

# Financial Inclusion in India

## A Demand-side Approach

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Existing literature on financial inclusion works with indices that use supply-side information on financial services and fail to capture demand-side information. These indices thus have a serious limitation: they might overestimate the extent of financial inclusion due to multiple bank accounts held by the same individual. Using micro-level data available from a pan-India survey, we compute a financial inclusion index for 22 states based on demand-side information. We find evidence of disagreement between the ranking of the states done on the basis of a supply-side information-based index and our demand-side information-based index. Also, exploiting the microstructure of the data, we attempt to identify some determinants of borrowing from formal sources. We find that being male, having a bank account and higher educational qualification are positively correlated with the likelihood of formal borrowing.

In recent times, financial inclusion as a development objective has received tremendous attention of both global and nation-level policymakers. A well-functioning and inclusive financial system can play a critical role in the efficient allocation of resources in a liberalised economy. Policymakers have been embracing the fact that financial inclusion also facilitates the efficient delivery of other social programmes. Consequently, achieving greater financial inclusion now tops the policy priorities for inclusive growth in India. The launch of the Pradhan Mantri Jan-Dhan Yojana (PMJDY) in 2014, the flagship financial inclusion programme of the union government bears testimony to this mission. Broadly speaking, financial inclusion means making formal financial services accessible to all, especially the poor and the disadvantaged groups of the society.

In India, nationalisation of banks in 1969 marks the beginning of the process of financial inclusion. Following this, India adopted a number of other strategies such as setting up regional rural banks (RRBs), mandatory priority sector lending (PSL) by commercial banks, Lead Bank Scheme, introduction of no-frill account, linking self-help groups (SHGs) to banks, kisan credit cards, provisioning of doorstep delivery of financial services through approved banking correspondents and so on to promote financial inclusion. Hence, it is imperative to assess the progress of financial inclusion using a comprehensive index.

Existing financial indices are computed based on supply-side information on financial services (for example, the number of bank branches per lakh population in a district) and hence, these indices fail to capture the demand-side dynamics (Dev 2006). Focusing only on supply-side information to gauge financial inclusion has twin problems. First, it might lead to an overestimation of financial inclusion due to multiple bank accounts held by the same individual in different commercial banks. Second, merely giving access to financial services does not always result in use of such services (Beck et al 2007). Globally, 15% of adults have dormant accounts with financial institutions (Demirguc-Kunt et al 2015). In India, there is empirical evidence to suggest that the correlation between supply of institutional finance and demand for the same is low (Kamath et al 2010). Against this backdrop, it is imperative to measure financial inclusion from the demand-side which makes it necessary to collect and analyse in-depth micro-level data on “access to and use of financial services” (Beck et al 2009: 127; RBI 2014). This study is an attempt to fill this void in

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the existing literature. Using data available from India Financial Inclusion Insights Tracker Survey, *Bharat Ek Khoj*, conducted by InterMedia, we develop a state-level comprehensive index of financial inclusion for 2013.

The index we develop is computed based on data collected from a representative adult population across 22 states of India. To our knowledge, this is the first index that captures the demand-side dimensions of financial services. We examine means of borrowing and savings instruments availed by the poor and the non-poor<sup>1</sup> across states. We examine the determinants of borrowing from formal sources by employing bivariate probit model.

We rank the states based on the index of financial inclusion and find that Goa comes first and is followed by Delhi and Maharashtra in the ranking among states. Odisha, Bihar and north-eastern states of India are at the bottom of the ranking due to the appalling status of financial inclusion in these states. We find that ranking of states done on the basis of supply-side information-based index is not in perfect agreement with the ranking done on the basis of our demand-side information-based index of financial inclusion.

Our results show that the proportion of the poor who borrow from a bank is the highest in Maharashtra, Kerala and Gujarat. Despite rapid penetration of bank branches in India, the poor continue to borrow from informal sources such as local money-lenders, friends, and relatives in many states. We find evidence of differential access to bank credit between the poor and the non-poor in most of the states. Our results indicate that proportion of people saving with a bank is the highest in Punjab and the lowest in Kerala across all the states. We also find that keeping money at home, and chit funds, although risky are used as an instrument of saving in the north-eastern states, Kerala, Tamil Nadu and Chhattisgarh. It is observed that a non-poor person is more likely to save with a bank compared to the poor in majority of the states.

So far as determinants of formal borrowing are concerned we find evidence of gender disparity: male adults are more likely to access formal credit than their female counterparts. Our results indicate strong association between ownership of bank account and the likelihood of formal borrowing. We find that people with higher levels of education are more likely to borrow from a formal source. Similarly, farmers, professionals and self-employed individuals are more likely to borrow from formal sources than people engaged in other livelihood activities.

## Review of Literature

In developing countries, the poor face a “triple whammy” situation: they not only have very low and unpredictable incomes but also have inefficient financial instruments to manage such income flows and this makes money-management an extremely arduous task for them (Collins et al 2010). In addition to this, the poor are often led to a financial disaster as a consequence of unpredictable adverse shocks like death or sudden acute sickness of the breadwinner of the family. Therefore, poor households must have access to a broad range of financial

services including savings, credit and insurance. These quintessential financial services can help them smooth over consumption through mitigation of risk, building assets, and managing their livelihoods in a sustainable way (Brune et al 2013; Cole et al 2013; Dupas and Robinson 2013; Ruiz 2013). Therefore, the prime objective of financial inclusion is to bring the excluded and disadvantaged societal groups within the purview of formal financial system by making such services more accessible, affordable, safe, and dependable through technological innovations (Leyshon and Thrift 1995; Sinclair 2001; Conroy 2005).

Existing empirical studies show that financial inclusion helps poor households—a majority of whom are employed in the informal sector—to improve their standard of living and paves the way for achieving higher economic growth (Rajan and Zingales 1998; Burgess and Pande 2005; Bruhn and Love 2009; Bittencourt 2012). Moreover, an inclusive financial system helps in reducing poverty and income inequality (Beck et al 2009). Using data on financial behaviour of adults (aged 15 years and above) available from Gallup World Poll survey conducted across countries, Allen et al (2012) find significant difference in ownership of accounts with formal financial institutions between developed countries (91%) and developing countries (41%). The authors also show that reduction in banking costs and proximity to financial service providers can help in increasing ownership and frequency of usage of savings accounts.

