Working Paper 405

Understanding the Disparity in Financial Inclusion across Indian States: A Comprehensive Index for the Period 1984 – 2016

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ISBN 978-81-7791-261-6

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Working Paper Series Editor: **Marchang Reimeingam**

UNDERSTANDING THE DISPARITY IN FINANCIAL INCLUSION ACROSS INDIAN STATES: A COMPREHENSIVE INDEX FOR THE PERIOD 1984 – 2016

Shika Saravanabhavan*

Abstract

In this paper we have developed a new comprehensive index to study financial inclusion. We have expanded the range of financial institutions that are now being used for developing the financial inclusion index, by also subsuming the role of cooperatives, which are an integral part of the Indian financial structure. This is especially important for India as it is largely rural in nature and historically the cooperative system has played an important role in improving financial access. By doing so we are able to assess the relevance of the cooperative system in the current financial system. As of now the RBI follows commercial bank-led approach towards financial inclusion: we suggest that the Government should encourage existing financial agencies such as cooperative banks in order to improve financial inclusion in the excluded areas, especially in the rural sector.

Introduction

The cooperative system has historically played a key role in providing credit access to the poor and the first Five-Year Plan of the country recognized it as an indispensable instrument for planned economic action; however, in recent times its potential has been overlooked. This study maintains that there is a need for greater emphasis for the role of cooperatives in the current financial development of the country. It is imperative to note that India is still primarily rural in nature with 68.4 percent of the population living in the rural areas[i]. To cater to this rural population, the cooperative movement is better equipped on account of the local nature of organisation of these institutions. Also the 'last mile problem' can be better addressed with the help of these grassroots institutions. Especially the Primary Agricultural Society, which forms the lowest tier of the cooperative structure, is an important channel through which the rural farmers access financial services. Along with Regional Rural Banks (RRBs), Cooperatives still disburse more than 50 percent of the rural credit[ii]. In 2016 the total number of borrowers was around 4.62 crores and the total credit outstanding was Rs 158487.25 crores[iii]. Therefore, studying the cooperative banking system in the light of the current financial scenario is relevant.

This study attempts to develop a new measure for financial inclusion to better gauge the level of inclusion amongst the various states of India, by subsuming the role of cooperatives, which are an integral part of the Indian financial structure. Existing studies have all used indicators related to scheduled commercial banks to study the level of inclusion amongst the states, but to obtain the actual measure of India's rural areas this measure becomes inadequate and can be considered narrow. Here we have expanded the range of financial institutions that are being used for developing the index. With

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This paper is part of the author's dissertation work and is funded by the ICSSR fellowship. The author is very grateful to her supervisor Prof Meenakshi Rajeev for her guidance. This paper has also benefitted from the useful suggestions by her DC members. The author would also like to thank the anonymous referees. The usual disclaimer applies.

the help of this index we examine the level of financial inclusion of various states (16 major states) in India so as to assess the disparity over the period 1984-2016. We use factor analysis to arrive at the weighting scheme for the indicators while most of the extant regional studies use arbitrary weighting schemes.

The motivation for gauging the extent of financial inclusion in India is derived from various evidences which show the positive impact of financial inclusion on development, especially in reducing poverty and inequality (Burgess & Pande, 2003; Honohan, 2007) (Burgess & Pande, 2003; Honohan, 2007) and thus improving people's living standards. It is especially critical for the poor as access to financial services opens out new choices in occupation (Banerjee & Newman, 1993), encourages thrift, helps in insuring against risks, enables investment in education etc. Recognizing these benefits and more, India has implemented several initiatives and policies over the years, with the objective of increasing people's access to financial services. This paper, therefore, tries to understand whether these initiatives have brought a change in the level of financial inclusion across Indian states.

The remainder of the paper is organised as follows. In the first section, the concepts are defined. The next section gives a brief outline of the structure and evolution of banking since Independence. The two subsequent sections discuss the key theoretical and empirical literature. This is followed by a discussion on the data sources and methodology. Then the various indicators used in the analysis are explained. The penultimate section presents the analysis. The last section provides the concluding observations.

Defining the Concept

Financial inclusion can be broadly defined as a process which ensures that there is no involuntary exclusion of individuals from the financial system. It is a process which results in an economic situation where appropriate financial services are accessible to the people, who are eligible, and where no section of society is discriminated against.

The above definition emerges from the classification of financial inclusion as voluntary and involuntary as explained in the Financial Development Report, 2014. For instance, some individuals may have access but may not use the services because they feel they do not need these services or they may not have the habit of saving or they may even just decide that the prices are too high for them (Claessens, 2006). This is termed voluntary exclusion. Involuntary exclusion is when people do not have access in the first place. Thus availability of services is a necessary but not sufficient condition for inclusion (*ibid*). People or firms may be involuntarily excluded due to price and non-price barriers, unsuitable products or low income. It may also be the case that the poor will get discriminated against on account of the higher risk involved in servicing them.

Also, of late the RBI has put more imperative on the role of mainstream institutional players in bringing about financial inclusion in India. Thus it is bank-led inclusion initiative that is being followed in India. For instance, one of the recent Reserve Bank documents defines it as 'a process of ensuring access to appropriate financial products and services needed by all sections of the society in general, and the weaker sections and lower income groups in particular, at an affordable cost in a fair and transparent manner by mainstream institutional players' (Rajan, 2014).

We must clearly understand that financial inclusion has various components such as savings accounts, credit, remittance products, insurance etc. Access to each of these components has several uses for individuals and households. For instance, households can save for retirement, children's marriage, education and several other contingencies. Similarly, credit is useful for starting and maintaining businesses, buying houses, investing in human capital and for other everyday consumption purposes. The other important component is remittance products which is mainly useful for migrant workers to transfer their savings.

India's Financial System and the Importance of the Cooperative Sector

The main banking system in India consists of commercial and cooperative banking system. The commercial banks include nationalised banks, State bank and its associates, Regional Rural Banks (RRBs) and also private sector banks. These together comprise the Scheduled commercial banks. According to the Rangarajan Committee report (2008), the RRBs accounted for 37 percent of the total rural offices of the Scheduled Commercial Banks and they accounted for 31 percent of deposit accounts and 37 percent of loan accounts in rural areas. So the RRBs have a strong presence in rural areas.

Table 1 gives us the flow of agricultural credit from different financial institutions over the years 2010-11 to 2014-15. We can see that around 16 percent of total credit disbursal in 2015 was from cooperative banks and 72 percent from commercial banks and the rest from the RRBs and other agencies. Also, from 2011 to 2015, the credit from cooperative banks, Regional Banks and Commercial banks has grown at the annual rate of 16, 24, and 19 percent respectively. So the credit disbursal through cooperative banks is still important.

