namely LOSH and G_i^* maps. After drawing inferences about the spatial-dispersion and spatial-mean levels through the LOSH and G_i^* maps, we seek confirmation of these inferences through

spatial panel regression results. We next build convergence indices given in (Boyle & McCarthy, 1997) to draw aspatial inferences about the extent of similarities in the levels of financial inclusion in major Indian states. Finally, we seek to correlate the results from the spatial tools of ESDA and spatial regressions with those from the aspatial convergence indices.

9. Organization of the thesis

The thesis is organized in six chapters. The research problem and the objectives of the study are laid out in Chapter 1. Chapter 2 reviews the major threads of literature on financial inclusion during recent years. Chapter 3 examines the contribution of financial inclusion to economic growth in developing Afro-Asian nations. Chapter 4 analyses the impact that financial inclusion through microfinance institutions and banks has had in reducing poverty and unemployment in rural and urban India. The possible convergence in the levels of financial inclusion across space in Indian states is discussed in Chapter 5. Finally, Chapter 6 concludes the thesis by summarizing the research and providing relevant policy implications.

CHAPTER 2

Review of literature

1. Introduction

One of the primary goals of financial inclusion has been expressed as alleviation of poverty and providing income earning opportunities to the backward sections. While inclusive finance has been found to be successful through the Grameen Bank model in Bangladesh and the SBLP in India, most channels of inclusion work through traditional banks in South Asia and beyond. While some studies in the Indian context as well as on a cross-country basis offer support to the view that greater inclusion has indeed contributed to decline in poverty (Burgess & Pande, 2005; Mushtaq & Bruneau, 2019), recent studies such as Milana & Ashta (2020) find that financial inclusion through microfinance may not have been successful in empowering their customers.

Furthermore, there are conflicting views regarding the causal as well as long run relationship between financial development and economic growth, which has in recent years transformed into empirical support for the argument on whether financial inclusion and financial depth improve economic growth.

Another stream of literature that has occupied considerable part of research on financial inclusion apart from development of various multidimensional indices relates to the factors/determinants that influence access and usage of formal finance.

The following sections of this chapter present reviews of the relevant literature in significant threads on financial inclusion. The rest of the chapter is planned in four sections, literature concerning inclusion and poverty, financial development/inclusion and economic growth, determinants of financial inclusion and measures of financial inclusion.

2. Role of financial development/inclusion in the process of economic development

Levine & Zervos (1996) explore the relationship between the development of financial system and long run economic growth. They review previous studies, which are divided regarding whether a robust financial system contributes to economic growth or stymies it. Some researchers are of the view that a developed financial system is crucial for the mobilization and allocation of funds, ensuring control in the corporate sector and to effectively manage risk (Bencivenga *et al*, 1996; Levine, 1991) , while some others are of the opinion that the financial system is only a passive participant in the process of growth and development (Mayer, 1988; Stiglitz, 1985, 1994). Through their paper, the authors examine the existence of an empirical association between financial advancement through stock market development and economic growth in the long run. Using instrumental variables estimation techniques on a cross-country data series, the authors find that greater stock market development is positively and significantly associated with economic growth. Growth regressions are employed in the study, wherein human capital and physical capital are proxied by enrolment rates in secondary school and per capita income. Political instability also controlled for the negative effects that it may have on economic growth.

De Gregorio & Guidotti (1995) review several studies that present views on the association between financial development and economic growth. Goldsmith (1969), Shaw (1973) and McKinnon (1973) were pioneering contributions in this field, while later research emphasized the role of intermediation in strengthening economic growth. The authors seek to empirically reinvestigate the association between financial development and growth in the long run. They employ the ratio of formal credit to private sector to GDP to measure the extent of financial development. Using this measure, they employ Barro's (1991) growth regressions on a panel data of 98 countries over the years 1960-85. Secondly, a panel data of 12 countries over 1950-85 is used to test the relationship among Latin American countries. The results suggest that

though most often financial development improves growth, badly regulated financial liberalization, as evidenced by Latin America during the study period, could hurt growth. Another finding of the study is that the volume of investment plays a second role to its efficiency.

Beck et al, (2000) find a positive and statistically significant association between development of financial institutions on the one hand and the growth rate of total factor productivity and the growth rate of per capita real GDP on the other. This relationship is found to be robust to estimation techniques and numerous measures of financial development. However, the authors find that the evidence from their results does not clearly indicate whether development of financial institutions relates positively to growth rate of physical capital and savings of private sector. From their results the authors conclude that financial systems with more developed financial institutions are likely to enhance resource allocation, besides positively contributing to total factor productivity. These associations are likely to improve economic growth in the long run.

Bekaert et al, (2005) observe that despite the mainstream focus on the nexus between financial development and economic growth, the effects of financial liberalization on growth and financial development have not been give due attention. Through their article, the authors demonstrate that opening up the equity market for investment by the external sector is likely to improve economic growth. Such a liberalization of the equity market could increase growth rate of per capita real GDP significantly. With the liberalization of the financial sector in general, and the equity market in particular being largely dependent on economy-wide reforms, the authors opine that the study's results are supported in practice. These findings are statistically significant despite controlling for reforms, crises and enforcement environment. However, on estimating the growth effect of financial liberalization, the authors find that their

results do not support the extant theoretical view that greater liberalization in the equity market could result in increased volatility in economic growth.

Alfaro et al, (2004) explore the linkages that exist between financial markets, economic growth and foreign direct investment. In particular, they examine if financially developed economies can utilize foreign investment more efficiently. Their empirical analysis consists of an instrumental variable approach on data on various countries between 1975 and 1995. The authors demonstrate that while the impact of FDI on economic growth is not empirically clear from their study, there is confirmation that countries with advanced financial markets stand to benefit from FDI better than their less developed counterparts. From the above findings they conclude that FDI is an important driver of growth.

Demetriades & Hussein (1996) assess the relationship between financial development and national income. Their causality tests do not present strong evidence in favour of the view that greater financial development could result in stronger economic development. Notwithstanding the above result, the authors find evidence for bidirectional causality between finance and development. From their ambiguous results obtained from causality tests on cross-country data, the authors conclude that inferring causality between finance and growth on such data sets may be misleading, owing largely to the variations in causality patterns across economies, though there may be certain scope for reverse causation.

Calderon & Liu (2003) investigate the causal relationship between financial development and economic growth among 109 developing and developed countries over the period 1960 to 1994. To achieve their purpose, the authors adopt the decomposition test procedures. The authors find in their study that greater financial development usually contributes to higher growth. They also find evidence of a bidirectional causality between the two variables representing growth and development of the financial sector. Another finding of the study is

that financial deepening expedites capital accumulation and improves the growth in productivity, thereby contributing positively to economic growth.

Christopoulos & Tsionas (2004) examine whether depth in financial markets is related with economic growth in the long run. Their study is among one of the early studies in cointegration analysis. On a panel of ten developing countries, the authors perform stationarity tests as preliminary check for validating the data. Proceeding further, they perform panel cointegration tests and panel-based vector ECM. The FMOLS is adopted as the econometric tool to model the long-run relationship. Their empirical results offer support to the view that financial depth unidirectionally causes economic growth, while a long run relationship does exist between their proxy variables.

Rioja & Valev (2004) note the confirmatory relationship from financial development and economic growth documented in literature. The authors perform a panel regression analysis on data from 74 countries using the GMM technique to test this relationship among three types of countries: low, intermediate and high financially developed countries. The results from their dynamic panel data analysis show that while further financial development in the low region has an ambiguous effect on growth, improvements in the intermediate group have significantly positive effects. Finally, though the study finds largely positive effects of finance on growth, the magnitude is found to be smaller.

Ang & McKibbin (2007) investigate whether the causality between finance and growth is unidirectional or bidirectional in the Malaysian economy. For this purpose, they employ the traditional causality and mainstream cointegration tests on a time series data running between the years 1960 to 2001. They consider other variables such as real interest rate and financial repression to control for macroeconomic effects. The findings of their study point out that liberalization in the financial sector mitigates the effects of repressionism, and thus stimulates

greater development in the financial system. Their second finding that it is economic growth that causes greater financial depth is contrary to traditional findings ([Demetriades & Hussein, 1996; Arestis & Demetriades, 1999; Choe & Moosa, 1999).

Levine et al, (2000) test the impact of exogenous component in the development of financial institutions on economic growth, and whether financial development in a given country is influenced by differences in legal and accounting procedures across countries. They employ cross sectional, IV and panel estimation methods, using which, they find that exogenous component in the development of financial intermediaries bears a positive relationship with growth. Their second finding shows that legal and accounting procedural differences help explain variations in cross-country levels of financial development. Based on the findings, the authors recommend that progressive reforms in the legal and accounting systems are likely to promote economic growth.

Levine (2002) attempts to offer new perspectives into the debate concerning market- and bank-dominant financial systems. Though the debate has been raging historically, the author points to the then recent literature about the flaws in categorizing economies as bank- or market-dominant. He presents an examination of data from several countries, using which he attempts to contribute to the debate on bank- or market-dominant economies. Firstly, the results from his empirical analysis indicate that financial development in general is strongly and positively linked with economic growth. However, his study does not confirm that either a bank-dominant financial system or a market-dominant system is better compared to the other.

Benhabib & Spiegel (2000) assess the linkage between a bevy of financial development measures and economic growth, investment and growth of TFP. Against a panel data setting, they show that financial development id associated positively with growth of TFP as well as with investment in human capital and physical capital. However, the various measures that are

employed in their study are not linked to all components of growth uniformly, which could reflect the difficult in constructing an ideal measure of financial development.

King & Levine (1993) revisit Schumpeter's theory that development through financial system can strengthen economic growth, by employing data on 80 countries a thirty-year period from 1960-89. The analysis is performed against a time series setting with four indicators being constructed to measure financial development. Their analysis reveals that the measures constructed as indicators of financial development are strongly correlated with per capita income, rate of investment, efficiency in employment of capital. The predetermined component of financial development is also found to be positively associated with future rates of economic growth and investment.

Arestis et al, (2001) explore the possible linkage between development of stock markets in five developed economies and their economic growth. They adopt vector autoregression (VAR) and vector ECM techniques for this purpose. In their time series regression analysis, the authors control for the effects of volatility in the stock market and variations through the banking system. The findings from the study provide evidence to the argument that development of the banking system and the stock markets are likely to improve economic growth. However, the authors provide a caveat that cross-country growth regressions could possibly overestimate the effect of stock market development on economic growth.

Beck et al, (2007) observe that the poorest households stand to benefit the most from financial development, since it rapidly reduces income inequality. By employing descriptive statistics, least squares regression and dynamic panel estimation techniques, the authors find that only three-fifths of the impact of financial development on the growth in incomes of the poorest is explained by economic growth per se, while two-fifths of the impact is due to decline in inequality. Financial development is also found to be positively linked with reduction in

proportion of poor among the population. Thus, the authors conclude that a well-developed financial system is in the interest of the poor.

Guiso et al, (2004) investigate the possible effects of local disparities in financial development on economic variables inside a single, broadly integrated financial market. They build a new financial development indicator, using which the authors find, through descriptive statistics and regression analysis on data from Italy, that greater financial development makes it more likely that an average person starts an enterprise on her own, besides paving way for newer firms by increasing competition and also encourages economic growth. They qualify their results by observing that larger firms that can access funds outside their locality more easily do not enjoy the benefits from financial development as much as smaller firms. These findings lend support to the view that local financial development influences economic growth.

Hermes & Lensink (2003) investigate whether financial development in a country mediates the influence that FDI may have on economic growth. They observe that greater financial development results in better diffusion of technology with respect to FDI. On a database of 67 countries, the authors apply the technique of growth regressions. From their empirical analysis, the authors find that financial development in 37 countries having highly developed financial systems offer support to their argument that financial development is almost a prerequisite for FDI to have a beneficial impact on the economy.

Raza *et al*, (2019) examine the association between financial inclusion and economic development between the period 2010-15 in Pakistan. Their research design is based on a framework of meta-analysis, while descriptive statistics and regression analysis are employed as tools for data analysis. Based on their empirical research, the authors find that financial inclusion and economic development are positively associated. In particular, the density of bank accounts and that of bank branches in relation to population bear a direct relationship with

Pakistan's Human Development Index (HDI). The density of ATMs (in relation to geographical area) on the other hand is evidenced to be negatively related to HDI. It follows from their study that expansion of bank branches and opening of new bank accounts can be effective ways to contribute to economic development, besides alleviating poverty and ensuring that economic growth in Pakistan is more inclusive. The authors further infer from their findings that financial inclusion could possibly contribute to enhancing the overall measures of health and education, besides promoting income levels in Pakistan. Hence, they underscore the need to ensure greater growth and development by ensuring that the financial system becomes more inclusive, especially through bank branch expansion and deposit services.

Ghosh (2016) observes that in against the recent advances in ICT, the potential of mobile telephony and internet to advance financial inclusion has been a focal point of policy debates off late. The author intends to explore the potential of mobile telephony in promoting economic growth. For this purpose, he employs a panel data on Indian states during the period 2001-12. Besides calibrating financial inclusion using indicators that include density of availability of bank branches (both in relation to geographical area and population), density of credit accounts and deposit accounts in relation to population, proportions of loan and deposit volumes to per capita income, the author also uses data related to mobile telephony as an additional feature of inclusion. Employing an endogenous growth framework, he estimates the effect of mobile telephony on growth through a GMM estimation procedure, with education, inflation and government size being among other determinants of economic growth. The results reveal that the positive effect of mobile telephony is statistically significant, with its magnitude being "non-negligible". Evidence from the study also point to possibilities of non-linear effects on growth. Furthermore, mobile telephony is also found to be positively associated with financial inclusion.

Kim *et al*, (2018) explore empirical evidence on the statistical association between inclusive finance and economic growth within countries that are members of the Organization of Islamic Cooperation (OIC). To elicit multilateral results from the analysis, the authors depend on a panel of 55 OIC countries. Besides estimating dynamic panel regressions, they also apply panel versions of VAR, IRF and Granger causality to the data. Their results, especially the dynamic panel regressions, show that financial inclusion exerts a positive and significant impact on economic growth in the OIC countries. The results from the impulse response functions and the corresponding panel VAR analysis reveal that financial inclusion affects growth positively. There is evidence of bidirectional causality between the two variables based on the panel Granger causality test. Notwithstanding their finding that financial inclusion contributes to growth in OIC countries, the authors recommend that in view of the sizable differences among the OIC countries in their levels of inclusion achieved, there could be a need to consider other socioeconomic and demographic factors that could possibly influence access and usage of formal finance. Taking into account such characteristics may result in better calibration and expansion of banking services, which could in the process enhance growth.

Sethi & Acharya (2018) analyse data on a sizable number of countries from the developed as well as the developing world with an objective to explore the relationship between inclusion and economic growth. For this purpose, they apply certain econometric techniques such as the country- and time-fixed effect regressions, random effects model. In addition, they also test the long run relationship between inclusion and growth through panel cointegration tests, besides using panel causality test to examine to direction of causality between the two variables. Basing on their research, the authors find evidence that in the panel of 31 countries under study, there exists a positive and long run cointegration between financial inclusion and growth over the period 2004-10. The causality test also shows that a bidirectional causality is present between financial inclusion and growth. The above findings enable the authors to conclude that financial

inclusion is among the important determinants of economic growth. Certain policy recommendations made by the authors include the need for financial sector reforms in the countries studied, along with expansion of financial access and usage, which could serve to enhance economic growth in the long run.

Sethi & Sethy (2018) present an empirical investigation of the statistical relationship between financial inclusion in India and the country's economic growth. They follow the UN-HDI method to present an index to quantify the level of financial inclusion across time, even as the apply the ARDL and NL-ARDL techniques to assess cointegration between inclusion and growth. The Toda-Yamamoto version of the Granger causality test is employed in the study to examine the direction of causality between the relevant variables. From their analysis, the authors find that the linear ARDL procedure provides evidence for the presence of a long run cointegrating relationship, which goes to suggest that enhancing demand- and supply-side of financial inclusion goes to strengthen economic growth. A relevant conclusion drawn by the authors from the above finding is that expansion of financial access has the effect of promoting economic growth, especially in the long run. However, the other finding that a nonlinear cointegration cannot be evidenced through NL-ARDL suggests that an asymmetric effect of financial inclusion cannot be inferred. There is only a unidirectional causality from inclusion to growth, the study finds. The authors recommend that there is a need to ensure that the outreach of financial services be expanded so as to improve economic growth in the long run.

Kim (2016) attempts to assess whether providing greater access to financial services helps in mitigating income inequality. The author also estimates the impact of accessibility to formal finance on economic growth through its dampening effects on inequality. At the outset, he notes that with the purpose of financial inclusion being to raise living standards through provision of financial services, the result often is better economic development. On performing various cross-sectional regressions, the author finds firstly that while inequality is negatively

associated with growth, this inverse relationship is stronger in low-income countries. Furthermore, the study finds that economic growth is weakened by income inequality in high-fragility economies. The second finding of the study is that income inequality is not influenced by progressivity in either low-income economies or high-fragility economies. Thirdly, the authors findings enable him to conclude that the negative impact of inequality on growth is dampened to an extent by greater financial access. This is brought about because financial inclusion has the effect of mitigating income inequality, which could then translate into improved effects of the latter on economic growth, the author finds. This final observation is found to hold true more in high-fragility economies compared to low-fragility economies.

Sharma (2016) investigates whether financial inclusion in the Indian economy is statistically associated with economic development in the country. The author applies the econometric techniques such as VAR and Granger causality test for addressing her research problem after checking the data for stationarity by employing the traditional unit root tests. The data collected and analysed correspond to the period between the years 2004-2013.The author concludes from her empirical findings that financial inclusion is positively and significantly related to economic growth, with certain dimensions including penetration of deposit services, availability of bank branches and usage of credit and deposit services being strongly correlated with growth. A bidirectional causality is observed between economic development and financial outreach, while volumes of deposit and credit accounts opened with banks is found to Granger cause GDP unidirectionally. These findings encourage the author to recommend more social banking experiments similar to the bank branch expansion drive taken up by the government after nationalizing banks in 1969. The author further discusses possible policies that might lead to further deepening of the financial system, with focus on working towards an economy that is not only developed, but also follows an inclusive and sustainable growth model.

Park & Shin (2017) initially note the theoretical possibility of either positive or negative statistical association between income inequality and financial development. The existence of various direct as well as indirect channels through which financial development could impact inequality are seen to make the relationship more complex. However, observing that the relationship being considered is essentially empirical, they analyse the factors influencing the relationship between development of the financial sector and inequality, besides assessing the impact of financial development itself on inequality. They consider relevant variables as proxies for factors controlling for education, institutions and systemic stability. The results from their regression analysis do not point to an unambiguous relationship running from financial development to inequality. The authors point out that this finding of theirs reflects the lack of theoretical consensus regarding the issue. They conclude from their mixed results, however, that economies that are not highly financially developed are those that stand to benefit most from financial development. Furthermore, an observation is made that bolsters the popular argument that financial resources with those economies having advanced financial systems might not be able to reap either growth or equity benefits.

Iqbal & Sami (2017) observe that with financial inclusion developing as the bedrock of economic development in India, it could possibly succeed as an effective policy tool to improve economic growth and drive away poverty. They define inclusive finance as that which provides financial services in general, and banking services in particular, to the unbanked masses, along with the underprivileged and marginalized sections among the population at affordable cost. They note that financial inclusion could play a crucial role in advancing the economy as well the society, especially since it serves to mitigate the effects of poverty and inequality. With banking institutions developing into drivers of economic development, the authors seek to study the association between financial access and economic growth in India between 2007-08 and 2013-14. They apply multiple regression on data sourced from the RBI, Government of

India and various other sources. Their empirical analysis reveals that there exists a significantly positive statistical relationship running from number of branch access points to GDP and from credit-deposit ratio to GDP as well. However, the rate of growth of ATMs has not been observed to significantly impact economic growth of the country. Despite the strongly favourable relationship found from financial access to growth, the authors argue for a regulated financial system along with structured financial education programs to be put in place.

Alhassan et al, (2019) study the impact that financial inclusion through formal sources has on financial intermediation through semi-formal and informal sources. It also assesses whether financial inclusion has any relationship with patterns in the cash economy in African countries. The authors use data from the World Bank's Global financial inclusion database (2014) to investigate the response of usage patterns of cash and intermediation through informal sources of finance. Their results confirm that informal intermediaries provide financial services that are positively correlated with formal inclusion related activities such as providing banking services. These findings indicate that informal intermediation may be complementary to financial inclusion through banks, rather than working against it. This confirms the significance held by informal finance in African countries. Another finding of the study is that engagement with formal financial institutions contributes to a reduction in cash holdings in general. The authors opine that there is need to develop a resilient financial system that displays the ability to channelize any excess liquidity from the informal economy for productive investment purposes that aid in the development of the respective countries.

Mago & Chitokwindo (2014) investigate the Zimbabwean economy for the relationship that financial inclusion bears with mobile banking. They treat financial inclusion as a policy issue that requires immediate consideration due to the vast proportion of unbanked segments of population. The authors observe in the paper that households that earn meagre income and unemployed individuals often face barriers to accessing formal financial services, as a result of

which they get excluded from the mainstream development process. To achieve their aim, the authors survey the Masvingo district by adopting a qualitative survey design. In addition, by employing a qualitative research methodology, they find from their analysis that households with low income are positively disposed to adopting mobile banking due to its low cost, ease of access and use and the relative security and convenience it provides. Hence, they recommend that the central bank in Zimbabwe should monitor mobile banking structures that are not bank-led, while regulating their cash holding limits. With the poor households and low-income earners historically belonging to the informal sector, they have not benefited from formal banking services, which could be remedied by providing banking services through mobile networks. The authors note that duly monitored mobile banking structures are likely to improve financial linkages in rural areas, thereby contributing to economic growth.

Van *et al*, (2019) point out that despite the vast amount of academic, regulatory and policy concerns that the status of financial inclusion has been generating at the international level, empirical evidence of related issues has been limited for emerging markets. In their paper, the authors attempt to fill the gap in literature by providing empirical insights into the linkage between inclusive finance and economic growth in these economies. For this purpose, they initially construct an index that measures inclusion on three dimensions, including availability of bank branches, availability of ATMs, and usage of credit by private sector. The authors note that their index is representative of inclusivity at an international level. They apply certain panel estimation techniques such as the generalized method of moments to investigate the statistical impact of greater inclusion on growth. Their study offers evidence that lends support to most articles reviewed above, which are of the view that financial inclusion strengthens growth in emerging economies. An additional finding by the authors is that countries that exhibit low level of financial inclusivity and low-income levels are more likely to experience

growth benefits due to inclusion. Hence, the authors recommend that greater access and usage of financial services must be promoted in emerging economies.

3. Role of financial inclusion in poverty reduction

Mushtaq & Bruneau (2019) conducted a study to investigate the role of financial inclusion through information & communication technology in reducing poverty and inequality. Their study consists of a panel of 62 developing and emerging countries between the years 2001-12. Poverty is measured by headcount ratio, while gini index is taken to quantify inequality. To overcome the lack of continuous data, they considered three-year non-overlapping cross-sections over the study period. Financial inclusion in their study is measured on the dimensions of microfinance, commercial banks and ICT. Further, variables that act as proxies for economic growth, financial development, size of government and share of cultivable land are included in the model to reflect relevant macroeconomic effects on poverty and inequality. Institutional factors such as political rights and cost of enforcing contracts are considered as institutional factors. The fixed and random effects regressions are run while accounting for endogeneity in regressors. The results of panel regressions suggest that financial inclusion through banks and MFIs negatively impacts poverty and inequality levels. The authors also find evidence that subscriptions of mobiles, fixed lines and internet show negative impact on poverty and inequality, despite controlling for other factors. The authors recommend that ICT infrastructure and financial sectors in developing countries could be synergized to facilitate better structured response to poverty. Digital banking and better financial regulation are also felt to be helpful.

Li (2018) assesses the impact of relative income comparisons among Chinese households on their tendency to be financially included. The paper refers to the contrasting ideas of ‘tunnel effect’ and ‘keeping up effect’ that may drive a household’s demand for credit. While the latter effect might lead to excessive indebtedness through conspicuous consumption, the former is

based on ambition to work up through social hierarchy by way of making investments in human capital and income-earning activities. The author uses the China Household Finance Survey conducted in 2011 on 8348 households across various communities, counties and provinces in China. The logistic regression results suggest that the financial decisions of a household are positively associated with the average income of households in the community. Furthermore, while the poorer households are more sensitive to income comparisons. The results indicate that the 'tunnel effect' dominates the 'keeping up effect' in encouraging the poor to demand credit. The study recommends that households that exhibit 'tunnel effect' must be ensured sufficient funding opportunities and repayment guidance so as to promote investment and wealth accumulation.

Jones (2008) provides theoretical insights into the role of credit unions in alleviating poverty and furthering financial inclusion in Britain. He analyses how the operational structure of credit unions have changed in the nation and what are the factors that necessitated the change. Beginning as informal volunteer-dependent organizations whose overarching purpose was to address the financial needs of Britain's poor, these credit unions had to shift to a more formal and commercial operational structure that employed trained staff. This change was necessitated in a large part by the weak finances of the informal credit unions themselves, which were addressed to a large extent after adopting a commercial operational structure. Jones (2008) argues that the shift in operational structure places the credit unions in a better position to fight financial exclusion by offering formal banking accounts, affordable credit and financial consultation facilities appropriate to the poor, which in turn may help diminish the incidence of poverty.