The Rangarajan Committee on Financial Inclusion in India, 2008 defined financial inclusion as 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.” In India despite several steps taken by the government to accelerate financial inclusion the status remains dismal.

As per Census 2011, 58.7% households avail banking services in India. Documentary proofs needed to meet Know Your Customer (KYC) requirements as mandated by the Reserve Bank of India (RBI) posed a serious impediment to access banking services especially for poor migrants from rural India (Demirgüç-Kunt and Klapper 2012). Even no-frills accounts fail to reduce their woes since these accounts remain mostly dormant or inoperative (Thyagarajan and Venkatesan 2008). High transaction costs in terms of account opening and closing charges, minimum account balance requirement, transportation costs, high opportunity costs of visiting bank branches in terms of forgone wages, etc, also deter access to bank accounts in India (Beck et al 2009; Mowl and Boudot 2014). Kamath et al (2010) find that supply of institutional credit measured by access to formal finance is weakly correlated with institutional debt outstanding in rural India (Pearson rank correlation is 0.28).

The National Bank for Agriculture and Rural Development (NABARD)-led SHG-Bank Linkage Programme and the parallel microfinance services offered by microfinance institutions (MFIs) aim to ameliorate the effects of this financial exclusion by directly lending tiny amounts to the poor households. However, poor households continue to languish under financial

exclusion due to limited availability of suitable financial products that match their diverse financial needs and varying income–expenditure patterns. Such financial exclusion entails larger transaction and opportunity costs for the poor. Hence, the Committee on Comprehensive Financial Services for Small Businesses and Low Income Households argues in its report that “Financial inclusion can be said to be complete only when there is access to a suite of appropriate products and services for all the financial needs of a household or enterprise” (RBI 2014: 153).

Sarma (2008) develops a country-level multidimensional composite index of financial inclusion (IFI) using a methodology similar to the United Nations Development Programme’s (UNDP) methodology of computing the Human Development Index (HDI). She uses three basic dimensions of banking services: banking penetration (measured by the number of bank accounts as a proportion of population), availability of banking services (measured by the number of bank branches per 1,000 population), and the usage of banking system (for which credit to gross domestic product (GDP) and deposit to GDP ratios are used as proxies). Unlike the average, IFI for any particular country is computed as Euclidean distance from the ideal state of financial inclusion. IFI lies between zero and unity, and the higher the value of the index, better is the status of financial inclusion. A similar state level index for rural India is developed by Karmakar et al (2011).

CRISIL (2015) also develops a similar index called Inclusix (for 2013) for India. It is a composite index which consists of three critical indicators of banking service penetration, namely, branch penetration, deposit penetration, and credit penetration. The value of the index can range between zero and 100. In case of Inclusix<sup>2</sup> as well, higher values of the index indicate better status in terms of financial inclusion. According to the CRISIL (2015) report, the pan India Inclusix for 2013 is as low as 50 and southern India fares best in terms of financial inclusion among all the regions. However, any supply-side information-based index of financial inclusion suffers from two serious limitations. First, it fails to “distinguish between resident bank accounts from non-resident accounts” (Sarma 2008: 14). Second, it cannot account for multiple accounts held by the same individual in different banks and hence there is always a possibility of overestimating financial inclusion if only supply-side measures like number of bank accounts as a proportion of population are used as indicators of financial inclusion.

### Empirical Strategy

Financial inclusion is a multidimensional concept and hence any unidimensional measure of financial inclusion will capture only partial information. The status of a particular state could be “quite good in one dimension of financial inclusion but not in another dimension” (Chakravarty and Pal 2013: 814). Therefore, computation of a composite index that captures some of the important quantifiable dimensions of financial inclusion becomes necessary.

In this article, we compute Financial Inclusion Index (FII) following the axiomatic approach developed by Chakravarty

and Pal (2013). The FII we compute has twin merits: it is easy to compute and can be used for comparing status of financial inclusion across states. The methodology for computing FII in general is elaborated as follows.<sup>3</sup> Let us assume that there are  $n$  dimensions of FII where  $n \geq 1$ . Each dimension refers to a “functioning” of the financial service in question. Let  $x_i$  denote the level of attainment of a particular state in dimension  $i$ . The lower and upper bounds of  $x_i$  are denoted by  $m_i$  and  $M_i$  respectively ( $m_i < M_i$ ). For our empirical analysis, we choose the state-level sample minimum and maximum as the estimates of  $m_i$  and  $M_i$  respectively. We measure  $A(x_i, m_i, M_i)$ , the indicator of performance of the state in question in terms of dimension  $i$  using the following function:

$$A(x_i, m_i, M_i) = \left( \frac{x_i - m_i}{M_i - m_i} \right)^r \quad \dots(1)$$

where,  $i = 1, 2, \dots, n$ ;  $r$  is a constant such that  $0 < r < 1$

$A$  is continuous in its arguments and  $r$  is the “inclusion sensitivity parameter” such that  $A$  increases as  $r$  decreases for given values of  $x_i$ ,  $m_i$ , and  $M_i$ .

Next, we compute FII by averaging the individual indicators as given by (1):

$$FII(A(x_1, m_1, M_1), \dots, A(x_n, m_n, M_n)) = \frac{1}{n} \sum_{i=1}^n \left( \frac{x_i - m_i}{M_i - m_i} \right)^r \quad \dots(2)$$

The FII given by (2) satisfies basic axioms of an ideal financial inclusion index, namely, boundedness, monotonicity, homogeneity, concavity, and symmetry (for details about each of these axioms see Chakravarty and Pal (2013)). Due to boundedness, FII lies between 0 and 1. The higher the value of the index, the better is the status of financial inclusion.