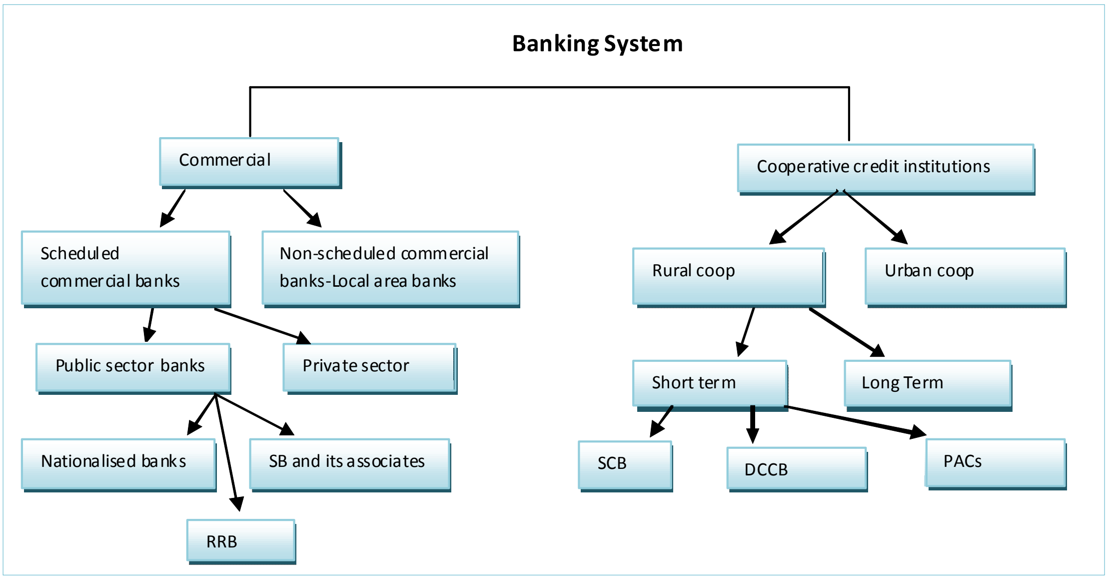
Table 1: Credit Flow to Agriculture according to Different Banking Institutions (Amount in Crores)

	2010-11	2011-12	2012-13	2013-14	2014-15	CAGR (%) 2010-11 to 2014-15
Commercial Banks	332706 (74%)	368616 (72%)	432491 (71.2%)	527506 (72.2%)	604376 (71.5%)	16
RRB	43968 (9.8%)	54450 (10.7%)	63681 (10.5%)	82653 (11.3%)	102483 (12.1%)	24
Co-op Banks	70105 (15.7%)	87963 (17.2%)	111203 (18.3%)	119964 (16.4%)	138469 (16.4%)	19
Total	**446779 (100%)**	**511029 (100%)**	**607375 (100%)**	**730123 (100%)**	**845328 (100%)**	**17**

Source: Adapted from NABARD Annual Report 2015-16

The cooperative credit institutions are broadly divided as Rural Cooperative credit institutions and Urban Cooperative credit institutions. Of these, the Rural Cooperatives have both short-term and long-term credit institutions. The short-term cooperative credit system has a three-tier structure consisting of the State Cooperative Banks, the District Central Cooperative Banks and the Primary agricultural credit societies (PACS). Figure 1 shows a diagrammatic representation of the financial system in India.

Figure 1: Banking System in India



Note: SB=State Bank; RRB=Regional Rural Banks; SCB=State Cooperative Bank; DCCB=District Central Cooperative Bank; PACS=Primary Agricultural Credit Societies

Source: Reserve Bank of India

In order to develop a more comprehensive measure of financial inclusion we need to represent all the important institutions that come under the financial system and so here in our paper we include data from public sector banks, private sector banks and regional rural banks (together termed as scheduled commercial banks) and also the cooperative sector. The primary agricultural credit societies have close links to the grassroots level in the rural areas and we use it in our analysis to capture credit inclusion through the cooperative system in the rural areas.

Evolution of the Indian Financial System

Nationalisation of banks was the most decisive point in the history of Indian banking and can be rightly called the beginning of actual banking development in the country. This move saw 14 large banks being brought under the control of the central bank in 1969 and later six more banks were nationalised in 1980. This move was largely aimed at directing the financial resources of the banks for planned development of the country. Another important milestone in the history of Indian banking was the establishment of the Regional rural banks in 1975 with the objective of specifically developing the rural areas and to provide banking services to the small farmers, cottage industries and agricultural labourers.

Furthermore, in 1977 the 1:4 bank licensing policy was introduced which required banks to open four branches in unbanked areas in order to obtain permission for opening a branch in an already banked area. This helped in branch expansion especially in rural areas and studies have shown that this branch expansion policy has indeed reduced rural poverty mainly due to the increased savings mobilisation and credit provision as a result of the compulsory branch expansion programme (Burgess & Pande, 2005). Also during this period the Lead Bank scheme was adopted in which every district was allotted to a particular bank (Lead Bank). This was done with the objective of raising banking services in that area under the supervision of the appointed bank. Together these measures increased the geographical coverage of banking services. Also policies for directed lending to priority sector and differential interest rate scheme for weaker sections were also laid down during this period. But by the 1980s these policies eroded the profitability of the banks and many of them had become inefficient and incompetent.

Consequently, the Narasimham Committee made several recommendations in 1991 for structural change in the economy as well as reformation of the banking system. The first phase of banking reforms was between 1991 and 1998, and it brought out several liberal measures such as deregulation of the differential interest rates, reduction in SLR, CRR, abolishment of the 1:4 bank licensing system etc. Most of the reforms were based on 'efficiency considerations' (Ahluwalia, 2000) and thus this phase particularly focussed on improving and strengthening the banking system. But this focus on increasing the financial depth overlooked the importance of financial inclusion. Moreover, the banks now had no incentive to service the poor as the cost involved was high. In fact, the user-side data from All-India Debt and Investment Survey shows that credit from institutional services had decreased from 64 percent in 1991 to 56 percent in 2013. Consequently, the share of informal services increased during this period. During 1995-2009 several bank branches in rural areas were closed and the share of rural branches declined at the rate of 1 percent per annum[iv].

The financial inclusion drive period: As a response to the low financial inclusion, in 2005 the Khan Committee brought out several important recommendations. For instance, it introduced Business Correspondents (BC) and business facilitators (BF) which were designed to provide door-step delivery of services so as to resolve the last-mile problem (Joshi, 2014). The RBI also introduced the no-frills account which could act as the entry point for the unbanked into the formal financial system. Also, it is now mandatory to open 25% of total number of branches which are opened during a year to be in unbanked rural centres. Moreover, the financial drive period saw the simplification of procedures for obtaining new bank accounts.

The Jan Dhan Yojana

The recent Jan Dhan Yojana aims at bringing universal access to banking services and aims to provide basic banking accounts for savings and for payment services. These basic accounts are also linked to a Rupay Debit Card and each account has an inbuilt insurance cover of Rs 1 lakh. Moreover, these accounts are also eligible for an overdraft facility of up to Rs 5,000 after being active for at least six months[v]. The idea here is to enable the poor to have access to some form of credit and thereby lessen dependence on money-lenders and other unscrupulous informal sources. The statistics provides a picture where the public sector banks and the Regional rural banks are having the highest share in opening new bank accounts under this scheme. By December 2017, the private banks have opened .99

crores bank accounts as compared to 24.78 crores by public sector banks and 4.94 crores by Regional Rural Banks. Also, from Appendix 1 we see that the number of accounts opened under the Jan Dhan Yojana is the highest for the low inclusion states both in rural and urban areas. However, the major concern facing policy makers now is whether these accounts are being actually utilised.

Theoretical Literature

As early as 1923, Schumpeter posited the important relationship between financial services and economic growth and according to him, access to finance is imperative for new entrepreneurs to come up, which in turn helps to mobilise the society's savings into productive investment. At a macro level, financial development also helps countries to adopt better technology and thus move towards a higher steady state per capita (Aghion, Howitt, & Mayer-Foulkes, 2005).

Nowadays, financial inclusion is seen as one of the important means to development and policy makers contemplate it not as a policy choice but as a policy compulsion (Chakrabarty, 2010). And financially inclusive policies have gained ground in recent years. The World Bank definition of inclusive growth implies that even though rapid economic growth is necessary, this growth should be broad-based across different sectors and should involve a large part of the country's population. Therefore, the financial system has a critical role in strengthening this process of inclusive growth. Arunachalam (2008) argues that the structural problems have also to be addressed for increasing financial inclusion; otherwise, the poor will move in and out of temporary inclusion and exclusion. So he suggests a new paradigm, which should address the overall needs of the poor, and thus would keep them included in the financial system.

