Financial Inclusion in India and its Impact on Development and Poverty

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Abstract
This paper aims at analysing the situation of financial inclusion in India. For this purpose, an index is developed which suggests presence of vast inter-state variations in financial inclusion in India.The study further reaches out to seek whether financial inclusion affects growth and standard of living in different states of the country. The results suggest that the level of financial inclusion is very poor in most of the states and further analysis points a direct relation of financial inclusion with growth and standard of living while a negative relation with poverty.

1. Introduction

Financial inclusion is a buzzword in the aspects of economic development in the 21st century. It is hypothesized that inclusion of the last person in the system seems important as financial system strengthens economic growth, and hence, an inclusive financial system can significantly enhance economic growth. Before reaching out to any other aspect of financial inclusion, it is important to clearly understand what exactly it means. For this, we take the two mostly used definitions of financial inclusion in India are given by: Rangarajan Committee on financial inclusion (2006), stating financial inclusion to be a "*process of ensuring access to financial services and timely and adequate credit where needed by vulnerable groups such as weaker sections and low income groups at an affordable cost.*" and RaghuramRajan Committee on Financial Sector Reforms (2007), which defined financial inclusion as "*expanding access to financial services such as payment services, savings products, insurance products and inflation-protected pensions.*". These definitions focus on providing affordable access to financial services to each individual of the economy. In the Indian context, it is a well-known fact that the government has put much effort in increasing the level of financial inclusion, or we can say, decreasing financial exclusion across the national territory. Many schemes were introduced by the government from time to time so that the level of financial inclusion can be increased. But the question we need to ask is whether these efforts were successful in deliveringthe desired results? Further, linkages of financial inclusionwith some macro fundamentals in the economy should also be analysed. With these questions in mind,this study aims at analysing the situation of financial inclusion in India, and to further understand relationship between instruments of financial inclusion and macro fundamentals among Indian states. For this purpose, an index is developed which

suggests presence of vast inter-state variations in financial inclusion in India, andOLS functions are used to study the linkages between financial inclusion and macro-fundamentals.

2. Literature Review

There is a vast variety of work done on financial inclusion. The literature available can be divided on many grounds. Works of Arora (2010), Goel & Sharma (2017), Gupte, Venkatramani, & Gupta (2012), Cámara & Tuesta (2017), Chakravarty & Pal (2010), Sarma (2008), Mialou et.al. (2017), Wang & Guan (2017) seem important in defining the methodological aspects of financial inclusion. Among these, Chakravarty & Pal (2010) have performed a comprehensive research on cross-country and pan-India measurement of financial inclusion by development of a multi-dimentional index. In its limited capacity, Arora (2010) measrues the cross-country extent of access to financial services. Moving forward to conceptualground, many studies have explained different aspects of financial inclusion in India. Ananth & Öncu, (2013) in this regard explain various challenges related to financial inclusion in Andhra Pradesh. Subba Rao, (2007) has highlighted the problem of insufficient database on financial inclusion in India. Further, Dev (2006) focuses on the role of financial inclusion in transforming the lives of poor farmers in India. On similar lines,EPW Research Foundation (2006), has also focused on failure of financial inclusion and its impact on farmers. Majumdar & Gupta(2013), along with Bhatia & Chaterjee (2010) are few of the studies which reveal how mis-management in financial inclusion schemes can lead to failure in achieving the objective. The latest developments in financial inclusion are more focused broadening the area. For example, Wang & Guan (2017) explain the factors which influence financial inclusion and how inclusion changes with a change in eographical regions. Further, Davutyan & Öztürkkal (2016) discuss the influence of financial inclusions on household-level decisions. Morgan & Pontines (2018) talk about financial stability through improved inclusion and priority SME lending. In the same issue, Turegano & Herrero (2018) suggests that promoting financial inclusion leads to reducing income inequality.Zhu, He, & Zhai (2019) talk about the spillover effects which different geographical regions can be caused due to promotion of financial inclusion.