For computing state-level FII we choose the following three basic dimensions ( $n = 3$ ) of banking services:<sup>4</sup> (i) accessibility measured by proportion of adults who reported having access to a bank account (through own account or through an account of another person); (ii) usage measured by proportion of adults who ever used bank accounts for any financial activity; (iii) availability measured by proportion of adults who had access to a bank branch/ATM/Eko counter/others within one kilometre distance from the place of stay.

Out of the three dimensions mentioned above, dimension (i) and (ii) capture the demand-side of financial inclusion and dimension (iii) captures the supply-side. Thus, our index is composite in nature as it captures both supply and demand sides of financial services and hence our approach is unique. In dimension (i), bank account includes savings, current, fixed deposit, recurring and students accounts. In dimension (ii), financial activity refers to remitting and receiving money, saving money, and making payments. We note that dimension (ii) is a fairly weak measure of account usage because it does not depend on frequency of such usage.

Next, we examine the means of borrowing and savings across states of India. We do this for two categories—the poor and the non-poor—where poor means persons below the poverty line and non-poor refers to people above the poverty line. That is, a person is poor (non-poor) if he/she lives below

(above) \$2.50 per day PPP (purchasing power parity) poverty line as classified by the Grameen Foundation's Progress out of Poverty Index.<sup>5</sup>

Finally, we examine the determinants of borrowing from formal sources using micro-level data. We restrict our analysis only to those adults (above 15 years of age) who borrowed for some purpose either from formal or informal sources or both to avoid problem arising out of voluntary exclusion (Beck et al 2009). We estimate the following regression equation using the bivariate probit model:

$$y_{2i} = \alpha + \delta y_{1i} + x_i \beta + \mu_s + \varepsilon \quad \dots(3)$$

The above bivariate probit model specification is akin to the econometric specification in Burnett (1997) as discussed in Greene (2005: 715). In equation 3, the dependent variable  $y_2$  (whether ever borrowed from a formal source) is a binary variable which is 1 if the adult  $i$  has ever borrowed from formal financial institutions which include scheduled commercial banks, post office, and MFIs and zero for borrowing only from informal sources such as local moneylenders, friends, etc. The "having bank account dummy"  $y_1$  is also a binary variable which takes the value 1 if the adult  $i$  owns a bank account (such as savings, current, fixed deposit, recurring deposit or student account) and zero otherwise.  $x_i$  is a vector of other adult specific covariates, namely, gender (binary variable which takes 1 for male and zero for female), age, age squared, marital status (married dummy), dummy variables for educational attainment levels (education dummies 1–11), livelihood group dummies (livelihood group dummies 1–6), a dummy for poverty (poverty dummy) which is 1 if the adult is below the poverty line and zero otherwise, and a dummy for adults residing in rural areas (rural dummy).

A brief explanation for considering these covariates is in order. If it is relatively easier for male adults to borrow from a formal source than female adults then we expect gender to have positive association with likelihood of formal borrowing. Because we expect borrowing needs to vary nonlinearly with age, we control for both age and its square. Since marital status of an adult might matter for formal borrowing, we control for it, but we cannot predict the sign of its coefficient a priori. We also consider indicator variables for educational attainment levels as covariates because adults having higher levels of education are more likely to borrow from formal sources. We consider 11 educational attainment levels, details of which are given in the Appendix (p 54). We include livelihood group dummies as covariates because existing empirical evidence suggests differential access to formal finance for different occupational categories (Kamath et al 2010). We consider seven livelihood categories, details of which are given in the appendix. For educational and livelihood categories we consider illiterate with no formal education (category 1) and retired and others (category 1) as the omitted (base case) category respectively. We interpret the coefficients of the remaining categories as changes in relation to the base case. We expect that the poor are less likely to borrow from a formal source. We expect those residing in rural India to be less likely to borrow from a

formal source due to several barriers to access to finance such as distance from the nearest branch of a bank.  $\mu_s$  captures state-specific factors affecting borrowing from formal sources (state-fixed effect).

In equation 3 both  $y_1$  and  $y_2$  are endogenous because unobserved random determinants of formal borrowing and ownership of bank account might be correlated (Angrist and Pischke 2009: 199). As a result, ordinary least square (OLS) estimation results are biased. However, the endogenous nature of the variable  $y_1$  can be safely "ignored in formulating the log-likelihood function" (Greene 2005: 715). Examining determinants of bank account ownership ( $y_1$ ) is not the focus of this paper for two reasons. First, giving universal access to a bank account is the prime objective of financial inclusion drive anyway. Second, determinants of account ownership have been studied in great detail by Allen et al (2012). Hence, we report bivariate probit estimation results of equation 3 alone in this paper. Finally, in order to test robustness of our results, we estimate equation 3 using OLS and probit as well.

### Data Source

We use micro-data available from the Financial Inclusion Insights Tracker Survey, *Bharat Ek Khoj*, conducted by Inter-Media. The main objective of the survey was to understand the financial behaviour of Indian citizens and identify barriers to access and usage of banking services and mobile money in India. The survey was conducted between 15 October 2013 and 8 January 2014 with a nationally representative sample of 45,024 persons (aged 15 years and above) spread across 22 states in India. This is the main strength of the data set. Out of these 22 states, the North East cluster was treated as one state comprising of Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Sikkim and Tripura.

A stratified clustered random sampling technique was used to select respondents for the survey. Within each state, the population was divided into town (urban) and village (rural) classes based on the size of the population available from Census 2011. Primary sampling units (PSU), that is, sample villages and towns within each class were selected using probability proportional to population size (PPS) method. Electoral rolls were mostly used to select the starting households, the secondary sampling units (SSU) in a selected town or a village. The ultimate sampling units (USU), namely, the adults within a particular household were chosen using Kish Grid method. After the first interview, every fifth household in towns and every third household in rural areas were selected as subsequent households following the right-hand rule method. Thus, a total sample of 45,024 respondents was divided among the states in proportion to the size of the adult population in respective states.

### Results

The overall demographic composition of the sample is as follows: among the respondents, 49% were female and 57% of the respondents were in the age-group 20–45 years. Respondents in this age-group are expected to be actively involved in conducting financial transactions.