Another significant study by Galor and Zeira (1993) posits that people are unable to invest in human capital due to financial market imperfections (specifically, high cost of borrowing) and therefore end up in unskilled work which reduces their lifetime earnings. Along a similar line of argument, Banerjee & Newman (1993) have modelled credit market imperfections and the occupational choice of the poor and they suggest that due to market imperfections the poor have fewer funds to borrow from and hence they cannot make occupational choices which require higher investment. For instance, they are unable to become self-employed or become entrepreneurs and mostly end up working for rich employers.

These credit market imperfections are mainly brought about by credit rationing (Stiglitz and Weiss, 1981). This is caused because the banks have difficulty in identifying the good borrowers from the bad. If the interest rates are set too high it tends to attract the more risky borrowers (adverse selection) and also there is a possibility that borrowers use funds in riskier projects (moral hazard). So generally banks ration the supply of credit to reduce the risk and uncertainty in borrowing. In this process even the bankable may get involuntarily excluded (Claessens, 2006).

Empirical Literature Review

Financial exclusion is caused by several reasons. According to the Findex survey 2011, adults in low-income countries cite distance to banks, affordability of services, lack of money, lack of trust in formal financial system, documentation requirements etc as different reasons for not having access to banking services (Beck, Demirgüç-kunt, & Martinez Peria, 2005; Demirguc-kunt & Klapper, 2012). Access to financial services is also being considered as important alongside other basic needs such as water, health, education etc (Peachey & Roe, 2004). This is justified as access to financial services can actually improve access to the basic requirements. So understanding the level of access has become imperative over the years and several attempts have been made to measure financial inclusion using mostly country-wise data. Also, regional studies using State-wise analysis have also been attempted.

Measuring Financial Inclusion

One of the earliest attempts at measuring financial sector outreach, uses commercial banks data across 98 countries (Beck *et al*, 2005) and looks at two dimensions – financial sector access and usage. The specific indicators used to measure access are geographic and demographic branch/ATM penetration, and the usage indicators that are included are loan accounts per capita, loan income ratio, deposit account per capita and deposit income ratio. Similarly, Honohan (2008) too proposes a composite indicator to measure access using data on both formal banking and Micro Finance Institutions which are semi-formal in nature. This study uses both household survey data as well as data from financial institutions.

Another cross-country study (Sarma, 2012) groups the various indicators into three dimensions – banking penetration, availability and usage. The indicator for banking penetration is the number of bank accounts per thousand adult population. The indicators for availability are the number of bank branches/ATMs per thousand adult population and finally the indicators under the usage dimension are the volume of deposits and volume of credit as a proportion of GDP.

As an improvement on the above index, several others have also attempted to construct Financial Inclusion Indices (Arora, 2012; Gupte, Venkataramani & Gupta, 2012) by introducing new indicators such as ease and cost of transactions. They adapted the UNDP's new methodology of calculating HDI where the geometric mean is used to compute the index so as to not allow for perfect substitutability. Thus this method gives higher importance to the dimensions having lower performance and is not linearly compensated by overachievement in other dimensions.

In another cross-country study, Cámara & Tuesta (2014) have developed a multidimensional index for 82 countries for the year 2011. This study uses both user information from World Bank's Global Findex and supply-side information from IMF's Financial Access Survey. This study postulates that financial inclusion is determined by three dimensions – usage, barriers and access. The usage and barriers dimension is constructed using user-side data and access dimension from supply-side data at country level. Another study using demand-side information (Demirgüç-kunt & Klapper, 2013) tries to assess the level of inclusion across countries and explores country-level and individual-level variation in the use of financial services and finds that account penetration varies across countries depending on the level of economic development and the income inequality within countries.

Indices can also be used to understand the level of inclusion within different regions of a country. Amongst the studies using data from Indian states, Chakravarty & Pal (2010) study follows an axiomatic approach and has set five basic postulates – boundedness, global monotonicity, global homogeneity, global lower difference in gain at higher levels of attainment difference and symmetry against which a suitable index is identified.

Mehrotra *et al* (2009) also constructed an index for 20 states for the years 2003 and 2006 as the weighted average of the dimension indices by following UNDP's earlier methodology of calculating the HDI. The four dimensions used by him are number of rural offices, number of rural deposit accounts, volume of rural deposits and volume of rural credit. The index has been calculated at the ditrict level and these values are aggregated to get the state-level values. Chattopadhyay (2007) calculated the index for 23 states across the years 2006-07 to 2009-10 using similar dimensions and methodology used by Sarma (2012) . In another study, Kumar & Mishra (2011) have calculated two indices using distance from average method, one for banking outreach (supply-side index) and the other for household level access (demand-side index). In another study, Piñeyro (2013) has developed an index for the municipalities of Mexico. Unlike other studies, this study uses three new indicators – financial education, consumer protection and social development.

Most of the studies have used the Euclidean distance formula for final aggregation (Pal & Vaidya, 2014; Sarma, 2012) and a few have also used the geometric mean (Gupte *et al*, 2012). The geometric mean is also used by UNDP to calculate the latest HDI and it is preferred over the distance formula as it does not allow for perfect substitutability. The weights assigned to the dimensions are arbitrarily set, mostly assigning equal weights to all the indicators (Pal & Vaidya, 2014; Sarma, 2012). In more recent studies, non-parametric methods have been used for indexing and the weights have been estimated by applying PCA or factor analysis (Amidzic, Massara & Mialou, 2014; Cámara & Tuesta, 2014; Piñeyro, 2013).

Data and Methodology Used

Data for this study is compiled from various sources over the years 1984-2013. First, the data on Scheduled commercial banks is taken from various issues of the Basic Statistical Returns of Scheduled Commercial Banks published by the RBI. Secondly, the data on Primary Agricultural Societies is obtained from the various issues of the Statistical Statements relating to cooperative movement in India published by RBI, NABARD and NAFSCOB (2003-2016). Thirdly, the adult population (above 14 years of age) data has been calculated from various Census of India publications and the in-between census years data has been obtained through linear interpolation. In order to construct the geographic reach of banks the area has been taken according to the latest available census year.

The indicators have been normalised using the min-max method. To achieve comparability of the index over the years, we have used the global maxima and minima in order to normalise the index. The weights have been arrived at using factor analysis. The aggregation method used is geometric aggregation. We have used tables and graphs to present the analysis. Data on the progress of Jan Dhan Yojana is obtained from the website of Pradhan Mantri Jan Dhan Yojana, Ministry of Finance.

The Main Indicators Used for the Construction of the Index

This section defines and discusses each of the eight indicators that we use in constructing the financial inclusion Index. Also in this section we carry out an initial analysis on the status of each of the individual indicators for the year 2016.

(1) The demographic reach: This gives us the average population serviced by an institution. This has been the conventional indicator which represented financial inclusion. During the early days of development planning in India, mainly during the 'sixties and 'seventies, the Government tried to increase financial inclusion largely by increasing the number of institutions that can be reached by people. In our study, we construct this indicator by dividing the total number of bank branches in each state by the number of total adult population. An initial glance at this indicator shows that Goa ranks the highest followed by Himachal Pradesh, Punjab and Kerala for the year 2016. Bihar, West Bengal, Madhya Pradesh and Uttar Pradesh give us the lowest demographic reach (Appendix 2).