Despite availability of abundant literature, it is strogly felt that the the problem of regional disparities in financial inclusion with reference to India has not been properly addressed. This study, therefore is important as it looks for the nature of diparities occuring in financial inclusion amongIndianstates and study the links between financial inclusion and select macro-issues in the economy.

Objectives

1. To have an inter-state assessment of various instruments of financial inclusion in India

2. To form an index of overall financial inclusion for Indian states
3. To understand relationship between instruments of financial inclusion and macro fundamentals among Indian states.

3. Methodology

Formation of an index is a key aspect of this study as the inter-state variations are analysed on the basis of the index of financial inclusion. Many studies in the past have used an index of financial inclusion in their work, see for example, Arora (2010), Goel & Sharma (2017), Gupte, Venkatramani, & Gupta (2012), Cámara & Tuesta (2017). Lately, a trend is observed to put various dimensions of financial inclusion together and form what is called a '*Muli-Dimensional Index*'. For this purpose, we have followed Sarma (2008) in methodology; i.e. the index of financial inclusion (FII) is based on the formula:

$$FII = 1 - \sqrt{\frac{(1 - x_i)^2 + (1 - x_i)^2 + \cdots + (1 - x_i)^2}{n}}$$

Where x_i is one of the dimension of the n dimension space; $1 - x_i$ is explained as the "Euclidian distance from the ideal point" (Sarma, 2008). It should be noted that x_i is first normalised as per the UNDP methodology, using the formula:

$$x_i = \frac{X_i - X_{min_i}}{X_{max_i} - X_{min_i}}$$

$X_i = Actual\ value$; $X_{min_i} = Minimum\ Value$; $X_{max_i} = Maximum\ Value$

To normalize x_i, all the data is first converted to ratio-scale so that the variables can be standardized using the distant function.

Table 1: Variables Constituting the FII

No	Name	Code
1	Offices of the Scheduled Commercial Banks per '00 Square Kilometer	OSK
2	ATMs per Lakh Adult Population	ATM
3	Offices of the Scheduled Commercial Banks per Lakh Adult Population	CBO
4	ATMs per '00 Square Kilometer	ASK
5	Ratio of Deposits to Total Deposit Accounts	DPG
6	Ratio of Credit to Total Credit Accounts	CRG
7	Personal Loans as a percentage of Net State Domestic Product (NSDP$_{FC}$)	PLG

The variables taken into study cover the dimensions of access, availability, usage and penetration of banking services into different states (see table 1). This is done so that different dimensions of financial inclusion are captured through the index and it is able to capture the complete state of the level of financial inclusion in Indian states. We hypothesize that penetration, access and availability, and usage are required as a limited

measure of the level of financial inclusion. Penetration is taken to measure the reach of financial services to its potential users. Indicators of access and availability will measure the degree to which these services are available to the users, when penetrated. It should be noted that without proper penetration, access and availability cannot be ensured, and without availability, the services cannot be properly utilized to the target population. At last,the indicators of usage see the degree to which the available services are used by the users. There are many studies available which have captured some, or all of the above dimensions to measure financial inclusion. For example, take Sarma (2008), who used penetration, access and usage in her study, orChakravarty & Pal (2010), and Cámara & Tuesta (2017) who have included only access and usage, or Arora (2010) who have used penetration (named as outreach), ease of transtactions and costof transtactions as three different dimensions under which financial inclusion is measured.While Goel & Sharma (2017) have used penetration, availability and access, by Gupte, Venkatramani, & Gupta (2012) have used penetration, usage, easeof transtactions and costof transtactions, while combining the methodology of both Sarma (2008) and Arora (2010) in their approach.