Table 1 presents the descriptive statistics of the dimensions used in computing the FII at the state level. We find considerable variation across states in terms of all the three dimensions. The proportion of adults having access to bank account is the highest (71.25%) in Goa and the lowest (30%) in the North East cluster, and the average across states is 48%.<sup>6</sup> The proportion of adults who ever used bank account to make financial transaction is the highest (68.87%) in Goa as well and the lowest (27.40%) in the North East cluster, and the state-level average is 45%. The proportion of adults having access to a bank branch or an ATM or an Eko counter or other financial service providers within one kilometre distance is the highest (55.38%) in Goa and the lowest (6.92%) in Himachal Pradesh, and the state-level average is 21%.

### Status of Financial Inclusion across States

Table 2 presents the values of FII for the respective states for 2013. We compute FII for 2013 for three values of  $r$ , the “inclusion sensitivity parameter” (0.25, 0.5, and 0.75). As per theory, we find that FII decreases as the value of the inclusion sensitivity parameter increases. Clearly, Goa outperforms in terms of financial inclusion and is ranked first. This result is in line with

**Table 1: State-level Summary Statistics of the FII Indicators**

Variables	N	Mean	Median	SD	Min	Max
Respondents having access to bank account (%)	22	48.26	48.78	11.60	30.00	71.25
Respondents who ever used bank account (%)	22	45.11	46.59	10.63	27.40	68.87
Respondents having access to a bank branch/ATM/Eko counter/ others within 1 km (%)	22	21.00	20.65	11.55	6.92	55.38

All figures are weighted using suitable weights available from the data set. These figures are for 2013.

Source: Author's own calculations from Financial Inclusion Insights Tracker Survey.

**Table 2: Statewise Financial Inclusion Index (FII)**

	FII ( $r=0.25$ )	FII ( $r=0.5$ )	FII ( $r=0.75$ )	Rank
Goa	1.000	1.000	1.000	1
Delhi	0.924	0.854	0.790	2
Maharashtra	0.869	0.756	0.658	3
Tamil Nadu	0.863	0.752	0.661	4
Andhra Pradesh	0.865	0.749	0.650	5
Kerala	0.860	0.746	0.652	6
Uttarakhand	0.859	0.738	0.634	7
Punjab	0.837	0.705	0.596	8
Karnataka	0.809	0.655	0.532	9
Uttar Pradesh	0.793	0.636	0.515	10
Haryana	0.789	0.624	0.495	11
Gujarat	0.761	0.579	0.441	12
Himachal Pradesh	0.608	0.555	0.507	13
West Bengal	0.729	0.532	0.388	14
Madhya Pradesh	0.692	0.479	0.332	15
Rajasthan	0.676	0.459	0.312	16
Jharkhand	0.672	0.454	0.309	17
Chhattisgarh	0.603	0.382	0.250	18
Odisha	0.550	0.303	0.167	19
Bihar	0.544	0.298	0.165	20
Assam	0.522	0.273	0.143	21
North East cluster	0.167	0.083	0.042	22
India	0.776	0.604	0.472	

North East Cluster consists of Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Sikkim, and Tripura. FII is computed for 2013.

Source: Author's own calculations.

evidence available from other sources (Sequeira 2014). Delhi and Maharashtra rank second and third respectively. Odisha, Bihar, Assam and the North East cluster are the poor-performing states in India in terms of financial inclusion. Uttar Pradesh, Haryana and Gujarat secure 10th, 11th and 12th positions respectively in the overall ranking of the 22 states.

Table 3 shows the ranking of the states based on Inclusix, a supply-side information based index of financial inclusion developed by CRISIL (2015), as well as our demand-side information-based index FII for 2013. We do the comparison only between FII based on  $r = 0.5$  and Inclusix index. Needless to mention that the results will remain the same even if we do the comparison for other values of  $r$  because the relative ranking of the states based on FII remains the same for different values of  $r$ .

Clearly, the two rankings are not in perfect agreement with each other. The Spearman's rank correlation coefficient between the two rankings is 0.8. Goa, the top performing state in terms of FII, ranks third in terms of Inclusix (2013). Kerala which comes first in the ranking based on Inclusix ranks sixth in the ranking based on FII. We find a few more intriguing results from this comparative exercise. First, Maharashtra which performs well in terms of FII (third rank) performs badly (rank 12) in terms of Inclusix. Second, Andhra Pradesh, Punjab, Haryana, and Madhya Pradesh rank the same in both the rankings. Third, Bihar, Assam and the North East cluster are laggards in terms of financial inclusion in both the rankings.

### Access to Credit and Savings

Existing empirical evidence suggests access to various financial instruments differs between the poor and the non-poor. Therefore, we make an attempt to examine the differential access to

**Table 3: Comparison between FII and Inclusix**

	FII ( $r=0.5$ )	Inclusix (2013)	Rank as per FII	Rank as per Inclusix (2013)
Goa	1.000	76.1	1	3
Delhi	0.854	67	2	6
Maharashtra	0.756	49	3	12
Tamil Nadu	0.752	79.2	4	2
Andhra Pradesh	0.749	69.2	5	5
Kerala	0.746	88.9	6	1
Uttarakhand	0.738	59.3	7	9
Punjab	0.705	59.7	8	8
Karnataka	0.655	74.4	9	4
Uttar Pradesh	0.636	40.1	10	16
Haryana	0.624	53.2	11	11
Gujarat	0.579	46	12	14
Himachal Pradesh	0.555	60.5	13	7
West Bengal	0.532	46.6	14	13
Madhya Pradesh	0.479	40.5	15	15
Rajasthan	0.459	39.4	16	19
Jharkhand	0.454	39.4	17	18
Chhattisgarh	0.382	35.4	18	21
Odisha	0.303	55.2	19	10
Bihar	0.298	30.2	20	22
Assam	0.273	39.6	21	17
North East cluster	0.083	38.6	22	20
India	0.604	50.1		