(2) The geographic reach: This indicator is important, as one of the most important reasons for people in developing countries not having banking accounts is the distance to the banks (Beck *et al*, 2005). This indicator is calculated by dividing the total number of bank branches by the total area. In 2014, this indicator shows the highest ranking for Goa, Kerala, Punjab and Haryana. Not surprisingly, HP shows very low ranking for this indicator. This could be the result of difficult terrain in the hilly reaches of the state. Madhya Pradesh, Rajasthan, Himachal Pradesh and Orissa show the lowest values for the geographic reach of banks and these are all states with rough terrain (Appendix 2).

(3) Deposit account penetration: Ideally the number of people availing of banking services (the number of people with bank accounts) should be the measure for the penetration of banking services. But in the absence of such data, the number of bank accounts is popularly taken as a corresponding measure. This indicator is calculated in terms of the total number of adult population. For the year 2014, Goa, Kerala, Punjab, Haryana and Andhra Pradesh give the highest values for this particular indicator. Bihar, Rajasthan, Odisha, Madhya Pradesh have the lowest ranking while TN, Karnataka and Maharashtra are medium-ranked states (Appendix 2).

(4) Deposit account utilisation[vi]**:** This gives us an average of how much is deposited by each. It is not just enough to have a bank account but people should actually use it for transactions. At present this is one of the major concerns regarding the financial inclusion drive as a large number of banking accounts are created but the actual usage is not so high. For our analysis this indicator is constructed by dividing the total volume of deposits by the total adult population. In 2014, Goa, Maharashtra, Karnataka, Kerala and Punjab show the highest values for this indicator. Here we note that though Maharashtra and Karnataka have moderate ranking for the deposit account penetration, the volume of deposits is relatively higher for both these states. On the other hand, Andhra Pradesh and Tamil Nadu show lower ranking as compared to their ranking for deposit account penetration indicating that the usage is lower in these states (Appendix 2).

(5) Credit account Penetration: This indicator is defined as the number of credit accounts (borrowal accounts) per person. It is obtained by dividing the total number of credit accounts by the total population. Tamil Nadu, Kerala, Andhra Pradesh show the highest ranking, while West Bengal, Bihar and Madhya Pradesh rank the lowest (Appendix 3).

(6) Credit service utilisation: This indicator measures the actual utilisation of banking services. Here we use the total volume of credit of scheduled commercial banks to construct the indicator and we do so by dividing it by the total adult population. This indicator is the highest for the states of Maharashtra, Goa, Tamil Nadu and Karnataka. For instance, Maharashtra is comparatively more industrialised and thus there is a demand for larger credit and advances and this could perhaps explain its top ranking under this indicator. Bihar, Uttar Pradesh, Odisha, Madhya Pradesh, Rajasthan and Himachal Pradesh are found to be having a low value for this indicator (Appendix 3).

(7) Demographic reach of Primary Agricultural Societies: This is calculated by dividing the total number of Primary agricultural societies (after subtracting the dormant and defunct societies) with the rural population of the particular state. Unlike most other bank indicators, states such as Maharashtra, Himachal Pradesh and Gujarat are the leading states with respect to number of Primary Agricultural Credit Societies in the rural areas (Appendix 3).

(8) Credit from primary agricultural societies per person: Similarly, the indicator for utilisation of the primary agricultural societies is obtained by dividing the total credit by the total rural population of a specific state. Kerala, Haryana, Tamil Nadu, Karnataka and Gujarat rank the highest when it comes to this indicator indicating that these states are the ones that avail more credit from Primary agricultural societies for their various agricultural needs (Appendix 3).

When we look at the overall picture we see that states like Goa and Kerala have done comparatively well with respect to all the bank indicators, especially the outreach indicators and the deposit-related indicators. In the case of credit-related indicators, certain other states such as Tamil Nadu, Maharashtra etc also feature significantly amongst the top-ranked states. States such as Madhya Pradesh, Uttar Pradesh, Bihar have remained in the lowest category for all the indicators. In all, we can see that these indicators vary sharply across the states and also across the years.

Financial Inclusion Index

We can see from the preliminary analysis that different indicators fare differently with regard to the different states; therefore, to get an overall picture of Financial Inclusion in India we need to develop a comprehensive index. An important aspect of indexing is assigning the weights to the indicators. Arbitrary assignment of weights will result in subjectivity in the measure and hence we have used the Factor analysis in our calculation. To put it simply, it reduces the number of indicators into a smaller number of factors, which accounts for most of the variation in the indicators that are chosen. Most importantly, when we usually aggregate the indicators into sub-dimensions and then create a final indicator, it is probable that the number of indicators in each of the sub-dimensions may be unbalanced and this may result in a less meaningful measure. Using factor analysis, it is possible to statistically determine the sub-dimensions. In effect the index will not depend on the "dimensionality of the data set but on the statistical dimensions of the data"[vii].

Table 2: Trend of Financial Inclusion Index from 2005 to 2016

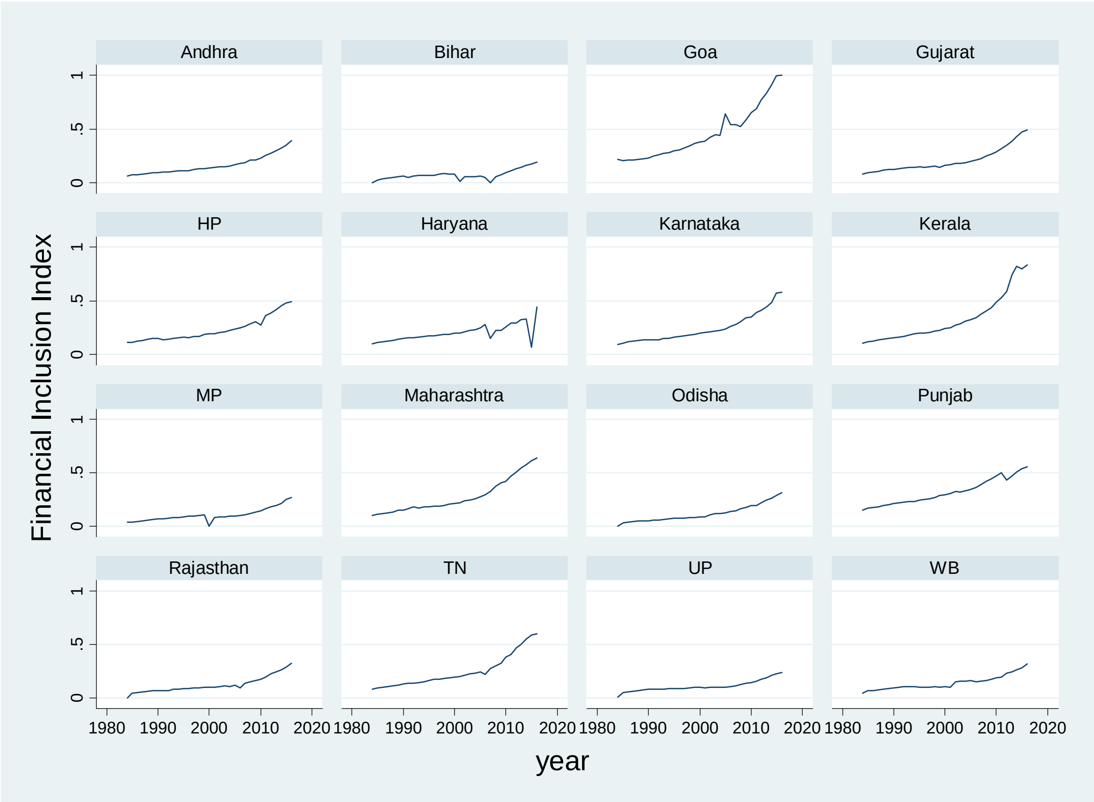
State	2016	Rank	State	2011	Rank	State	2005	Rank
Goa	1.00	1	Goa	0.69	1	Goa	0.64	1
Kerala	0.84	2	Kerala	0.53	2	Punjab	0.34	2
Maharashtra	0.64	3	Punjab	0.50	3	Kerala	0.32	3
TN	0.60	4	Maharashtra	0.47	4	Maharashtra	0.28	4
Karnataka	0.58	5	TN	0.40	5	Haryana	0.25	5
Punjab	0.56	6	Karnataka	0.39	6	TN	0.25	6
HP	0.49	7	HP	0.36	7	HP	0.24	7
Gujarat	0.49	8	Gujarat	0.32	8	Karnataka	0.24	8
Haryana	0.44	9	Haryana	0.29	9	Gujarat	0.20	9
Andhra	0.39	10	Andhra	0.25	10	Andhra	0.17	10
Rajasthan	0.33	11	Odisha	0.20	11	WB	0.16	11
WB	0.32	12	WB	0.19	12	Odisha	0.13	12
Odisha	0.31	13	Rajasthan	0.19	13	Rajasthan	0.12	13
MP	0.27	14	MP	0.16	14	UP	0.10	14
UP	0.24	15	UP	0.16	15	MP	0.10	15
Bihar	0.19	16	Bihar	0.11	16	Bihar	0.06	16