In her presidential address to the International Atlantic Economic Society Demirguc-Kunt (2014) highlights the challenges faced by the World Bank in calibrating financial inclusion, and discusses the role played by financial inclusion in fighting income inequality and poverty.

More than half of World Bank member countries have included policy tools to achieve financial inclusion within a specific timeframe. Regarding the measurement of financial inclusion, Demirguc-Kunt (2014) speaks about the challenges faced due to not being able to always observe access to finance, unlike the case is with respect to usage. Not using financial services does not always arise from lack of access; for example, one may not need financial services, or may be accessing indirectly through a family member or may shun finance due to religious or cultural reasons. The interest of the policymakers lies largely with those segments of population that are excluded from formal finance due to structural, institutional and regulatory shortcomings, which could otherwise have served as an attractive customer base for the formal financial institutions. The speaker further mentions several self-reported reasons for exclusion from finance. These reasons include not possessing sufficient funds to access finance, another family member already being an account holder, high cost of opening and maintain accounts, access points being too distant, onerous documentation procedures and lack of trust in formal finance. Demirguc-Kunt (2014) also notes the negative association between financial inclusion and poverty & inequality across various countries, and hence cautions that financial inclusion must be promoted not just for the sake of expanding credit, but to address the larger developmental issues also through banking accounts to promote savings. Furthermore, policies to bailout borrowers systematically may backfire.

Sehrawat & Giri (2014) investigate the effect of financial development on the level of poverty in India. With some earlier studies suggesting that financial development negatively impacts poverty while some others offering explanation why financial development may impair economic growth and thereby derail any efforts to reduce poverty, the authors set out to offer empirical evidence on the effect of financial development on the level of poverty in India. By obtaining data from the World Bank, RBI & NSSO from the year 1970 to 2012, the authors use per capita consumption expenditure as a measure of poverty. The private sector credit as a

ratio to GDP as well as broad money (M3) to GDP are used to represent the level of financial development. Inflation measured by consumer price index (CPI) and economic growth proxied by per capita GDP are used as control variables. The results of the study provide support to theories that argue that financial development reduces poverty, especially in the Indian context. The ARDL and Granger-causality results confirm the existence of long-run cointegration as well as unidirectional causality from financial development to the poverty alleviation. The paper concludes that promoting financial development helps in reducing poverty in India.

Inoue (2019) also seeks to investigate the effect of financial development on poverty conditions, especially in India. In addition, he also aims to analyse the impact of financial deepening on poverty in India. The study uses unbalanced panel data sets for several states & UTs in India from 1973 to 2004, to which the Arellano & Bond (1991) GMM estimator is applied to explain the effect of financial breadth and financial depth on poverty. Bank branches and deposit accounts are used to measure availability and usage of formal banking services. Financial depth is measured in terms of bank credit. The results of the study suggest that both financial depth and inclusion through PSU banks have negative and statistically significant impact on poverty ratio, due to which the author is able to conclude that PSU banks in India contribute to poverty reduction. However, such a conclusion could not be drawn in the case of private sector banks, owing to the statistically insignificant coefficients on the corresponding estimates. The author recommends that owing to the stronger relationship PSU banks have on poverty alleviation through financial inclusion compared to private sector banks, any restructuring of banks that is necessitated by increasing NPAs due to loans to large industries should be done in a way that does not affect the financial inclusion agenda of PSU banks.

Burgess & Pande (2005) evaluate the impact of bank branch expansion programmes in India as social banking experiments on poverty in rural areas. The authors specifically review the performance of branch expansion after the ambitious nationalization initiated in 1969. They

note that about thirty thousand branches opened in various parts of rural India in the two decades running up to 1990 have sought to improve cost-effective access to funds and savings products to the poor. The authors find that opening bank branches in the rural hinterland of India has helped in lowering poverty in rural areas. This desirable outcome was brought about, the authors observe, through mobilization of savings through deposits and disbursal of loans as part of formal financial services. The benefits of these channels of inclusion (access to deposits and credit) through banks could be amplified because f the 1:4 licensing policy, which necessitated banks seeking to open new branches to first open four branches in rural unbanked areas. Little or no effect was found to have been made on urban poverty as a result of branch expansion program.

Chibba (2009) notes the usefulness and necessity of financial inclusion programs in tackling poverty at an international level. He builds explanatory models which explain that in the light of the 2008 global financial crisis, there is a definite need to push the efforts to pursue financial inclusion so as to address poverty. Financial inclusion is seen to reduce poverty, promote pro-poor growth, raise the standard of living of low-income households, besides facilitating better money management, providing safer avenues to save and aiding in starting microenterprises.

Das (2019) employs secondary data from RBI's Basic Statistical Returns, quarterly statistics of commercial banks and Census (2011) report by the Registrar General of India as well as primary data obtained from a field survey in Assam, wherein twenty households each from a total of twelve households were interviewed in an attempt in examine the impact of expanding formal finance in rural areas on poverty reduction. Probit and Tobit estimation procedure is chosen for econometric modelling. The study opines that the level of poverty could be overestimated if the per capita income is not measured properly. The author opines that the poverty gap is higher among those borrowers who depend on informal means for obtaining credit. By contrast, formal sources of credit are found to be effective in supporting those

households which are closest to the poverty line. The overall incidence of poverty is not found to have been significantly lowered by formal credit. The modes of financing education and health requirements have not been found to provide benefit on an immediate basis, which might be a result of the government's policy towards developmental aspects while formulating schemes that are likely to benefit rural inhabitants. To break the vicious circle of poverty, the author recommends emphasizing more on formal credit sources, while limiting informal sources to activities that can be linked with structured markets.

Demirguc-Kunt & Levine (2008) focus on the functions of the financial system that aid in eliminating frictions in the market. The role of the financial system in a) generating information prior to making investments and allocating resources to productive uses, b) ensuring the corporate governance principles are adhered to after the investments are financed, c) enabling risk diversification and management along with transfer of risk without undermining the stability of the system, d) encouraging pooling and channelization of savings among various units and e) lubricating the process of exchanging goods and services among economic agents. However, the authors note that despite all financial systems being involved in discharging the same functions mentioned above, there might be noticeable differences in the effectiveness of performance by different financial systems. For a financial system to develop – and perform its functions effectively – its markets, intermediaries and the corresponding instruments traded need to continuously improve in performing these functions. The authors note that for that to happen information dissemination, enforcement of contracts, keeping transaction costs in check hold the key. Frictions in financial markets also need to be ameliorated by bringing the policies and regulations across various platforms more in consonance with each other, besides maintaining stability over time. The authors opine that a more balanced perception of the primary imbalances in financial markets that prevent improving access to formal financial services in general, and appropriate services in particular,

plays a crucial role in alleviating the incidence of poverty as well as in enhancing growth prospects.

Wang & He (2020) provide evidence on the impact of financial inclusion through digital mode on the susceptibility of farmers in rural China to poverty. With an increased responsibility being placed on financial institutions to expand access to finance as a tool to fight poverty, the authors observe that digital finance could possibly play a crucial role to further advance the cause. Their study employs data on 1900 households in rural China, based on a field survey. They measure the likelihood of a farmer household to become poor using the Asset-based Vulnerability model. Their survey results reveal that about 36% of farmers in their sample make use of digital modes of financial services, based on which figure, the authors estimate that greater usage of digital forms of access to finance possibly mitigates vulnerability to poverty. The ability of farmers to manage financial risk could be an important factor in helping them stay above the poverty line. Moreover, the authors find that those financial services offered to rural farmers by information and communication technology companies has a positive an impact on poverty that is greater in magnitude compared to the impact of digital financial products offered by brick-and-mortar bankers.

Dawood *et al*., (2019) investigate the contribution of financial services in reducing poverty in developing countries, with particular reference to Indonesia. Despite achieving reasonably high pace of financial development, Indonesia suffers from high incidence of poverty. To decode the effect of access to formal finance on poverty in the country, the authors employ data from the Susenas (2017) research on around 3,00,000 households. Using a binary logistic regression model on this data, the authors find primarily that greater the access to finance, lower the probability of a household to suffer absolute poverty. Other important findings of the research include the following: lack of physical as well as financial assets can be compensated by access to formal finance; vocational opportunities other than agriculture, opportunities for education

can also possibly be made up for based on financial inclusion. Moreover, households that are generally more financially included exhibit the capacity to migrate to urban areas in search of better economic opportunities, besides utilizing other relevant economic incentives. Based on the findings from their study, the authors recommend that while espousing the cause of financial inclusion might help poor households in general, farming households that are especially headed by women in rural areas stand to benefit most. Furthermore, financial inclusion, in the opinion of the authors, is also necessary to incentivise the poor to find employment opportunities within their villages, there by mitigating ad-hoc urbanization.

Omar & Inaba (2020) perform a panel data analysis with a focus on how financial inclusion combats poverty and inequality in developing countries. They argue that access and usage of finance open up new opportunities that were previously closed to the marginalized sections of the populations. Additionally, the authors examine various determinants of inclusive finance, and their individual effects in an unbalanced panel of 116 countries over a thirteen-year period between 204 and 2016. They initially construct an index of financial index, using which they find evidence that income level, density of internet usage, an economy's dependency on working age population and inflation are among the most important factors influencing the level of inclusion. The primary finding of their research however, is that greater access and usage of finance in these countries has a significant impact in mitigating the effects of poverty and income inequality. Based of these findings, the authors recommend that the scope and outreach of the formal financial sector by expanded for wider benefit of the disadvantaged sections, so that the societal benefit is maximized.

Maity & Sarania (2017) study the effects of microfinance on poverty reduction as well as on income inequality through SHGs in Bodoland, Assam. The SHGs chosen for study are sponsored by the government via the SBL program. The sample size surveyed amounts to 330 respondents, of which 150 constituted participants in the SBL program, while the rest was

treated as the control group. A survey design that is suitable for a multistage sampling is chosen by the authors. The authors argue that SBLP could be seen to aid the participants in owning productive assets that help them stay employed, besides generating income. As a result, their households are lifted up from poverty, besides increasing the probability of their becoming active participants in the financial (at least the banking) sector. They employ the propensity score matching method through the probit model in order to evaluate the probability that a household member is a participant in the SBLP program. The study empirically evidences that the level of income, number of days engaged in employment and participation in banking activities are considerably higher among the participants of SBLP compared to non-participants. These findings, the authors opine, provide support for similar programs to be initiated besides enhancing certain other aiding mechanisms like infrastructure, technology and awareness.

Mohammed *et al*, (2017) define financial inclusion as making formal financial services available to those whose income levels are relatively low. They argue that despite the theoretical literature proposing several welfare benefits arising from inclusion, the empirical evidence regarding the effect on poor households in African countries has not been given due attention. Judged against the fact that African is growing at a pace second only to Asia, the authors opine that the developmental effects – especially the poverty reduction effects – of greater inclusion in Africa needs to researched more. Therefore, the authors researches on this problem with particular focus on individuals earning relatively low-income in thirty-five countries in the Sub-Saharan region. The methodology they employ for this purpose include propensity score matching estimator and treatment effects. The results from their research suggest that those individuals, who are financially included despite being poor can expect to increase their overall wealth, besides availing other welfare benefits. On the other hand, those

who are financially excluded may not be among the recipients of wealth and overall welfare benefits.

Churchill & Marisetty (2020) explore the relationship between efforts to promote the inclusivity of financial sector and outcomes in poverty reduction in India. For this purpose, they use data from Financial Inclusion Insights program, with a nationally representative sample for the period running from September 2016 to January 2017. The survey utilizes responses from over 45,000 individuals from more than a thousand towns and villages in India. Various factors influencing poverty (apart from financial inclusion) including level f education, age, religion and location of residence were used as control variables in the study. They build a multidimensional index to measure the level of financial inclusion of the individuals. Poverty is measured against three different standards to allow for biases in various measures. The author's primary finding is the significant poverty reducing potential of financial inclusion, across various standards of measuring poverty. This finding was also consistent even after allowing for alternative measurements of inclusion. Especially, the effect of insurance provision to the poor is seen to fight poverty more effectively compared to access to deposits and credit. Based on their findings, the authors recommend that financial inclusion needs to be pursued by policymakers in a purposeful manner so as to achieve desirable results in reducing poverty in countries with similar conditions.

Sehrawat & Giri (2015) investigate the impact of financial development in dampening the incidence of poverty in eleven developing countries in South Asia. The data they employ for this purpose is of a panel nature, with the period of analysis spanning from 1990 to 2012. After the customary checks for stationarity of data, the authors investigate the presence of a cointegrating long run relationship between financial development and poverty reduction. Their empirical results confirm that financial development and poverty alleviation are cointegrated in the long run in the context of South Asian developing countries. The other

results of secondary interest suggest that inflation and trade openness also bear a strong positive association with poverty reduction. The authors find causality running in a single direction from financial development and poverty reduction. The findings of the study offer the authors scope for recommending relevant reforms in the financial sector as well as the macroeconomy in connection with financial inclusion so as to dampen the incidence of poverty in developing economies. They further recommend that programs that focus on providing greater access to credit and deposit services may be given greater push, since they also cut down transaction costs and habituate the poor to save regularly.

Ajide (2020) notes that the policies promoting financial inclusion primarily focus on including the unbanked sections of the population in the formal financial folds, which has the potential to mitigate the effects of, and even lift households out of poverty, reduce inequality and provide opportunities for business startups. The author aims to study the association between greater inclusion levels in some of the African countries and the entrepreneurship possibilities there. For this purpose, the author uses data from the World Bank's WDI, International Monetary Fund's IFS, ease of doing business reports and the Entrepreneurship Survey conducted by the World Bank between the years 2005 and 2016. Econometric tools such as static random effects, instrumental variables were employed to test the hypothesis that greater financial inclusion does not improve entrepreneurship potential of an economy. The findings help the author conclude that access to financial services is positively and significantly associated with startups and the encouragement they receive in the thirteen African economies under study. The study recommends that the central bankers could possibly support the low-income earners and young entrepreneurs in the form of greater credit support at rebated interest rates, besides investing to promote financial education.

Sakanko *et al,* (2019) examines the contribution of financial inclusion to national development in Nigeria between the period 1980-2018. They make use of the ARDL bounds testing

approach for this purpose, besides employing the FMOLS, canonical cointegrating regression and DOLS to check the results for robustness and consistency. Their empirical analysis reveals that access to ATM services, physical bank branches and credit services exhibit a long run cointegrating relationship with national development in Nigeria. It is found that in the short run, ATM availability and credit volume have statistically significant positive effect on the current and past values of national development. However, access to bank branches are found to bear a negative and statistically significant association with national development in the short run. A bidirectional causality is evidenced by the data between access to physical banking points and national development, while a unidirectional causality is found to run from national development to availability of credit services. These findings encourage the authors to recommend that the policymakers work towards building those inclusion strategies that will enhance the availability of brick-and-mortar financial institutions, especially banks, credit services at affordable costs and payment systems for the unbanked population.

Khaki & Sangmi (2017), in an attempt to explore further the relationship between availability of finance in India, elaborate the significance of making financial services available to the poor on an unrestricted basis. They argue that policies that aim to establish such conditions help in achieving inclusive growth, besides making the financial sector itself more inclusive. They opine the this will help the marginalized and poor households to play a more active role in the economy through better honed skill sets, participation in the labour market and involvement in production activities. Such a change is desirable since it increases the individual and household welfare of the poor and raises their standard of living which could be seen to contribute significantly towards alleviating poverty, besides increasing growth. The authors' evaluation of beneficiaries under the NRLM scheme of the GoI empirically evidenced their arguments summarized above, besides suggesting that participation in the program is likely to compensate for deprivations in certain other development indicators also. However, that the NRLM

program has been found in their research to not focusing on the poor alone has caused the authors to suggest that the it would serve the purpose of the program if the beneficiaries were selected on a logically fixed criterion.

Koomson *et al*, (2020) empirically analyse the contribution of access to finance in reducing poverty in Ghana. They use data from the Ghana Living Standards Survey conducted in 2016-17 to develop an index of financial inclusion, besides employing a three-stage FLS to examine the vulnerability to poverty of the Ghanaian households. The IV probit estimation technique is used to resolve the problem of endogeneity. Their estimation results suggest that even as just over half of the households in Ghana can be considered to be vulnerable to poverty, about one-fourth of the households are actually poor. It is found that expansion of financial access results in a decline in the probability of a household being poor by 27%. It also mitigates a household's vulnerability to poverty by 28%. Financial inclusion causes households with women as their heads are more likely to experiencing greater upliftment from the clutches of poverty. It is also found that the poverty alleviating effects of financial inclusion are more apparent in rural areas. From their findings, the authors recommend policies that enable environment conducive for private sector enterprises to thrive, and those that further provides access to finance in remote areas. Investment in and due regulation of mobile money firms is observed as a crucial component in advancing inclusion in Ghana.

Lal (2018) collect primary data from 540 customers of cooperative banks based in the three Indian states of Punjab, Himachal Pradesh and Jammu & Kashmir. They employ a purposive sampling design to obtain the data from the participants between July-December 2015. Factor analysis is employed to summarize the data into vital factors. They also perform the second-order confirmatory factor analysis to check whether the data are reliable. Data analysis techniques employed include ANOVA, structural equation modelling and t-test. The results of their research show that cooperative banks enable significant poverty alleviation on account of

the financial access through them. Especially, the authors find through their study that access to deposit, credit and insurance services through these banks succeeds in lifting households out of poverty. These findings encourage the authors to suggest that policymakers might want to promote banking habits among poor households, especially in rural areas. It is to be noted that the recommendations by the authors are not made with a limited scope restricted to the three states surveyed, but are extended by them to the national and international contexts as well.

Park & Mercado (2017) analyse the determinants influencing financial inclusion, besides investigating the contribution of inclusion in mitigating the effects of poverty and inequality across the world as well as in Asia. For this purpose, they initially build an indicator based on Sarma (2008) to estimate the level of inclusion in 176 countries. A plethora of country-specific and cross-country related factors influencing financial inclusion in these countries is also studied. The study assigns specific focus on the effects of inclusive finance on 37 developing countries from Asia. Certain other control variables are also employed by the authors while assessing the poverty alleviation and inequality reduction effects of inclusion. The results of their empirical analysis show that the level of income, governance quality and demographic factors including age dependency ratio influence financial inclusion the world over as well as in Asia. Their findings are tempered with conclusions that education does not significantly affects inclusion in developing Asian countries. Financial inclusion is found to be negatively and significantly associated with poverty both within Asia and across the globe, while its correlation with income inequality is not statistically significant. The authors recommend that ensuring that restrictions to financial access are eliminated could ensure easing of the burden due to poverty and inequality.

Shaikh (2017) assesses the effectiveness of Islamic finance in encouraging enterprises, besides examining its scale and efficiency outcomes to highlight the principal-agent problem in micro equity finance. The authors find that financial inclusion through debt financing often involves

indebtedness, while Islamic equity and related financing channels in their present form are subject to principal-agent problems. The enterprise level finance, together with the distinct entry rule put in place to avail debt and micro equity through Islamic MFIs, the authors find, can help funds reach those who are the target beneficiaries, while contributing to lower monitoring costs and address adverse selection. Through a framework that enables microenterprises owned by poor individuals possessing related skills to obtain equity finance, the author suggests that equity finance through Islamic modes can improve MFIs to expand their outreach, besides achieving scale. The author further sees the increasing usage of equity finance helping Islamic finance in achieving its vision of an egalitarian world, besides contributing to alleviate poverty in countries where majority population are Muslim. This observation, the author observes, holds weight because Muslim countries are home to half of the world's poor. Hence, poverty alleviation efforts through Islamic finance need to be scaled up.

Lopez & Winkler (2017) investigate challenges to microfinance in rural areas across the globe where incidence of poverty is highly evident. Starting with the premise that financial inclusion experiences slow progress as a result of various challenges including, but not limited to, greater transaction costs, disproportionally high risks and unsuitable contracting environment where quality of enforcement is lax, the authors note that unless the general operational environment improves, sustainability of microfinance institutions is difficult to achieve, much less maintain in rural areas. They sample 772 microfinance institutions over 2008-13 with an objective to test if financial inclusion through advancement of credit in areas is impaired by challenges to sustainability of the microfinance institutions themselves, as compared to the environment in urban areas. The results from their study show primarily that MFIs possessing a greater share of borrowers from rural areas may not often face sustainability issues. However, it is found that those MFIs possessing a greater share of borrowers from rural areas are often unable to avail

productivity gains and benefits from economies of scale. In sum, the study results offer substance to the argument that challenges with respect to operational sustainability might create difficulties for the MFIs in serving the poor by providing them employment opportunities.

Milana & Ashta (2020) observe that the primary purpose of social inclusion and financial access is to uplift households from poverty. They note that despite the operational success of the microfinance model in general, the microfinance institutions have not realized the goal of empowering their customers through contributing to their living standards. Microcredit, the authors opine, have not provided the expected encouragement to new microenterprises, while its success in bringing about greater integration of women into the society has been ordinary. Their study presents a thematic review of research papers that offer empirical insights into various aspects of divisions and inequalities existent in developing economies with regard to topics related to financial inclusion and microfinance. Among the major ideas covered in the review is the recommendation that women be appointed as chairs of audit committees and on the boards of banks since their general risk-averse perceptions are seen to balance risky decisions with respect to advancing of trade credit. Some studies reviewed in the authors' research highlight that women in charge of entrepreneurial positions are also felt to play active roles in developing inter-gender economic and social networks, in ways that do not especially challenge the existing social norms directly.

4. Determinants of financial inclusion

While literature on financial inclusion has documented – both theoretically and empirically – its importance for poverty reduction, its contribution to economic growth, financial stability and employment generation (Bruhn & Love, 2013; Mugo & Kilonzo, 2017), research has also focused on the factors that influence whether an individual or household is financially included, as well as the macroeconomic determinants. The insights that research on these factors

provided are helpful in better understanding requirements for policies that seek to promote inclusion at an individual-level as well as throughout the economy.

Fungacova & Weill, (2015); Sahoo et al, (2017); Chitra & Selvam (2013); Dar & Ahmed (2020); Martinez et al, (2013); Wang & Guan (2017); Zins & Weill (2016) are among those studies that present empirical evidence on factors influencing financial inclusion at an individual level. It has been found by these studies that households possessing greater wealth and those that earn more income are likely to include family members who hold an account at a bank (Sahoo et al, 2017; Martinez et al, 2017; Dar & Ahmed, 2020). Being a man is also strongly associated with holding a formal bank account (Martinez et al, 2013; Fungacova & Weill, 2015; Dar & Ahmed, 2020). The above studies also verify empirically that the age and education level of the household head are positively and significantly linked with being financially included. While Corrado & Corrado (2015) find from their analysis on household data from European countries that those households which have recently lost employment and/or income, and those without possession of collateral for obtaining loans are likely to be financially excluded, Sahoo et al, (2017) find that among households in Tribal districts of Odisha state in India, participation in employee guarantee schemes and private land ownership boost their likelihood of being included. Corrado & Corrado (2015) also find that greater local usage of financial services prompts households in the locality also to adopt formal finance.

Park & Mercado (2015); Bozkurt et al, (2017); Chitra & Selvam (2013); Kumar (2013); Martinez et al, (2013); Camara et al, (2014) & Tuesta et al, (2015) analyse the factors influencing financial inclusion at a macroeconomic level. These studies agree that while governance standards (Park & Mercado, 2015; Hariharan & Marktanner, 2012), per capita income (Chithra & Selvam, 2013; Tuesta et al, 2015), external trade volumes (Hariharan & Marktanner, 2012), employee and factory base in relation to population (Kumar, 2013), literacy levels (Chithra & Selvam, 2013; Tuesta et al, 2015; Zins & Weill, 2016)have positively

significant effects on inclusion levels, other variables such as age structure (Tuesta et al, 2015; Park & Mercado, 2015); income inequality (Hariharan & Marktanner, 2012) are found to be exerting strong negative influence on inclusion. The extent of penetration of mobile banking, bank branches and ATMs, financial depth and banking health (Tuesta et al, 2015; Kumar, 2013; Wang & Guan, 2017) are the principal banking factors that have been documented to strengthen financial inclusion.

5. Multidimensional measures of financial inclusion

Sarma (2008) develops an index of financial inclusion based on various dimensions. The author, in her paper, uses dimensions such as penetration of banking services (as proxied by density of deposit accounts with respect to population), availability of banking services (proxied by areal density of bank branches) and usage (given by volume of credit and deposit services as a proportion of GDP). The final index constructed in the study is a normalization of inverse Euclidean distance each of the three dimensions from the ideal point. A higher value of the dimension is seen to reflect better performance of the geographic region either across space or time, thereby increasing the value of the index, *ceteris paribus*. Variants of the index are also presented in Sarma (2010; 2012; 2015).

Arora (2014) constructs a multidimensional index to measure financial access on a cross-country basis. Besides indicating the level of inclusion, the index developed by the author reflects the social and economic development in a country. Proxies are used to measure various dimensions of financial inclusion used to develop the index. The dimensions include outreach/availability of services, ease of accessing the services, procedural burden involved while initial access, monetary costs in procuring credit services & maintaining deposits. In contrast to the index constructed in Sarma (2008), Arora (2014) does not measure financial inclusion as the distance from the ideal point. Rather, the author takes into account various properties of the dimensions involved and assigns weights to each of them based on PCA.