We have considered offices of the scheduled commercial banks which are taken in two ratios to capture the effects of geographical penetration andavailability of financial services. The number of ATMs is also taken in two ratios to capture availability in geographical anddemographic terms.Penetration of banking services is captured through the offices of the scheduled commercial banks geographically (per 100 sq. km.). Population in this sense is the total population of the respective state. Availability and access is seen by using ratio of ATMs per lakh adult population (demographic availability) and ATMs per 100 square kilometres (geographic availability).Offices of the scheduled commercial banks per lakh adult population is also used to measure the access and availability of financial services demographically.Ratio of deposits to total deposits (including jan-dhan bank accounts and deposits in them); ratio of credit to total credit accounts and personal loans as a percentage of GDP are taken to measure the usage of financial services in the respective state. These ratios define how much the accounts are used to avail the financial services and seem to be important indicators of usage.

The data of the scheduled commercial banks and taken from the RBI Database in the year 2017-18 and adult population is taken from the Census 2011 data. Moreover, we have included all Indian states but Telangana, and none of the UTs but Delhi in our analysis. Telangana was left out because finding data on population parameters was not possible, and Delhi was included because it can be considered a quasi-state and is an important area according to the point of view of the analysis. For the sake of continuity, states will include Delhi in this study.

4. Analysis

The calculated values of indexes are shown in table 2, and their ranks are available in annexure I. All the variables in table 2 show the normalized value and FII is calculated

on the basis of these variables using the formula explained in the methodology section. In all the indicators, excluding FII, 'zero' represents the highest value and 'one' represents lowest value.For example, Delhi has a 'zero' value for OSK while Arunachal Pradesh has the value equal to 'one'. This indicates that Delhi has the highest number and while Arunachal Pradesh has the lowest number of the offices of the scheduled commercial banks per '00 square kilometre among the states. Sarma (2008) has classified the results of FII into three groups: first showing high degree of financial inclusion ($0.5 < \text{FII} \leq 1$); second showing medium degree of financial inclusion ($0.3 \leq \text{FII} < 0.5$); and third showing low degree of financial inclusion ($0 \leq \text{FII} < 0.3$). It should be noted that the calculated value of FII cannot go below 'zero'.Using these groups, we have identified the states with high, medium, or low financial inclusion.

It can be seen that only Delhi (rank 1), out of the states, fall into the category of states with high financial inclusion. Thereafter, only Goa (2nd rank) has a medium level of financial inclusion, while all others Maharashtra, (3rd Rank), Kerala (4th rank), Karnataka (5th rank), Haryana (6th rank), Tamil Nadu (7th rank), Punjab (8th rank) and Jammu and Kashmir (9th rank) and Gujarat (10th rank) to Bihar (29th rank) fall into the category of low financial inclusion states. The last five states are of West Bengal (25th rank), Jharkhand (26th rank), Assam (27th rank), Tripura (28th rank) and Bihar (29th rank). This analysis reveals that there is a tremendous disparity in the level of financial inclusion across India. The reasons can be mapped out from annexure I. See that Delhi, the only state having a high level of financial inclusion, isn't performing well in all the variables. Delhi has a medium performance in availability of the banking services (CBO, rank 05th). Goa, the state with medium FII, also follow the same trend. Goa is performing with mediocracy in the usage (DPG, 03rd rank; CRG, rank 06th and PLG, rank 07th). The last five states are constantly performing poor in all the dimensions, except for the cases of West Bengal, which has a 06th rank in OSK. It is thus clear that Indian states are in need to work rigorously so as to improve the level of financial inclusion in their respective areas. After a careful examination of the financial inclusion index, we now move forward to comparing the index with some macro-variables so as to analyse how states with different level of financial inclusion perform in growth and standard of living, including poverty. For this purpose, Per Capita Net State Domestic Product (Factor Cost) at constant prices, which may be called as the Per Capita Income (PCI) of the states, has been taken as a proxy for growth and Human Development Index is considered as a proxy for standard of living. Percentage of Persons Below Poverty Line (BPL) is an indicator for poverty among Indian states. It should be noted that the data for PCI and BPL is taken from RBI Handbook of Indian States. PCI for Tripura is a forecasted value as the data was not available. Moreover, the data on HDI is taken from the Global Data Lab (https://globaldatalab.org/). While BPL is taken for the year 2011-12. It has been assumed that the poverty rates have not changed significantly since then. The year 2011-12 for poverty is taken because of unavailability of data. For the sake of comparison,