North East Cluster consists of Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Sikkim, and Tripura. For Inclusix (2013) the average value of the index across these six states is used. Source: Author's own calculation and CRISIL (2015). For ranking based on Inclusix (2013) we consider only the 22 states studied in this paper.

credit and savings instruments between them. Table 4 presents the main sources of credit and the fraction of adults in each category who borrow from the respective sources across states.<sup>7</sup>

We find that the fraction of poor borrowers who have borrowed from a bank is the highest (76.45%) in Maharashtra, followed by Kerala and Gujarat. Interestingly, we find that

**Table 4: Statewise Proportion of Poor and Non-poor Who Borrowed from Different Sources**

States	Sources of Borrowing (%)											
	Poor					Non-poor						
	Bank	MFI	Savings Group	Moneylender	Friends/ Relatives, etc	Gold	Bank	MFI	Savings Group	Moneylender	Friends/ Relatives, etc	Gold
Delhi	13.20	0.00	0.00	11.74	37.68	0.00	76.05	0.00	7.11	0.00	10.15	6.68
Himachal Pradesh	2.01	0.00	0.56	0.00	96.13	0.00	0.00	0.00	0.00	0.00	100.00	0.00
Haryana	34.28	0.96	5.03	15.71	38.82	0.00	60.95	0.00	4.18	5.45	34.23	0.00
Punjab	6.31	0.00	0.00	4.11	88.57	0.48	4.72	0.00	0.00	1.89	92.18	0.00
Uttar Pradesh	1.62	0.11	0.17	1.19	93.31	0.40	2.11	0.00	0.00	0.00	91.33	1.23
Uttarakhand	1.18	0.00	0.00	0.41	97.33	0.19	1.85	0.00	0.00	0.00	97.18	0.86
Assam	19.72	24.91	13.69	37.78	2.01	0.00	46.30	14.93	0.00	34.85	8.64	0.00
North East cluster	48.44	25.10	0.00	22.15	0.00	0.00	55.71	0.00	0.00	44.29	0.00	0.00
Bihar	8.52	1.99	3.65	47.18	37.89	0.05	18.44	2.06	0.00	29.70	53.70	0.00
Jharkhand	12.40	5.99	0.62	33.25	23.48	0.00	20.99	4.21	5.84	3.59	31.49	6.97
Odisha	10.80	4.01	30.51	12.36	16.98	0.00	39.98	7.29	29.97	18.04	11.79	0.00
West Bengal	18.36	7.79	1.88	15.36	40.46	0.00	39.32	1.20	2.77	10.41	35.53	0.00
Rajasthan	46.95	1.79	2.63	17.08	27.73	0.00	76.80	0.00	0.00	14.98	12.80	0.00
Gujarat	52.61	2.01	3.99	17.57	12.10	1.49	75.77	4.37	0.00	10.78	3.18	2.60
Madhya Pradesh	24.49	1.15	6.08	47.12	3.42	0.00	50.75	8.95	9.42	9.65	5.64	0.00
Maharashtra	76.45	2.47	8.86	5.11	1.75	0.60	84.12	3.27	3.10	4.14	2.37	0.00
Chhattisgarh	5.50	0.00	39.30	23.58	30.97	0.00	33.61	0.00	20.03	0.00	42.62	0.00
Goa	0.00	0.00	0.00	100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00
Andhra Pradesh	11.92	0.78	11.37	11.51	64.52	0.74	11.87	0.69	4.60	6.62	72.69	2.32
Karnataka	40.61	1.34	20.38	11.88	10.26	4.30	37.62	0.99	5.14	3.75	51.31	1.38
Kerala	55.15	2.06	18.28	9.36	5.92	11.04	59.95	1.55	10.42	9.54	8.89	5.47
Tamil Nadu	8.32	3.67	8.45	55.08	11.38	3.17	19.95	6.73	7.37	47.02	13.26	7.27
All India	8.82	1.19	3.98	12.32	68.54	0.82	19.26	1.92	3.61	11.20	59.17	2.46

North East Cluster consists of Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Sikkim, and Tripura. For each category in a particular state, the base for percentage computation is the total number of adult respondents who had taken a loan. The sum of the percentages across different sources under each category for a particular state does not add up to 100 for two reasons. First, a few infrequently availed sources of credit were dropped for the analysis. Second, an adult can borrow from more than one source.

Source: Author's own calculations.