However, as the study notes, notes data availability could prove to be a hurdle in constructing the index based on these dimensions across countries/regions. Gupte et al, (2012) construct a composite index that is partly derived from Arora (2010), and is similar to Arora (2014). The dimensions considered by Gupte et al, (2012) are representative of those used for developing indices in most other acclaimed studies.

Chattopadhyay (2011) augments the index proposed by Sarma (2008) with additional measurements in the dimensions. While they use number of ATMs, bank correspondents and bank branches per 1000 persons and per km^2 to represent availability of financial services, the measurement of penetration and usage dimensions largely remain same from Sarma (2008).

Wang & Guan (2017) construct an index of financial inclusion based on Sama (2008), but limit the broad dimensions to access and usage. The authors consider the aspects of account and debit card possession as factors related to "access" of banking accounts, while measuring availability of banking facilities through ATM and branch availability. Usage of cheques, electronic banking services, outstanding credit and deposit accounts with financial institutions are used to measure the "usage" aspect.

Chakravarty & Pal (2013) follow an axiomatic approach while developing a relevant index. Their methodology provides for the relative contribution of each dimension to be made known. They point out that their index satisfies the following properties of an ideal index: being bounded between 0 and 1, monotonicity, homogeneity, symmetry.

World Bank's Global Findex provides estimated financial inclusion scores for around 143 countries, with at least 1000 representative individuals surveyed surveyed regarding their financial preferences. All the data obtained is weighted to ensure cross-country and cross-gender uniformity, together with socioeconomic representation.

CRISIL Inclusix (2018) construct a financial inclusion index by closely following UNDP's HDI. The index measures financial inclusion on five parameters namely, branch expansion, deposit penetration, credit penetration, microfinance and insurance. Greater details on the methodology are presented in chapter 5, where an index is constructed based on CRISIL (2018).

CHAPTER 3

Financial inclusion and economic growth in Afro-Asian developing countries

1. Introduction

In recent years, especially since the latter half of the first decade of 2000s, governments across the globe have come to realize that inclusive finance holds promise in lighting up the lives of the marginalized sections of the society. This awareness has resulted in framing of policies conducive to the alleviation of the distressful conditions that these segments are most often found to be living in. While the extent of exclusion from the folds of formal financial sector in advanced countries can be termed as ranging from minor to moderate, in the case of developing nations, especially in Asia and Africa, the excluded sections comprise a significant portion of the entire population. This assertion is corroborated by the data from the World Bank's Global Findex (2017) Database. The report observes that whereas the proportion of bank and/or mobile money account holders around the world stood at 69 percent in 2017, the account ownership in high-income countries was as high as 94 percent, while the corresponding figure for developing nations was only 63 percent (World Bank, 2018).

Keeping in view the facts referred to above, a pertinent question that arises is whether financial inclusion has any impact on the growth levels of per capita GDP, which is often perceived to be an acceptable proxy for the standard of living of the citizens of a country. There have been numerous studies in recent years probing the effect of financial inclusion on economic growth (Sethi & Sethy (2019); Sethi & Acharya, (2018); Sharma (2016); Babajide et al. (2015) to name few notable ones) which attempted to delve into this issue. At this juncture, it is noted that all these studies focus on either a single country (such as India that is the focal point of Sethi & Sethy (2019) and Sharma (2016)), or a group of countries within the same continent (such as Makina & Walle (2019) and Babajide et al. (2015), both of which target countries in the African

continent). However, there seldom have been made attempts to synthesize research which emphasizes on investigating the linkage between financial inclusion and economic growth across continents that mainly comprise of a panel of *developing nations*. Though Sethi & Acharya (2018) is a notable exercise in this direction, their sample consists of developed countries alongside developing nations.

In contrast to the extant research works, the present chapter makes an attempt to explore the impact that financial inclusion has had on the levels of economic growth in major developing countries in Asia and Africa. The chapter employs Generalized Method of Moments (GMM) regression tools on a panel of thirty-seven developing countries in these two continents between the years 2009 and 2015. It is sought to clarify at the outset that the panel of countries included in the sample has been limited to Asia and Africa, since it is these two continents that account for bulk of the developing nations in the world. A total of 37 developing countries have been included in the sample for the purpose of the chapter, out of which 17 are from Africa, and the rest belong to Asia. The 17 developing African countries included in the work are Algeria, Cambodia, Central African Republic, Republic of Congo, Egypt, Equatorial Guinea, The Gambia, Ghana, Kenya, Mauritius, Morocco, Rwanda, Seychelles, South Africa, Tanzania, Uganda, and Zimbabwe, while the 20 developing Asian countries included are Armenia, Bangladesh, Bhutan, Brunei Darussalam, Burundi, China, Fiji, Georgia, India, Indonesia, Malaysia, Mongolia, Pakistan, Philippines, Samoa, Solomon Islands, Republic of Korea, Thailand, Tonga and Uzbekistan. The chapter spans a time period of seven years from 2009 to 2015, and had to be limited to this time span due to lack of availability of data on measures used to build an Index of Financial Inclusion (IFI). The index (IFI) has been used as a proxy for measuring the cumulative extent of financial inclusion achieved till the end of a particular year by a country in the sample.

The rest of this chapter is organized as follows: Section 2 reviews the relevant literature on the subject. Section 3 presents the theoretical framework within which the empirical analysis in the chapter has been performed. Section 4 describes the sources of the data used in the chapter, together with the methodology employed to analyse the data at hand. Section 5 includes the results of the empirical analysis, which is thereafter followed by interpretation of those results. Finally, in Section 6, we draw conclusions from the chapter, and then provide relevant policy recommendations that could possibly serve to enhance the purpose of financial inclusion.

2. Review of some past studies

This section briefly reviews some important empirical studies on the impact of financial inclusion on economic growth in various countries.

Makina & Walle (2019) perform a macroeconomic study to analyse the relationship between financial inclusion and economic growth. The study focuses on countries in the African continent only. The study measures financial inclusion only from the access dimension. The authors find that financial inclusion has a positive and significant effect on economic growth in Africa, and therefore recommend pursing the agenda of financial inclusion to achieve the end of inclusive growth. Cnaan, Moodithaya & Handi (2012) target four sites in southern India, which were claimed to have been fully financially included by banks. In three out of the four villages surveyed, the authors find that about seventy-five percent of households are financially included, while one village in the state of Tamil Nadu exhibited inclusivity only up to forty-six percent. From the findings, the authors conclude that though holding a bank account is becoming a more common trend in most villages in south India, villages with higher incidence of poverty are yet to catch up with other villages in this respect (i.e., in being more financially included with time). Raza, Rubab & Wen (2019) assess the relationship between greater financial inclusion through banks and economic development in Pakistan. The authors find a

positive relationship between the density of bank accounts and density of bank branches on the one hand and the human development index (HDI) on the other. In contrast, the density of automated teller machines in Pakistan bears a negative relationship with HDI. From their findings, the authors conclude that pursuing the objective of financial inclusion through expansion of bank branches and deposit facilities could be an effective means of fighting poverty. Iqbal & Sami (2017) note that financial inclusion being an important priority for furthering economic growth and advancement of economic growth, it also helps lower inequality. They examine how financial inclusion impacts economic growth in India. From their results, the authors find that bank branches and expansion of credit have a positive impact on GDP.

Ghosh (2016) investigates if expansion of mobile telephone network has an impact on economic growth in Indian states. For the purpose of his analysis, the author employs panel data techniques on data from Indian states in the first decade of the present millennium. The author finds that expanding mobile telephony is positively and statistically associated with economic growth, with the strength of association differing across states. Besides this, mobile telephony is found to exert a significant on loan behaviour. Mago & Chitokwindo (2014) also find evidence that mobile banking is ideal for remote areas given their accessibility, affordability, convenience and speed. The authors also conclude that increased financial activity made possible through mobile banking boosts economic growth.

Sehrawat and Giri (2014) investigate the impact of financial development on income inequality in India. They analyse annual time series data between 1982 and 2012 and employ cointegration techniques to establish long run relationship between income inequality and financial development in India. From their findings that financial development exacerbates income inequality in the short run as well as in the long run, the authors conclude that necessary care needs to be maintained while pitching for financial development, and responsible financial

reforms need to be undertaken so as to promote inclusive financial solutions to mitigate income inequality in India. Kim, Yu and Hassan (2018) analyse the relationship between financial inclusion and economic growth in the context of fifty-five Organization of Islamic Cooperation (OIC) countries. The results of their panel data regression estimations suggest that while financial inclusion has a positive effect on growth, there exists a bidirectional causality between the two variables.

Sethi & Acharya (2018) examine the effect of financial inclusion on economic growth in a dynamic panel data setting of several developed and developing countries. Like Kim, Yu and Hassan (2018) the authors find a long cointegrating run relationship between financial inclusion and growth, along with a causality that runs in both directions. Sethi & Sethy (2018) also assess if financial inclusion is related to economic growth in India. Employing the cointegration approach on a time series data, the authors also test for causality between financial inclusion and economic growth. They find that greater economic growth in India can be achieved by expanding the access and usage of financial services. However, they do not find any evidence in favour of the presence of asymmetric effects of financial inclusion on economic growth. In a similar study on the Indian economy, Sharma (2016) finds that financial inclusion in India is positively related to economic growth, where as there is evidence of bidirectional causality between financial access and economic development. Based on her findings, the author recommends that the banking system in the country be deepened, besides initiating carefully calibrated social banking experiments.

Kim (2015) identifies that income inequality has a negative effect on economic growth, especially in low-income countries. However, the author finds in his empirical analysis that the relationship between inequality and growth improves when access to financial services is improved. This improvement is brought about when better financial accessibility in low-income countries makes it possible to reduce inequality, as a result of which economic growth

improves. Park & Shin (2017) analyse the relationship between financial development and inequality. They find that although financial development results in lower inequality initially, it causes inequality to rise when pursued beyond a certain point. They also find that focusing on improving primary schooling rates as well as ensuring better law enforcement cause financial development to contribute to lowering inequality more effectively. Financial inclusion is also found to play a crucial role in reducing inequality.

While noting that large parts of Asia and Africa are running the risk of losing their demographic dividend", Ssewamala (2014) argues for financial inclusion programs to be run with a youth-focused objective, so that poverty, illiteracy and low-skill levels of these youth may be addressed. Alhassan, Li, Reddy & Duppati (2019) investigate the financial inclusion through formal financial intermediaries on informal financial intermediation in Africa. They find that instead of a trade-off between formal and informal financial intermediation, there exists a complementary relationship between the two. Going by these findings, the authors conclude that informal finance plays a crucial role in financial systems of major African countries. Their another finding that facilitating better infrastructure has the potential to channelize financial resources available in the informal economy has positive implications for growth and development of African nations.

3. Theoretical framework

The theoretical framework employed in this chapter utilizes ideas put forth in Kodan & Chhikara (2013) and Sethi & Acharya (2018), besides the author's own insights with respect to the effect of financial inclusion on economic growth.

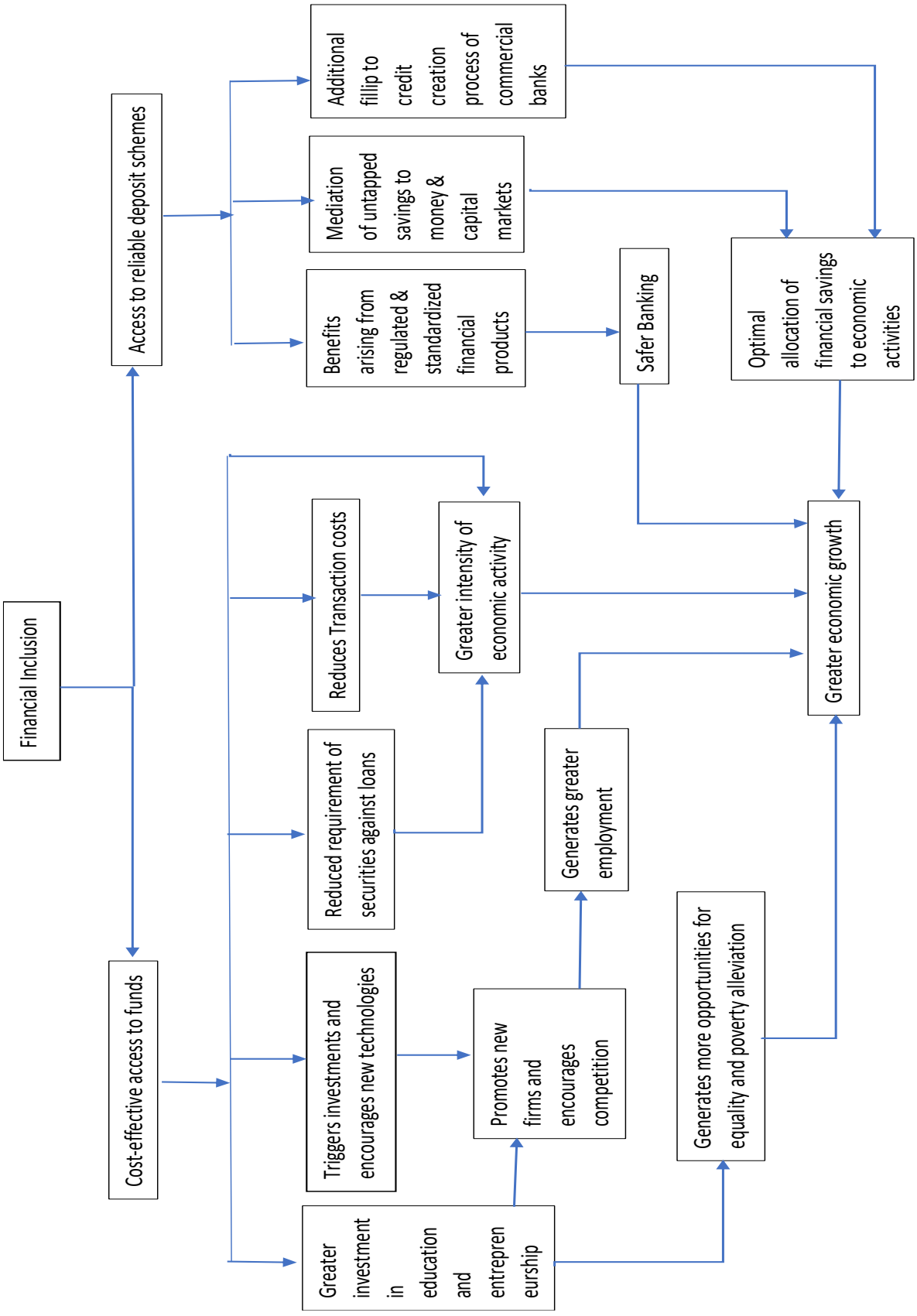
Financial inclusion through banks broadly takes the dual forms of affordable access to credit sources and access to reliable deposit schemes. Considering cost-effective access to funds at the outset, it triggers investments by making available capital resources and encourages new

production technologies. The low-income groups and households below the poverty line are provided access to funds at lesser cost, so that they may be able to invest in education and microenterprises. New investments in businesses, production technologies and education are seen as important tools to generate more opportunities for equality and poverty alleviation, besides generating greater employment through new firms and the resultant greater competition.

Less expensive credit facilities also imply reduced requirement of securities against loans and reduced transaction costs while banking, both of which are likely to result in greater intensity of economic activity because of easier availability of funds at costs lower than earlier times.

The other feature of financial inclusion is access to reliable deposit schemes through banks. Most deposit schemes offered by commercial banks are standardized financial products, besides being regulated by the central bank. Thus, the accountholders may be ensured of safer financial services being provided to them. This enhances the trust in the financial system, causing greater mediation of untapped savings to money & capital markets, besides providing additional fillip to the credit creation process by mainstream banks. Hence, the scope generated by cheaper access to funds towards greater investment in human capital and entrepreneurial activities promotes greater competition and generates employment, besides reducing transaction costs and promotes economic growth. On the other hand, reliable deposit schemes enable safer and trustworthy banking activities and enhances the ability of the financial system to optimally allocate savings to economic activities. This is expected to promote economic growth. The diagrammatic representation of the theoretical framework is given in figure 1.

Figure 1: Theoretical framework – effect of financial inclusion on economic growth



Source: Kodan & Chhikara (2013); Sethi & Acharya (2018); and author

4. Data & method

The data employed for empirical analysis in this chapter has been sourced from the World Development indicators and the World Governance Indicators published by the World Bank and the Financial Access Survey published by the IMF. The period considered for the study ranges for 7 years from 2009 to 2015. A total of 37 Afro-Asian developing countries, of which 20 are Asian and 17 are African, have been chosen for analysis. Hence, the top 20 countries in the Asian continent ranked as per their GDP growth rate in 2016 and the top 17 countries in Africa ranked as per their GDP growth rate in the same year (i.e., 2016) have been included. The (20) Asian countries and (17) African countries that are part of the study have been referred to in section 1 of this chapter.

In order to investigate the effect of financial inclusion on economic growth in developing Afro-Asian economies, we first build an index of financial inclusion (IFI), which we in turn employ as an independent variable in a dynamic panel data regression model containing the economic growth of the respective countries as the dependent variable.

The level of financial inclusion achieved till the end of each year has been computed for each country by closely following the multidimensional index constructed in Sarma (2012). To derive the values of country-wise financial index, we have first estimated each of the dimension indices separately, followed by the final inclusivity index.

The dimension indicator (D_i) that measures the country's i^{th} dimension inclusion index has been calculated using the following formula:

$$di = \frac{(Ai - Mi)}{(Mi - mi)}$$

Where,

Ai = Actual value of i^{th} dimension

mi = lower limit on the value of i^{th} dimension

Mi = upper limit on the value of i^{th} dimension

The formula ensures that the value of D_i lies between 0 and 1. Higher the value of D_i, better the country's performance on that indicator. If a three-dimensional financial inclusion context is considered, as is the case in our country-wise index (see Table 1), then a country's financial inclusion achievement in all the three dimensions will be reflected by a point X = (D1, D2, D3). To compute the final IFI, the following formulae are employed:

$$X1 = \frac{\sqrt{(D1)^2+(D2)^2+(D3)^2}}{\sqrt{3}}$$

$$X2 = 1 - \frac{\sqrt{(1-D1)^2+(1-D2)^2+(1-D3)^2}}{\sqrt{3}}$$

Index of financial inclusion = ½ (X1+X2)

Financial Inclusion Index is the unweighted average of X1 and X2. This index therefore incorporates the distances from the worst point (0,0,0) as well as the ideal point (1,1,1). Then the FII would be:

$$IFI = \frac{1}{2}\left[\left\{\frac{\sqrt{(D1)^2+(D2)^2+(D3)^2}}{\sqrt{3}}\right\} + \left\{1 - \frac{\sqrt{(1-D1)^2+(1-D2)^2+(1-D3)^2}}{\sqrt{3}}\right\}\right]$$

Thus, IFI is calculated using the three dimensions (D1 to D3 as indicated in Table 1) of inclusion, such as, penetration (D1), availability (D2) and usage (D3).

Table 1: Dimensions used in construction of IFI		
	Dimension	Variables used as proxies for the dimension
D1	Penetration	number of deposit accounts in banks per 1,000 population
D2	Availability	total number of bank branches and ATMs per 1,000 km^2 area
D3	Usage	total volume of credit and deposits in bank accounts as a proportion of GDP

Certain socio-economic variables have been used as control variables in the stepwise regression employed, with social indicators which include gross enrolment ratio (used as a proxy for literacy), index of political stability (used as a proxy for political stability) and rule of law index (which proxies governance standards) being used as the set of control variables for the first regression. Economic indicators that consist of inflation, real interest rates and foreign direct investment (% of GDP) are used as control variables in the second step. Both social and economic indicators are used as control variables in the final regression. In all three stepwise regressions, the IFI constructed for our purpose has been used as the primary independent variable.

This chapter employs the Arellano-Bover/Blundell-Bond two-step system Generalized Method of Moments (GMM) for estimation purposes. The GMM technique has been employed to allow for any possible effect that the lagged dependent variable (lagged value of GDP per capita growth) might have on the dependent variable.

For the purpose of the stepwise regression analysis, we build the following model specification:

$$Y_{it} = \alpha + \beta\, L.Y_{it} + \gamma\, IFI_{it} + \delta\, Z_{it} + \varepsilon_{it} \quad \ldots\ldots\ldots\ldots\ldots\ldots (1)$$

where,

Y refers to growth rate of per capita GDP

L.Y refers to the dependent variable, growth rate of per capita GDP, lagged by one year

IFI refers to the Index of Financial Inclusion

Z refers to the set of control variables

ε is the error term.

In System-GMM, a set of first-differences of variables are instrumented on lagged levels, and of levels of variables instrumented on lagged first-differences. It provides a rigorous remedy for endogeneity bias. Moreover, it is more robust to measurement error than cross-sectional regressions. We employ the two-step estimator, and use the GMM standard errors, besides using the Wald statistic to test for stability of coefficients over time.

5. Results & discussion

The results of the Arellano-Bover/Blundell-Bond two step estimation on the model built in equation (1) reveal that the lagged value of per capita GDP growth rate carries a positive and significant coefficient, which is in line with the theoretical expectation that the value of GDP growth of a country during a given year is likely to have a reinforcing impact on the GDP growth rate for the next year. The value of the coefficient on IFI is positive and significant throughout the three specifications, with the magnitude of the coefficient dropping in the third (and complete) specification as compared to the earlier two specifications where only one set

of social or economic indicators are included. This goes to suggest that the control variables carry a significant amount of explanatory capability in the regressions estimated on model (1).

As far as the control variables are concerned, the coefficients on gross enrolment ratio and the rule of law index are statistically significant. While the former has a positive coefficient throughout, the latter flips its sign from positive to negative in the complete specification. On the other hand, the coefficient on the index of political stability is statistically insignificant. While the coefficients on real interest rates and inflation are negative and statistically insignificant, the coefficient on FDI (% of GDP) is positive and significant. The Hansen/Sargan J test is statistically insignificant throughout, suggesting that the null hypothesis that the standard difference instruments are valid cannot be rejected. The autoregressive tests for serial correlation in error terms produce statistics that are significant for 1st order but insignificant for 2nd order serial correlation. These latter results indicate that the GMM results are *consistent*. The statistically significant Wald statistics also underscores the joint significance of the regression coefficients.

With the exception of index of political stability, all the control variables bear the expected sign and are statistically significant. Greater enrolment in primary educational institutions is seen as a proxy for literacy. Hence the positive coefficient on gross enrolment ratio may be interpreted as greater literacy having a positive impact on economic growth, through the beneficial effects of human capital on economic development. In the initial specification where only the social indicators are used as control variables, rule of law is seen to be positively associated with economic growth. The exception of political stability index, which is the lone variable that is statistically insignificant, could be explained as being a result of the political unrest that shook the African continent in the late 2000s and early 2010s. However, the positive sign on the coefficient of the variable indicates that despite the political anarchy in the Middle

East & North Africa (MENA) region, the economic growth in these countries has not dipped alarmingly.

Table 2: Results of two step GMM (stepwise) regression

Dep. Var: per capita GDP Growth Rate	Social Indicators (1)	Economic Indicators (2)	Socioeconomic Indicators (3)
L. per capita GDP growth rate	0.1903***	0.0298***	0.1510***
	(0.00)	(0.00)	(0.00)
IFI	0.0605***	0.0628***	0.0479***
	(0.00)	(0.00)	(0.00)
Gross enrolment ratio	0.0595*		0.0182**
	(0.05)		(0.05)
Index of political stability	-0.0149		0.0064
	(0.15)		(0.22)
Rule of law index	0.0680***		-0.0811***
	(0.01)		(0.00)
Real interest rate		-0.0894***	-0.0615***
		(0.00)	(0.00)
Inflation		-0.0233***	-0.0290*
		(0.00)	(0.09)
FDI (% GDP)		0.0136*	0.0319**
		(0.08)	(0.03)
Constant	-8.1257**	1.1375***	2.7481**
	(0.02)	(0.00)	(0.02)
Hansen/Sargan test statistic	31.28	24.45	21.13
Test for 1st order serial correlation	-2.754***	-2.2013**	-2.38**
Test for 2nd order serial correlation	0.1210	-0.7434	0.68
Wald statistic for joint significance	1101.45***	1379.15***	7629.71***
Number of instruments	32	32	29
Number of observations	227	199	179

Figures in parenthesis are p-values. ***, **, * indicate significance at 1%, 5% & 10% respectively

As far as the economic indicators are concerned, inflation is negatively associated with economic growth and its coefficient is statistically significant, which confirms the received economic theory that inflation hurts growth. Foreign Direct Investment is observed to be positively associated with growth rate as well, suggesting that greater investment from external

sources in production activities promotes competition, generates employment opportunities and paves way for higher levels of economic growth. “A negative correlation between real interest rates & economic growth implies that long-run costs due to a period of low interest rates will tend to be slightly offset by a period of high productivity growth” (Hansen & Seshadri, 2014). This is borne out by the negative coefficient on real interest rates in this chapter.

The coefficients on the index of financial inclusion (IFI) indicate that access and usage of banking services, especially deposit and credit facilities, serve the low-income group to invest in education and start microenterprises, which generate employment and alleviate poverty thereby reducing income inequality. Greater investment in production technologies promotes competition, while reduced securitization and transaction costs while obtaining loans also contribute to greater economic activity. Safer banking made possible through reliable, standardized and regulated financial products together with better channelization of financial resources to money & capital markets made possible through mediation of savings all result in greater economic growth.