HDI was categorised into three categories viz. High (0.700-1.000); Medium (0.555-0.699); and Low (0.350-0.554). PCI and BPL were also categorised into three categories (High, Medium and Low) but their definitions are based on elementary tools of central tendency and dispersion.The formula used to define the limits of the 'Medium' category is $limits = \overline{X} \pm 0.5 * \sigma$, $\overline{X}$being mean of indicator and σ as its standard deviation. States having values higher than the upper limit are 'High' categorystates having values lower than the lower limit are put in the 'Low' category states. Table 3 and table 4 show the cross-tabs between FII and PCI and FII and HDI respectively.

Table 2: Index of Financial Inclusion

STATE/UT	OSK	ATM	CBO	ASK	DPG	CRG	PLG	FII	RANK (FII)
ANDHRA PRADESH	0.966	0.531	0.628	0.977	0.975	0.902	0.165	0.198	15[^]
ARUNACHAL PRADESH	1	0.736	0.700	0.999	0.498	0.815	0.307	0.205	12[^]
ASSAM	0.977	0.868	0.906	0.983	0.962	0.973	0.695	0.108	27[^]
BIHAR	0.944	1	0.925	0.971	1	0.985	0.940	0.081	29[^]
CHHATTISGARH	0.986	0.838	0.792	0.992	0.920	0.782	0.786	0.127	22[^]
DELHI	0	0.086	0.354	0	0	0	0.036	0.756	1[*]
GOA	0.855	0	0	0.903	0.331	0.713	0.136	0.394	2[#]
GUJARAT	0.969	0.658	0.658	0.979	0.640	0.573	0.505	0.211	10[^]
HARYANA	0.913	0.474	0.412	0.948	0.599	0.672	0.357	0.26	6[^]
HIMACHAL PRADESH	0.979	0.477	0.342	0.989	0.670	0.851	0.923	0.191	17[^]
JAMMU AND KASHMIR	0.995	0.561	0.567	0.996	0.785	0.882	0.025	0.224	9[^]
JHARKHAND	0.971	0.895	0.807	0.985	0.847	0.944	0.785	0.117	26[^]
KARNATAKA	0.959	0.413	0.544	0.967	0.615	0.767	0	0.270	5[^]
KERALA	0.871	0.450	0.469	0.912	0.673	0.868	0.003	0.271	4[^]
MADHYA PRADESH	0.984	0.784	0.822	0.988	0.937	0.864	0.498	0.143	20[^]
MAHARASHTRA	0.968	0.566	0.768	0.970	0.316	0.586	0.033	0.275	3[^]
MANIPUR	0.995	0.894	1	0.995	0.953	0.897	0.258	0.135	21[^]
MEGHALAYA	0.989	0.770	0.636	0.994	0.560	0.902	0.376	0.192	16[^]
MIZORAM	0.994	0.710	0.452	0.997	0.691	0.914	0.340	0.202	13[^]
NAGALAND	0.994	0.747	0.869	0.994	0.625	0.896	0.272	0.179	18[^]
ODISHA	0.976	0.740	0.732	0.984	0.837	0.935	0.952	0.123	24[^]
PUNJAB	0.899	0.496	0.314	0.949	0.725	0.696	0.598	0.235	8[^]
RAJASTHAN	0.984	0.728	0.737	0.989	0.899	0.822	0.641	0.149	19[^]
SIKKIM	0.986	0.401	0.325	0.991	0.512	0.838	1	0.205	11[^]
TAMIL NADU	0.934	0.303	0.622	0.929	0.767	0.932	0.095	0.243	7[^]
TRIPURA	0.966	0.856	0.703	0.999	0.925	1	0.942	0.106	28[^]
UTTAR PRADESH	0.944	0.912	0.830	1	0.910	0.902	0.626	0.125	23[^]
UTTARAKHAND	0.970	0.450	0.356	0.999	0.672	0.811	0.862	0.200	14[^]
WEST BENGAL	0.929	0.883	0.880	1	0.799	0.835	0.888	0.119	25[^]
High Financial Inclusion; [#]Medium Financial Inclusion; [^]Low Financial Inclusion									

Source: Author's Calculations.