**Table 5: Statewise Proportion of Poor and Non-poor Who Saved with Different Means**

States	Means for Savings for Future Payments (%)															
	Poor							Non-poor								
	Bank	MFI	Savings Group	Moneylender	PO	CF	At Home	Gold	Bank	MFI	Savings Group	Moneylender	PO	CF	At Home	Gold
Delhi	81.17	0.00	1.16	0.00	1.89	1.66	3.96	4.93	86.57	0.00	2.26	0.00	0.00	0.00	0.00	9.03
Himachal Pradesh	54.70	0.00	0.77	0.00	2.75	0.00	49.47	0.00	67.52	0.00	0.00	0.00	13.83	0.00	28.85	0.00
Haryana	85.80	0.00	4.58	8.01	0.00	0.00	8.86	0.00	94.09	0.00	0.97	0.00	0.00	0.00	3.54	0.00
Punjab	96.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	97.21	0.00	0.00	0.00	0.48	0.00	2.18	0.00
Uttar Pradesh	67.03	0.03	0.25	0.09	0.13	0.05	54.07	0.85	74.82	0.11	0.12	0.00	0.44	0.00	39.92	1.59
Uttarakhand	59.95	0.00	1.02	0.00	0.00	0.00	41.98	1.34	73.76	0.00	0.00	0.87	0.00	0.00	29.46	0.00
Assam	70.91	0.00	8.60	0.00	20.53	0.00	0.00	0.00	97.99	3.58	0.00	0.00	3.56	0.00	0.00	0.00
North East cluster	73.15	3.77	0.00	0.00	0.00	24.96	0.00	4.22	49.75	0.00	9.11	3.34	5.63	68.83	3.34	6.67
Bihar	71.78	0.00	6.66	0.57	1.11	0.00	3.90	0.00	86.12	0.00	1.51	0.00	2.57	0.00	4.14	0.00
Jharkhand	57.69	1.46	1.95	0.73	0.98	1.17	19.74	0.00	64.03	0.00	3.06	0.00	2.65	0.00	5.00	0.00
Odisha	66.23	0.14	6.57	0.00	3.24	0.00	26.19	0.00	74.80	0.54	3.36	0.00	2.01	0.88	22.91	0.00
West Bengal	80.77	0.00	2.66	0.00	7.53	0.84	0.00	0.00	94.25	0.00	0.62	0.00	4.35	0.00	0.00	0.00
Rajasthan	89.77	0.00	0.66	0.00	3.55	0.00	0.77	0.00	89.18	0.00	0.00	0.00	2.39	0.00	0.00	0.00
Gujarat	64.52	2.98	4.09	0.00	5.17	0.00	1.95	6.82	71.68	0.00	0.00	0.00	0.00	0.00	0.00	1.29
Madhya Pradesh	42.72	14.33	0.00	1.98	7.81	0.00	7.99	0.00	80.75	0.00	0.00	0.00	3.21	1.77	0.00	3.36
Maharashtra	77.01	0.54	11.93	0.00	8.03	0.56	0.32	3.79	84.96	1.67	16.13	0.00	10.61	0.62	0.24	21.06
Chhattisgarh	70.14	0.00	27.33	0.00	0.00	3.97	2.19	2.70	91.54	0.00	0.00	0.00	0.00	15.06	1.27	4.63
Goa	76.92	9.91	9.89	0.00	21.61	0.00	0.00	3.26	91.96	8.04	0.00	0.00	68.97	0.00	0.00	0.00
Andhra Pradesh	56.64	0.00	25.52	0.00	6.01	0.00	0.00	8.82	57.09	0.00	20.52	0.00	4.56	6.90	1.95	2.00
Karnataka	60.30	0.00	49.77	0.00	0.00	7.97	0.00	0.00	95.50	0.00	19.48	0.00	0.00	0.00	0.00	0.00
Kerala	24.04	2.29	21.99	0.00	6.52	48.89	0.00	0.00	48.12	0.00	1.42	0.00	22.25	45.31	0.00	0.00
Tamil Nadu	52.68	0.00	2.29	2.11	11.52	7.66	0.00	0.00	41.94	0.31	0.00	1.13	8.11	14.88	0.00	3.22
All India	67.70	0.23	2.27	0.20	1.54	0.50	40.80	0.98	76.61	0.41	3.29	0.13	3.93	3.20	17.33	4.21

North East Cluster consists of Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Sikkim, and Tripura. For each category in a particular state, the base for percentage computation is the total number of adult respondents who had saved money for future. The sum of the percentages across different sources under each category for a particular state does not add up to 100 for two reasons. First, a few infrequently availed sources of credit were dropped for the analysis. Second, an adult can borrow from more than one source.

Source: Author's own calculations.

**Table 6: Determinants of Borrowing from Formal Sources**

	Dependent Variable: Whether Ever Borrowed from a Formal Source			
	(1)	(2)	(3)	(4)
Having bank account dummy	0.1143*** (0.0509)	0.0966** (0.0447)	0.8612*** (0.0977)	0.4955* (0.2561)
Gender	0.0103 (0.0129)	0.0233** (0.0093)	0.1392*** (0.0374)	0.1506*** (0.0337)
Age	0.0085*** (0.0029)	0.0039** (0.0017)	0.0352*** (0.0065)	0.0413*** (0.0094)
Age squared	-0.0001*** (0.0000)	-0.0000** (0.0000)	-0.0003*** (0.0001)	-0.0003*** (0.0001)
Married dummy	0.0310** (0.0142)	0.0110 (0.0075)	0.1900*** (0.0562)	0.1858*** (0.0605)
Education dummy 2	0.0353 (0.0235)	0.0056 (0.0137)	0.0871 (0.1082)	0.1039 (0.1185)
Education dummy 3	0.0983*** (0.0269)	0.0133 (0.0234)	0.1078 (0.1138)	0.1348 (0.1181)
Education dummy 4	0.0446* (0.0221)	0.0159 (0.0132)	0.1476* (0.0783)	0.1694* (0.0895)
Education dummy 5	0.0706** (0.0284)	0.0192 (0.0124)	0.1672*** (0.0618)	0.2089*** (0.0767)
Education dummy 6	0.0831** (0.0387)	0.0138 (0.0152)	0.1207 (0.0795)	0.1933 (0.1196)
Education dummy 7	0.0727* (0.0368)	0.0354 (0.0238)	0.3114*** (0.0845)	0.4194*** (0.1283)
Education dummy 8	0.1531*** (0.0531)	0.0364 (0.0290)	0.3266*** (0.1223)	0.4582** (0.1772)
Education dummy 9	0.0949** (0.0447)	0.0371 (0.0287)	0.3987** (0.1889)	0.5579** (0.2211)
Education dummy 10	0.0537 (0.0375)	0.0229 (0.0166)	0.3012*** (0.0773)	0.4301*** (0.1352)
Education dummy 11	0.0313 (0.0441)	0.0407 (0.0273)	0.5208*** (0.0961)	0.6376*** (0.0969)
Livelihood group 2 dummy	0.0789** (0.0360)	0.0357*** (0.0098)	0.2912*** (0.0877)	0.3226*** (0.0826)
Livelihood group 3 dummy	0.0216** (0.0094)	-0.0254** (0.0092)	-0.0804 (0.0550)	-0.0558 (0.0555)
Livelihood group 4 dummy	0.0611** (0.0251)	-0.0006 (0.0249)	0.0031 (0.1207)	0.0547 (0.1056)
Livelihood group 5 dummy	0.1681*** (0.0544)	0.1005** (0.0406)	0.3159** (0.1258)	0.3664*** (0.1401)
Livelihood group 6 dummy	0.0602*** (0.0130)	0.0210** (0.0085)	0.1419*** (0.0392)	0.1751*** (0.0397)
Poverty dummy	-0.0515** (0.0223)	-0.0158 (0.0167)	-0.0245 (0.0864)	-0.0422 (0.0808)
Rural dummy	-0.0011 (0.0104)	0.0209 (0.0170)	0.1229 (0.0966)	0.1520 (0.0953)
Constant	-0.2015** (0.0891)	0.1418 (0.0910)	-2.4328*** (0.2449)	-2.4539*** (0.2570)
State dummies	No	Yes	Yes	Yes
R <sup>2</sup>	0.1137	0.3133		
Adjusted R <sup>2</sup>	0.1123	0.3112		
Pseudo R <sup>2</sup>	0.381			
Wald test (Ho:rho = 0):Chi2(1)				1.74
Observations	13,708	13,708	13,708	13,708