6. Conclusions

This chapter aims to investigate the statistical association between financial inclusion and economic growth in Afro-Asian developing economies. Although there are previous studies that have previously examined the relationship between the two in the context of a single country or a group of countries (important studies among which have been reviewed in the second section of this chapter), there is no study till date that analyses the problem from the perspective of developing African and Asian nations, whose economies are increasingly claiming their share in the world economy with each passing year. We perform a panel data analysis on 37 developing Afro-Asian countries, 17 of which are African nations and the rest

belong to Asia. We initially construct an index of financial inclusion by closely following the methodology given in Sarma (2012).

Thereafter, we build a dynamic model (as given in equation (1)), where we assign growth rate of the respective economies as the dependent variable and the index of financial inclusion constructed earlier as the primary explanatory variable. Certain socioeconomic variables like gross enrolment ratio, rule of law index, index of political stability along with real interest rates, inflation and foreign direct investment (% of GDP) have been employed as control variables. Against this setting, the Arellano-Bover/Blundell-Bond two step dynamic linear regression estimator was employed in a stepwise context in order to account for any possible endogeneity and simultaneity in the data.

The regression results across the three specifications strongly suggest that financial inclusion has a positive impact on economic growth in major Afro-Asian developing economies. It is possible that greater employment opportunities generated through improved investment in human capital and production technology made possible through cheaper access to funds result in reduced inequality and greater economic activity. Furthermore, the reduced need for securitization and lower transaction costs can also further the cause of economic growth. On the other hand, reliable deposit schemes help in enhancing growth through optimal allocation of resources and increased trust in banking system.

Among control variables, greater literacy through primary enrolment is seen to promote growth, while better governance standards are found to be positively associated in the initial specification only. The positive and insignificant coefficient on the index of political stability indicates that despite the political unrest in the MENA region in the early 2010s, economic growth has not dipped alarmingly.

The economic variables used as control variables are inflation, real interest rates and FDI (% of GDP). Among these three variables, greater FDI is seen to enhance economic growth. As observed by Hansen & Seshadri, "a negative correlation between real interest rates & economic growth implies that long-run costs due to a period of low interest rates will tend to be slightly offset by a period of high productivity growth" (Hansen & Seshadri, 2014). In line with this observation, real interest rates in our study are negatively associated with economic growth, while high inflation is found to hurt growth.

CHAPTER 4

Financial inclusion, poverty and unemployment in India: Some evidence

1. Introduction

With the advent of globalization and the rapid advancement of technology, the economic scenario in both the rural as well as the urban areas of India has undergone significant changes. Many goods and services that were once available for purchase only by the elite in major metros are now accessible to dwellers in tier-II and tier-III cities. In the rural areas, equipment and tools employed in agriculture and allied activities have witnessed major upgradation, thereby improving the productivity noticeably. However, many individuals, families and firms, both in villages and cities, are still financially constrained; while some people are completely excluded from the formal financial system. As they try to deal with the consequences of such exclusion, they encounter the danger of jeopardizing their finances, which are already imperiled. Therefore, over the last two decades and more, researchers have been showing great interest in financial inclusion, so as to improve the lives of the hitherto financially excluded population.

It is relevant to note that the Indian government has taken up the programme of financial inclusion with great zeal and to good measure. Financial inclusion in India took roots with the nationalization of banks in 1969. In 1975, many Regional Rural Banks were established, followed by the inception of NABARD in1982. The next major step towards a financially included India was the commissioning of the SHG Bank linkage Program (SBLP) in 1992. The establishment of SIDBI followed in 2000. Post the Andhra Pradesh Microfinance crisis, the government launched the “Swavalamban” program in 2011. The NDA government that came to power in 2014 went a step further by launching the PMJDY and MUDRA schemes. At the time of writing, 29.52 crore accounts were opened and Rs. 65,845 crore deposited under PMJDY in about 2.5 years. As per the World Bank’s Global Findex estimates, the proportion

of adults holding an account at a financial institution took a leap from 35.2% to 52.8% between 2011 and 2014. Given the large positive response that PMJDY received, one may expect that this figure may have received further boost over the past three years.

These policy measures taken by the government could be expected to ameliorate the socio-economic conditions of the financially excluded population of the country. Financial inclusion is said to have been achieved when every individual and firm in the economy has access to, and uses, the financial products and services offered by formal financial intermediaries at costs affordable to them. Though India has made palpable progress in bringing the excluded under the folds of formal financial services, the nation still lags other developing countries in many aspects of financial inclusion. For instance, many communities, mainly Scheduled Castes (SCs) and Scheduled Tribes (STs) in both rural and urban India are still unbanked, while a majority of population is under-banked. These segments of population suffer very many constraints in making use of formal financial services. Though prodded by the Reserve Bank of India to expand financial inclusion in the remote and rural areas, banks often find ways to avoid offering financial services in rural areas. The reason for this could be that carrying on the banking business in rural areas is not remunerative enough to cover the costs, let alone earn profit on a sustainable basis. In the absence of banks and other formal financial intermediaries, the affected people have fallen back on informal financial service providers like pawn-brokers, moneylenders, chit funds etc. Frequent usage of the services of such informal institutions has caused the operators to often exploit, and not rarely cheat the susceptible clients. Such malpractices often take the form of high interest rates charged on credit, embellishment of money (deposited with chit fund operators) & jewelry (deposited with pawn brokers). Such malafide acts of exploitation have led to the worsening of the economic condition of the financially excluded families, and contributed to the escalation of poverty levels. Individuals or groups managing micro- & small firms need access to financial services at an affordable

cost at the appropriate time to procure inputs, to pay for maintenance, to pay wages of labour, and also need to have access to savings in banks so as to smoothen cash flow, manage transportation to markets, to manage peak-season incomes, to cover expenses in off-season. Having access to formal financial services also helps individuals to invest in their childrens' education, their own job training so as to hone skills required to advance careers, health and other unforeseen circumstances.

While previous studies have looked into the relationship between financial development and/or deepening and poverty reduction, the literature is scanty so far as the effect of financial inclusion on poverty and unemployment in India is concerned. Given the potential of financial inclusion as a crucial policy measure to usher credibility and stability to an economy's financial system; and as a measure to generate employment & alleviate poverty in a sustained manner, the present study pays specific attention to the importance of financial inclusion as an important tool to reduce poverty as well as fight unemployment at the rural, urban and overall levels in India. To investigate the research question, the present study adopts a panel data investigation of 29 states and union territories of India at the rural, urban and overall levels. The rest of the chapter is organized as follows: the second section presents a review of relevant literature, the third section outlines the methodology employed, the fourth section presents the results and the discussion thereof and the final section wraps up with important conclusions.

2. Review of some past studies

Among the definitions given by previous researches on financial inclusion, few well-received ones are as follows:

Sarma defines financial inclusion as "a process that ensures the ease of access, availability and usage of the formal financial system for all members of an economy" (Sarma, 2008).. The RBI committee on Financial Inclusion in India chaired by Dr. C. Rangarajan (2008) refers to

financial inclusion as the "*process of ensuring access to financial services and timely and adequate credit where needed by vulnerable groups such as the weaker sections and low income groups at an affordable cost*".

Some researchers have also opted to approach the topic by first defining financial exclusion. Leyshon and Thrift (1995) discuss financial exclusion in the context of mechanisms which prevent certain social groups, usually the lower strata of the society, from acquiring access to formal financial services. Rakesh Mohan (2006) opines that financial exclusion is the lack of access by the lower sections of the community to safe & affordable financial services provided by the mainstream financial intermediaries.

The need for financial inclusion has been realized at the policy level in most developed as well as developing countries. Most central banks are now taking efforts to make available bank accounts, insurance/line of credit & pension schemes to the poor. Without access to any or some of these services, the poor have to rely on informal sources for funding their needs. With financial inclusion, the unbanked tend to save more safely, and smoothly manage cash flows, even while raising their consumption levels. Financial inclusion can lead to greater investment in education, health and female empowerment (Ashraf, Karlan & Yin, 2010). Besides, greater financial inclusion minimizes the exploitation of the downtrodden by the moneylenders by enabling the unbanked to access credit at lower interest rates.

Lack of financial inclusion has many untoward costs both at the individual and aggregate levels. Individuals lacking access to mainstream financial services incur higher transaction fees and are usually unable to tide over unforeseen shocks to cashflows or to finance investments. They experience difficulties in realizing cheques and often may have to visit informal sources for loans, where interest rates may be higher. Without access to formal finance, running a household or business can be costly. This process becomes self-confirming and could possibly

lead to social exclusion (Rakesh Mohan, 2006). At the macro level, lack of financial inclusion could lead to untoward effects on socioeconomic equity as well as on efficiency, owing to reduced access to credit; moreover, it starves the economy of the opportunity to capture the savings of the unbanked.

A financially included economy offers greater opportunities for the unbanked to involve in formal saving and investment activities. Rural women who are housewives, self-employed involved in petty trade, marginal farmers etc., stand chance to benefit most (Onaolapo A.R, 2015). Levine (2005) argues that improved institutional infrastructure of a financial system reduces information asymmetry, there by contributing to greater economic growth. Rakesh Mohan (2006) argues that financial development accelerates growth by both supply-leading and demand-following mechanisms.

Demirguc-Kunt & Levine (2008) point out that greater financial inclusion reduces poverty and income inequality besides promoting economic growth. Burgess & Pande (2004) show that branch expansion post bank-nationalization in India has resulted in decline in the levels of rural poverty.

Subrahmanyam & Acharya (2017) note that financial inclusion fosters faster growth by increasing financial saving as a fraction of macro-saving and by maintaining a high level of productivity of financial investment. They employ three different models, viz., a multiplier model, the “AK” growth model and the Harbinger little triangle and rectangle to analytically demonstrate that financial inclusion contributes significantly to creating faster growth. Further to this, the authors observe that financial development enhances financial inclusion through the dual frameworks of financial tripod and policy tripod.

Evidence from research around the world suggests that financial inclusion plays a vital role in alleviating poverty, reducing inequality and tackling unemployment.

One of the major objectives of economic growth is poverty reduction. However, economic growth alone is not sufficient to achieve poverty alleviation. Complementary social policies viz., access to basic healthcare, sanitation, education and employment opportunities are must if the economy is to make satisfactory progress in eradicating poverty. To resolve the complex issue of poverty, it is necessary for all the socio-economic policies to be worked in synergy, so that the results produced are feasible as well as sustainable.

Bhavani & Bhanumurthy (2012) approach the issue from a macroeconomic perspective by defining financial access as making financial services accessible to all potential users without any barriers. The study compares actual use of formal financial services in relation to their requirement as a measure of financial access. An indicator is computed in 'financial resource gap' (FRG). The study finds that access to financial services is both inadequate and unequal across firms. Measuring access at three levels of economy, segment and sectoral levels, the work finds that the FRG is highest in the unorganized sector at 68%. At the overall level, 61% of the economy's financial requirements are seen to be met by the formal financial system. The reasons often cited for such poor levels of access are high risk and transaction costs. At the international level, India ranks at the bottom when compared with the UK, Brazil and China on the financial development and access front. To address the above lacunae in expanding financial access, the authors suggest allowing issuance of Priority Sector Lending certificates so as to reduce costs through specialization, besides promoting innovative credit & insurance schemes and providing for larger role of local banks with better knowledge of ground reality.

Park & Mercado Jr. (2015) argue that as financial inclusion increases, poverty rates should decline, since more people will now have access to formal financial services in order that they may smooth their consumption, besides engaging in productive activities. In their study, the authors found that financial inclusion is negatively and significantly associated with poverty levels across a set of thirty-seven developing Asian economies.

In 2005, the Union government of India accepted financial inclusion as a policy objective. Microfinance has also been accepted as a tool of economic growth and poverty alleviation (Sharma et al., 2011). During the last decade, the SHG movement has gained traction, and is being actively promoted by many village panchayats in the country. By means of greater financial inclusion, the poor can lead better lives due to access to formal money management services, availability of financial services at a reasonable cost, safe places to save and having more options to make financial transactions than in informal sector. Besides these, social and economic development cannot materialize meaningfully if a large part of the society is marginalized and/or neglected (Chibba, 2009).

Providing access to finance is a step towards empowering the poor. In India, access to financial services such as loans, savings, insurance etc., by the population living in rural and remote areas has been limited. This has been a major deterrent of economic growth in these areas. Ensuring that the underprivileged gain access to these services raises their standard of living, besides having favourable effects on health & hygiene (Murari & Didwania, 2010).

Financial inclusion enables low-income households, micro- and small-enterprises to participate in "inclusive and sustainable development" by providing them with an opportunity to make financial transactions, earn income, build assets and manage risks (Mugo & Kilonzo, 2017). Bruhn & Love (2013) find evidence that bank branch expansion alleviates poverty by decreasing unemployment; financial inclusion enables existing business owners to sustain their operations rather than becoming unemployed, or seek job elsewhere. Besides, new startups and expansions of existing firms enabled by financial inclusion help generate employment opportunities for many individuals, both in rural as well as urban areas.

3. Data & Method

The study utilized secondary data from 2008-2013 sourced from Status of Microfinance in India (for the respective years) published by NABARD, Database on Indian Economy published by the RBI, Report of the Expert Group to Review the Methodology for Measurement of Poverty (Rangarajan, 2014), Report on Employment and Unemployment survey (2009 to 2013) published by the Planning Commission, 66^{th}, 68^{th} and 70^{th} National Sample Survey Reports and 2011 Census Report.

The study built two models, one each for poverty and unemployment. The study uses the percentage of population below the poverty line as a measure of poverty. Unemployment is measured by the unemployment rate for the year as indicated in the Report on Employment and Unemployment survey. In the first model, poverty indicator served as the dependent variable, while unemployment rate took its place in the second model.

For the purpose of this study, financial inclusion was measured on three levels: Microfinance Financial Inclusion Index (covering only MFIs) (MFIFII), Total Financial Inclusion Index (covering SHGs, MFIs and banks) (TOTFII). Financial inclusion has been measured using the multi-dimensional approach discussed in Sarma (2012). These dimensions may be number of SHGs, savings amount with SHGs, amount of SHG loans disbursed, MFI client size, MFI loans outstanding and number of branches of scheduled commercial banks in the state. To derive the state wise financial indexes (MFIFII and TOTFII), we have first estimated each dimension index followed by the final inclusiveness index.

The dimension index (D_i) that measures the state's i^{th} dimension inclusion index has been calculated using the following formula:

$$di = w_i \frac{(Ai - Mi)}{(Mi - mi)}$$

Where,

wi is the weight assigned to the dimension i. $0 \leq wi \leq 1$.

Ai = Actual value of i^{th} dimension

mi = lower limit on i^{th} dimension

Mi = upper limit on i^{th} dimension

The formula ensures that the value of D_i lies between 0 and 1. Higher the value of D_i, better the country's performance on that indicator. If a n-dimensional financial inclusion context is considered, then a staten's financial inclusion achievement in all the three dimensions will be reflected by a point X = (D1, D2, D3). To compute the final IFI, the following formulae are employed:

$$X1 = \frac{\sqrt{(D1)^2+(D2)^2+-\cdots.+(Dn)^2}}{\sqrt{n}}$$

$$X2 = 1 - \frac{\sqrt{(1-D1)^2+(1-D2)^2+-\cdots.+(1-Dn)^2}}{\sqrt{n}}$$

Financial Inclusion Index = ½ (X1+X2)

Financial Inclusion Index is the unweighted average of X1 and X2, thus incorporating distances from both the worst point and the ideal point. Since, wi is 1 then the FII would be:

$$FII = \frac{1}{2}\left[\left\{\frac{\sqrt{(D1)^2+(D2)^2+-\cdots.+(Dn)^2}}{\sqrt{n}}\right\} + \left\{1 - \frac{\sqrt{(1-D1)^2+(1-D2)^2\pm\cdots.+(1-Dn)^2}}{\sqrt{n}}\right\}\right]$$

Thus the Total Financial Inclusion Index (TOTFII) "is being calculated using seven dimensions (D1 to D7) of an inclusion, such as, number of SHGs and amount of deposits in saving accounts, number of SHGs and amount of loan disbursed, number of MFI clients and total MFI loan outstanding and number of commercial branch offices" (Acharya & Parida, 2013), while the MFI Index (MFIFII) is being calculated using the dimensions number of MFI clients and total MFI loan outstanding (D5 & D6). The TOTFII index subsumes in itself three approaches to financial inclusion: SHG-bank linkage, MFIs and scheduled commercial banks. Besides, Credit-Deposit ratio of scheduled commercial banks (SCBs) has been introduced as a control variable to account for the financial services offered by banks. The chapter focuses on the ability of financial inclusion to reduce poverty and unemployment in Indian states, for the period 2009-10 to 2011-12 (for poverty), and 2009-10 to 2013-14 (for unemployment). Owing to paucity of data,, we have had to derive data for 2010-11 through interpolation for inclusion index. The study includes 29 states and UTs to achieve the objective through a panel regression analysis.

Credit-Deposit Ratios for the relevant years have been obtained from the DBIE published by the RBI, while literacy rates are obtained from 66^{th}, 68^{th}, 70^{th} NSS reports and 2011 Census Report.

While the paper uses a mix of thin and large samples, some of the existing literature mention the relative merits and demerits of use of thin samples in panel data settings. Bali & Demitras (2007) use simulations and stock level data to investigate into the issue of small sample bias in a panel data setting. They conclude that while the bias resulting from using small samples could be a matter of concern in time-series regressions, it is not serious issue in a panel data background. Buddelmeyer et al. (2008) run Monte Carlo simulations and conclude that when the cross-section is small and the time span is short (N is near about 20 and T is close to 5), OLS performs very well in panel data. Nerlove (2002) points out that even for GLS estimates,

such bias is “very slight” since, when rho (ρ) is known, a cross section over time presents us with a fairly large number of observations. Hence, it may be argued that using a thin sample in the present analysis for testing the effect that financial inclusion has had on poverty and unemployment in Indian states does not affect the validity of the results, the rationale being that the study uses a reasonable number of cross-sections (N=29), with T=3 and T=5 in case of poverty and unemployment results respectively, so that the sample size is moderately large (87 for regression on poverty, and 145 for regression on unemployment).

The chapter proposes two models, each dealing with one among the effects of financial inclusion on poverty and unemployment separately.

To formally verify the link between poverty, unemployment and financial inclusion, we estimate the following dynamic-panel equation:

$$Pov_{it} = a + bL.Pov_{i,t-1} + c(FII)_{it} + \beta X_{it} + e_{it} \text{ …….. (1)}$$

$$Unemp_{it} = d + eL.Unemp_{i,t-1} + f(FII)_{it} + \delta Z_{it} + u_{it} \text{ …….(2)}$$

where,

Pov = Poverty ratio,

Unemp = Unemployment rate,

FII = Financial inclusion index,

a, b, c, d, e, f, β and δ are the parameters to be estimated,

X and Z are vectors of controls – C-D ratio and literacy rate,

eit & uit are error terms

We estimate equations (1) & (2) by using the Blundell-Bond (1998) system-GMM dynamic panel estimator. In System-GMM, a set of first-differences of variables are instrumented on lagged levels, and of levels of variables instrumented on lagged first-differences. It provides a rigorous remedy for endogeneity bias. Moreover, it is more robust to measurement error than

cross-sectional regressions. We employ the one-step estimator, and use the conventional GMM standard errors, and use the Wald statistic to test for stability of coefficients over time. The results of the regression estimations are presented below.

4. Results & interpretation

The results of different models of system-GMM regressions on poverty are presented from Tables I through III. We have run the multi-variate panel regressions using rural/urban/total poverty as dependent variables and MFI-financial inclusion index (FII)/Total FII, C-D ratio and literacy rate as the explanatory variables (all in percentage terms). In the rural scenario, we find that the microfinance index (MFIFII) as well as total financial inclusion index (TOTFII) enter negatively and significantly into the models, as expected. Also, both MFIFII as well as TOTFII have the expected negative sign, and turn out to be statistically significant, in the urban as well as overall situations. Between the control variables, literacy rate yields negative and significant coefficients in the overall and rural cases. As regards the effect of literacy on poverty, individuals with lower levels of literacy are more likely to be on payrolls for shorter periods, and also earn lower wages when employed. Low-skilled adults are likelier to be below the poverty line than their peers, and hence, the coefficient for literacy rate is expected to be negative and significant, as is found in our estimations. In the case of C-D ratio, the coefficients are largely insignificant, suggesting that credit services through banks has not met the theoretical expectations in the extent to which it could reduce poverty. However, in greater C-D ratio is seen to aggravate poverty in urban areas. The Wald statistics are significant in all the models, suggesting that the coefficients are all stable over time.

These results on the effect of financial inclusion on poverty are in line with the findings of Demirguc-Kunt & Levine (2008), Burgess & Pande (2004) and Chibba (2009), where the respective authors argue that inclusive financial systems help eradicate poverty in the the economy.

Table I: GMM regression with rural poverty as DV

	specif 1	specif 2
L.Rural poverty	0.834***	0.752***
	(0.00)	(0.00)
MFI-IFI	-0.155***	
	(0.00)	
TOT-IFI		-0.361***
		(0.00)
C-D Ratio	-0.120***	-0.590
	(0.00)	(0.11)
Literacy Rate	-0.239**	-0.455***
	(0.01)	(0.00)
Constant	28.20***	45.64***
	(0.00)	(0.00)
No. Obs.	87	87
No. Instruments	9	9
Wald Chi2	157.67	180.99
Prob Chi2	0.000	0.000

Table II: GMM regression with urban poverty as DV

	specif 3	specif 4
L.Urban poverty	1.406***	1.248***
	(0.00)	(0.00)
MFI-IFI	-0.135**	
	(0.02)	
TOT-IFI		-0.319***
		(0.00)
C-D Ratio	0.123**	0.154***
	(0.01)	(0.00)
Literacy Rate	-0.886***	-1.150***
	(0.00)	(0.00)
Constant	56.98***	83.14***
	(0.00)	(0.00)
No. Obs.	87	87
No. Instruments	9	9
Wald Chi2	231.57	280.68
Prob Chi2	0.000	0.000

Figures in parenthesis are p-values. ***, **, * indicate significance at 1%, 5% & 10% respectively.

Table III: GMM regression with total poverty as DV

	specif 5	specif 6
L.Total poverty	0.949***	0.835***
	(0.00)	(0.00)
MFI-IFI	-0.169***	
	(0.00)	
TOT-IFI		-0.414***
		(0.00)
C-D Ratio	-0.061	-0.011
	(0.33)	(0.39)
Literacy Rate	-0.191	-0.589***
	(0.10)	(0.00)
Constant	19.01*	52.40***
	(0.06)	(0.00)
No. Obs.	87	87
No. Instruments	9	9
Wald Chi2	175.13	209.45
Prob Chi2	0.000	0.000

Figures in parenthesis are p-values. ***, **, * indicate significance at 1%, 5% & 10% respectively.

The system-GMM results with unemployment as dependent variable are presented from Tables IV to VI. The multi-variate panel regressions have been run using Stata 14.0. In all the models, the Wald statistic indicates that the coefficients are stable over time. In the case of rural and overall unemployment, the financial inclusion indices (both MFI and Total) have the expected negative and significant sign. Furthermore, C-D ratio bears a negative and significant

coefficient, indicating that financial inclusion through banks has resulted in a decline in unemployment across states. The sign borne by literacy rate is positive and insignificant, suggesting that we cannot infer the direction of impact that greater literacy has on unemployment. This latter effect could be due to the lack of data for the respective models, owing to which the true effect fails to come through.

In the urban scenario, the financial inclusion indices bear insignificant sign. This suggests that financial inclusion does not reduce unemployment in urban areas up to the expected levels. Besides, one may conclude that there is jobless growth in urban areas, since higher literacy in urban India also is seen not to generate much employment, since the sign of literacy is positive and significant. In a case unlike the rural scenario, greater C-D ratio is seen to have a minimal impact on unemployment in urban areas.

In a broad sense, Mugo & Kilonzo (2017) and Bruhn & Love (2013) arrived at similar findings of this chapter with respect to the relationship between financial inclusion and unemployment, in that greater financial inclusion in an economy would reduce unemployment.

Table IV: GMM regression with rural unemployment as DV

	specif 7	specif 8
L.Total unemp	0.494***	0.516***
	(0.00)	(0.00)
MFI-IFI	-0.078**	
	(0.02)	
TOT-IFI		-0.170**
		(0.01)
C-D Ratio	-0.176***	-0.167***
	(0.00)	(0.00)
Literacy Rate	0.075	0.072
	(0.19)	(0.20)
Constant	8.577	9.607
	(0.11)	(0.10)
No. Obs.	145	145
No. Instruments	17	17
Wald Chi2	169.54	168.14
Prob Chi2	0.000	0.000

Table V: GMM regression with urban unemployment as DV

	specif 9	specif 10
L.Total unemp	0.393***	0.384***
	(0.00)	(0.00)
MFI-IFI	-0.012	
	(0.30)	
TOT-IFI		0.025
		(0.30)
C-D Ratio	-0.054	-0.057
	(0.12)	(0.11)
Literacy Rate	0.221***	0.215**
	(0.00)	(0.01)
Constant	-11.07	-10.94
	(0.13)	(0.10)
No. Obs.	145	145
No. Instruments	17	17
Wald Chi2	17.91	17.75
Prob Chi2	0.001	0.001

Figures in parenthesis are p-values. ***, **, * indicate significance at 1%, 5% & 10% respectively.