Table 3: Cross-Tabulation between FII and Per Capita Income (PCI)

		PCI		
		High	Medium	Low
FII	High	Delhi		
	Medium	Goa		
	Low	Haryana, Sikkim	Andhra Pradesh, Arunachal Pradesh, Gujrat, Himachal Pradesh, Karnataka, Kerala, Maharashtra, Mizoram, Punjab, Rajasthan, Tamil Nadu, Uttarakhand	Assam, Bihar, Chhattisgarh, Jammu and Kashmir, Jharkhand, Madhya Pradesh, Manipur, Meghalaya, Nagaland, Odisha, Tripura, Uttar Pradesh, West Bengal

Source: Author's Presentation.

Table 4: Cross-Tabulation between FII and Human Development Index (HDI)

		HDI	
		High	Medium
FII	High	Delhi	
	Medium	Goa	
	Low	Haryana, Himachal Pradesh, Kerala, Punjab, Sikkim	Andhra Pradesh, Arunachal Pradesh, Assam, Bihar, Chhattisgarh, Gujrat, Jammu and Kashmir, Jharkhand, Karnataka, Madhya Pradesh, Maharashtra, Manipur, Meghalaya, Mizoram, Nagaland, Odisha, Rajasthan, Tamil Nadu, Tripura, Uttar Pradesh, Uttarakhand, West Bengal

Source: Author's Presentation.

Table 5: Cross-Tabulation between FII and Persons Below Poverty Line (BPL)

		BPL		
		High	Medium	Low
FII	High			Delhi
	Medium			Goa
	Low	Arunachal Pradesh, Assam, Bihar, Chhattisgarh, Jharkhand, Madhya Pradesh, Manipur, Odisha, Uttar Pradesh	Gujrat, Karnataka, Maharashtra, Mizoram, Nagaland, Rajasthan, Tripura, West Bengal	Andhra Pradesh, Haryana, Himachal Pradesh, Jammu and Kashmir, Kerala, Meghalaya, Punjab, Sikkim, Tamil Nadu, Uttarakhand

Source: Author's Presentation.

It can be understood that a majority of states with low FII have either low (13 states) or medium (11 states) PCI and medium HDI (21) (see table 3 for PCI and 4 for HDI). This indicates that there can be an association between FII and PCI; and FII and HDI. The same assumption cannot be maintained in case of FII and BPL as table 5 has an almost even spread of states with low FII into high and low categories of BPL. To check this association, we have used simple linear regression analysis (OLS method) as a tool where a unidirectional relationship among the variables is assumed, defined as:

1. $PCI = \int (FII)$
2. $HDI = \int (FII)$
3. $BPL = \int (FII)$

The functional relationship is regressed using the equation: $Y_{ij} = \alpha_j + \beta_j FII_i + \mu_{ij}$ where Y_{ij} is the dependent variable with i cross-section and j is 1 for PCI; 2 for HDI and 3 for BPL. The α_j's and β_j's are intercept and slope coefficients respectively and μ_{ij} is the stochastic error term. The models and their values are presented in table 6.