Source: Author's Calculation

As a prerequisite to doing the Factor analysis, the Bartlett's test is significant and the Kaiser Meyer Olkin test also shows acceptable values greater than .6, indicating that Factor Analysis is appropriate (See Appendix 5). The number of factors extracted is based on Kaiser's criterion where factors with eigen-value more than one are taken. Following the method used by (Nicoletti, Scarpetta & Boyland, 1999) the variables are statistically grouped into intermediate composite indicators. These intermediate indicators are further aggregated into the final composite Financial Inclusion Index.

For final aggregation, we have used the weighted geometric aggregation method which is superior to other additive methods because of non-compensability of the indicators. That is, low values of some indicators cannot be compensated for by the high values of some other indicators (OECD, 2008). The resulting factor loadings are as given in Appendix 6. By using the appropriate weights obtained from the factor analysis, we get the ranking of the states given in Table 2 above.

Figure 2: Trend of Financial Inclusion Index 1984-2016



Note: HP: Himachal Pradesh; TN: Tamil Nadu; WB: West Bengal; Andhra: Andhra Pradesh; UP: Uttar Pradesh; MP: Madhya Pradesh

Source: Author's Calculation

The Trend of Financial Inclusion Index from 1984-2016

Table 2 gives the index values and ranking of the states in India over the drive period. We see that states like Goa, Maharashtra and Kerala are continually the top-ranked states while states such as Bihar, Madhya Pradesh, Uttar Pradesh are the low-ranking states. Also it is evident from the table that states like Bihar, Madhya Pradesh, Uttar Pradesh and Odisha have remained the lowest inclusive states throughout the period 2005-2013.

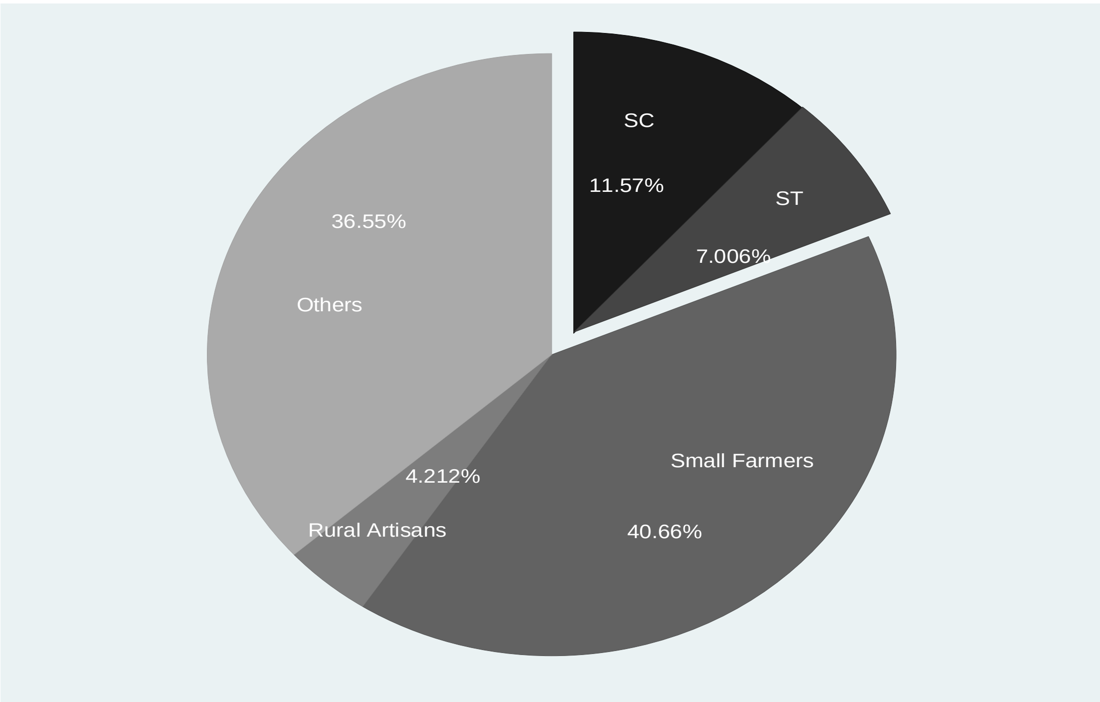
We see that the top-ranking state Goa has moved from .64 in 2005 to a higher index value of 1 in 2016. Similarly, Maharashtra has made remarkable improvement from a value of just .28 in 2005 to a high value of .64 in 2016. Kerala has also improved much in its index value. Though the index value for Punjab has increased over this period, it has come down in ranking as other states have comparatively done better. In fact, from the table we can see that all of the states have improved over the period 2005-2016. But if we look carefully we can also see that the low-index states like Bihar, Madhya Pradesh and Uttar Pradesh have not improved significantly over the recent years. For example, Bihar has a value of .06 in 2005 and it just improved to .19 in 2016 and in the case of UP from .10 in 2005 it has increased to .24 in 2014.

When we look at changes across states during different reform periods (Figure 2), we see that the period before 1990, before liberalisation, shows low inclusion levels for all the states. The period before 2005 has remained without significant changes for all the states. However the period after 2005 shows a prominent increase in the index values for all states. This particular period corresponds with the Government's Financial Inclusion Drive period. Even so, for low inclusion states such as Rajasthan, Uttar Pradesh, West Bengal, Odisha, Bihar the inclusion levels have remained low throughout in the range 0.1 to 0.3.