Table VI: GMM regression with total unemployment as DV

	specif 11	specif 12
L.Total unemp	0.473***	0.493***
	(0.00)	(0.00)
MFI-IFI	-0.078***	
	(0.00)	
TOT-IFI		-0.166***
		(0.00)
C-D Ratio	-0.127***	-0.117***
	(0.00)	(0.00)
Literacy Rate	0.089	0.074
	(0.15)	(0.15)
Constant	4.675	6.460
	(0.23)	(0.16)
No. Obs.	145	145
No. Instruments	17	17
Wald Chi2	143.11	141.90
Prob Chi2	0.000	0.000

Figures in parenthesis are p-values. ***, **, * indicate significance at 1%, 5% & 10% respectively.

Table A.1 shows the change in state-level unemployment between 2009 and 2013, in comparison with the change in ranks of TOTFII for various states. The trends from Table A.1 suggest that states which have experienced decreases in unemployment rates over the study

period are largely the ones whose financial inclusion index values have risen. For instance, Assam, Bihar, Haryana, Jharkhand, Karnataka are some of the states in which a fall in their rank of unemployment rate could be witnessed besides a rise rank of TOTFII. Furthermore, New Delhi and Tamil Nadu performed worse in unemployment rates even as they slipped in ranks in financial inclusion. Figures 1 & 2 depict graphically the relationship between unemployment and TOTFII in the years 2009 and 2013. From the graphs, it may be inferred that there is a fairly negative relationship between the level of unemployment and the level of financial inclusion in Indian states.

Table A.1: State-level unemployment and TOTFII – Change between 2009 and 2013

Region/State	Rank unemp 2009 (%)	Rank TOTFII 2009	Rank unemp 2013 (%)	Rank TOTFII 2013
A & N Islands	-	29	1	29
Andhra Pradesh	14	1	22	1
Arunachal Pradesh	-	28	3	27
Assam	15	14	13	13
Bihar	4	12	12	9
Chattisgarh	21	15	28	17
Goa	1	23	6	25
Gujarat	9	11	29	11
Haryana	11	16	19	15
Himachal Pradesh	16	20	3	20
Jammu & Kashmir	20	21	7	21
Jharkhand	2	18	24	16
Karnataka	22	4	27	2

Kerala	7	8	2	7
Madhya Pradesh	13	9	21	10
Maharashtra	16	5	25	5
Manipur	-	25	18	23
Meghalaya	5	24	13	26
Mizoram	-	27	25	24
Nagaland	-	26	10	28
New Delhi	23	17	20	18
Odisha	10	7	15	8
Punjab	8	13	8	14
Rajasthan	3	10	23	12
Tamil Nadu	18	2	15	3
Tripura	-	22	5	22
Uttar Pradesh	12	6	8	6
Uttarakhand	19	19	11	19
West Bengal	6	3	17	4

Note: States have been ranked in descending order of unemployment rate and TOTFII.

FIGURE 1: TOTAL FII AND TOTAL UNEMPLOYMENT 2009

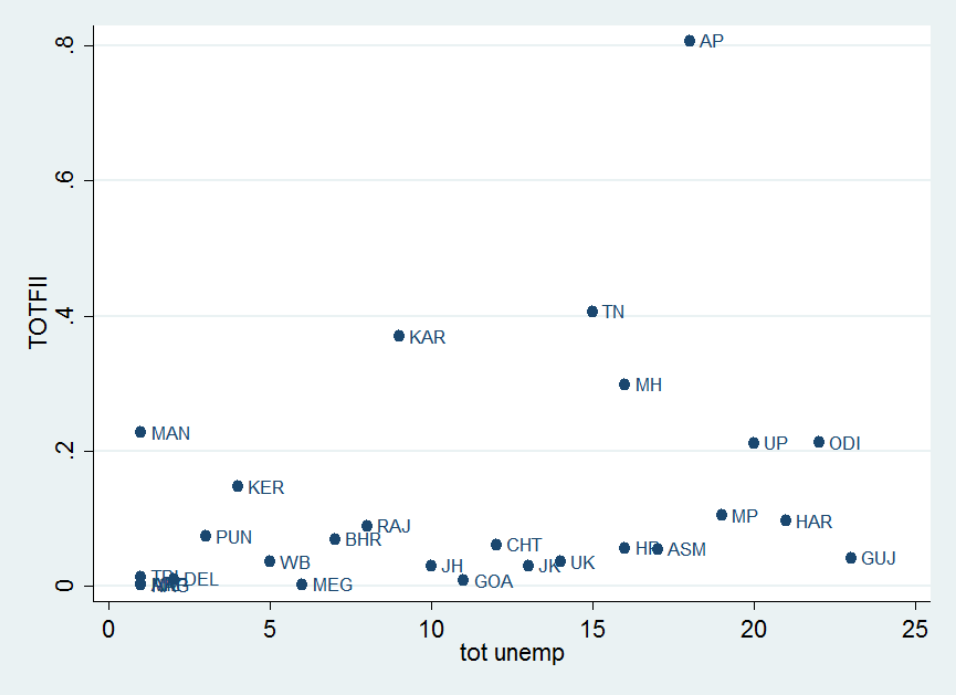
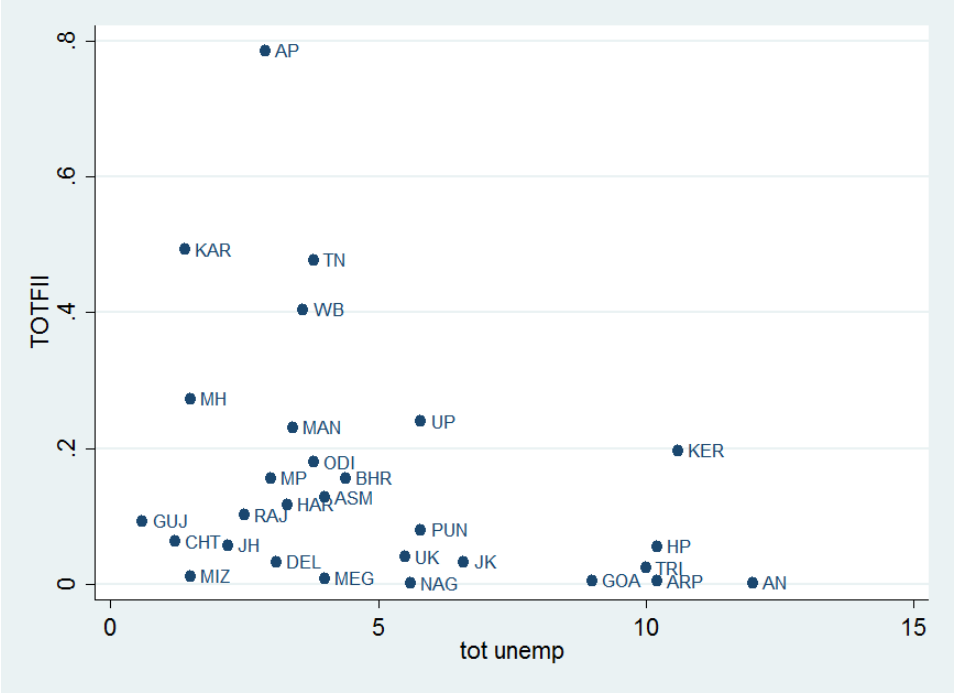


FIGURE 2: TOTAL FII AND TOTAL UEMPLOYMENT 2013



5. Conclusion

Financial inclusion is an important tool to fight poverty and reduce unemployment in India. Due to lack of relevant studies, the impact has not been clear. Against the background of the "Digital India" strategy by the government, financial services are likely to become more accessible to the poor, at a cheaper cost. Lining up financial services on an e-platform can quicken their delivery at the users' doorstep up to a few seconds. This shift towards e-payments is already evident in many states, where many petty shops and even street vendors have begun using electronic payment systems. Such a transition to digital payments and e-banking systems have great potential to further the cause of financial inclusion, thereby reducing poverty and unemployment.

The purpose of this study is to examine the effect of financial inclusion through MFIs (characterized by MFIFII), as well as through SHGs, MFIs and banks (indicated by TOTFII), on poverty and unemployment in India. The study is a panel data analysis across 29 states and union territories in India between 2009-10 and 2013-14, with C-D ratio and literacy rate as control variables at the rural, urban and overall levels. C-D ratio could also be seen as a means to financial inclusion since it could indicate the financial services offered by banks such as credit and deposits. The study finds that financial inclusion has a negative and statistically significant relationship with poverty at the rural, urban and overall levels; while financial inclusion has a negative and statistically significant association with unemployment rate at the rural and all India levels, the association between the variables at the urban stage is insignificant.

From the empirical analysis, it could be inferred that financial inclusion in India reduces poverty at the rural, urban and overall in all Indian states. Besides, financial inclusion is seen to fight unemployment too, especially in rural India. However, the authors conclude that the

impact of financial inclusion on unemployment in urban India is minimal, owing to the statistically insignificant relationship between the two variables. The results are encouraging and recommend that the government continue to pursue its measured efforts to promote financial inclusion, so that poverty and unemployment could be meaningfully reduced in the foreseeable future.

CHAPTER 5

Does financial inclusion exhibit convergence in Indian states?

1. Introduction

Financial inclusion refers to the access and usage of appropriate financial products and services by all individuals and firms in the economy. The Reserve Bank of India (RBI) defines financial inclusion as "*the process of ensuring access to appropriate financial products and services needed by all sections of the society in general and vulnerable groups such as weaker sections and low-income groups in particular at an affordable cost in a fair and transparent manner by mainstream institutional players*" (Rangarajan, 2008). Acharya & Parida (2013) discuss the different definitions of financial inclusion and the inclusion landscape in India in detail. The findings from the previous chapter confirm earlier theoretical and empirical evidence that greater financial inclusion is negatively associated with poverty and unemployment (Burgess & Pande, 2005; Bruhn & Love, 2013). Demirgüç-Kunt & Levine (2008) argue that greater access to finance lowers income inequality. Recognizing these benefits on the economy, the government of India (GoI) and the RBI have taken several steps to promote financial inclusion in India. The financial inclusion drive in the country began in 1956 with the nationalization of insurance companies, and continued with the bank nationalization in 1969 and 1980. The GoI and RBI have been active participants in multilateral fora such as the GPFI and OECD to promote financial access and financial literacy (RBI, 2019).

The financial inclusion drive in the country picked up pace with the initiation of the self-help group bank linkage programme (SBLP) in 1992. By 2014, there were nearly 75 lakh saving-linked SHGs and 42 lakh credit-linked SHGs with savings to the tune of Rs. 9897 crores (Shivaprasad, 2020). A series of schemes followed thereafter in the form of Kisan Credit Card (1998), no frills accounts in 2005 (later merged with Basic Savings Bank Deposit Accounts),

Swavalamban/Atal Pension Yojna. In 2014, PMJDY was launched as the flagship programme to promote usage of banking services that also provide overdraft and insurance facilities. Usage of insurance services are also sought to be expanded under the Pradhan Mantri Suraksha Bima Yojna. The PMGDISHA has been initiated in 2017 to promote financial literacy, especially in rural areas.

Given the long history of financial inclusion in India, it is expected that there would be an improvement in access and usage of finance in the country. The numbers confirm that 40.98 crore bank accounts have been opened under PMJDY so far, while 1.26 lakh banking correspondents (BCs) are delivering services (Ministry of Finance, 2020). Despite the overall improvement in inclusivity, the question remains whether Indian financial sector has become more equitable. With the BIMARU states (Bihar, Madhya Pradesh, Rajasthan and Uttar Pradesh) which have traditionally lagged in their economic growth rates slowly developing, although much is left to be desired (Sharma, 2015), one might ask if these states remain backward on the financial inclusion front also.

In this study we attempt to provide evidence on whether there is convergence in financial inclusion levels across major Indian states & Union Territories (i.e., across space) over time. Convergence in inclusion levels would indicate that backward states are closing their gap with the more financially advanced states. On the other hand, lack of spatial convergence would suggest that the less-included states are not catching up with the advanced states. To uncover the evidence on spatial convergence in financial inclusion, we utilize the tools of Exploratory Spatial Data Analysis (ESDA) and spatial panel regression techniques. We further seek to correlate our spatial results with aspatial measures, namely convergence indices given in Boyle & McCarthy (1997).

The rest of this chapter is organized as follows: section 2 surveys the major strains of literature on financial inclusion and specifies the contribution of the present study. Section 3 details the theoretical framework for the study, besides specifying the model for empirical analysis. Section 4 consists of results of empirical analysis and discussion thereof. Conclusions and policy implications are presented in section 5.

2. Review of some past studies

The importance that better access and usage of finance holds for welfare at the individual and economy levels has been a major focal point of literature. Burgess & Pande (2005) find evidence that opening of new bank branches in rural India is associated with decline in poverty levels. Lenka & Bairwa (2016) examine the role of financial inclusion in assisting monetary policy. They find that financial inclusion is negatively associated with inflation in SAARC countries. Financial liberalization has also been found to improve the effectiveness of monetary policy in India (Ray & Prabu, 2013) and in Africa (Mbutor & Uba, 2013). Mehrotra & Yetman (2015) conclude that by enabling consumption smoothing through formal saving and borrowing, volatility in output is dampened. This in turn aids in stabilizing price level. Levine (2005) theorizes the role of financial intermediaries in diversifying risk, mobilizing & channelizing savings and providing liquidity, there by promoting growth. De Gregorio & Guidotti (1995) find positive correlation between financial development and growth in a cross-country sample. Sethi & Acharya (2018), Sethi & Sethy (2019) and Sharma (2016) provide further empirical evidence that greater financial inclusion contributes positively to economic growth. Das (2019) finds that in the Indian state of Assam, formal sources of finance are likely to benefit those households that are closest to the poverty line. Access to finance is also found to reduce poverty in Kashmir (Khaki & Sangmi, 2017) and other northern states in India (Lal, 2018). Khan (2011) offers theoretical evidence that greater financial inclusion tends to reinforce financial stability, while buttressing the financial system against any adverse phases

in business cycles. Menon *et al*. (2011) find evidence that bank branch expansion in rural India aids in generating more productive and profitable self-employment opportunities, especially for women. Swamy (2014) also highlights the role of financial inclusion programs in empowering women.

Given the benefits from financial inclusion, better policy decisions would be possible if analysis is based on quantitative measures. Literature has developed many indexes/measures of financial inclusion for this purpose, of which Sarma (2008), CRISIL (2018), Arora (2014), Chakravarty & Pal (2013), Gupte *et al*. (2012) and Wang & Guan (2017) are well known.

The factors determining financial inclusion are also widely researched by scholars. Corrado & Corrado (2015) show that the probability of being included in formal finance varies positively with income and education levels, social networking and internet connectivity. Fungáčová & Weill (2015) find that besides income and education, being a man and an older person also have a positive effect on being able to access formal finance. Sahoo, Pradhan & Sahu (2017) show that participation in employment guarantee schemes and owning private-land are also positively associated with being banked. Park & Mercado Jr. (2015) observe that greater population and higher governance standards increase inclusion levels in an economy. Inequality levels, literacy rate, rule of law, industrialization and employee base are among other determinants highlighted in literature (Hariharan & Marktanner, 2012; Bozkurt *et al*., 2018; Kumar, 2013; Chitra & Selvam, 2013; Zins & Weill, 2016).

Our study contributes to literature by offering evidence on possible convergence in financial inclusion levels in Indian states. There is no study in the Indian context that investigates spatial convergence in inclusion levels. Such an exercise could have important policy implications since convergence across states could provide for better transmission of financial inclusion policies to neighbouring states. Although Bozkurt *et al.* (2018) analyse spatial convergence in a cross-country sample, their approach in employing "barro regressions" to measure β-

convergence may be subject to Galton's fallacy (Friedman, 1992; Quah, 1993). Such regressions can only measure convergence circuitously (Boyle & McCarthy, 1997). In view of the above caveat, we have opted to infer β-convergence in inclusion levels through convergence indices while employing spatial regressions to test for spatial convergence.

3. Theoretical framework & model specification

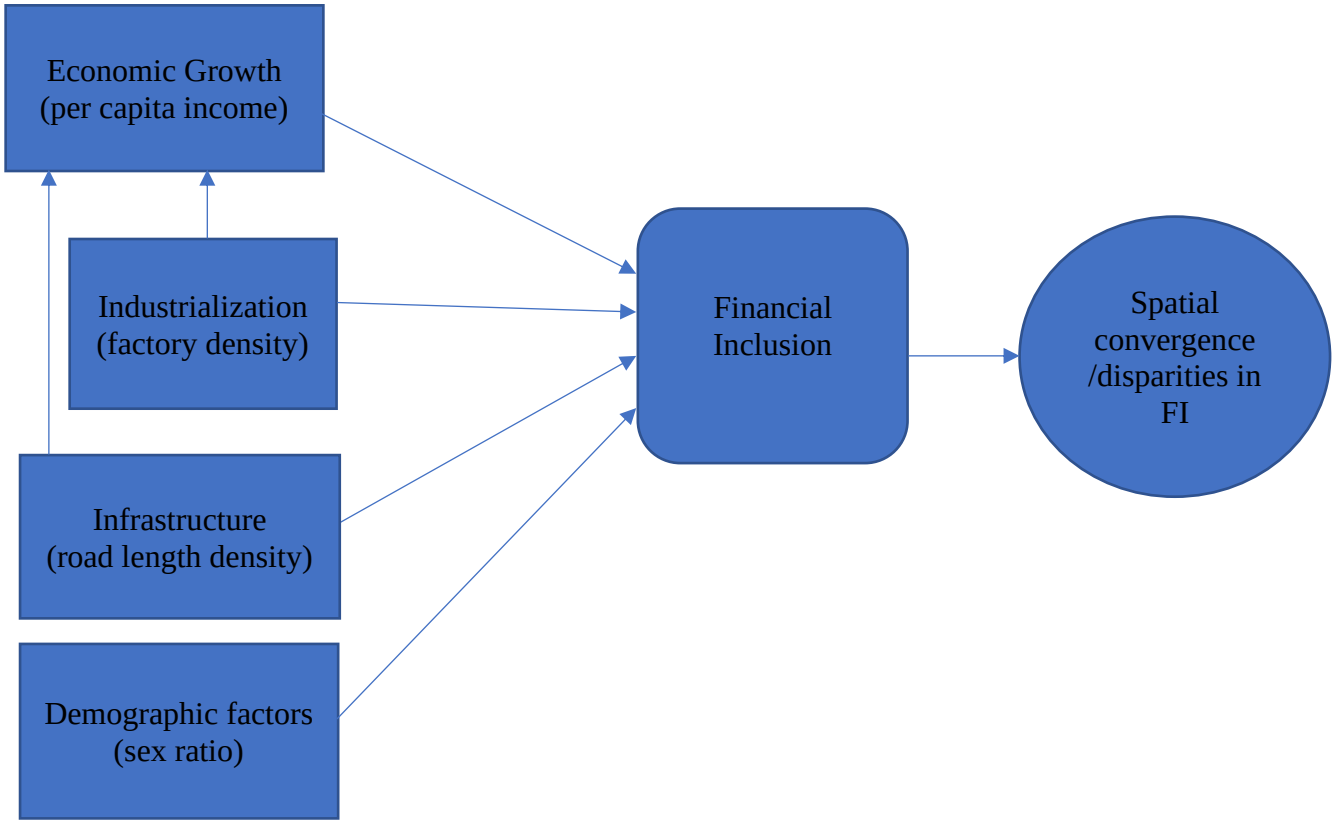
3.1 Theoretical framework:

Financial development and economic growth have long been seen to drive each other. Levine (2005) highlights the role of finance in facilitating the exchange of goods and services. Better financial intermediation also helps in mobilization of savings to lucrative investment opportunities, besides diversifying risk and increasing general liquidity. Further, Patrick (1966) discusses "finance-led growth and growth-led finance models" in underdeveloped countries. Increase in income contributes to greater demand for institutions to save, borrow, invest and insure, which could be seen as growth-led financial development. On the other hand, supply of financial services provides sources to fund economic growth, which enhances demand for finance. Thus, greater economic growth can be seen to help increase and sustain financial inclusion, especially because higher levels of income are associated with greater savings, investment and liquidity, which require greater financial intermediation. Kumar (2013) observes that economies that are more industrialized are usually the ones which could be expected to offer a "greater role for banking and financial activities" owing to their advanced stage of economic development. Besides, the employment opportunities generated through greater industrialization also help in increasing economic security. As Devlin (2005) notes, economic security is negatively associated with financial exclusion. Better infrastructure facilities boost the growth potential of an economy and creates demand for financial services. With greater connectivity and economic opportunities, the economy and its neighbours stand better equipped to avail appropriate financial services (growth-led finance). This helps increase

financial inclusion in these regions. Women are traditionally seen to save better owing to their budgetary skills. However, World Bank (2014) notes that women face more barriers to accessing finance, which prevent their meaningful participation in the economy. World Bank (2018) reports that in 2017, 76.6% of women in India had an account with a formal financial institution, up from 43.1% in 2014, and 26.5% in 2011. Despite this impressive rise in the participation of women in finance, they still lag behind men by 6.4 percentage points on this metric. With greater budgetary skills and entrepreneurial capabilities (Harvard Business Review, 2019), more women in the economy could mean greater activity in the financial sector. The small-scale production and self-employment opportunities generated by women in self-help groups also provides sizable demand for finance at the rural level. Hence, greater participation of women in the economy might lead to better demand for financial services at large.

We have used the above theories to build our theoretical framework, basing on which we have framed an eclectic model. The intuition underlying the testable form of this model is given in the following flowchart (Figure 1). In the absence of a likely formal model relating financial inclusion to its determinants, our eclectic model given in section 3.2 draws primarily on these theoretical insights given in Levine (2005), Kumar (2013), Devlin (2005) and others.

Figure 1: Factors determining financial inclusion (FI) and possible spatial convergence in FI



Source: author

3.2 Methodology & model specification:

To examine the distribution of financial inclusion across states using the measures of convergence as well as spatial panel regression techniques, an index of financial inclusion (IFI) is constructed for each state. The period considered for the study consists of 14 years of annual data from 2003 to 2016. The level of financial inclusion achieved till the end of March in each year is computed for each state by closely following the methodology given in CRISIL (2018). Credit Rating Information Services of India Limited (CRISIL), which is a leading global financial analytical company based in India, has been ranking Indian states on financial inclusion achieved since the year 2013. However, data on insurance and microfinance were available only for the period post-2015, and hence, to ensure consistency, the IFI in our study

is constructed using all other criteria, namely Branch Penetration (BP), Deposit Penetration (DP) and Credit Penetration (CP) (see Table I). The constructed IFI measures the extent of inclusivity in the banking sector across each of 26 states[1] and 2 Union Territories (Chandigarh and Pondicherry) on an annual basis from 2003 to 2016 (the states of Mizoram, Arunachal Pradesh have been omitted from the study due to lack of consistency in availability of data). The index allows for comparison of inclusion levels across space and time. A key characteristic of the IFI is that it does not measure the parameters in monetary units.

Table I: Inputs into Index of Financial Inclusion (IFI)

Dimension	Parameter/Proxy	Significance
Branch Penetration (BP)	Number of bank branches per lakh population in a state	Measures the ease of access to financial services.
Deposit Penetration (DP)	Number of deposit accounts with banks per lakh of population in a state	Measures the level of access to deposit products of banks
Credit Penetration (CP)	Number of credit accounts per lakh population in a state	Measures level of access to overall credit
	Number of agricultural loans outstanding per lakh of population in a state	Measures farmers' level of access to credit

To begin with, each of the four parameters (X*i*) is normalised using the Min-Max method:

$$\text{Normalized } X_i = \frac{Actual\ X_i - Minimum\ X_i}{Maximum\ X_i - Minimum\ X_i} \times 100 \quad \ldots\ldots\ldots\ldots\ldots\ (1)$$

After normalization, IFI is computed as the inverse Euclidean distance from the ideal point through the formula given in equation (2). BP and DP are the normalized parameters on branch penetration and deposit penetration respectively. CP is the average of normalized values of total credit and agricultural loans.

$$IFI = 100 - \frac{\sqrt{(100-BP_i)^2+(100-DP_i)^2+(100-CP_i)^2}}{\sqrt{3}} \quad \ldots\ldots (2)$$

Based on the index just built, we next perform a spatial analysis of the variance in IFI in 2003 and 2016 through a pair of exploratory spatial data analysis (ESDA) tools, namely LOSH and G_i^* maps. When the LOSH maps (Ord & Getis, 2012) are read together with the G_i^* maps proposed in Getis & Ord (1992), they provide insights into the variability and spatially-weighted means of IFI, which could throw light on the distribution of IFI levels in a given year. This exercise could provide insights into (dis)similarities in IFI levels in Indian states in the initial and final years of the study.