All regressions equations are estimated at the adult-level. Cluster robust standard errors are in parentheses. Standard errors are clustered at the state-level. \*, \*\* and \*\*\* indicate significance at 10%, 5% and 1% level of significance respectively. Source: Author's own calculations.

none of the poor borrowers in Goa has borrowed from a bank. The proportion of poor adults who have borrowed from a bank is also abysmally low in Uttarakhand, Uttar Pradesh and Himachal Pradesh. Poor borrowers in these states mostly depend on informal sources such as friends and local moneylenders. Our results also indicate that a sizeable fraction (more

than 30%) of poor adults borrow from private moneylenders in Tamil Nadu, Bihar, Madhya Pradesh, Assam, and Jharkhand. At the all-India level, moneylenders, friends and relatives remain an important source of credit (around 80%) for poor borrowers in a majority of the states. Our results suggest that the fraction of non-poor adults who have borrowed from banks is much higher compared to their poor counterparts in most of the states except in Himachal Pradesh, Punjab, Andhra Pradesh and Karnataka.

Table 5 (p 51) tabulates the key savings instruments used by adults and the proportion of adults who use those instruments in each category across the states. The fraction of poor adults who have saved with a bank is the highest (96%) in Punjab and the lowest in Kerala (24%). Our results show that chit fund is a common instrument of savings for many adults (48%) in Kerala. Results also indicate that chit funds are quite popular as a savings instrument even among the non-poor in the North East cluster, Kerala, Tamil Nadu and Chhattishgarh. Saving money at home is risky but a sizeable fraction (more than 40%) of poor savers continues to do so in Uttar Pradesh, Himachal Pradesh and Uttarakhand. However, a non-poor adult is more likely to save with a bank compared to a poor adult saver in most of the states. The other common saving instruments are post office savings and gold. Interestingly, at the all-India level, our results indicate that 40% poor adults save at home and the corresponding figure for the non-poor adults is around 17%.

**Determinants of Formal Borrowing**

From our previous discussion it is evident that not all individuals have equal access to formal finance in India. Hence, we examine the determinants of borrowing from formal sources. A comparison between adults who have borrowed from formal sources and those who borrow only from informal sources is presented in Table 7 (p 53). We present the estimation results of equation 3 in Table 6. OLS estimation results with and without state fixed effects are presented in column 2 and column 1 of Table 6 respectively. Column 3 shows the results of probit estimation without accounting for any endogeneity. Column 4 presents results of bivariate probit estimation. However, for our discussion we focus on bivariate probit estimation results.

We find evidence of gender bias: the coefficient of the gender dummy is positive and statistically significant. Hence, males are more likely to borrow from formal sources than females. The coefficient of the bank account ownership dummy is positive and statistically significant at 10% level of significance. Thus, in marginal terms, keeping other factors constant for an average individual, having a bank account increases likelihood of borrowing from a formal source by 3.2 percentage points. Due to cross-sectional nature of the data, this result should not be interpreted as a causal inference but only as significant correlation. The effect of ownership of bank account on likelihood of formal borrowing might be limited due to dormancy of many of these accounts and other potential determinants. But why would having a bank account matter for formal borrowing? Because opening a bank account is the first stepping stone towards building a

relationship with a bank as a potential lender for future credit needs. Moreover, savings account balance and bank account statement can serve as easy to use metrics of creditworthiness of a new borrower.

**Table 7: Characteristics of Adults Borrowing from Formal Sources**

	All	Borrowed from a Formal Source = 1	Borrowed from a Formal Source = 0	Difference
Gender	0.55	0.72	0.52	0.19***
Age	37.55	43.22	36.76	6.46***
Married dummy	0.81	0.92	0.79	0.13***
Having bank account dummy	0.55	0.89	0.51	0.38***
Education dummy 1	0.27	0.13	0.29	-0.16***
Education dummy 2	0.07	0.06	0.07	-0.01
Education dummy 3	0.05	0.07	0.04	0.03***
Education dummy 4	0.08	0.08	0.08	-0.01
Education dummy 5	0.17	0.18	0.17	0.02***
Education dummy 6	0.16	0.20	0.15	0.06***
Education dummy 7	0.10	0.12	0.10	0.02***
Education dummy 8	0.01	0.02	0.01	0.01***
Education dummy 9	0.01	0.01	0.01	0.01***
Education dummy 10	0.06	0.08	0.05	0.03***
Education dummy 11	0.02	0.03	0.02	0.01**
Livelihood group 1 dummy	0.47	0.25	0.50	-0.24***
Livelihood group 2 dummy	0.15	0.25	0.13	0.12***
Livelihood group 3 dummy	0.23	0.21	0.23	-0.02
Livelihood group 4 dummy	0.04	0.08	0.04	0.04***
Livelihood group 5 dummy	0.02	0.05	0.01	0.03***
Livelihood group 6 dummy	0.10	0.16	0.09	0.07***
Poverty dummy	0.80	0.65	0.82	-0.17***
Rural dummy	0.72	0.67	0.73	-0.06**
N	13,751	1,675	12,076	

For all non-binary variables difference in mean test is used. For binary variables, chi-square test of difference in proportions is used. \*\*\* significant at 1%; \*\* significant at 5%.

Source: Author's own calculations.