Analysis of the Rural Cooperative System-Primary Agricultural Credit Societies

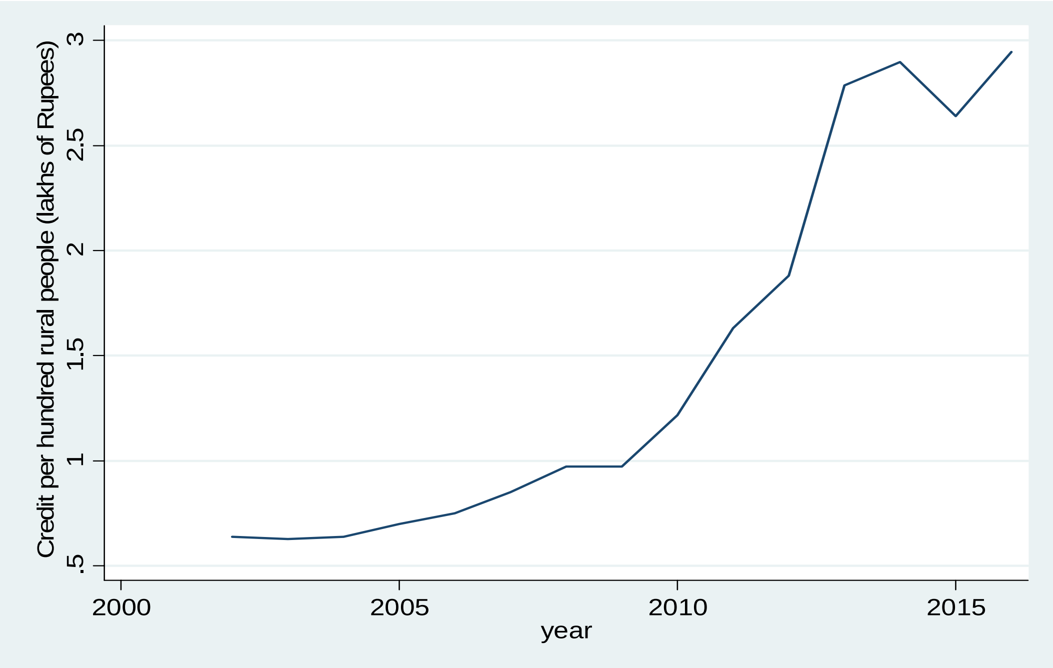
Geographic and demographic access clearly has a large role in providing financial access. However, in the rural areas the number of branches of scheduled commercial banks is much lower than in the urban areas and other alternate institutions such as cooperatives play an important role in improving financial access. One of the main problems faced by the Financial inclusion drive is to reach out over the 'last mile'. Even though financial institutions are in place, connecting them with the rural poor is still a problem. So this paper argues that the financial inclusion drive should make use of existing financial infrastructure (the cooperative system) to overcome this 'last mile problem'.

Figure 3: Percentage of borrowers from Primary Agricultural Credit Societies 2016



Source: Calculated by author using NAFSCOB data

Figure 4: Credit Issued by PACs – All-India



Source: Calculated by author using NAFSCOB data

We see from Figure 3 that a large portion of the cooperative credit goes to the small farmers, rural artisans and also the traditionally oppressed castes. Moreover in the year 2016, we see that around 74 percent of the total number of villages in India are covered by Primary Agricultural societies. States such as Andhra Pradesh, Kerala, Bihar, Haryana, Himachal Pradesh, Uttar Pradesh, Manipur, Mizoram, Sikkim etc. have 100 percent coverage for their villages. This implies the wide presence of cooperative societies in the rural regions of India and the important role that the cooperative banks could play in increasing financial inclusion in these regions.

A Rural Measure to Understand the Reach and Penetration of PACs

Here we have used a simple geometric mean to arrive at a measure to analyse the access to primary agricultural cooperatives in rural India. The two indictors used to develop this measure are the demographic reach of Primary Agricultural Societies and the amount of credit issued per person (rural).

Table 3: Rural Index

2016			2011			2004		
States	**PACS**	**Rank**	**States**	**PACS**	**Rank**	**States**	**PACS**	**Rank**
Kerala	0.69	1	**Punjab**	0.49	1	**Punjab**	0.44	1
Maharashtra	0.53	2	**Maharashtra**	0.47	2	**Maharashtra**	0.42	2
Gujarat	0.51	3	**Kerala**	0.43	3	**Haryana**	0.37	3
HP	0.36	4	**Gujarat**	0.40	4	**Gujarat**	0.34	4
Karnataka	0.35	5	**HP**	0.34	5	**HP**	0.28	5
TN	0.34	6	**TN**	0.29	6	**WB**	0.26	6
Rajasthan	0.33	7	**Karnataka**	0.29	7	**Kerala**	0.24	7
Goa	0.19	8	**Rajasthan**	0.21	8	**Odisha**	0.22	8
Odisha	0.17	9	**MP**	0.18	9	**TN**	0.22	9
MP	0.16	10	**Odisha**	0.13	10	**Rajasthan**	0.17	10
Punjab	0.15	11	**Goa**	0.13	11	**Karnataka**	0.16	11
WB	0.12	12	**WB**	0.10	12	**MP**	0.14	12
Andhra	0.09	13	**Bihar**	0.07	13	**Goa**	0.11	13
Haryana	0.06	14	**Andhra**	0.07	14	**Andhra**	0.11	14
UP	0.05	15	**UP**	0.06	15	**UP**	0.06	15
Bihar	0.05	16	**Haryana**	0.05	16	**Bihar**	0.03	16

Source: Calculated by author using NAFSCOB data.

Table 3 gives the ranking of the states based on the indicators of the primary agricultural societies. Kerala, Maharashtra, and Gujarat are the states that have done well in the rural index, while Bihar, Uttar Pradesh and Andhra Pradesh have low ranking.

Concluding Observations and Discussions

In this paper we have analysed the financial inclusiveness of the various states in India over the period 1984 to 2016. In order to do this, an index has been constructed with the objective of creating a more comprehensive measure. Existing studies on Indian states have restricted themselves to data on scheduled commercial banks only; but in our case we have also considered the cooperative system which is an integral part of the rural financial structure. This widens the range of institutions that are used in constructing the index and thus provides a truer picture of financial inclusion in India. From our index we find that states like Bihar, Madhya Pradesh, Uttar Pradesh and Rajasthan are low inclusive states throughout the period of study. However, the financial inclusion drive period shows a prominent increase in the index values for most states. Also, a brief descriptive analysis of the Jan Dhan Yojana shows us that the largest number of bank accounts being opened are in low financial inclusion states. However, the important question that arises is whether these accounts are being utilised. Further micro studies have to be conducted to understand this better.

Considering the wide network of cooperative societies and also the local advantage that they have, it is important that they should have a larger role to play in the Government's financial inclusion efforts. We have seen from the analysis the extensive spread of these institutions and therefore, instead of looking at newer options, the RBI should make use of the rural cooperative framework that is currently in place and find ways of improving it making the cooperatives sustainable in the longer run. However, in the short run, it could seem a formidable task as cooperatives have their own problems relating to efficiency and conduct. But these organisations, being closest to the grassroots level, should play an important role in improving financial access in the country.

Thus we propose that the government should follow a multi-agency approach in order to be able to reach every strata of the economy and should make use of the existing infrastructure and networks, such as the cooperative system, to reach out to the rural poor. In doing so the Government should also work towards improving the governance and working of the cooperatives. Further, there is a need to bring in reformations at the organisation level rather than letting the cooperative structure go to ruin.

Notes

[i] Census 2011

[ii] NABARD website, https://www.nabard.org/English/idd_objectives.aspx

[iii] Statistical statements relating to the cooperative movement in India 2015-16

[iv] Rural development statistics, www.nird.org.

[v] Pradhan Mantri Dhan Jan Yojana Brochure, 22-August-2014, Dept of Financial Services, Ministry of Finance

[vi] Other studies have used the credit-income and the deposit-income ratios as the measure for actual utilisation. But here we argue that since these ratios measure the credit and deposit volume in terms of per rupee value, it is not an apt gauge of usage in the context of financial inclusion. Rather, the average volume per head would give us a better measure of usage as it also captures the depth as well as the width of financial inclusion. It gives us an average of 'how much' goes to each. Here we use the total volume of credit and deposits of scheduled commercial banks to construct the indicator and we do so by dividing it by the total adult population. Similarly, for the credit issued from the PACS we have divided by the total adult rural population.