After drawing inferences about the spatial-dispersion and spatial-mean levels through the LOSH and G_i^* maps, we seek confirmation of these inferences through spatial panel regression results. The spatial panels consist of 14 years of data from 2003 to 2016 on 26 states and 2 UTs. Following the theoretical framework detailed in section 3.1, we frame the following econometric model wherein we model the spatial interactions among IFI (dependent variable), the explanatory variables (determinants of IFI) as well as the error term. The time and space subscripts are suppressed without altering the nature of the model:

$$IFI = \alpha + \tau_i + \eta_t + \rho\ W\_IFI + \beta_1\ pc\_gsdp + \beta_2\ fac1000 + \beta_3\ rd100km^2 + \beta_4\ sexratio + \theta_1\ W\_pc\_gsdp + \theta_2\ W\_fac1000 + \theta_3\ rd100km^2 + \theta_4\ sexratio + u \quad \ldots\ldots (3)$$

with the error term being given as:

$$u = \lambda\ W\_u + \varepsilon \quad \ldots\ldots (4)$$

where W is the squared inverse distance spatial weights matrix. The economic integration of Indian states is accounted for by the squared inverse distance matrix which allows modelling of global effects along with local clusterings. This is in contrast to contiguity-based matrices which consider only the effects of geographic neighbours, and not of any other states in the economy (Kopczewska *et al*., 2017). α is the intercept in the model, while τ and η reflect the

spatial and time effects. ρ is the coefficient of spatial convergence of IFI. *pc_gsdp, fac1000, rd100km²* and *sex ratio* are the factors that could determine IFI within a given state, viz., per capita income, factories per 1000 population (proxy for industrialization), road length per 100 km² (infrastructure) and sex ratio (demographic factor) respectively. *W_pc_gsdp, W_fac1000, W_rd100km²* and *W_sexratio* are the spatially-weighted averages of the respective variables in other states that could affect IFI in a given state. u is the error term given by equation (4), where λ is the coefficient of the spatial lag of error term (*W_u*) and ε is the random term.

Thereafter, we adopt the model selection criteria proposed in Kopczewska *et al*. (2017) by testing sequentially for the significance of (1) spatial and time effects (two-way effects first, then one-way), (2) spatial lags of dependent and error terms (ρ and λ) and finally (3) regression coefficients of explanatory variables. The model that emerges after the elimination of all the insignificant parameters is chosen as the final model. The coefficient of spatial lag of IFI (ρ) in the final model offers evidence regarding the convergence in IFI across states.

We next build convergence indices to draw inferences about the extent of similarities in the levels of financial inclusion in major Indian states.

The indices of σ-convergence and γ-convergence are given as follows:

$$\sigma = \left(\frac{\text{variance}(\mathbf{IFI}_{it})/mean(\mathbf{IFI}_{it})}{\text{variance}(\mathbf{IFI}_{i0})/mean(\mathbf{IFI}_{i0})}\right) \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (4)$$

$$\gamma = \left(\frac{\text{variance}(\text{Rank}\ \mathbf{IFI}_{it}+\text{Rank}(\mathbf{IFI}_{i0})}{\text{variance}(\text{Rank}(\ \mathbf{IFI}_{i0})\ \text{x}\ 2)}\right) \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (5)$$

where, *variance(**IFI**)* refers to the variance in IFI for each cross-state distribution; while *variance(Rank **IFI**)* is the variance in the ranks of IFI; *i* refers to the state and *t* indicates the year. Since σ-convergence is a sufficient condition for β-convergence (Quah, 1993), if we find evidence of the former in the data, the magnitude of β-convergence in IFI levels could be inferred from the level of γ-convergence (Boyle & McCarthy, 1997).

Data on bank branches, loans and deposits for constructing IFI has been accessed from Reserve Bank of India (RBI)'s Database of Indian Economy for relevant years. Data on population has

been obtained from Registrar General of India (2006, 2011). Missing data points on population have been generated through interpolation. Data on number of factories, road length and sex ratio has been accessed from the Handbook of Statistics on Indian States published by RBI. Data on GSDP at constant prices is also available in different base years (1999-2000, 2004-2005, 2011-2012) from the Handbook of Statistics on Indian States. These data on GSDP have been rebased to 2011-2012 using the methodology in Bhanumurthy & Singh (2013). The spatial econometric analysis and ESDA have been performed in MATLAB and GeoDa respectively.

4. Results & Discussion

4.1. LOSH & G_i maps*

Figure 2: LOSH map of IFI for the year 2003

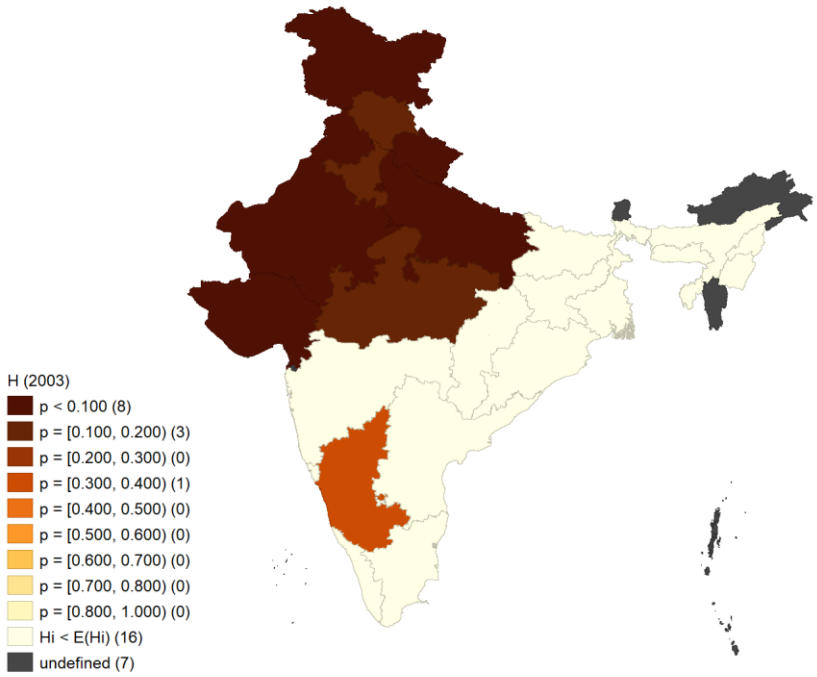
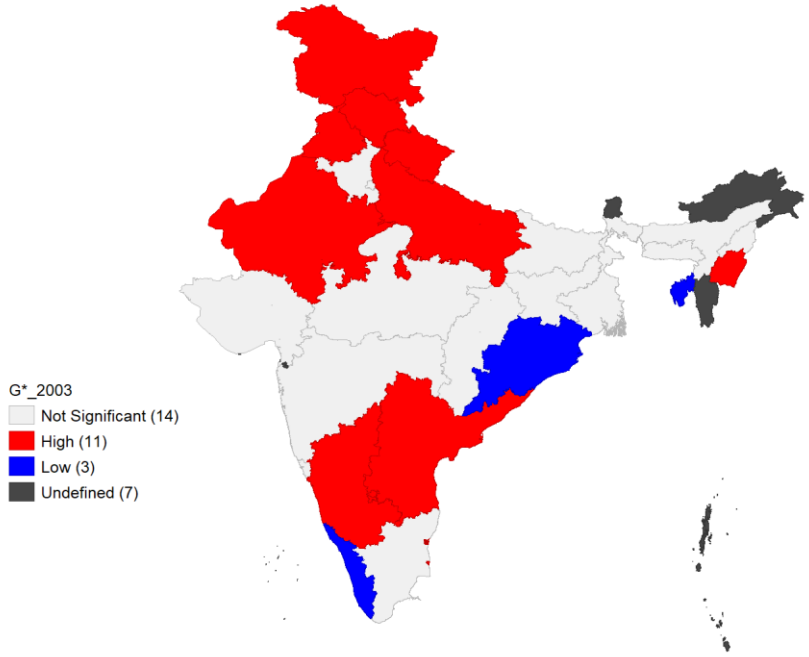


Figure 3: Local G_i^* map of IFI for the year 2003 (depicted at 0.10 level of significance)



The LOSH & G_i^* maps indicate that in 2003, large parts of northern and central India displayed high variance in inclusion levels (Figure 2). Karnataka is the lone state in south India which exhibited high variance (but with a p-value greater than 0.3) in IFI. Many states exhibited high spatially weighted mean levels in financial inclusion values in 2003, indicating 'high-level' hotspots in IFI (Figure 3). It is these eleven states in the north that acted as hotspots of financial inclusion (as depicted by the G_i^* map in Figure 3) in 2003, but with high local variability in IFI levels. We see that most other states displayed low variance, indicating that they possessed homogenous local inclusion levels.

Figure 4: LOSH map of IFI for the year 2016

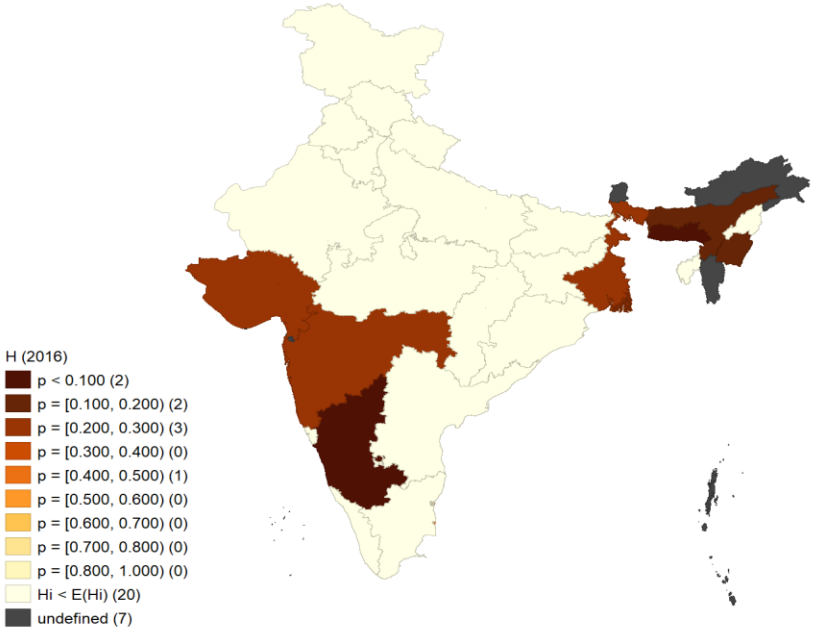
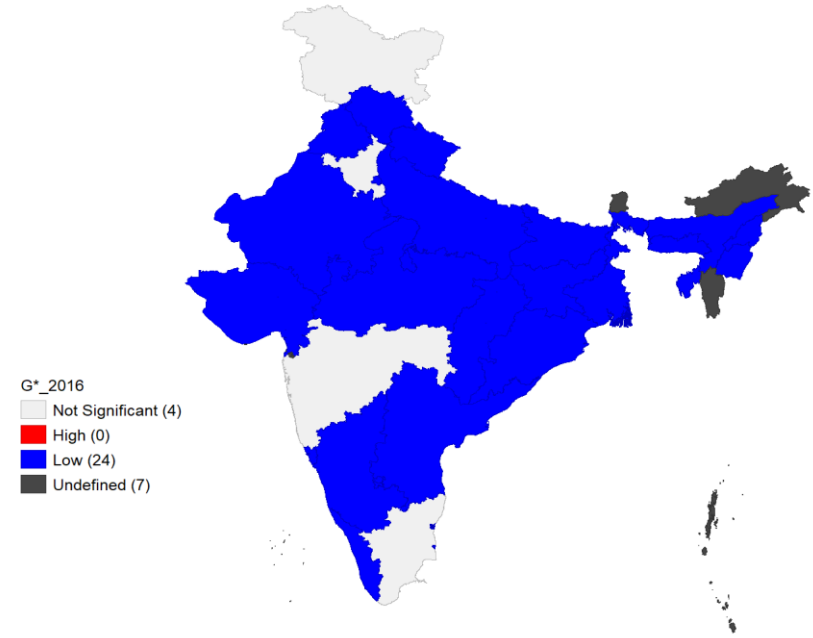


Figure 5: Local G_i^* map of IFI for the year 2016 (depicted at 0.10 level of significance)



Moving over to year 2016, we see that the dispersion has narrowed to a considerable extent in general, with heterogeneity in financial inclusion now visible mostly in Karnataka and north-eastern parts of the country (Figure 4). While most other states (20) exhibit low levels of dispersion along with low mean in IFI, the p-values for Maharashtra, Gujarat, West Bengal and Pondicherry are well above 0.2, indicating that heterogeneity in these states may not be statistically significant. With most states now characterizing low variance in IFI (Figure 4), the country also largely portrays low mean levels in financial inclusion in 2016 (Figure 5).

That large part of the country (24 states) experienced low spatially-weighted means in financial inclusion in 2016 indicates that most of the states have *relatively* low index values. Special attention must be given to the fact that most of the states in the north and in the south, which were hotspots of financial inclusion in 2003, exhibited low spatial means in 2016. Since the squared inverse distance spatial weight matrix employed in this chapter considers both global and local effects, the weighted means of IFI even for a state that has a high level of IFI is affected by the values of all other states in that year. This highlights the dependence of financial inclusion in a state on factors arising in other states as well, such as income, employment, infrastructure and demographic factors among others.

4.2. Spatial regression analysis:

Table II: Coefficients of the model with squared inverse distance W matrix

DV: IFI	GNS model (Two-way FE)	GNS model (One-way spatial FE)	GNS model (One-way temporal FE)	GNS model (Pooled)	SDEM model (Pooled)	SDEM model (Pooled, with variables deleted)
	(1)	(2)	(3)	(4)	(5)	(6)
ρ	0.626***	0.757***	0.083	-0.001	-	-
λ	-0.901***	-0.982***	0.231	0.481***	0.486***	0.474***
pc_gsdp	0.045***	0.015	0.148***	0.141***	0.141***	0.139***
fac1000	12.006	18.480**	19.540***	20.856***	20.828***	21.004***
rd100km^2	-0.007**	-0.006**	0.009***	0.010***	0.011***	0.011***
sexratio	0.001	0.008	0.025**	0.026**	0.026***	0.026***
W_pc_gsdp	-0.199***	0.002	0.068	-0.017	-0.023	-
W_fac1000	12.162	-14.876	31.226**	43.733***	43.150***	40.432***
W_rd100km^2	-0.002	0.002	0.009***	0.014***	0.015***	0.014***
W_sexratio	-0.161***	-0.059	0.060***	0.070***	0.071***	0.072***
constant	167.320***	51.591	-86.229***	-91.582***	-92.740***	-94.461***
Loglik	-1152.82	-1162.91	-1337.25	-1348.67	-1348.68	-1349.80

1. p-values in parentheses. *, **, *** indicate significance at 10%, 5% and 1% levels.
2. The econometric results above have been estimated in MATLAB software.

Table III: Direct, indirect and total effects from spatial regressions			
	ADE	AIE	ATE
pc_gsdp	0.139***	-	0.139*
fac1000	21.004***	40.432***	61.436***
rd100km	0.011***	0.014***	0.025***
sexratio	0.026***	0.072***	0.098***

1. p-values in parentheses. *, **, *** indicate significance at 10%, 5% and 1% levels.
2. ADE: average direct effects; AIE: average indirect effects; ATE: average total effects.

The spatial panel regression analysis incorporates these determinants of financial inclusion while analyzing the convergence of financial inclusion levels (given by the size and significance of ρ) and similarities in fluctuations of spillover effects (reflected in λ). The results of the spatial regression analysis are presented in Table II. Model (6), which has been chosen for analysis following the model selection criteria proposed in Kopczewska *et al*. (2017) confirms the dependence of IFI on the determinants listed in the previous paragraph. Having started out with the two-way fixed effects model containing both ρ and λ (General Nesting Spatial model), we found that the two-way spatial- and time-fixed effects – model (1) – and the one-way spatial-effects – model (2) – along with one-way time effects – model (3) – were all sequentially insignificant. Hence, we then adopted the pooled model with both ρ and λ in model (4). On finding ρ to be insignificant in model (4), it was dropped from the subsequent Spatial Durbin Error component Model (SDEM) specification in model (5). After dropping the insignificant spatially lagged per capita GSDP variable (W_pc_gsdp) from model (5), we arrived at the final SDEM specification in model (6). The log likelihood – considered as a model selection criterion – being the least for the last model among all the specifications (-1349.80) offers further credence to the model. The Moran's I test on regression residuals confirms that spatial autocorrelation in residuals is not a problem. In the SDEM specification, the coefficients on the primary explanatory variables are treated as the 'direct effects' on IFI

within the state. The coefficients on the spatially lagged explanatory variables are the spillover effects or the 'indirect effects' of factors from other states on IFI. The total effects are then obtained by summing together both. In other words, indirect effects may either complement direct effects (if the signs are same) or backwash them (if the signs are opposite).

Table IV: Comparison of IFI levels - 2003 & 2016

State	IFI 2003	Rank in 2003	IFI 2016	Rank in 2016
Andhra Pradesh	26.3133	10	42.6195	6
Assam	6.25721	26	16.1533	22
Bihar	6.57785	25	10.6862	26
Chandigarh	44.7593	3	42.5932	7
Chhattisgarh	7.84967	24	15.7946	24
Goa	39.3801	4	54.2273	1
Gujarat	17.1689	14	23.37	17
Haryana	49.7351	1	33.9311	13
Himachal Pradesh	46.7788	2	40.5527	9
Jammu & Kashmir	14.7626	17	26.9718	15
Jharkhand	11.1458	23	16.2029	21
Karnataka	28.1594	7	41.5628	8
Kerala	35.5531	5	52.367	3
Madhya Pradesh	11.2759	22	15.9137	23
Maharashtra	15.8619	15	28.2163	14
Manipur	2.05862	27	5.95871	27
Meghalaya	11.472	21	16.8841	20
Nagaland	1.61118	28	2.40145	28
New Delhi	26.0041	11	35.9015	10
Odisha	15.6211	16	23.4459	16
Pondicherry	27.5728	9	43.0179	4
Punjab	29.1688	6	42.6871	5
Rajasthan	13.0274	18	17.467	19
Tamil Nadu	27.9457	8	52.6221	2
Tripura	21.2099	13	35.6638	11
Uttar Pradesh	12.8291	19	14.3444	25
Uttarakhand	23.5098	12	35.5259	12
West Bengal	12.4838	20	19.816	18

The absence of ρ – the coefficient on the spatial lag of IFI – in the final spatial regression model – model (6) – suggests that there is no evidence of spatial convergence in IFI during the study

period. This finding is reflected in the relative persistence in rankings over (Table IV). With the spatial weight matrix enveloping global *and* local relations, the statistical insignificance of ρ in model (4) and its subsequent exclusion from model (5) suggest that the level of financial inclusion in a given state is not statistically dependent on the values of IFI in other states. Hence there is no evidence to conclude that there is either a clustering of states with similar IFI values or that the policies to promote inclusion have set in place common reactions to achieve convergence over the study period. As can be observed from Table IV, despite the overall improvement in inclusion levels across states, there has only been a moderate shift in rankings between 2003 and 2016 with most states in the top 10 positions shifting places only among themselves (except Haryana which slipped from the 1st place to 13th spot). On the other hand, the bottom 10 positions also remained relatively unchanged, with most states shifting only two places.

The direct and indirect effects of the explanatory variables on IFI are given in Table III.

4.2.1 Direct effects:

The direct effect of an increase of per capita income (*pc_gsdp*) in a state leads to an improvement in IFI by 0.139 percentage points within the state. An increase in income level is generally seen to cause a rise in demand for instruments to save, invest and preserve liquidity in an economy as has been well-documented in Levine (2005). Employment opportunities and economic development generated by an increase in industrialization promote demand for financial services in the state, as is reflected in the positive and significant coefficient on *fac1000*. A new factory established per thousand people in a state is expected to increase financial inclusion in the state by 21 percentage points. The state of infrastructure, especially roads, play a major role in banks opening branches in a particular location. Also, better infrastructure provides better economic opportunities to people, who in the process resort to formal finance. The spatial regression results suggest that IFI improves up to 0.011 percentage

points as a result of an increase in road length density per 100 km^2 area (*rd100km^2*) in a given state. Women involved with self-help groups and formally employed women are increasingly finding opportunities to engage in economic activity and transact with banks more often, whether to receive and repay loans, or to withdraw or deposit savings. It is inferred that the positive and significant coefficient on *sexratio* is contributed largely by these segments of female population who transact banks frequently. Although gender parity is still far from being achieved in the socioeconomic activity, the results suggest that greater the participation of women, higher the benefits from inclusion.

4.2.2 Indirect effects:

As far as the indirect effects of the determinants are concerned, greater industrialization in other states (*W_fac1000*) is seen to have a positive effect on IFI in a given state. Greater industrialization within the country, results in greater interstate trade in factory inputs, essentials and finished products, thereby fueling demand for financial services in a given state. We find that the effect of industrialization in other states (*W_fac1000*) on financial inclusion in a given state is almost double compared to own-state industrialization. The remittances of migrant-workers to home state through banks could be another contributor to this effect. Better infrastructure facilities channelize economic interactions between states in a more systematic manner, as reflected by the positive and significant coefficient on *W_rd100km^2*. Overall improvement in road connectivity between all states creates more economic opportunities. Appropriate financial services could be demanded and made available in due course. We also find that the participation of women in economic activity in states other than their native, which has been an increasing phenomenon in India in recent years, has led to greater demand for financial services in the state of employment. Hence, the spatial lag of sex ratio (*W_sexratio*) is positively associated with IFI. The positive and significant coefficient of the spatial lag of

the error term (λ) confirms that the fluctuations in the spillovers in neighbouring locations are similar to each other.

Although we find that the various (spatial) determinants of financial inclusion have resulted in a general increase in the absolute levels of IFI in Indian states over the study period, we do not find evidence that there is a tendency for the index values to converge. This is reflected in the absence of the coefficient of the spatial lag of IFI (ρ) from the final model. This observation is further confirmed by the analysis in section 4.3.

4.3 Convergence Index analysis:

Table V: Tabulated convergence values for IFI across major Indian states and UTs

Year	σ-convergence	γ-convergence
2003	1.000	1.000
2004	1.196***	0.970***
2005	1.249***	0.964***
2006	1.261***	0.963***
2007	1.324***	0.956***
2008	1.069*	0.754**
2009	1.137***	0.961***
2010	1.167***	0.959***
2011	1.165***	0.958***
2012	1.103**	0.956***
2013	1.031	0.962***
2014	1.044	0.958***
2015	1.014	0.959***
2016	0.883***	0.947***

*, **, *** indicate 10%, 5% & 1% significance respectively

When find from the σ- and γ-convergence indicators (see Table V) that there is no evidence that the less-included states have closed their gap with advanced states (β-convergence) such as Goa, Tamil Nadu, Kerala and Punjab. The σ-measure, while being statistically (in)significant for some years, hovers above unity until the last year, suggesting that compared to the 2003, the gap between the two categories of states (advanced and backward) widened.

However, the statistical significance then reduces in 2012 and then disappears during the next three years. The *single* significant value below unity in 2016 is not sufficient to infer convergence. It can be seen from Table IV that the difference in the mean value of IFI of top 10 and bottom 10 states has increased by nearly 4.46 points from 2003 to 2016. This analysis corroborates the spatial map and regression analyses in the above sections 4.1 & 4.2, and offers further evidence to the argument that although financial inclusion has improved in absolute values across all states, the distribution of benefits therefrom has remained skewed, since some states have remained ahead of others throughout the study period. Since we cannot find evidence of the presence of β-convergence (for which σ-convergence is a sufficient condition), we are not in a position to quantify it through the γ-measure.

4.4 Discussion:

The above analysis suggests that there has been a growing similarity in financial inclusion levels across Indian states without significant change in the composition of the entire structure over recent years. From a heterogenous northern segment with high mean hotspots in southern states such as Karnataka & Andhra Pradesh, which indicated moderate to high variability in 2003, the picture transformed into a largely homogenous scenario in 2016 where only Karnataka and few north-eastern states possessed IFI levels that vary significantly. However, that twenty-four out of the twenty-eight states under study display low mean levels in 2016 is an indication that access and usage of financial services has not improved evenly during the period between 2003-16. Despite the initiation of several flagship programmes by the government, of which the 'no frills'/BSBDA accounts, the Swavalmban/APY, PMJDY and PMGDISHA are often highlighted in the popular media, financial inclusion in the country has not seen an uptake in some states during recent times.

Despite claims by the government claims that these initiatives have been yielding consistent results, the Nachiket Mor committee (2014) highlights deeper problems in the Indian economy, which run contrary to the government's narrative. The distribution of bank credit is very skewed, with the country's average ratio to GDP being 70 percent, but poorer states such as Bihar registering a figure well below 20 percent (Mor, 2014). Majority of small businesses in both rural India lack access to a formal banking service (World Bank, 2018). The gross domestic savings as a proportion of GDP, which was as high as 34.27% in 2010 fell to 30.39% in 2016. By 2019, it further declined to 28% (World Bank, 2020). The Mor committee found that access to finance for poor households and small businesses is rarely equitable and that NPAs often play a big role in commercial banks not being able to comply with RBI's norms to reserve at least 40% of lending to priority sectors, which might explain the backwardness in rankings of the largely rural states such as Uttar Pradesh, Bihar, Rajasthan and Madhya Pradesh. The World Bank's Global Findex reported that a mere 4% of the population in India received welfare payments through bank accounts (Dhawan, 2014). Though the Global Findex report offers hope that the formal bank accounts as a proportion of population have increased up to 79% by 2017, the same report (World Bank, 2018) reveals that about 48% of these accounts were inactive.

Acharya & Parida (2013) observe that even in self-help groups, financial inclusion encounters such issues as delays in operationalizing SHG accounts, making disbursals of loans, appropriation of savings into collateral, multiple membership and multiple borrowings among other problems that limited the efficacy of SBLP in acting as a facilitator of access to finance and as a generator of employment opportunities.