Table 6: Regression Results

Model	r	R^2	α	p-value (α)	β	p-value (β)
1. $HDI = \int (FII)$	0.7132	0.4275	0.607	0.000[*]	0.272	0.000[*]
2. $PCI = \int (FII)$	0.7807	0.6095	19736.398	0.193	396551.6	0.000[*]
3. $BPL = \int (FII)$	-0.4916	0.2147	28.386	0.000[*]	-43.145	0.006[*]

Source: Author's Calculations [*]Significant @ 1 percent Level

See that the correlation coefficients (r) of all three models are quite high. R^2's are not much high, but considering running regressions on indexed data, the results seem pretty good. The lowest R^2 is that of model number 3 (BPL; 21.47 percent); and the highest is that of model number 2 (PCI; 60.95 percent). HDI has a R^2 of 42.75 percent, which is also a decent number. See that all the three models have both α's and β's significant at 1 percent level of significance except model number 2 (PCI), which has an insignificant intercept value at 10 percent level. All the regressions, along with correlation, thus can be said to have significant results, which are interesting. The results suggest that all three of HDI, PCI and BPL are affected by FII, which, put in other words, means that financial inclusion impacts standard of living and economic growth directly (see that the slope coefficients are positive) and poverty in an inverse relation (see negative slope coefficient).

5. Conclusion

The results of this study generate muchcuriosity and a scope for further research. It has been found that financial inclusion in India is at a very unfortunate level. Only Delhi falls

in the category of high financial inclusion index (FII), and Goa under medium category FII. All of the remaining states have low FII. This is a very alarming situation and should be addressed immediately. Further, the regression analysis suggested a positive unidirectional relationship between financial inclusion and economic growth; and financial inclusion and standard of living. Moreover, increase in level of financial inclusion was seen to reduce poverty as well. The results are not very strong, yet we can accept them to be conclusive. However, due to insufficiency of data, questions like direction of these relationships couldn't be answered which becomes the scope of further research on Indian scenario.

From the results obtained in this study, it is evident that financial inclusion can lead to improvement in the living standards for a more number of members of society, and ensuring maximum inclusion can lead to better growth. But given the case of India, the objective is far from achieved. The reasons could be dearth of financial literacy, or lack of basic education for that matter; tight regulatory framework in the market; high maintenance cost of infrastructure or many others. However, this is way beyond the purview of this study and is another gap that can be pursued. But the government should act upon increasing the level of financial inclusion so that the country can move ahead on a path of more inclusive growth.

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Appendix I: Ranks of Indicators

State/UT	OSK	ATM	CBO	ASK	DPG	CRG	PLG	FII
Andhra Pradesh	12	11	13	10	28	21	8	15
Arunachal Pradesh	29	17	16	26	4	10	11	12
Assam	18	24	27	12	27	27	20	27
Bihar	8	29	28	9	29	28	26	29
Chhattisgarh	23	22	21	19	23	8	22	22
Delhi	1	2	5	1	1	1	5	1
Goa	2	1	1	2	3	6	7	2
Gujarat	14	14	15	11	10	2	16	10
Haryana	5	8	7	5	7	4	13	6
Himachal Pradesh	19	9	4	16	11	14	25	17
Jammu and Kashmir	27	12	11	23	17	17	3	9
JharKhand	16	27	22	14	20	26	21	26
Karnataka	10	5	10	7	8	7	1	5
Kerala	3	7	9	3	13	16	2	4
Madhya Pradesh	20	21	23	15	25	15	15	20
Maharashtra	13	13	20	8	2	3	4	3
Manipur	28	26	29	22	26	19	9	21
Meghalaya	24	20	14	21	6	22	14	16
Mizoram	26	15	8	24	14	23	12	13
Nagaland	25	19	25	20	9	18	10	18
Odisha	17	18	18	13	19	25	28	24
Punjab	4	10	2	6	15	5	17	8
Rajasthan	21	16	19	17	21	11	19	19
Sikkim	22	4	3	18	5	13	29	11
Tamil Nadu	7	3	12	4	16	24	6	7
Tripura	11	23	17	27	24	29	27	28
Uttar Pradesh	9	28	24	29	22	20	18	23
Uttarakhand	15	6	6	25	12	9	23	14
West Bengal	6	25	26	28	18	12	24	25

Source: Authors' Calculations