[vii] Handbook on constructing composite indicators Methodology and user Guide-OECD 2008,pp-89

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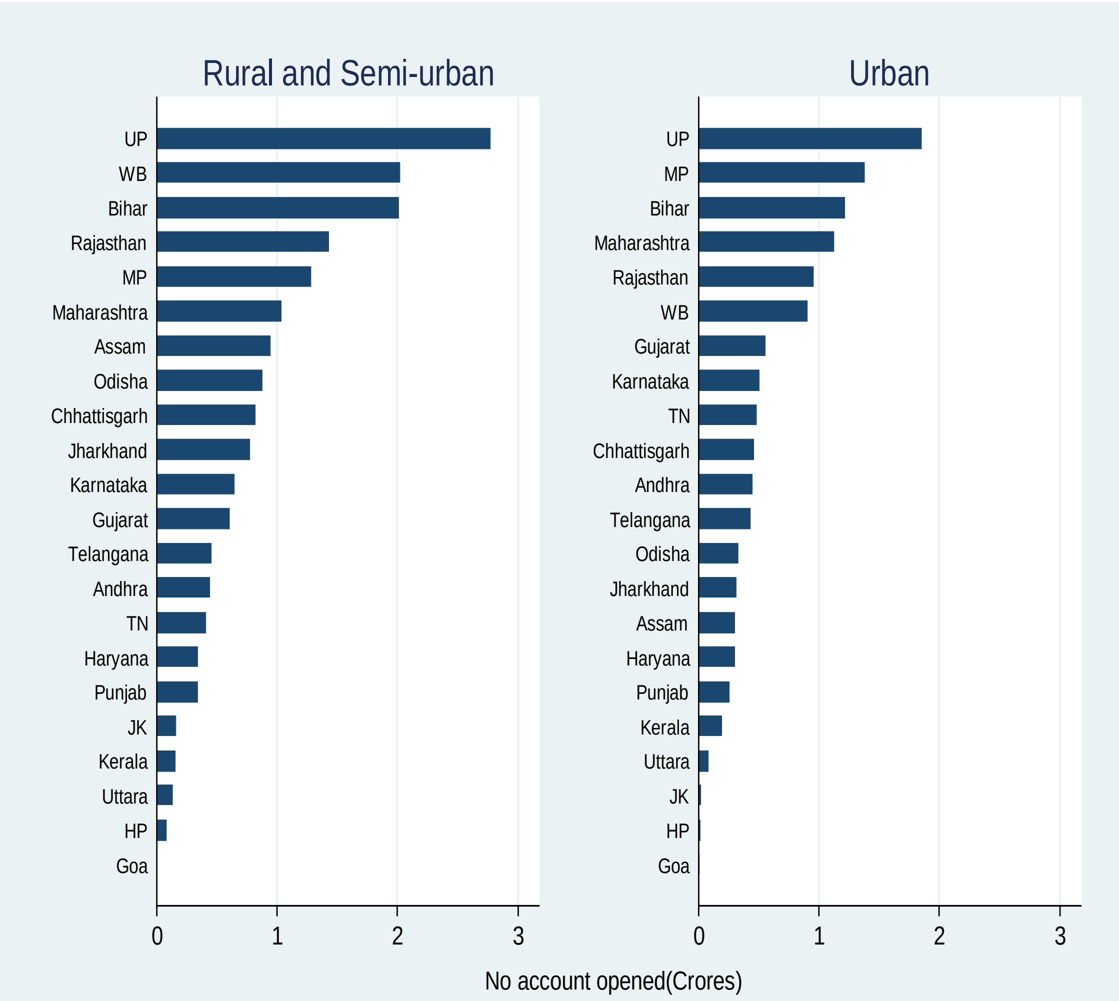
Appendix 1

Total number of accounts opened under Jan Dhan Yojana as of 6-12-2017:



Source: Calculated by author

Appendix 2: Ranking of Indicators - 2016

States	Demographic Reach	Rank	States	Geographic Reach	Rank	States	Deposit Services Penetration	Rank	States	Deposit services utilisation	Rank
Goa	0.99	1	**Goa**	1.00	1	**Goa**	1.00	1	**Goa**	1.00	1
HP	0.41	2	**Kerala**	0.89	2	**Kerala**	0.51	2	**Maha**	0.51	2
Punjab	0.40	3	**Punjab**	0.66	3	**Punjab**	0.50	3	**Karnataka**	0.30	3
Kerala	0.34	4	**Haryana**	0.56	4	**Haryana**	0.47	4	**Kerala**	0.30	4
Haryana	0.31	5	**WB**	0.46	5	**Andhra**	0.46	5	**Punjab**	0.27	5
Karnataka	0.25	6	**TN**	0.41	6	**HP**	0.45	6	**Haryana**	0.27	6
TN	0.20	7	**UP**	0.32	7	**Karnataka**	0.45	7	**HP**	0.25	7
Andhra	0.20	8	**Bihar**	0.27	8	**TN**	0.44	8	**Gujarat**	0.23	8
Gujarat	0.17	9	**Karnataka**	0.25	9	**Maha**	0.41	9	**TN**	0.21	9
Ods	0.14	10	**Andhra**	0.20	10	**Gujarat**	0.38	10	**WB**	0.18	10
Raj	0.13	11	**Maha**	0.19	11	**WB**	0.36	11	**Andhra**	0.18	11
Maha	0.12	12	**Gujarat**	0.18	12	**UP**	0.35	12	**Ods**	0.14	12
UP	0.10	13	**Ods**	0.13	13	**MP**	0.34	13	**UP**	0.12	13
MP	0.09	14	**HP**	0.12	14	**Ods**	0.33	14	**MP**	0.11	14
WB	0.07	15	**Raj**	0.08	15	**Raj**	0.32	15	**Raj**	0.11	15
Bihar	0.06	16	**MP**	0.07	16	**Bihar**	0.29	16	**Bihar**	0.09	16

Note: Maha: Maharashtra; HP: Himachal Pradesh; TN: Tamil Nadu; WB: West Bengal; Andhra: Andhra Pradesh; Ods: Odisha; Raj: Rajasthan; UP: Uttar Pradesh; MP: Madhya Pradesh

Source: Calculated by author

Appendix 3: Ranking of Indicators: 2016

States	PACS	Rank	States	Credit services utilisation	Rank	States	PACs	Rank	States	Credit utilisation (PACS)	Rank
TN	1.00	1	**Maha**	1.00	1	**Maha**	0.31	1	**Kerala**	0.79	1
Kerala	0.61	2	**Goa**	0.52	2	**HP**	0.29	2	**Haryana**	0.09	2
Andhra	0.50	3	**TN**	0.46	3	**Gujarat**	0.21	3	**TN**	0.08	3
Maha	0.47	4	**Karnataka**	0.40	4	**Goa**	0.10	4	**Karnataka**	0.06	4
Goa	0.46	5	**Punjab**	0.36	5	**Karnataka**	0.10	5	**Gujarat**	0.06	5
Karnataka	0.38	6	**Haryana**	0.35	6	**Raj**	0.09	6	**Raj**	0.05	6
Punjab	0.22	7	**Andhra**	0.35	7	**TN**	0.07	7	**Maha**	0.04	7
Haryana	0.20	8	**Kerala**	0.35	8	**Kerala**	0.07	8	**Andhra**	0.03	8
Ods	0.20	9	**Gujarat**	0.33	9	**WB**	0.06	9	**Ods**	0.03	9
HP	0.19	10	**WB**	0.19	10	**Punjab**	0.05	10	**MP**	0.02	10
Raj	0.16	11	**HP**	0.16	11	**MP**	0.04	11	**Punjab**	0.02	11
WB	0.15	12	**Raj**	0.15	12	**Bihar**	0.04	12	**HP**	0.01	12
MP	0.14	13	**MP**	0.13	13	**Ods**	0.04	13	**Goa**	0.01	13
Gujarat	0.14	14	**Ods**	0.11	14	**UP**	0.02	14	**WB**	0.00	14
Bihar	0.13	15	**UP**	0.10	15	**Andhra**	0.01	15	**UP**	0.00	15
UP	0.12	16	**Bihar**	0.05	16	**Haryana**	0.00	16	**Bihar**	0.00	16