There could be multiple reasons behind the skewed distribution of financial inclusion in India. Firstly, in a large geography such as India, it is important that banking offices are physically reachable to the clients – an area which policymakers began addressing only

recently. Especially the rural population would tend to persist with their informal approach to finance if the touch points are too far to access. Next, financial literacy is yet to pick up at a healthy rate in all states (highest in Goa at 50%; overall at 24% for India) (National Centre for Financial Education, 2015). large segments of population are still dependent on BCs and bank staff to partly avail, and in many cases to make sense of accessible financial services. This may possibly lead to frictions during interactions. Any forgettable previous experiences that they may have had could play a psychological role in deterring illiterate consumers from dealing with banks in future. Another highly significant factor that could negatively affect formal financial exposure is financial illiteracy itself. Apart from creating frictions in banking transactions, financial illiteracy results in lack of awareness regarding digital finance and fintech, due to which certain segments of population get excluded from formal finance. Another important reason could be bankers' tendency to not always prioritize low-ticket customers that tends to push out the poor from the framework of financial inclusion. These factors are more common to the largely rural and financially illiterate states such as Uttar Pradesh (financial illiteracy of 10% in 2015), Madhya Pradesh (23%), Jharkhand (15%), Chhattisgarh (4%) and Bihar (8%), which also appear at the bottom of financial inclusion rankings in 2003 as well as 2016. The above factors help explain the lack of spatial convergence in financial inclusion levels in Indian states over time, as evidenced through the results of the empirical analysis.

5. Conclusion

This study aims to investigate the convergence in financial inclusion across major Indian states over the period 2003 to 2016. Till date, there is no study that examines the spatial interactions of financial inclusion in the Indian context. We initially construct an index of financial inclusion, after which we utilize ESDA tools (LOSH and G_i^* maps) and spatial panel regression tools to draw inferences about the existence of convergence in IFI. For the purpose of the spatial analysis, we have employed the squared inverse distance weight matrix that envelopes the

global and *local* spatial effects. The σ- and γ-convergence indices are then employed as aspatial tools to provide further evidence on the issue.

The results from the ESDA analysis suggest that over the study period, there has been a tendency towards homogenous local conditions with low mean levels in IFI in most of the states, suggesting that many states have been relatively left out of the financial inclusion drive. The spatial panel regression analysis also does not find any evidence of convergence in financial inclusion across states. The determinants in the model – income level, industrialization, infrastructure and gender parity – are seen to positively affect financial inclusion, both within and across states. The convergence indices offer further evidence for lack of convergence in IFI across states. Our conjecture is that scarcity of bank branches in rural areas, financial illiteracy (especially in backward states), bankers' unwillingness to prioritize low-ticket customers could be some of the factors explaining lack of convergence in financial inclusion.

To allow for a level playing field for economic agents in all states, there is a need to promote more even financial development. For this to materialize, it is recommended that the policymakers initiate financial inclusion schemes suitable to the local conditions instead of "One size fit all" type policies, especially the more backward states. Promoting banking habits and financial literacy in these states (for e.g., BIMARU states) is expected to help them catch up with advanced states such as Goa, Punjab, Karnataka, Kerala. Such a development is expected to improve economic growth and reduce poverty and unemployment in these states.

The study has been subject to limitations on data availability on determinants of inclusion post-2016, besides lack of a better proxy other than sex ratio for participation of women in the economy (for example, data on proportion of women in labour force is not available for every

year). We have only included banking institutions for measuring financial inclusion. Further studies could explore other components such as insurance and pension.

Notes

[1] Though bifurcated in 2014, Andhra Pradesh & Telangana states have been considered undivided for sake of uniformity in analysis. “Jammu & Kashmir” in this chapter refers to the undivided state prior to bifurcation in 2019, since the period of study ends with 2016.

CHAPTER 6

Conclusions & policy implications

Financial inclusion has been identified as a necessary policy tool to address developmental issues. World Bank (2014) documents that several countries have incorporated inclusive finance as part of their financial policy tools to create a more robust financial system (Khan, 2011) and raise the living standards of the unbanked population.

Several benefits resulting from financial inclusion, both at the individual and at the macroeconomic level, have been identified in the literature (Fungacova & Weill, 2015; Dar & Ahmed, 2020; Sahoo et al, 2017). Certain positive effects at the micro level include easier transactions and availability of finance for MSMEs, access to safe avenues for savings, which could also help in mitigating shocks to cash flows and tide over unexpected expenses. As Subrahmanyam & Acharya (2017) observe the macroeconomic benefits from financial inclusion which include fostering faster economic growth, which could be a result of increasing share increasing financial saving as a fraction of macro-saving and by maintaining a high level of productivity of financial investment. They employ three different models, viz., a multiplier model, the "AK" growth model and the Harbinger little triangle and rectangle to analytically demonstrate that financial inclusion contributes significantly to creating faster growth. Further to this, the authors observe that financial development enhances financial inclusion through the dual frameworks of financial tripod and policy tripod. Studies such as Sethi & Sethy (2019), Sethi & Acharya (2018), Sharma (2016) also find that financial inclusion furthers the cause of economic development.

Financial inclusion is important at the systemic level also because it can reduce inequality as observed by Beck *et al*, (2007) and because it has a positive impact in promoting productive investment (Dupas & Robinson, 2009). Carpenter & Petersen (2002) find in their study that

use of credit is positively associated with the growth of budding enterprises. Tuesta *et al*, (2015) find that the marginal benefits arising from financial inclusion generally outweigh the costs therefrom. Khan (2011) observes that greater financial inclusion has the capability to buttress the financial system against possible fluctuations in business cycles, thereby contributing positively to financial stability.

Certain other studies focus on the ability of financial inclusion to dampen the incidence of poverty (Banerjee & Newman, 1993; Burgess & Pande, 2005) and inequality (Demirguc-Kunt & Levine, 2008) along with its negative association with unemployment (for example, Mugo & Kilonzo, 2017; Bruhn & Love, 2013).

Though the studies mentioned above may have investigated the impact of financial inclusion on economic growth, poverty, unemployment and financial stability, no study, to the best of the author's knowledge, has attempted to look into the growth effects of financial inclusion on a panel of developing countries comprising of Afro-Asian economies. While studies such as Alhassan et al, (2019), Makina & Walle (2019) examine the relationship between inclusion and growth in African nations and Sethi & Sethy (2018), Raza, Rubab & Wen (2019) perform country-specific studies in Asia, regarding the problem, a study is yet to be performed on the problem with respect to a panel of Afro-Asian developing nations. Despite the growing share of economic pie being claimed by these economies, along with their significant strides in financial inclusion through formal banking as well as mobile banking, they have not received due attention while exploring the contribution of financial inclusion to economic growth.

Proceeding further with the developmental concerns that follow from the expansion of the financial sector, although studies such as Banerjee & Newman, (1993), Demirguc-Kunt & Levine, (2008), Mugo & Kilonzo (2017) and Bruhn & Love (2013) have previously analysed the relationship between greater access and usage of financial services on the one hand and

poverty and unemployment on the other at an international level, no study has investigated the relevant impact in the case of Indian states.

Although poverty and unemployment, along with economic growth are important policy concerns to which financial inclusion could possibly contribute in developing economies including India, it is to be recognized that any possible effects, whether positive or negative, that inclusion can bring about on these variables can be better appreciated in light of the relative distribution of the inclusivity of financial sectors of various states across the country. Hence, a need is felt for a study that examines the spatial convergence of financial inclusion across Indian states in light of the findings from other chapter(s).

To synthesise from the previous paragraphs, the present study seeks to examine the growth enhancing and poverty & unemployment mitigating effects of financial inclusion in Afro-Asian developing countries with special focus on India, besides investigating the convergence in financial inclusion across states in India, the latter among which could shed more light on the poverty alleviating and unemployment reducing capabilities of formal finance.

The data employed for empirical analysis is sourced from World Governance Indicators, World Development Indicators, the IMF Financial Access Survey (2017), Status of Microfinance in India reports published by NABARD for the years 2008-13, Database of Indian Economy (DBIE) published by the RBI, report of the expert group headed by Dr. C. Rangarajan to review the methodology to measure poverty (Rangarajan, 2014), report on employment and unemployment survey for the years between 2009 and 2013 published by the planning commission, 66^{th}, 68^{th} and 70^{th} NSSO reports, Census (2011) report and Handbook of Statistics on Indian States published by the RBI.

We initially build the index of financial inclusion based on the Sarma (2012) methodology (for objectives 1 and 2) or CRISIL (2018) methodology (for objective 3). Both the methodologies

are largely similar in their construction of indices, and should result in similar levels of financial inclusion since they possess all the ideal properties given in Nathan *et al*, (2015). As part of our objective 1, we perform a system GMM estimation of regressing per capita GDP growth rates of 37 developing Afro-Asian countries on the index of financial inclusion (IFI) and a set of socioeconomic control variables.

We thereafter regress poverty and unemployment in 29 Indian states and UTs on the IFI using the system GMM estimation technique, with literacy rate and credit-deposit ratio as control variables. The regressions are performed at the rural, urban and overall phases for both poverty and unemployment with inclusion being measured either under the umbrella of microfinance institutions (MFIs) – designated as MFIFII – or under SHGs, MFIs and banks put together – designated as TOTFII. Thus, we estimate six specifications for each of the cases of poverty and unemployment – each case under the three rural, urban and overall phases being estimated with either MFIFII or TOTFII as the primary explanatory variable.

In the next chapter, based on the index that has been built following CRISIL (2018), we next perform a spatial analysis of the variance in IFI through a pair of exploratory spatial data analysis (ESDA) tools, namely LOSH and G_i^* maps. After drawing inferences about the spatial-dispersion and spatial-mean levels through the LOSH and G_i^* maps, we seek confirmation of these inferences through spatial panel regression results. All these spatial inferential and regression techniques are adopted with an objective to draw conclusions about the spatial convergence of IFI in Indian states. The spatial panels consist of 14 years of data from 2003 to 2016 on 26 states and 2 UTs. Certain economic and demographic variables are utilized as control variables. The methodology proposed in Kopczewska *et al*., (2017) has been adopted to arrive at the final model with relevant parameters. Further, it may be possible to utilize the σ-convergence and γ-convergence indices as aspatial techniques to provide further evidence on the nature of convergence.

The spatial regression results, when compared against the generalized method of moments regressions in the earlier chapters, provide relevant findings with significant policy implications.

1. Major findings

The important findings of the chapters that constitute this study are as follows:

i) The study finds that financial inclusion in Afro-Asian developing economies to be positively associated with economic growth. Greater level of financial access and usage is seen to promote greater investment in human capital, production technologies, which could possibly generate employment opportunities, besides alleviating poverty. Greater economic activity also results due to lower cost of funding and reduced transaction costs from cheaper access to credit. Safer banking and better allocation of resources also result from standardized financial services. The results are consistent with earlier studies on financial inclusion and economic growth such as Sethi & Acharya (2018), Sethi & Sethy (2018), Sharma (2016) & Park & Mercado (2016).

ii) The three panel regressions with rural, urban and total poverty in 29 Indian states offer insights into the effect of financial inclusion through MFIs, SHGs and banks. The results show that both MFIFII and TOTFII have the expected negative sign as the primary explanatory variables. This result suggests that financial inclusion has a significant negative impact on poverty at the rural, urban and overall levels in India. These results confirm the findings of Demirguc-Kunt & Levine (2008), Burgess & Pande (2004) and Chibba (2009).

However, the coefficients on C-D ratio are largely insignificant, suggesting that credit services through banks have not met the theoretical expectations to an extent that it could reduce poverty. Literacy rate is found to be negatively associated with poverty, which is an expected outcome.

iii) From the regression analysis with unemployment as the regressand, the coefficients on both MFIFII and TOTFII have the expected negative sign and are statistically significant in the rural and overall cases. Furthermore, the C-D ratio also has a negative and statistically significant coefficient in both these cases, indicating that credit disbursal through banks has resulted in generated opportunities for employment in general, and specifically in rural India. The sign borne by the coefficient on literacy rate for rural India is positive but statistically insignificant, suggesting that efforts made to promote literacy in interior regions have not made the desired impact in reducing unemployment.

In the urban scenario, the financial inclusion drive may not have had commensurate beneficial effects in reducing unemployment. The financial inclusion either through MFIs (as reflected in MFIFII) and banks (as reflected in TOTFII and C-D ratio) can at best be said to have had a minimal impact on unemployment in urban areas.

The results of our regression analysis of financial inclusion on unemployment are in conformity with results from previous research. Mugo & Kilonzo (2017) and Bruhn & Love (2013) have offered evidence that improved access to financial services in Kenya and Mexico has contributed to dampening effects on unemployment. However, our present study reveals that credit disbursal through MFIs and banks in India has not contributed significantly to employment generation. We believe that a longer period of analysis may reveal more about the employment generation effects of financial inclusion.

iv) The results from the ESDA analysis to investigate the spatial convergence of IFI in Indian states suggest that over the study period, there has been a tendency towards homogenous local conditions with low mean levels in IFI in most of the states, suggesting that many states have been relatively left out of the financial inclusion drive. The spatial panel regression analysis also does not find any evidence of convergence in financial inclusion across states. These results may partly explain the disparities in poverty and unemployment rates across

states when judged in the context of findings from earlier chapters, where financial inclusion has been found to reduce poverty and inequality. The determinants in the model – income level, industrialization, infrastructure and gender parity – are seen to positively affect financial inclusion, both within and across states. The convergence indices offer further evidence for lack of convergence in IFI across states. Our conjecture is that scarcity of bank branches in rural areas, financial illiteracy (especially in backward states), bankers' unwillingness to prioritize low-ticket customers could be some of the factors explaining lack of convergence in financial inclusion.

2. Policy implications:

Certain policy implications follow from the findings above, the most significant of which are discussed below.

i) The findings above imply that the financial inclusion efforts of governments across Asia and African continents have been helpful in furthering their economic growth. It is recommended that such policies be persisted with, so that the growth potential of these countries may be achieved along with the expansion of their financial sectors.

ii) Policies promoting financial inclusion in these nations are desirable also because they often result in greater investment in human capital due to lower cost of funding and decline in transaction costs. The greater scope offered for entrepreneurship also serves to help the cause of greater growth. Better allocation of resources to efficient uses combined with trustworthy banking system allows smoother functioning of the economy.

iii) Turning specifically to the Indian context the results of the study offer encouragement to the financial inclusion policies such as SHG-BLP, PMJDY, APY and PMSBY (among others) initiated by the government which are aimed at alleviating poverty and reducing

unemployment. Other initiatives such as PMGDisha could also contribute to poverty reduction in the country by fostering financial literacy.

iv) However, the impact of financial inclusion on unemployment in urban India is found to be minimal. This could be due to the study period being too short to bring out the effect that FI has through improvements in human capital among urban youth.

v) The results from the spatial analysis that seeks to examine the spatial convergence of financial inclusion levels across Indian states also have certain policy implications. To ensure that economic agents across states are allowed a level playing field, there is a need to promote more even financial development. For this to materialize, we recommend that financial inclusion schemes suitable to specific regions, especially those with backward states be actively considered, instead of initiating blanket-coverage programs for the entire country. Promoting banking habits and financial literacy in backward states (for e.g., BIMARU states) is expected to help them catch up with advanced states such as Goa, Punjab, Karnataka, Kerala. Such a development is expected to improve economic growth and reduce poverty and unemployment in these states.

3. Limitations

The generalized method of moments regression analysis performed for investigating the contribution of financial inclusion in furthering economic growth and alleviating poverty and unemployment (in India) could not be extended beyond 2013 owing to paucity of state-wise data on poverty. Besides this, the data on inputs for construction of MFIFII and TOTFII were also lacking.

Furthermore, the study has been subject to limitations on data availability on determinants of inclusion post-2016 for the spatial analysis, besides lack of a better proxy other than sex ratio for participation of women in the economy (for example, data on proportion of women in labour

force is not available for every year). We have only included banking institutions for measuring financial inclusion. Further studies could explore other components of inclusion such as insurance and pension in their analysis.

References

Acharya, D. (2017, January 26). Special perspectives series on demonetization in India: The recent Indian demonetisation and cash exclusion. *IMTFI Blog*. https://blog.imtfi.uci.edu/2017/01/special-perspectives-series-on_26.html

Acharya, D., & Parida, T. (2013). *Financial inclusion in India: Why not happened*. Indian Institute of Banking & Finance. http://www.iibf.org.in/documents/reseach-report/Final-Report-on-FI-for-IIBF-by-DAcharya-and-TParida.pdf

Acharya, D., Subbarao, V. V., & Venkatachalapathy, T. K. (2017, February 13). Special perspectives series on demonetization in India: The recent Indian demonetization and cash exclusion (Part 2). *IMTFI Blog*. https://blog.imtfi.uci.edu/2017/02/special-perspectives-series-on_13.html

Ajide, F. M. (2020). Financial inclusion in Africa: Does it promote entrepreneurship? *Journal of Financial Economic Policy*, *12*(4), 687-706. https://doi.org/10.1108/jfep-08-2019-0159

Alfaro, L., Chanda, A., Kalemli-Ozcan, S., & Sayek, S. (2004). FDI and economic growth: The role of local financial markets. *Journal of International Economics*, *64*(1), 89-112. https://doi.org/10.1016/s0022-1996(03)00081-3

Alhassan, A., Li, L., Reddy, K., & Duppati, G. (2019). The impact of formal financial inclusion on informal financial intermediation and cash preference: Evidence from Africa. *Applied Economics*, *51*(42), 4597-4614. https://doi.org/10.1080/00036846.2019.1593316

Ang, J. B., & McKibbin, W. J. (2007). Financial liberalization, financial sector development and growth: Evidence from Malaysia. *Journal of Development Economics*, *84*(1), 215-233. https://doi.org/10.1016/j.jdeveco.2006.11.006

Anselin, L. (2020). GeoDa (Version 1.18) [Software]. Center for Spatial Data Science, University of Chicago. https://geodacenter.github.io/

Arestis, P., Demetriades, P. O., & Luintel, K. B. (2001). Financial development and economic growth: The role of stock markets. *Journal of Money, Credit and Banking*, *33*(1), 16-41. https://doi.org/10.2307/2673870

Arora, R. (2014). Access to finance: an empirical analysis. *The European Journal of Development Research*, *26*(5), 798-814. http://dx.doi.org/10.1057/ejdr.2013.50

Ashraf, N., Karlan, D., & Yin, W. (2010). Female empowerment: Impact of a commitment savings product in the Philippines. *World Development*, *38*(3), 333-344. https://doi.org/10.1016/j.worlddev.2009.05.010

Asian Development Bank. (2000). *Finance for the Poor: Microfinance Development Strategy* (Institutional Document). https://www.adb.org/documents/finance-poor-microfinance-development-strategy

Babajide, A. A., Adegboye, B., & Omankhanlen, A. E. (2015). Financial inclusion and economic growth in Nigeria. *International Journal of Economics and Financial Issues*, *5*(3), 629-

637. https://www.researchgate.net/publication/295656568_International_Journal_of_Economics_and_Financial_Issues_Financial_Inclusion_and_Economic_Growth_in_Nigeria

Bali, T. G., & Demirtas, K. O. (2009). Small sample bias in panel data. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.1434425

Beck, T., Demirguc-Kunt, A., & Levine, R. (2007). Finance, inequality and the poor. *Journal of Economic Growth, 12*, 27-49. https://doi.org/10.1007/s10887-007-9010-6

Beck, T., Levine, R., & Loayza, N. (2000). Finance and the sources of growth. *Journal of Financial Economics, 58*, 261-300.

Bekaert, G., Harvey, C., & Lundblad, C. (2005). Does financial liberalization spur growth? *Journal of Financial Economics, 77*, 3-55. https://doi.org/10.3386/w8245

Bencivenga, V. R., Smith, B. D., & Starr, R. M. (1996). Equity markets, transactions costs, and capital accumulation: An illustration. *The World Bank Economic Review, 10*(2), 241-265. https://doi.org/10.1093/wber/10.2.241

Benhabib, J., & Spiegel, M. M. (2000). The role of financial development in growth and investment. *Journal of Economic Growth, 5*, 341-360.

Bhanumurthy, N. R., & Singh, P. (2013). Financial sector development and economic growth in Indian states. *International Journal of Economic Policy in Emerging Economies*, *6*(1), 47. doi:10.1504/ijepee.2013.054472

Bhavani, T., & Bhanumurthy, N. (2012). *Financial access in post-reform India*. OUP India.

Blundell, R., & Bond, S. (1998). Initial conditions and moment restrictions in dynamic panel data models. *Journal of Econometrics, 87*(1), 115-143. https://doi.org/10.1016/s0304-4076(98)00009-8

Boyle, G. E., & McCarthy, T. G. (1997). A simple measure of β-convergence. *Oxford Bulletin of Economics and Statistics, 59*(2), 257-264. doi:10.1111/1468-0084.00063

Bozkurt, I., Karakuş, R., & Yildiz, M. (2018). Spatial determinants of financial inclusion over time. *Journal of International Development*, *30*(8), 1474-1504. doi:10.1002/jid.3376

Bruhn, M., & Love, I. (2013). The real impact of improved access to finance: Evidence from Mexico. *The Journal of Finance*, *69*(3), 1347-1376. doi:10.1111/jofi.12091

Buddelmeyer, H., Jensen, P. H., Oguzoglu, U., & Webster, E. (2008). *Fixed effects bias in panel data estimators* (Discussion Paper No. 3487). The Institute for the Study of Labor (IZA), Germany.

Burgess, R., & Pande, R. (2005). Do rural banks matter? Evidence from the Indian social banking experiment. *American Economic Review, 95*(3), 780-795. https://doi.org/10.1257/0002828054201242

Calderón, C., & Liu, L. (2003). The direction of causality between financial development and economic growth. *Journal of Development Economics*, *72*(1), 321-334. https://doi.org/10.1016/s0304-3878(03)00079-8

Cámara, N., & David, T. (2015). Factors that matter for financial inclusion: Evidence from Peru. *AESTIMATIO*, *9*(2015), 8-29. https://doi.org/10.5605/ieb.10.1

Chakravarty, S. R., & Pal, R. (2013). Financial inclusion in India: An axiomatic approach. *Journal of Policy Modeling*, *35*(5), 813-837. doi:10.1016/j.jpolmod.2012.12.007

Chattopadhyay, S. K. (2011). *Financial inclusion in India: A case-study of West Bengal* (MPRA Paper 34269). University Library of Munich, Germany. https://ideas.repec.org/p/pra/mprapa/34269.html

Chibba, M. (2009). Financial inclusion, poverty reduction and the millennium development goals. *The European Journal of Development Research*, *21*(2), 213-230. https://doi.org/10.1057/ejdr.2008.17

Chithra, N., & Selvam, M. (2013). Determinants of financial inclusion: An empirical study on the inter-state variations in India. *SSRN Electronic Journal*. doi:10.2139/ssrn.2296096

Christopoulos, D. K., & Tsionas, E. G. (2004). Financial development and economic growth: Evidence from panel unit root and cointegration tests. *Journal of Development Economics*, *73*(1), 55-74. https://doi.org/10.1016/j.jdeveco.2003.03.002

Churchill, S. A., & Marisetty, V. B. (2019). Financial inclusion and poverty: A tale of forty-five thousand households. *Applied Economics*, *52*(16), 1777-1788. https://doi.org/10.1080/00036846.2019.1678732

Cnaan, R. A., Moodithaya, M. S., & Handy, F. (2012). Financial inclusion: Lessons from rural South India. *Journal of Social Policy*, *41*(1), 183-205. https://doi.org/10.1017/s0047279411000377

Corrado, G., & Corrado, L. (2015). The geography of financial inclusion across Europe during the global crisis. *Journal of Economic Geography*, *15*(5), 1055-1083. doi:10.1093/jeg/lbu054

CRISIL. (2018). *CRISIL Inclusix: Financial inclusion surges, driven by Jan-dhan yojana* (4). Retrieved from https://www.crisil.com/en/home/our-analysis/reports/2018/02/crisil-inclusix-financial-inclusion-surges-driven-by-Jan-Dhan-yojana.html

Dar, A. B., & Ahmed, F. (2020). Financial inclusion determinants and impediments in India: Insights from the global financial inclusion index. *Journal of Financial Economic Policy*, *ahead-of-print*(ahead-of-print). https://doi.org/10.1108/jfep-11-2019-0227

Das, T. (2019). Does credit access lead to expansion of income and multidimensional poverty? A study of rural Assam. *International Journal of Social Economics*, *46*(2), 252-270. https://doi.org/10.1108/ijse-12-2017-0592

DataMeet. (2020). States - Community created maps of India. https://projects.datameet.org/maps/states/

Dawood, T. C., Pratama, H., Masbar, R., & Effendi, R. (2019). Does financial inclusion alleviate household poverty? Empirical evidence from Indonesia. *Economics & Sociology*, *12*(2), 235-252. https://doi.org/10.14254/2071-789x.2019/12-2/14

De Gregorio, J., & Guidotti, P. E. (1995). Financial development and economic growth. *World Development*, *23*(3), 433-448. https://doi.org/10.1016/0305-750X(94)00132-I

Demetriades, P. O., & Hussein, K. A. (1996). Does financial development cause economic growth? time-series evidence from 16 countries. *Journal of Development Economics*, *51*(2), 387-411. https://doi.org/10.1016/s0304-3878(96)00421-x

Demirgüç-Kunt, A. (2014). Presidential address: Financial inclusion. *Atlantic Economic Journal*, *42*(4), 349-356. https://doi.org/10.1007/s11293-014-9429-z

Demirguc-Kunt, A., & Levine, R. (2008). Finance, financial sector policies, and long-run growth. *World Bank Policy Research Working Papers*. https://doi.org/10.1596/1813-9450-4469

Devlin, J. F. (2005). A detailed study of financial exclusion in the UK. *Journal of Consumer Policy*, *28*(1), 75-108. doi:10.1007/s10603-004-7313-y

Dhawan, R. (2014, April 17). *Why is financial inclusion in India not improving?: New numbers, new approaches*. NextBillion. https://nextbillion.net/why-is-financial-inclusion-in-india-not-improving/

Erra, K. S. S., Acharya, D. (in press). Financial Inclusion Across Major Indian States: Some Spatial Panel Econometric Evidence. *International Journal of Social Economics*.