We find evidence of non-linear relationship between the likelihood of formal borrowing and age: the former increases with age and then falls. The coefficient of the indicator variable for marital status is positive and statistically significant at 1% level of significance—this implies being married increases likelihood of borrowing from formal sources. We find that higher educational attainment levels positively affect the likelihood of formal borrowing as most of the coefficients of the dummies indicating educational attainment levels are positive and statistically significant at 5% level of significance. For example, the dummy for educational attainment category 10 (graduates) is positive and statistically significant. Hence, holding other things constant, an average individual with a graduate degree is more likely to borrow from a formal source than one without any formal education (base category). Again, this is not a causal inference because an individual can also borrow from formal sources to invest in higher education.

Our results suggest that farmers (category 2), professionals (category 5), and self-employed individuals (category 6) are more likely to borrow from formal sources than retired adults, adults engaged in moneylending (base category) and working as casual labourers, etc. This might be true as banks have lending commitments to agriculturalists under PSL mandate given by the RBI. The coefficient of the poverty dummy is negative as

expected but it is not statistically significant. The coefficient of the rural dummy is positive which is counter-intuitive but it is also not statistically significant. These results might be true due to rapid penetration of microfinance as a tool for providing poor households access to formal finance in rural India.

## Conclusions

We study the status of financial inclusion across 22 states in India from the demand-side perspective of financial inclusion. Using micro-level data, we compute a comprehensive index of financial inclusion. Based on the index we rank the states and find Goa's performance to be the best. Odisha, Bihar and the north-eastern states are lagging behind in terms of financial inclusion. Hence, the need of the hour is to expedite the process of financial inclusion in these states, learn lessons from Goa's experience, and implement them. We argue that merely giving access to financial services may not yield satisfactory results because it does not necessarily translate into actual usage of these services. This is seen through the less than perfect agreement between rankings of states done on the basis of a supply-side information based index and the demand-side information based index presented here.

Our results suggest that there is an urgent need to broaden access to formal finance for the poor in general and more so in states like Uttarakhand, Uttar Pradesh and Himachal Pradesh. We find that even after more than four decades since nationalisation of banks, people in many states continue to save in chit funds and at home in spite of the risks. This can be partly explained by the non-availability of suitable savings products. Thus, there is a need to bring the financial services such as savings at the doorstep of the poor even in remotest parts of the country. The recently issued in principle licences by the RBI to set up small finance banks and payment banks is a commendable step towards the promotion of financial inclusion in India. Our analysis of determinants of formal borrowing shows that ownership of bank account matters. What policy implication does this result have? Clearly, the Pradhan Mantri Jan-Dhan Yojana, which aims to give universal access to bank account, if successful, can pave the way for better access to institutional finance in future. For this to happen, those bank accounts must remain active through regular financial transactions made using those accounts. Finally, our results suggest that casual labourers working in the non-farm sector lack access to formal finance. Hence, appropriate policies must be undertaken to bring them under the purview of institutional finance. One of the factors that cause low demand for financial services is low level of financial education of adults in India. Hence setting up of Financial Literacy Centre (FLC) is the right strategy adopted by the government to impart necessary financial education among the financially excluded segments of the country.

The analysis of financial inclusion in this article has some limitations. First, the FII tracker survey enumerated individual respondents and hence it did not capture the financial behaviour of small and medium enterprises who are also equally important stakeholders in the process of financial inclusion. Globally it has been found that smaller firms face greater



barriers to access to finance (Beck et al 2009). Second, the FIN index we compute assigns equal weights to all the three dimensions and hence fails to account for unequal weight emanating from different policy priorities. Third, our index is obtained through linear averaging of the indices of three constituent dimensions and hence it implicitly assumes perfect substitutability among the indices which might be questioned. An alternative way of computing such an index would be to

use the Displaced Ideal (DI) method (Zeleny 1974 as cited in Nathan et al 2008).

There is a huge scope for further research on financial inclusion in India. One of the main thrusts of future research would be to understand the financial needs of the poor in India and design suitable financial products tailored to their needs. The other area of research would be to establish causal relationship between the potential determinants and actual usage of financial services.

## NOTES

- Poor (non-poor) if defined as a person living below (above) \$2.50/day (purchasing power parity (PPP) poverty line as classified by the Grameen Foundation's Progress Out of Poverty Index).
- Inclusix, 2013 also combined districtwise data on MFIs as available from Microfinance Institutions Network (MFIN) under branch penetration and credit penetration.
- The following description borrows heavily from Chakravarty and Pal (2013).
- All results are weighted using suitable weights available in the data set.
- Progress Out of Poverty Index (PPI) is a poverty assessment tool used to compute the likelihood that a household lives below the poverty line defined at \$2.50/day.
- This state-level average figure (48%) is at the adult-level and hence it does not contradict the household-level average bank account access figure (58.7%) available from Census 2011 and cited previously. This is because not all adults within a financially included household will have access to a bank account.
- The sum of the fractions across different sources under each category for a particular state does not add up to 100 for two reasons. First, a few infrequently availed sources of credit were dropped for the analysis. Second, an adult can borrow from more than one source.

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## Appendix: Educational Attainment Categories

- Illiterate with no formal education
- Literate without formal education
- Below primary
- Primary
- Middle (up to eighth standard)
- Secondary
- Higher secondary
- Non-technical diploma or certificate holder
- Technical diploma or certificate holder

- Graduate
- Postgraduate

## Livelihood Categories

Category 1: retired and others such as money-lender, landlord or landlady, student, housewife; Category 2: farmer; Category 3: labourer which includes farm worker, cleaner or house help, factory employee, sales person in store, and manual labour of any kind; Category 4: salaried individuals

such as public or health service worker (non-professional), clerk, waiter/cook, driver, including personal driver, taxi, rickshaw and autorickshaw driver, secretary, manager, watchman, messenger/courier, policeman, conductor; Category 5: professional which consists of professional, that is, doctor, teacher, nurse, etc; Category 6: self-employed which includes carpenter/mason, mechanic, electrician, tailor, shop owner, street vendor, hawker, business owner, salonist, etc.