Note: Maha: Maharashtra; HP: Himachal Pradesh; TN: Tamil Nadu; WB: West Bengal; Andhra: Andhra Pradesh; Ods: Odisha; Raj: Rajasthan; UP: Uttar Pradesh; MP: Madhya Pradesh

Source: Calculated by author

Appendix 4: Descriptive Statistics

Variable	Obs	Mean	Std Dev.	Min	Max
Demographic Reach (per 1000 population)	528	.14	.07	.07	.56
Geographic Reach (per 1000 sq Km)	528	37.59	29.95	6.36	180.98
Dep Acc Penetration	528	.93	.603	.0001	4.54
Dep service Utilisation (Rupees in lakhs)	528	.32	.54	.004	4.63
Credit Account Penetration (Number in thousands)	528	.12	.06	.04	.49
Credit Service Utilisation	528	.19	.32	.003	2.43
PACS Reach (per 1000 rural Population)	528	.24	.18	.05	1.2
Credit utilisation PACS (amount in thousands)	528	1.5	5.92	.006	75.52

Source: Calculated by author

Appendix 5: Results from Factor Analysis

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.662
Bartlett's Test of Sphericity	Approx. Chi-Square	3358.993
	df	28
	Sig.	.000

Source: Calculated by author

Appendix 6: Results from Factor Analysis

Factor Loadings Table

	factor loadings		Squared Factor Loading		Squared factor loading summed to unity	
Variables	**1**	**2**	**1**	**2**	**1**	**2**
Demographic Reach	0.88	-0.18	0.78	0.03	0.21	0.02
Geographic Reach	0.72	0.43	0.52	0.19	0.14	0.11
Deposit account penetration	0.95	0.08	0.90	0.01	0.24	0.00
Deposit volume of banks	0.88	0.19	0.77	0.03	0.21	0.02
Credit account Penetration	0.48	0.58	0.23	0.34	0.06	0.21
Credit volume of banks	0.67	0.37	0.45	0.13	0.12	0.08
No of PACs	0.14	-0.71	0.02	0.50	0.01	0.31
Credit volume of PACs	0.21	0.63	0.05	0.40	0.01	0.24
explained variance	3.72	1.64				
expl/tot	0.69	0.31				

Source: Calculated by author

Appendix 7: Financial Inclusion Index 1984-1994

1984			1988			1991			1994		
States	**FII**	**Rank**	**States**	**FII**	**Rank**	**States**	**FII**	**Rank**	**States**	**FII**	**Rank**
Goa	0.22	1	**Goa**	0.22	1	**Goa**	0.25	1	**Goa**	0.28	1
Punjab	0.15	2	**Punjab**	0.19	2	**Punjab**	0.22	2	**Punjab**	0.23	2
HP	0.11	3	**Kerala**	0.14	3	**Maha**	0.16	3	**Kerala**	0.19	3
Kerala	0.11	4	**HP**	0.14	4	**Kerala**	0.16	4	**Maha**	0.18	4
Haryana	0.10	5	**Haryana**	0.13	5	**Haryana**	0.15	5	**Haryana**	0.17	5
Maha	0.10	6	**Maha**	0.13	6	**HP**	0.14	6	**HP**	0.16	6
Karnataka	0.10	7	**Karnataka**	0.13	7	**TN**	0.14	7	**TN**	0.15	7
TN	0.08	8	**Gujarat**	0.11	8	**Karnataka**	0.13	8	**Karnataka**	0.15	8
Gujarat	0.08	9	**TN**	0.11	9	**Gujarat**	0.13	9	**Gujarat**	0.14	9
Andhra	0.06	10	**Andhra**	0.09	10	**WB**	0.10	10	**Andhra**	0.11	10
WB	0.04	11	**WB**	0.08	11	**Andhra**	0.10	11	**WB**	0.11	11
MP	0.04	12	**UP**	0.07	12	**UP**	0.08	12	**UP**	0.09	12
UP	0.01	13	**Raj**	0.06	13	**MP**	0.07	13	**Raj**	0.09	13
Raj	0.00	14	**MP**	0.06	14	**Raj**	0.07	14	**MP**	0.08	14
Bihar	0.00	15	**Bihar**	0.05	15	**Ods**	0.06	15	**Bihar**	0.07	15
Ods	0.00	16	**Ods**	0.05	16	**Bihar**	0.05	16	**Ods**	0.07	16

Note: Maha: Maharashtra; HP: Himachal Pradesh; TN: Tamil Nadu; WB: West Bengal; Andhra: Andhra Pradesh; Ods: Odisha; Raj: Rajasthan; UP: Uttar Pradesh; MP: Madhya Pradesh

Source: Calculated by author

Appendix 8: Financial Inclusion Index 1995-2004

1995			1998			2001			2004		
State	**FII**	**Rank**	**State**	**FII**	**Rank**	**State**	**FII**	**Rank**	**State**	**FII**	**Rank**
Goa	0.30	1	**Goa**	0.34	1	**Goa**	0.39	1	**Goa**	0.44	1
Punjab	0.25	2	**Punjab**	0.27	2	**Punjab**	0.31	2	**Punjab**	0.33	2
Kerala	0.20	3	**Kerala**	0.22	3	**Kerala**	0.25	3	**Kerala**	0.31	3
Maha	0.18	4	**Maha**	0.19	4	**Maha**	0.22	4	**Maha**	0.26	4
Haryana	0.17	5	**Haryana**	0.19	5	**Karnataka**	0.20	5	**TN**	0.23	5
TN	0.16	6	**TN**	0.18	6	**TN**	0.20	6	**Haryana**	0.23	6
HP	0.16	7	**Karnataka**	0.18	7	**Haryana**	0.20	7	**HP**	0.22	7
Karnataka	0.16	8	**HP**	0.17	8	**HP**	0.20	8	**Karnataka**	0.22	8
Gujarat	0.15	9	**Gujarat**	0.15	9	**Gujarat**	0.17	9	**Gujarat**	0.19	9
Andhra	0.11	10	**Andhra**	0.13	10	**Andhra**	0.14	10	**WB**	0.16	10
WB	0.10	11	**WB**	0.11	11	**Raj**	0.10	11	**Andhra**	0.15	11
UP	0.09	12	**MP**	0.10	12	**WB**	0.10	12	**Ods**	0.12	12
Raj	0.09	13	**Raj**	0.10	13	**UP**	0.09	13	**Raj**	0.11	13
MP	0.09	14	**UP**	0.09	14	**Ods**	0.09	14	**UP**	0.10	14
Ods	0.07	15	**Bihar**	0.08	15	**MP**	0.08	15	**MP**	0.09	15
Bihar	0.07	16	**Ods**	0.08	16	**Bihar**	0.01	16	**Bihar**	0.05	16

Note: Maha: Maharashtra; HP: Himachal Pradesh; TN: Tamil Nadu; WB: West Bengal; Andhra: Andhra Pradesh; Ods: Odisha; Raj: Rajasthan; UP: Uttar Pradesh; MP: Madhya Pradesh

Source: Calculated by author

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Price: ₹ 30.00

ISBN 978-81-7791-261-6

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