Friedman, M. (1992). Do old fallacies ever die? *Journal of Economic Literature*, *30*(4), 2129-2132. Retrieved from https://www.jstor.org/stable/2727976

Fungáčová, Z., & Weill, L. (2015). Understanding financial inclusion in China. *China Economic Review*, *34*, 196-206. doi:10.1016/j.chieco.2014.12.004

Getis, A., & Ord, J. K. (1992). The analysis of spatial association by use of distance statistics. *Geographical Analysis*, *24*(3), 189-206. doi:10.1111/j.1538-4632.1992.tb00261.x

Ghosh, S. (2016). Does mobile telephony spur growth? Evidence from Indian states. *Telecommunications Policy*, *40*(10-11), 1020-1031. https://doi.org/10.1016/j.telpol.2016.05.009

Guiso, L., Sapienza, P., & Zingales, L. (2004). Does local financial development matter? *The Quarterly Journal of Economics*,, *119*(3), 929-969. doi.org/10.1162/0033553041502162

Gupte, R., Venkataramani, B., & Gupta, D. (2012). Computation of financial inclusion index for India. *Procedia - Social and Behavioral Sciences*, *37*, 133-149. doi:10.1016/j.sbspro.2012.03.281

Hansen, B. E., & Seshadri, A. (2014). Uncovering the relationship between real interest rates and economic growth. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.2391449

Hariharan, G. H., & Marktanner, M. (2012). *Growth potential of financial inclusion*. Paper presented at Atlanta Fed/GSU International Development Economics Workshop, Atlanta. Retrieved from https://www.frbatlanta.org/-/media/documents/news/conferences/2012/intl-development/Hariharan.pdf

Harvard University. (2019, January 18). The latest research: Women and gender. *Harvard Business Review*. https://store.hbr.org/product/the-latest-research-women-and-gender/WOMGEN

Inoue, T. (2019). Financial inclusion and poverty reduction in India. *Journal of Financial Economic Policy*, *11*(1), 21-33. https://doi.org/10.1108/jfep-01-2018-0012

Iqbal, B. A., & Sami, S. (2017). Role of banks in financial inclusion in India. *Contaduría y Administración*, *62*(2), 644-656. https://doi.org/10.1016/j.cya.2017.01.007

Jones, P. A. (2008). From tackling poverty to achieving financial inclusion—The changing role of British credit unions in low income communities. *The Journal of Socio-Economics*, *37*(6), 2141-2154. https://doi.org/10.1016/j.socec.2007.12.001

Khaki, A. R., & Sangmi, M. (2017). Does access to finance alleviate poverty? A case study of SGSY beneficiaries in Kashmir Valley. *International Journal of Social Economics*, *44*(8), 1032-1045. https://doi.org/10.1108/ijse-10-2015-0277

Khan, H. R. (2011, November). *Fianncial inclusion and financial stability: A Toda-Yamamoto causality approach*. Conference session presented at BANCON organised by the Indian Bankers Association and Indian Overseas Bank, Chennai. Retrieved from https://www.bis.org/review/r111229f.pdf

Kim, D., Yu, J., & Hassan, M. K. (2018). Financial inclusion and economic growth in OIC countries. *Research in International Business and Finance*, *43*, 1-14. https://doi.org/10.1016/j.ribaf.2017.07.178

Kim, J. (2015). A study on the effect of financial inclusion on the relationship between income inequality and economic growth. *Emerging Markets Finance and Trade*, *52*(2), 498-512. https://doi.org/10.1080/1540496x.2016.1110467

King, R. G., & Levine, R. (1993). Finance and growth: Schumpeter might be right. *The Quarterly Journal of Economics*, *108*(3), 717-737. https://doi.org/10.2307/2118406

Kodan, A. S., & Chhikara, K. S. (2013). A theoretical and quantitative analysis of financial inclusion and economic growth. *Management and Labour Studies*, *38*(1-2), 103-133. https://doi.org/10.1177/0258042x13498009

Koomson, I., Villano, R. A., & Hadley, D. (2020). Effect of financial inclusion on poverty and vulnerability to poverty: Evidence using a multidimensional measure of financial inclusion. *Social Indicators Research*, *149*(2), 613-639. https://doi.org/10.1007/s11205-019-02263-0

Kopczewska, K., Kudła, J., & Walczyk, K. (2017). Strategy of spatial panel estimation: Spatial spillovers between taxation and economic growth. *Applied Spatial Analysis and Policy*, *10*(1), 77-102. doi:10.1007/s12061-015-9170-2

Kumar, N. (2013). Financial inclusion and its determinants: Evidence from India. *Journal of Financial Economic Policy*, *5*(1), 4-19. doi:10.1108/17576381311317754

Lal, T. (2018). Impact of financial inclusion on poverty alleviation through cooperative banks. *International Journal of Social Economics*, *45*(5), 807-827. https://doi.org/10.1108/ijse-05-2017-0194

Lenka, S. K., & Bairwa, A. K. (2016). Does financial inclusion affect monetary policy in SAARC countries? *Cogent Economics & Finance*, *4*(1), 1-8. doi:10.1080/23322039.2015.1127011

Levine, R. (1991). Stock markets, growth, and tax policy. *The Journal of Finance*, *46*(4), 1445-1465. https://doi.org/10.1111/j.1540-6261.1991.tb04625.x

Levine, R. (2002). Bank-based or market-based financial systems: Which is better? *Journal of Financial Intermediation*, *11*(4), 398-428. https://doi.org/10.1006/jfin.2002.0341

Levine, R. (2005). Finance and growth: Theory and evidence. In *Handbook of economic growth* (1st ed., pp. 865-934). doi:10.1016/S1574-0684(05)01012-9

Levine, R., & Zervos, S. (1996). Stock market development and long-run growth. *The World Bank Economic Review*, *10*(2), 323-339. https://doi.org/10.1093/wber/10.2.323

Levine, R., Loayza, N., & Beck, T. (2000). Financial intermediation and growth: Causality and causes. *Journal of Monetary Economics*, *46*(1), 31-77. https://doi.org/10.1016/s0304-3932(00)00017-9

Leyshon, A., & Thrift, N. (1995). Geographies of financial exclusion: Financial abandonment in Britain and the United States. *Transactions of the Institute of British Geographers*, *20*(3), 312-341. https://doi.org/10.2307/622654

Li, L. (2018). Financial inclusion and poverty: The role of relative income. *China Economic Review*, *52*, 165-191. https://doi.org/10.1016/j.chieco.2018.07.006

Lopez, T., & Winkler, A. (2017). The challenge of rural financial inclusion – evidence from microfinance. *Applied Economics*, *50*(14), 1555-1577. https://doi.org/10.1080/00036846.2017.1368990

Mago, S., & Chitokwindo, S. (2014). The impact of mobile banking on financial inclusion in Zimbabwe: A case for Masvingo province. *Mediterranean Journal of Social Sciences*, *5*(9), 221-230. https://doi.org/10.5901/mjss.2014.v5n9p221

Maity, S., & Sarania, R. (2017). Does microfinance alleviate poverty and inequality? Studying self-help groups in Bodoland, Assam. *Development in Practice*, *27*(7), 1006-1019. https://doi.org/10.1080/09614524.2017.1355353

Makina, D., & Walle, Y. (2019). Financial inclusion and economic growth: Evidence from a panel of selected African countries. In D. Makina (Ed.), *Expanding Financial Inclusion in Africa* (pp. 193-210). Academic Press.

Martinez, C. H., Hidaglo, X. P., & Tuesta, D. (2013). *Demand factors that influence financial inclusion in Mexico: analysis of the barriers based on the ENIF survey* (13/3). BBVA Research.

Mbutor, M. O., & Uba, I. A. (2013). The impact of financial inclusion on monetary policy in Nigeria. *Journal of Economics and International Finance*, *5*(8), 318-326. doi:10.5897/jeif2013.0541

Mehrotra, A., & Yetman, J. (2015). Financial inclusion - Issues for central banks. *BIS Quarterly Review (March 2015)*. https://ssrn.com/abstract=2580310

Menon, N., Rodgers, Y., & Vender, M. (2011). How access to credit affects self-employment: Differences by gender during India's rural banking reform. *Journal of Development Studies*, *47*(1), 48-69. doi:10.1080/00220381003706486

Milana, C., & Ashta, A. (2020). Microfinance and financial inclusion: Challenges and opportunities. *Strategic Change*, *29*(3), 257-266. https://doi.org/10.1002/jsc.2339

Ministry of Finance, GoI. (2020). Pradhan Mantri Jan-Dhan Yojana, Ministry of Finance. Retrieved October 15, 2020, from https://pmjdy.gov.in/

Mohammed, J. I., Mensah, L., & Gyeke-Dako, A. (2017). Financial inclusion and poverty reduction in Sub-Saharan Africa. *The African Finance Journal*, *19*(1), 1-22.

Mohan, R. (2006, January). *Economic growth, financial deepening and financial inclusion* [Conference session]. Address at the Annual Bankers' Conference, Hyderabad.

Mor, N. (2014). *Report on comprehensive financial services for small businesses and low income households*. Reserve Bank of India. https://rbidocs.rbi.org.in/rdocs/PublicationReport/Pdfs/CFS070114RFL.pdf

Mugo, M., & Kilonzo, E. (2017). *Community level impacts of financial inclusion in Kenya with particular focus on poverty eradication and employment creation* (Staff Report). United Nations. https://www.un.org/development/desa/dspd/wp-content/uploads/sites/22/2017/04/Matu-Mugo-and-Evelyne-Kilonzo-UN-SDGs-Paper5May2017-Kenya-Financial-Inclusion.pdf

Murari, K., & Didwania, M. (2010). Poverty Alleviation through Financial Inclusion: An Analytical Study with Special Reference to India. *Revelation*, *3*, 60-72. https://ssrn.com/abstract=2187201

Mushtaq, R., & Bruneau, C. (2019). Microfinance, financial inclusion and ICT: Implications for poverty and inequality. *Technology in Society*, *59*, 101154. https://doi.org/10.1016/j.techsoc.2019.101154

National Centre for Financial Education. (2015). *Report on financial literacy in India*.

Nerlove, M. (2005). *Essays in panel data econometrics*. Cambridge University Press.

Omar, M. A., & Inaba, K. (2020). Does financial inclusion reduce poverty and income inequality in developing countries? A panel data analysis. *Journal of Economic Structures*, *9*(1). https://doi.org/10.1186/s40008-020-00214-4

Onaolopo, A. R. (2015). Effects of financial inclusion on the economic growth of Nigeria (1982-2012). *International Journal of Business and Management Review*, *3*(8), 11-28.

Ord, J. K., & Getis, A. (2012). Local spatial heteroscedasticity (LOSH). *The Annals of Regional Science*, *48*(2), 529-539. doi:10.1007/s00168-011-0492-y

Park, C. Y., & Mercado, R. V. (2016). Does financial inclusion reduce poverty and income inequality in developing Asia? In S. Gopalan & T. Kikuchi (Eds.), *Financial inclusion in Asia: Issues and Policy Concerns* (pp. 61-92). doi:10.1057/978-1-137-58337-6_3

Park, C., & Mercado, R. (2018). Financial inclusion, poverty, and income inequality. *The Singapore Economic Review*, *63*(01), 185-206. https://doi.org/10.1142/s0217590818410059

Park, C., & Mercado, R. J. (2015). Financial inclusion, poverty, and income inequality in developing Asia. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.2558936

Park, D., & Shin, K. (2017). Economic growth, financial development and income inequality. *Emerging Markets, Trade and Finance*, *53*(12), 2794-2825. https://doi.org/10.1080/1540496X.2017.1333958

Patrick, H. T. (1966). Financial development and economic growth in underdeveloped countries. *Economic Development and Cultural Change*, *14*(2), 174-189. doi:10.1086/450153

Quah, D. (1993). Galton's fallacy and tests of the convergence hypothesis. *The Scandinavian Journal of Economics*, *95*(4), 427. doi:10.2307/3440905

Rangarajan, C. (2008). *Report of the committee on financial inclusion*. Government of India.

Rangarajan, C. (2014). *Report of the Expert Group to Review the Methodology for Measurement of Poverty*. Planning Commission, Government of India.

Ray, P., & Prabu, E. (2013). *Financial development and monetary policy transmission across financial markets: What do daily data tell for India?* (Working Paper Series No. 04/2013) Reserve Bank of India. https://rbidocs.rbi.org.in/rdocs/Publications/PDFs/WPS070513FDTP.PDF

Raza, M. S., Tang, J., Rubab, S., & Wen, X. (2019). Determining the nexus between financial inclusion and economic development in Pakistan. *Journal of Money Laundering Control*, *22*(2), 195-209. https://doi.org/10.1108/jmlc-12-2017-0068

Reserve Bank of India. (2019). *Report on national strategy for financial inclusion*. https://rbidocs.rbi.org.in/rdocs/content/pdfs/NSFIREPORT100119.pdf

Rioja, F., & Valev, N. (2004). Does one size fit all?: A reexamination of the finance and growth relationship. *Journal of Development Economics*, *74*(2), 429-447. https://doi.org/10.1016/j.jdeveco.2003.06.006

Sadharma, E. K. S., & Venkatachalapathy, T. K. (2018). Does Financial Inclusion Reduce Poverty and Unemployment? Some Evidences from Indian States. *The Microfinance Review*, *10*(1), 36-51.

Sahoo, A. K., Pradhan, B. B., & Sahu, N. C. (2017). Determinants of financial inclusion in tribal districts of Odisha: An empirical investigation. *Social Change*, *47*(1), 45-64. doi:10.1177/0049085716683072

Sakanko, M. A., Abu, N., & David, J. (2019, September). *Financial inclusion: A panacea for national development in Nigeria* [Paper presentation]. 2nd National Conference of the Faculty of Social Sciences, Federal University Lafia, Nigeria.

Sarma, M. (2012). *Index of Financial Inclusion: A measure of financial sector inclusiveness*, Competence Centre on Money, Trade, Finance and Development 1207, Hochschule fuer Technik und Wirtschaft, Berlin.

Sarma, M. (2008). *Index of financial inclusion* (Working Paper No. 215). Indian Council for Research on International Economic Relations. http://www.icrier.org/pdf/Working_Paper_215.pdf

Sehrawat, M., & Giri, A. K. (2016). Financial development and poverty reduction in India: An empirical investigation. *International Journal of Social Economics*, *43*(2), 106-122. https://doi.org/10.1108/ijse-01-2014-0019

Sehrawat, M., & Giri, A. K. (2016). Financial development and poverty reduction: Panel data analysis of South Asian countries. *International Journal of Social Economics*, *43*(4), 400-416. https://doi.org/10.1108/ijse-04-2014-0069

Sethi, D., & Acharya, D. (2018). Financial inclusion and economic growth linkage: Some cross country evidence. *Journal of Financial Economic Policy*, *10*(3), 369-385. doi:10.1108/jfep-11-2016-0073

Sethi, D., & Sethy, S. K. (2019). Financial inclusion matters for economic growth in India. *International Journal of Social Economics*, *46*(1), 132-151. doi:10.1108/ijse-10-2017-0444

Shaikh, S. A. (2017). Poverty alleviation through financing microenterprises with equity finance. *Journal of Islamic Accounting and Business Research*, *8*(1), 87-99. https://doi.org/10.1108/jiabr-07-2013-0022

Sharma, D. (2016). Nexus between financial inclusion and economic growth. *Journal of Financial Economic Policy*, *8*(1), 13-36. doi:10.1108/jfep-01-2015-0004

Sharma, R., Didwania, M., & Kumar, P. (2014). Need of financial inclusion for poverty alleviation and GDP growth. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.2434473

Sharma, V. (2015). Are BIMARU states still bimaru? *Economic and Political Weekly*, *50*(18), 58-63. https://www.epw.in/journal/2015/18/notes/are-bimaru-states-still-bimaru.html

Shivaprasad, G. (2020). Role of microfinance – Transforming the social conditions of women SHG. *Test Engineering and Management*, *83*, 2668-2680.

Ssewamala, F. M. (2014). Optimizing the "demographic dividend" in young developing countries: The role of contractual savings and insurance for financing education. *International Journal of Social Welfare*, *24*(3), 248-262. https://doi.org/10.1111/ijsw.12131

Subrahmanyam, G., & Acharya, D. (2017). Financial inclusion fosters growth: Simple multiplier and "AK" Growth model analysis. *Universal Journal of Accounting and Finance*, *5*(3), 55-59. https://doi.org/10.13189/ujaf.2017.050301

Swamy, V. (2014). Financial inclusion, gender dimension, and economic impact on poor households. *World Development*, *56*, 1-15. doi:10.1016/j.worlddev.2013.10.019

The MathWorks, Inc. (2018). MATLAB (Version R2018a) [Software]. https://in.mathworks.com/products/get-matlab.html?s_tid=gn_getml

Tuesta, D., Sorensen, G., Haring, A., & Camara, N. (2015). Financial inclusion and its determinants: the case of Argentina, *Working Papers 1503, BBVA Bank, Economic Research Department*.

Van, L., Vo, A. T., Nguyen, N. T., & Vo, D. H. (2019). Financial inclusion and economic growth: an international evidence. *Emerging Markets Finance and Trade*. https://doi.org/10.1080/1540496X.2019.1697672

Wang, X., & Guan, J. (2017). Financial inclusion: Measurement, spatial effects and influencing factors. *Applied Economics*, *49*(18), 1751-1762. doi:10.1080/00036846.2016.1226488

Wang, X., & He, G. (2020). Digital financial inclusion and farmers' vulnerability to poverty: Evidence from rural China. *Sustainability*, *12*(4), 1668. https://doi.org/10.3390/su12041668

World Bank. (2014). *The 2014 global findex*. https://globalfindex.worldbank.org/archives/2014-global-findex

World Bank. (2018). *The global findex database 2017*. https://globalfindex.worldbank.org/

Zins, A., & Weill, L. (2016). The determinants of financial inclusion in Africa. *Review of Development Finance*, *6*(1), 46-57. doi:10.1016/j.rdf.2016.05.001

Gmail Kamal Sai <kamal2sai@gmail.com>

International Journal of Social Economics - Decision on Manuscript ID IJSE-06-2020-0392.R1

International Journal of Social Economics <onbehalfof@manuscriptcentral.com> Sat, Dec 5, 2020 at 11:17 PM
Reply-To: rdellanno@unisa.it
To: kamal2sai@gmail.com, debuiitm@gmail.com

05-Dec-2020

Dear Erra, Kamal Sai Sadharma; Acharya, Debashis

It is a pleasure to accept your manuscript IJSE-06-2020-0392.R1, entitled "Financial Inclusion Across Major Indian States: Some Spatial Panel Econometric Evidence" in its current form for publication in International Journal of Social Economics. Please note, no further changes can be made to your manuscript.

Please go to your Author Centre at https://mc.manuscriptcentral.com/ijsec (Manuscripts with Decisions for the submitting author or Manuscripts I have co-authored for all listed co-authors) to complete the Copyright Transfer Agreement form (CTA). We cannot publish your paper without this.

All authors are requested to complete the form and to input their full contact details. If any of the contact information is incorrect you can update it by clicking on your name at the top right of the screen. Please note that this must be done prior to you submitting your CTA.

If you have an ORCID please check your account details to ensure that your ORCID is validated.

By publishing in this journal your work will benefit from Emerald EarlyCite. As soon as your CTA is completed your manuscript will pass to Emerald's Content Management department and be processed for EarlyCite publication. EarlyCite is the author proofed, typeset version of record, fully citable by DOI. The EarlyCite article sits outside of a journal issue and is paginated in isolation. The EarlyCite article will be collated into a journal issue according to the journals' publication schedule.

FOR OPEN ACCESS AUTHORS: Please note if you have indicated that you would like to publish your article as Open Access via Emerald's Gold Open Access route, you are required to complete a Creative Commons Attribution Licence - CCBY 4.0 (in place of the standard copyright assignment form referenced above). You will receive a follow up email within the next 30 days with a link to the CCBY licence and information regarding payment of the Article Processing Charge. If you have indicated that you might be eligible for a prepaid APC voucher, you will also be informed at this point if a voucher is available to you (for more information on APC vouchers please see http://www.emeraldpublishing.com/oapartnerships

Thank you for your contribution. On behalf of the Editors of International Journal of Social Economics, we look forward to your continued contributions to the Journal.

Sincerely,
Prof. Roberto Dell'Anno
Editor, International Journal of Social Economics
rdellanno@unisa.it

Tell us how we're doing! We'd love to hear your feedback on the submission and review process to help us to continue to support your needs on the publishing journey.

Simply click this link https://eu.surveymonkey.com/r/F8GZ2XW to complete a short survey and as a thank you for taking part you have the option to be entered into a prize draw to win £100 in Amazon vouchers. To enter the prize draw you will need to provide your email address.

53rd ANNUAL CONFERENCE
OF
THE INDIAN ECONOMETRIC SOCIETY (TIES)

Certificate

This is to certify that Erra Kamal Sai Sadharma *of* University of Hyderabad *has presented a paper titled* "Financial Inclusion in India Contribution to Economic Growth: An ARDL Approach" *in* **"53rd Annual Conference of TIES"** *from 22 – 24 December, 2016 at National Institute of Science Education and Research, Bhubaneswar.*

Prof. N R Bhanumurthy
Secretary, TIES

Dr. B Kamaiah
President, TIES

Dr. Amarendra Das
Organising Secretary, 53rdTIES

BITS Pilani
KK Birla Goa Campus

International Conference on Economics & Finance (ICEF - 2018)

Certificate of Presentation

This is to certify that

Mr. Erra Kamal Sai Sadharma

has presented a paper titled

Factors Determining Duration Of Credit Cycle in SBLP Households: A Case Study Of Tamil Nadu

in the International Conference on Economics & Finance
held during 16th and 17th February, 2018 at
BITS Pilani KK Birla Goa Campus

Rajorshi Sen Gupta

Dr. Rajorshi Sen Gupta
Organising Secretary

Aswini Kumar Mishra

Dr. Aswini Kumar Mishra
Convenor and Head,
Dept. of Economics
BITS Pilani KK Birla Goa Campus

The Nexus between Financial Inclusion and Economic Growth in Developing countries: Some Panel and Spatial Evidence

ORIGINALITY REPORT

8%	5%	7%	2%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	mafiadoc.com Internet Source	<1%
2	www.iibf.org.in Internet Source	<1%
3	"Inclusiveness in India", Springer Science and Business Media LLC, 2011 Publication	<1%
4	Submitted to University of Stellenbosch, South Africa Student Paper	<1%
5	"Analytical Issues in Trade, Development and Finance", Springer Science and Business Media LLC, 2014 Publication	<1%
6	Chien-Chiang Lee, Chih-Wei Wang, Shan-Ju Ho. "Financial inclusion, financial innovation, and firms' sales growth", International Review of Economics & Finance, 2020 Publication	<1%

7	digitalcommons.ilr.cornell.edu Internet Source	<1%
8	www.tandfonline.com Internet Source	<1%
9	www.kaavpublications.org Internet Source	<1%
10	Submitted to University College London Student Paper	<1%
11	journals.sagepub.com Internet Source	<1%
12	"Inequality, Poverty and Development in India", Springer Science and Business Media LLC, 2017 Publication	<1%
13	"Enhancing Financial Inclusion through Islamic Finance, Volume II", Springer Science and Business Media LLC, 2020 Publication	<1%
14	jital.org Internet Source	<1%
15	Shantanu Ghosh, Tarak Nath Sahu. "How financially inclusive the Asian's are – an empirical analysis", Rajagiri Management Journal, 2020 Publication	<1%

73	www.magscholar.com Internet Source	<1%
74	Biswa Swarup Misra. "Regional Growth Dynamics in India in the Post-Economic Reform Period", Springer Science and Business Media LLC, 2007 Publication	<1%
75	ibimapublishing.com Internet Source	<1%
76	Faizul Haque, Rehnuma Shahid. "Ownership, risk-taking and performance of banks in emerging economies", Journal of Financial Economic Policy, 2016 Publication	<1%
77	fr.scribd.com Internet Source	<1%
78	ro.uow.edu.au Internet Source	<1%
79	Muazu Ibrahim. "Interactive effects of human capital in finance–economic growth nexus in Sub-Saharan Africa", Journal of Economic Studies, 2018 Publication	<1%
80	Submitted to International Islamic University Malaysia Student Paper	<1%

81	Submitted to Indian Institute of Management, Bangalore Student Paper	<1%
82	orca.cf.ac.uk Internet Source	<1%
83	Submitted to The University of Manchester Student Paper	<1%
84	Submitted to Symbiosis Institute of Research & Innovation Student Paper	<1%
85	Submitted to University of Hull Student Paper	<1%
86	Sheri Markose, Thankom Arun, Peterson Ozili. " Financial inclusion, : Quantification of economic viability of a supply side roll out ", The European Journal of Finance, 2020 Publication	<1%

Exclude quotes	On	Exclude matches	< 14 words
Exclude bibliography	On		